



Evaluation of Physiotherapist and Podiatrist Independent Prescribing, Mixing of Medicines and Prescribing of Controlled Drugs

Department of Health Policy Research Programme Project PR-R7-0513-11002

Nicola Carey¹
Karen Stenner¹
Judith Edwards¹
Heather Gage¹
Peter Williams¹
Simon Otter²
Ann Moore²
Molly Courtenay³
Jane Brown⁴
Sue Westwood¹

¹University of Surrey

²University of Brighton

³University of Cardiff

⁴Greater Manchester Health and Social Care Partnership

Submitted June 2017

Acknowledgements

We would like to thank the following contributors:

Dr Freda Mold (research co-ordinator, literature search and review)
Dr Kerrie Margrove (research co-ordinator)
Emma Konstantara (support for data collection at case sites, research co-ordinator)
Clareece Kerby (data entry)
Dr Elisabetta Bersellini (support for data collection)
Elaine Mairis (support for data collection)
Dr Morro Touray (analysis of data for health economics)
Dr Jake Jordan (support for health economics)
Dr Mark Joy (analysis of audio- recorded consultation)
Dr Tara Kidd (proof reading)

We would also like to thank the physiotherapist and podiatrist independent prescribers, team members, HEI non-medical prescribing programme leads, the raters who helped assess the audio-recorded consultations and the patients and stakeholder participants who took part in our study.

Professor Jonathan Drennan gave us permission to use some questions from a previous survey of nurse and midwife prescribers in Ireland.

The team are also sincerely grateful for the advice and contribution of the Project Advisory Group (PAG) and Patient Public Involvement Group (PPI) (see **Appendix 1**).

This is an independent report commissioned and funded by the Department of Health. The views expressed are not necessarily those of the Department.

Contents

Acknowledgements	1
Contents.....	2
List of Tables.....	5
List of Figures	7
Abbreviations	8
Glossary of terms.....	10
1 Executive summary.....	12
1.1 Summary of Key Points.....	12
1.2 Background.....	14
1.3 Study aim and objectives	14
1.4 Study design and methods.....	14
1.5 Main findings.....	15
1.5.1 Phase One.....	15
1.5.2 Phase Two.....	15
1.5.3 Phase Three.....	15
1.5 Conclusion.....	17
2 Introduction	18
2.1 Study aim and objectives	18
2.1.1 Study aim.....	18
2.1.2 Study objectives.....	18
2.2 Background to the study	18
3 Methods.....	22
3.1 Overview of study design and research plan.....	22
3.2 Phase 1 (Macro level) - Literature Review	22
3.2.1 Aim.....	22
3.2.2 Objectives.....	22
3.2.3 Search strategy.....	22
3.2.4 Search procedure.....	23
3.3 Phase 2 (Meso level): National Survey of trainee PP-IP and analysis of key documents.....	24
3.3.1 Introduction	24
3.3.2 Aim.....	24
3.3.3 Objectives.....	24
3.3.4 Questionnaire development.....	24
3.3.5 Pilot.....	26
3.3.6 Participant recruitment.....	26
3.3.7 Data collection and analysis	27
3.3.8 Documentary analysis.....	28
3.4 Phase 3: (Micro level) – Comparative Case Study (n=14 sites)	29
3.4.1 Introduction	29
3.4.2 Aim.....	29
3.4.3 Objectives.....	29
3.4.4 Recruitment of case study sites	30
3.4.5 Observations.....	31
3.4.6 Work Sampling.....	32

3.4.7 Patient questionnaire.....	33
3.4.8 Semi-structured Interviews.....	37
3.4.9 Audio recordings.....	38
3.4.10 Patient record audit	40
3.4.11 Prescription audit	42
3.5 Economic analysis	43
3.6 Triangulation	45
3.7 Research ethics.....	45
3.8 Patient and Public Involvement group (PPI).....	46
4. Results from Phase 1 Literature Review	47
4.1 Review findings: Overview.....	47
4.2 Physiotherapy literature	48
4.2.1 Extent of prescribing, involvement in administration or medicines advice	48
4.2.2 Knowledge levels and training needs relating to role in medicines management or advice	52
4.2.3 Attitudes towards physiotherapist prescribing or extended medicines role	54
4.2.4 Care outcomes and costs.....	57
4.3 Podiatry literature	58
4.4 Summary	59
5 Results from Phase 2 National Survey of trainee PP-IP	97
5.1 Questionnaire 1: Physiotherapist & Podiatrist trainee independent prescribers ...	97
5.1.1 Response rate	97
5.1.2 Sample demographics.....	97
5.1.3 Areas of service provision	99
5.1.4 Medicines management activity	105
5.1.5 Therapy areas where treatment is provided.....	108
5.1.6 Barriers and facilitators to IP training	112
5.2 Questionnaire 2: PP-IP follow-up post-training	116
5.2.1 Sample demographics.....	116
5.2.2 Preparation and support for IP training.....	119
5.2.3 Clinical governance arrangements	121
5.2.4 Intended use of prescribing.....	123
5.2.5 Expected outcomes of IP	127
6 Results from Phase 3 Comparative Case Studies.....	129
6.1 Overview of case sites	129
6.1.1 Podiatry sites	130
6.1.2 Physiotherapy sites.....	130
6.2 Observations	131
6.2.1 Sample profile	132
6.2.2 Medicines Management Activity.....	137
6.3 Work sampling	141
6.3.1 Results	141
6.3.2 Analysis of work activities	141
6.3.3 Differences between Physiotherapy and Podiatry.....	142
6.4 Patient Questionnaire.....	146
6.4.1 Patient Questionnaire 1.....	146
6.4.2 Patient Questionnaire 2.....	155
6.5 Semi-structured interviews	160
6.5.1 Participant profiles.....	161
6.5.2 Podiatry.....	161
6.5.3 Physiotherapy	170
6.5.4 Summary and comments	181

6.6 Audio Recorded Consultations Assessment	182
6.6.1 Data profile.....	182
6.6.2 Physiotherapy consultation assessment results.....	182
6.6.3 Podiatry consultation assessment results.....	188
6.7 Patient record audit	194
6.7.1 Source documents and demographics.....	194
6.7.2 Medication.....	198
6.7.3 Referrals.....	198
6.7.4 Quality of GP letters.....	199
6.7.5 Unintended consequences.....	200
6.8 Prescription audit	201
6.8.1 Sample profile.....	201
6.8.2 Results.....	201
7 Economic analysis	203
7.1 Patient level care delivery.....	203
7.2 Training costs and benefits.....	209
7.3 Summary.....	209
8 Discussion	212
9 Study strengths and limitations	231
9.1 Phase 1: Literature review.....	231
9.2 Phase 2: National Survey of trainee PP-IP and analysis of key documents.....	231
9.3 Phase 3: Comparative Case Study.....	231
10 Further Research	234
11 Recommendations	235
12 Conclusions	238
References	239
Appendix 1: Project Advisory groups' members	254
Appendix 2: Literature review – additional information	256
Appendix 3: Trainee PP-IP Questionnaires	260
Appendix 4: Observation diaries	261
Appendix 5: Work sampling tool	266
Appendix 6: Patient Questionnaires	267
Appendix 7: Interview schedules	268
Appendix 8: Audio recording: Consultation assessment tool	274
Appendix 9: Patient record audit tool	279
Appendix 10: Prescription audit tool	280
Appendix 11: Case site matched pairs	281
Appendix 12: Case site: Site availability for observations of clinical practice	300
Appendix 13: Dissemination	302

List of Tables

Table 3.1 Sources of data for the economic analysis	44
Table 4.1 Summary of empirical papers and/or systematic reviews (n=45, physiotherapy n=40, podiatry n=5)	61
Table 4.2 Commentary papers (n=43, physiotherapy n=34, podiatry n=9)	86
Table 5.1 Physiotherapist and Podiatrist IP Questionnaire 1: Sample demographics.....	98
Table 5.2 Physiotherapist and Podiatrist IP Questionnaire 1: Service Provision	100
Table 5.3 Dominant type of service provided by physiotherapists.....	102
Table 5.4 All types of services provided by physiotherapists (n=56).....	103
Table 5.5 Care settings worked in by podiatrists.....	104
Table 5.6 Services provided by podiatrists	104
Table 5.7 Therapy areas in which physiotherapists and podiatrists currently provide treatment and intend to independently prescribe medication.....	109
Table 5.8 Treatment/therapy areas used before IP training by physiotherapists within clinical specialties.....	110
Table 5.9 Main therapy areas used before IP training by podiatrists within clinical specialties.....	111
Table 5.10 Prior training undertaken by PP-IPs	114
Table 5.11 Sources of funding and DMP for participants undertaking IP training	115
Table 5.12 Physiotherapist and Podiatrist IP Questionnaire 2: Sample demographics.....	116
Table 5.13 PP-IP Questionnaire 2 Service Provision	118
Table 5.14 Extent to which participants feel prepared for prescribing practice.	119
Table 5.15 Extent to which the prescribing programme met stated learning outcomes or personal learning needs.....	120
Table 5.16 Preparation and support during IP training	120
Table 5.17 Extent to which IP training prepared physiotherapists and podiatrists in prescribing competency areas.....	121
Table 5.18 NMP clinical governance systems.....	122
Table 5.19 Numbers of respondents reporting governance systems in different care settings	123
Table 5.20 Intended use of IP by physiotherapists and podiatrists following training	124
Table 5.21 Do you intend to prescribe controlled drugs?	125
Table 5.22 Comparison of treatment management areas used by physiotherapists and podiatrists at the beginning and end of IP training.....	126
Table 5.23 Anticipated benefits of independent prescribing	128
Table 6.1 Characteristics of case study sites.....	129
Table 6.2 Data collected at each case site.....	131
Table 6.3 Case site consultations: service type, consultation mode, referral source and type of consultation	133
Table 6.4 Colleague discussions and referrals	134
Table 6.5 Review arrangements.....	135
Table 6.6 Medicine management activity observed within physiotherapy case sites.....	138

Table 6.7 Type of medication by method of medicines management activity in Physiotherapy sites.....	138
Table 6.8 Information provided to patients about medication during Physiotherapy consultations	139
Table 6.9 Medicine management activity observed within Podiatry case sites ...	139
Table 6.10 Type of medication by method of medicines management activity in Podiatry sites.....	140
Table 6.11 Information provided to patients about medication during Podiatry consultations	140
Table 6.12 Main grouped work activities performed by physiotherapist and podiatrist prescribers and non-prescribers.....	141
Table 6.13 Work activities performed by physiotherapist and podiatrist prescribers and non-prescribers.....	143
Table 6.14 Demographic details: Patient Questionnaire 1- whole group (n=315)	147
Table 6.15 Patient views and experience of satisfaction with care received from physiotherapist or podiatrist	149
Table 6.16 Patient views and experience of medicines management advice and information provided by physiotherapist or podiatrist	152
Table 6.17 Patient Quality of life EQ5D dimension score percentages by prescribing group	154
Table 6.18 Participant demographics - Patient Questionnaire 2- whole group ..	156
Table 6.19 EQ5D index scores baseline and follow-up	160
Table 6.20 Case site interview data.....	161
Table 6.21 Physiotherapy independent prescriber consultation assessments....	184
Table 6.22 Physiotherapy non-prescriber consultation assessments.....	186
Table 6.23 Podiatry independent prescriber consultation assessments.....	190
Table 6.24 Podiatry non-prescriber consultation assessments.....	192
Table 6.25 Patient record Audit: by profession & prescriber/non-prescriber	196
Table 6.26 Assessment of Prescriptions	203
Table 7.1 Comparison of independent prescribers and non-prescribers, by profession, on variables used in the cost analysis.....	204
Table 7.2 Comparison of consultation costs IP v NP, by professional group	205
Table 7.3 Discussion with colleagues about patient.....	206
Table 7.4 Number and type of tests by profession and prescriber status	207
Table 7.5 Consequences – Satisfaction after the consultation; Baseline health status (EQ-5D-5L) with changes over 2 months - comparison of IP v NP, by professional group.....	208
Table 7.6 Stated reasons for undertaking IP training	211
Table 11.1: Recommendations for stakeholder groups	235
Table A2.1 Inclusion and exclusion criteria.....	259

List of Figures

Figure 2.1 Models of medicines supply, administration and prescribing for Physiotherapy and Podiatry the United Kingdom	21
Figure 5.1 PP-IP questionnaire 1: types of services provided (n=85)	101
Figure 5.2 Methods used to prescribe, administer or supply medicines for patients by all participants prior to undertaking IP programme (n=85)	105
Figure 5.3 Number of items PP-IPs anticipated that they would independently prescribe in a typical week	106
Figure 5.4 Methods used by Physiotherapists to supply, administer or prescribe medicines prior to training as an independent prescriber (n=53)	107
Figure 5.5 Methods used by Podiatrists to supply, administer or prescribe medicines prior to training as an independent prescriber (n=28)	108
Figure 5.6 Main therapy areas in which Physiotherapists provide treatment and intend to prescribe (IP) (n=56)	110
Figure 5.7 Main therapy areas in which Podiatrists provide treatment and intend to prescribe (IP) (n=29)	111
Figure 5.8 Reasons given by physiotherapists and podiatrists for undertaking IP	113
Figure 6.1 Podiatrist: Number of time activity was recorded in 95-minute observation period	144
Figure 6.2 Physiotherapists: Number of time activity was recorded in 95-minute observation period	145
Figure 6.3 Patients (%) reporting problems in the 5 quality of life domains	155
Figure 6.4 Methods used by patients to obtain medication recommended during consultation with physiotherapist or podiatrist	157
Figure 6.5 Patients referred by physiotherapist or podiatrist for diagnostic tests	158
Figure 6.6 Number of subsequent visits for treatment not planned in initial consultation	159
Figure A2.1 Literature review - sample search string	257
Figure A2.2 PP-IP Literature review PRISMA flow chart	258

Abbreviations

A&E	Accident and Emergency
ADR	Adverse Drug Reaction
AfC	Agenda for Change
AHP	Allied Health Professional
APA	Australian Physiotherapy Association
AoS	Advanced scope of practice
ASoPT	Advanced Scope of Physiotherapy
BMI	Body Mass Index
BNF	British National Formulary
CAT	Computerised tomography
CMP	Clinical Management Plan
CNS	Central Nervous System
COPD	Chronic Obstructive Pulmonary Disease
CPD	Continuing Professional Development
CSP	Chartered Society of Physiotherapy
DMP	Designated Medical Practitioner
DOB	Date of Birth
ED	Emergency Department
ENP	Emergency Nurse Practitioner
ESP	Extended scope of practice
EQ5-D	EuroQol 5-D
GP	General Practitioner
GSL	General Sales List
HCPC	Health and Care Professions Council
HEI	Higher Education Institute
HrQoL	Health related quality of life
IMATTS	Intermediate Musculoskeletal Assessment Treatment Team
IP	Independent prescribing
MCATTS	Musculoskeletal Clinical Assessment and Treatment Service
MMA	Medicines Management Activities
MRI	Magnetic Resonance Imaging
MSK	Musculoskeletal
NHMRC	The National Health and Medical Research Council
NHS	National Health Service
NIHR	National Institute of Health Research
NPC	National Prescribing Centre
NISP	Nurse Independent Supplementary Prescriber
NMC	Nursing & Midwifery Council
NMP	Non-medical Prescribing
NP	Non-prescriber

NSAID	Non-steroidal anti-inflammatory drug
NSW	New South Wales
NSWPRB	NSW Physiotherapists Registration Board
OOC	Orthopaedic outpatient clinic
OOS	Orthopaedic outpatient setting
OSS	Orthopaedic Screening Service
OTC	Over the counter
PAG	Project Advisory Group
PC	Primary care
PCC	Primary care centre
PGD	Patient Group Direction
PO	Podiatrist
POM	Prescription only medicine
PP	Physiotherapist & Podiatrist
PPI	Patient & Public Involvement
PP-IP	Physiotherapist & Podiatrist Independent Prescriber
PSD	Patient Specific Direction
PP-SP	Physiotherapist & Podiatrist Supplementary Prescriber
PT	Physiotherapist
QALYs	Quality adjusted life years
NICE	National Institute of Clinical Excellence
NISP	Nurse Independent Supplementary Prescriber
NP-PP	Non-prescribing Physiotherapist & Podiatrist
RCT	Randomised controlled trial
R&D	Research & Development
SDEP	Systematic and detailed examination in practice
SHA	Strategic Health Authority
SHO	Senior House Officer
SO	Standing Order
SP	Supplementary Prescribing
STI	Soft tissue injury
STROBE	Strengthening the Reporting of Observational studies in Epidemiology
UK	United Kingdom
USA	United States of America
VAS	Visual Analogue Score
WOMAC	Western Ontario McMaster University

Glossary of terms

Administration	To give a medicine either by introduction into the body, whether by direct contact with the body or not (e.g. orally or by injection), or by external application, e.g. application of an impregnated dressing ¹ .
Advice	The act of giving information, opinion, or recommendation for further intervention or actions to service users pertaining to aspects of the condition for which they are seeking intervention ² . This may include guidance to seek the opinion of another health professional. To advise on the use of medicines, it is imperative that the professional has the appropriate knowledge of the medicine, its pharmacology and dynamics and how it is handled in the body, as well as the legal framework surrounding medicines.
Exemptions	'Profession specific exemptions (established via Statutory Instrument) allow certain listed medicines to be sold/supplied and/or administered to patients by podiatrists who have attained the required qualifications and are recognised by the Health and Care Professions Council as competent to do so (as indicated by specific annotations to the HCPC register). Exemptions are not a form of prescribing. ³
Extended scope of practice	Practitioners, such as extended scope physiotherapists, working at a high level of expertise who have extended their practice and skills in a specialised clinical area ⁴ .
General Sales List	General sales list medicines are sold in general retail outlets without the supervision of a pharmacist ⁵
Independent prescribing	Prescribing by an appropriate practitioner responsible and accountable for the assessment of patients with undiagnosed or diagnosed conditions and for decisions about the clinical management required, including prescribing ⁶ .
Injection Therapy	The delivery of POMs and other products by injection to intra and extra-articular tissues and joint spaces ⁷ with the objective of reducing inflammation and improving joint mobility. Considered a post-registration technique in physiotherapy ⁸ .
Medicines Management Activities	A system of processes and behaviours that determines how medicines are used by patients and by the NHS ⁹ . For the purposes of this review, MMA refers to prescribing and/or the process of giving advice about medicines and the supply and administration of medicines.
Non-medical Prescribing	Prescribing by specially trained nurses, optometrists, pharmacists, physiotherapists, podiatrists and radiographers, working within their clinical competence as either independent or supplementary prescribers ⁶ .
Over the counter medicines	Over the counter medicines are sold directly to a consumer without a prescription from a healthcare professional ⁵
Prescription only medicine	Prescription-only medicines need a prescription issued by a GP or another suitably qualified healthcare professional. You then take the prescription to a pharmacy or a dispensing GP surgery to collect your medicine ⁵
Patient Group Directions	Written instructions that allow the supply and/or administration of a specified medicine(s), by named, authorised, registered health professionals, to a pre-defined group of patients needing prophylaxis or treatment for a condition described in the PGD, without the need for a prescription or an instruction from a prescriber ¹⁰ . While PGDs are designed for POM, some organisations use PGDs as best practice for over the counter (OTC) medicine.

Patient Specific Directions	Written instructions by an independent prescriber for medicines to be supplied and/or administered to a named patient after the independent prescriber has assessed the patient on an individual basis ³ . PSDs provide a clear demarcation of responsibilities with the independent prescriber responsible for prescribing, and a delegated individual or profession responsible for the supply and/or administration of medicines
Prescribing	To authorise in writing the supply and administration of a medicine or other healthcare treatment for a named individual patient ¹⁰ .
Supplementary Prescribing	The working definition of supplementary prescribing is “a voluntary partnership between an independent prescriber (a doctor or dentist) and a supplementary prescriber to implement an agreed patient-specific Clinical Management Plan with the patient’s agreement ¹¹ .
Supply	To provide a medicine directly to a patient or carer for administration ¹ .

1 Executive summary

1.1 Summary of Key Points

This is the first research to investigate the effectiveness and efficiency of independent prescribing by physiotherapists and podiatrists. The project was undertaken between February 2014 and January 2017. The literature review and survey of trainee physiotherapist or podiatrist independent prescribers found that:

- There is a lack of empirical literature relating to prescribing and a need for robust evaluation of physiotherapist and podiatrist involvement in medicines management activity, including prescribing.
- The first wave of physiotherapists and podiatrists to undertaking training were mainly highly experienced and highly qualified practitioners working in specialist or senior roles.
- Acute care was the largest single sector where physiotherapist and podiatrist independent prescribers worked, however a majority worked across multiple care sectors and the majority, particularly physiotherapists, worked in multi-professional services.
- Key areas in which physiotherapist independent prescribers worked were musculoskeletal services, orthopaedics, respiratory and pain management services. The key therapy areas for which trainee physiotherapist independent prescribers intended to prescribe were pain and musculoskeletal conditions, respiratory conditions and infections.
- Key areas in which podiatrist independent prescribers worked were high-risk foot, foot and ankle surgery and musculoskeletal /orthopaedics. The key therapy areas for which trainee podiatrist independent prescribers intended to prescribe were skin, infections and musculoskeletal conditions.
- Prior to undertaking independent prescribing training, physiotherapists and podiatrists were already regularly involved in supplying, administering or recommending medications and once qualified anticipated that they would prescribe a mean of 11 items per week.
- Key motivators for undertaking independent prescribing training were to improve the quality of patient care, access to medication and to make better use of professional skills. Introduction of physiotherapist and podiatrist independent prescribing was individually lead, with little evidence of strategic planning.
- The majority of trained physiotherapist and podiatrist independent prescribers were satisfied with the level of educational preparation for independent prescribing.

The comparative case study of physiotherapist and podiatrist independent prescribers and non-prescribers found that:

- Patients and healthcare professionals were generally positive about physiotherapist and podiatrist independent prescribing. A majority of patients agreed that physiotherapists and podiatrists should be able to prescribe medicine, although a minority of patients would prefer a doctor to prescribe their medicine.
- Physiotherapist and podiatrist independent prescribers were more active than non-prescribers in most aspects of medicines management, including providing medicine and giving advice or information to patients about medicine. Among physiotherapists, the predominant activity was pain/movement control. Among podiatrists, the predominant medications used were antibiotics, antifungal/microbial topical creams, emollients and pain medication.
- Perceived benefits included: reduced patient journey, fewer GP appointments, streamlining service, enabling services to continue when a doctor was not available, increased choice and enhanced quality of advice and information given. Benefits for physiotherapist and podiatrist independent prescribers included: improved knowledge around medicine management and safety, enhanced professional reputation, facilitation of advanced practice roles, and improved clarity over legality of medicines management activity practice.
- Barriers to independent prescribing included: finding a suitable Designated Medical Practitioner, access to a prescribing budget and patient medical records, clinical governance support for monitoring and auditing prescribing practice.
- Patients of physiotherapist and podiatrist independent prescribers received more information about how often to take medicines and more often intended to follow the advice of the physiotherapist and podiatrist independent prescribers than patients of non-prescribers. Additional benefits differed between the professions. Patients of physiotherapist independent prescribers received more information about their medicines, were more satisfied, able to understand and inclined to take their medicine than patients of physiotherapist non-prescribers. Patients of podiatrist independent prescribers were more satisfied with aspects of access to services than those of non-prescribing podiatrists.
- Health related quality of life, as measured by the EQ-5D-L, improved equally for patients in both independent prescriber and non-prescriber groups between baseline and two-month follow-up.
- Assessment of written prescriptions indicated gaps in provision of dose frequency in words in 9 out of 15 prescriptions. There was a high level of disagreement between assessors of audio-recorded consultations over the expected level of involvement by physiotherapists and podiatrists in diagnosis, assessment and providing information or advice about medicines. Overall, fewer issues of concern arose in physiotherapist and podiatrist independent prescriber

consultations than non-prescriber consultations. There was incomplete recording of allergy status in patient notes.

- Care delivery by physiotherapist and podiatrist independent prescribers was more resource intensive and costly than physiotherapist and podiatrist non-prescribers due to longer consultation duration and more frequent medicines management activities, however there are many limitations to the economic analysis so findings should be treated with caution.

1.2 Background

Non-medical prescribing was introduced in the United Kingdom (UK) as a means to improve healthcare service efficiency, access to medicines and to support service innovation. Physiotherapists and podiatrists are two of a growing number of allied health professions with entitlement to undertake training to prescribe medicines to patients in the UK. Legislation to enable physiotherapists and podiatrists to independently prescribe medicine was extended in 2013. This study was commissioned in the wake of this policy change to provide an evaluation of physiotherapist and podiatrist independent prescribing in England.

1.3 Study aim and objectives

The **aim** was to evaluate the effectiveness and efficiency physiotherapist and podiatrist (PP) independent prescribing (IP) in England. The **objectives** were to:

1. Describe and classify services provided
2. Identify factors that inhibit/facilitate uptake and implementation
3. Evaluate contribution to patient/carer experience and impact on choice, access, and self-reported health outcomes.
4. Identify medicines management activities that contribute most effectively to successful care outcomes.
5. Assess quality, safety and clinical appropriateness
6. Evaluate impact of on cost, quality, effectiveness and organisation of care.
7. Explore prescribing models in current practice, their associated resources, and patient utility.
8. Evaluate the appropriateness and effectiveness of educational programmes.

1.4 Study design and methods

A three phase mixed method study undertaken February 2014-April 2016. **Phase 1:** literature review to determine types of prescribing services provided and evidence of effectiveness of PP prescribing. **Phase 2:** survey of trainee PP-IPs, at beginning and end of training and document analysis to explore PP-IP at organisation and delivery level. **Phase 3:** comparative case study with economic analysis across 14 case sites (7 PPIP and

7 non-prescriber) in 11 geographical locations. Methods comprised observations; work sampling; interviews; patient questionnaire; audio recordings; patient record and prescription audit. Economic analysis examined cost implications through comparison of care delivery at PPIP and non-prescribing (NP) sites and consideration of costs and benefits of IP training.

1.5 Main findings

1.5.1 Phase One

87 articles relating to medicines management by physiotherapists or podiatrists were located. There was a lack of empirical work relating to prescribing in either profession. Physiotherapists in a number of countries administer, or advise patients about medicines, but there are concerns about available pharmacological training to support this activity.

1.5.2 Phase Two

85 trainee PP-IPs (56 physiotherapists, 29 podiatrists) completed questionnaire 1, and 39 (25 physiotherapists, 14 podiatrists) questionnaire 2. Participants were highly qualified, experienced practitioners working in specialist or senior roles: 82% had 10 years or more clinical experience, 58% were band 8 or higher and 50% had Master/PhD qualifications. 58% worked in acute care, 38% across multiple care sectors and 61.2% in multi-professional services. Medicines management activity was high prior to qualification: 94% recommended medicines and 84% reported weekly activity, using a median of 2 different methods to administer, supply or prescribe a mean 8.16 items per week. Participants anticipated they would IP a mean 11 items per week. Key areas of intended prescribing for physiotherapists were musculoskeletal (MSK) services, orthopaedics, respiratory and pain management, and for podiatrists' skin, infections and MSK conditions. Improving quality of care for patients, choice and efficiency were key motivators and anticipated benefits for PPIP. Improving clinician knowledge, skill use and job satisfaction were also anticipated, however improving job prospects or pay were weak motivators. The majority of questionnaire 2 respondents were satisfied with their educational preparation and felt adequately prepared to prescribe. Fewer physiotherapists than podiatrists had formal training in pharmacology prior to undertaking the training. Clinical governance systems for accessing prescribing data and facilities for audit were inconsistent. A minority reported difficulty in finding mentor support. Lack of availability of documents relating to service level agreements indicated low levels of strategic planning.

1.5.3 Phase Three

Observations: of 474 patient consultations (222 physiotherapist and 252 podiatrist). Medicines management activity (i.e. medicines supplied, administered, prescribed, recommended or adjusted) occurred in 24% of consultations. More activity was

recorded in PPIP (31.5%) than NP consultations (17%). Predominant physiotherapy activity was pain/movement control. Among podiatrists, predominant medications were antibiotics, antifungal/microbial topical creams, emollients and pain medication. Information provision to patients about medication was inconsistent, particularly when administered during consultations.

Work sampling: 2,720 data points collected. Podiatrist IPs were more involved in care planning and computer use, whereas podiatrist NPs were more active in providing treatment, room preparation and used computers outside of consultation. Physiotherapist IPs engaged more in medicines management and treatment whereas physiotherapist NPs engaged more in general discussion with patients.

Interviews: A total of 25 interviews were conducted with PPs (n=14) and team members (n=11) across case-sites. Reported service benefits included fewer GP appointments, streamlining and enabling services to continue when a doctor was not available. Patient benefits included reduced patient journey, enhancing choice, quality of information, and aligning professional practice with patient expectations of specialist roles. Prescribers reported improved knowledge, professional reputation, facilitation of advanced practice roles and clarity over legislative 'grey areas' around existing practices. Methods predating IP, such as exemptions continued to be used, were considered adequate for the majority of patients and rates of prescribing were low. Barriers included difficulty finding mentorship, accessing medical records, lack of patient follow-up, time limitations and lack of prescribing budget. Concerns included over-medicalisation of roles, isolation, resistance, increasing responsibility and use of IP for cost saving rather than patient benefit.

Patient questionnaire: 315 patients completed an initial questionnaire (135 physiotherapy and 180 podiatry patients). Most (76%) agreed that PPIPs should be able to prescribe medicines, however 23% would prefer a doctor to prescribe. Patients of PPIPs were more likely to agree that they received information on how often to take medicines and that they would follow the advice given. In addition, patients of physiotherapist prescribers were more often told how to take their medicine, were more satisfied with the advice given, were better able to understand their treatment, more inclined to take their medicine and felt they had been treated more as an individual than patients of physiotherapist non-prescribers. In contrast, patients of podiatrist prescribers were more satisfied with the ease of making an appointment and the ability to contact the service by phone or in times of emergency.

Consultations: Clinicians assessed 55 audio-recorded consultations independently. There were high levels of disagreement regarding the applicability of medicines activity within physiotherapy or podiatry consultations. No agreed areas of safety concern occurred within physiotherapist IP consultations. Some concerns were raised about physiotherapist non-prescriber consultations in relation to assessment and

communication. A greater number of concerns were identified in podiatry consultations overall relating to assessment, diagnosis and communication, most of which occurred within non-prescriber consultations.

Patient record and prescription audit: 153 patient records were reviewed 2 months following their consultation. The general quality of records and availability of source documents was poor. 15 prescriptions (6 physiotherapists and 9 podiatrists), were collected from 4 sites. All were written on the appropriate form, used generic drug names, and gave instructions on timing/frequency and dosage. All but one included appropriate dose/product preparation, terminology, and were written legibly in ink, 9 omitted the dose frequency in words and 2 the quantity to be supplied.

Economic analysis: Available case site data suggests that IP care delivery is more resource intensive and costly than NPs due to longer consultations, more discussions with colleagues, and higher frequency of requiring new medications and tests. No differences between IP and NP groups were found in changes in patient health status (as measured by EQ-5D-5L) between baseline and two months follow up, although the sample for which data at both time points were available was limited.

1.5 Conclusion

This is the first research to investigate effectiveness and efficiency of PPIP and provides valuable information for key stakeholders. PPIP is acceptable to the majority of patients and with reported benefits in terms of intention to follow treatment, satisfaction with information and access to services. The study confirms that PPIP is developing in line with original policy intentions to improve care across a range of services, by advanced practitioners who regularly engage in medicines management. Evidence at this early stage of implementation and from case sites in this study suggest that PPIP care delivery is more resource intensive, but this study is limited and its findings needs to be verified through further research, including a full economic analysis. Evaluation of the educational programme was satisfactory. No safety issues were detected directly resulting from PPIP, although improvement could be made in the completeness of prescription writing, as for all prescribers.

2 Introduction

This evaluation is the first research project to investigate independent prescribing by physiotherapists and podiatrists.

2.1 Study aim and objectives

2.1.1 Study aim

The aim of the study was to evaluate the effectiveness and efficiency of independent prescribing by physiotherapists and podiatrists.

2.1.2 Study objectives

Framed by the principles of case study design this 3-phase study addressed the following objectives:

1. Describe and classify the services provided by podiatrist and physiotherapist independent prescribers
2. Identify the factors that inhibit/facilitate the uptake and implementation of physiotherapist and podiatrist independent prescribing.
3. Evaluate the contribution of physiotherapist and podiatrist independent prescribing to the experience of patients and carers and its impact on choice, access, and self-reported health outcomes.
4. Identify the medicines management activities that enable podiatrist and physiotherapist independent prescribers to contribute most effectively to successful care outcomes.
5. Assess the quality, safety and clinical appropriateness of physiotherapist and podiatrist independent prescribing.
6. Evaluate the impact of physiotherapist and podiatrist independent prescribing on cost, quality, effectiveness and organisation of care.
7. Explore the prescribing models in current practice, their associated resources, and patient utility.
8. Evaluate the appropriateness and effectiveness of physiotherapist and podiatrist independent prescribing educational programmes.

2.2 Background to the study

Enhancing the roles of healthcare professionals, i.e. nurses, pharmacists, physiotherapists and podiatrists ¹²⁻¹⁴, is fundamental to improving quality and accessibility of UK healthcare ¹²⁻¹⁸. Non-medical prescribing was introduced as a means to improve service efficiency, access to medicines and to support service innovation ^{17, 19, 20}. Independent Prescribing (IP) and Supplementary Prescribing (SP) are two different forms of prescribing within the UK. Training to become a non-medical prescriber (NMP)

is interdisciplinary, typically involving 26 classroom days and 12 days in practice under medical supervision ^{13, 21}; a dual qualification in IP and SP being awarded ¹⁶.

Independent prescribing rights were extended in 2001 to include all registered nurses ²². Nurse independent supplementary prescribers (NISPs) are able to independently prescribe from the full range of licensed and unlicensed medicines, with the exception of some controlled drugs for addiction treatment ^{13, 23, 24} and can also prescribe any medicine as a supplementary prescriber ¹³. Supplementary Prescribing, in contrast, is a form of dependent prescribing where initial diagnosis is made by a doctor and a clinical management plan, detailing medicines that can be prescribed, must be agreed between the SP, doctor and patient ²⁵. Pharmacists were given supplementary prescribing rights in 2003 and later legislative changes also enabled this group the same independent prescribing rights as nurses ¹⁴. SP rights were extended to optometrists and allied health professions (AHP) (i.e. physiotherapists, radiographers, and podiatrists) in 2005 ²⁵, with optometrists later granted independent prescribing rights ²⁶.

By 2013, only 222 physiotherapists and 152 podiatrists had registered as SPs ²⁷. Despite the anticipated benefits of SP, evidence suggests that its uptake was limited as SP is not applicable in all clinical settings and is limited by doctor availability ^{1, 28} and its use by nurses and pharmacists in decline to similar limitations ^{29, 30}.

A legislative change in 2013 enabled physiotherapist and podiatrists (PP) to independently prescribe ³¹. The introduction of IP by physiotherapists and podiatrists was widely supported ^{32, 33} and many benefits anticipated ^{1, 34, 35}. Physiotherapist and Podiatrist Independent Prescribing (PP-IP) training is similar to current NMP training ³⁶, with conversion for those who are already supplementary prescribers to independent prescribers mainly involving 2 days of face-face to contact, and 12 hours in practice ^{16, 37}. Figure 2.1 illustrates the various methods by which physiotherapists and podiatrists can supply, administer or prescribe medicine in the UK and the related legislative acts.

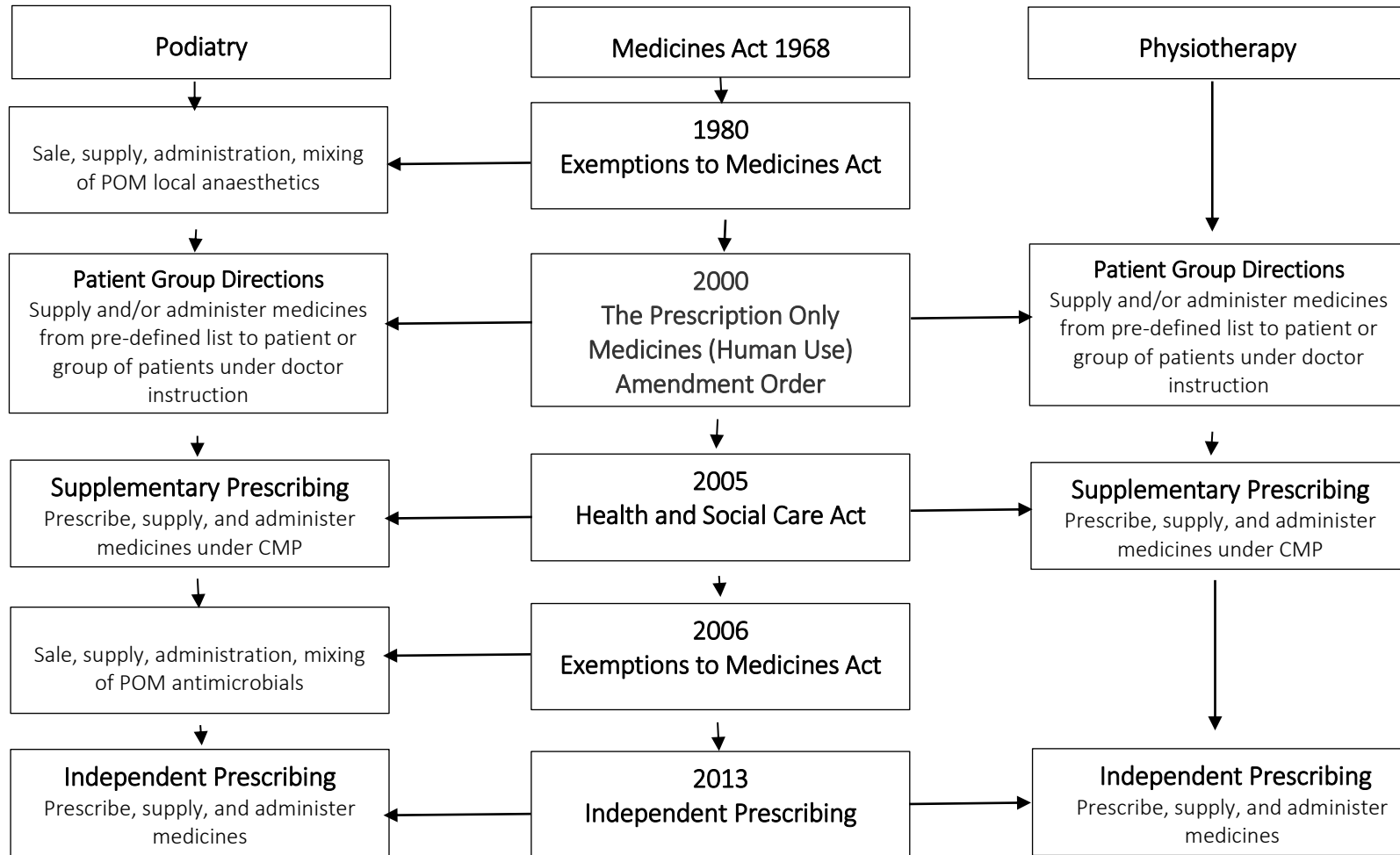
Evidence relating to AHPs is limited but suggests that prescribing supports several services e.g. musculoskeletal, back pain, vascular triage and diabetes foot clinics ³⁸⁻⁴⁰. Benefits reported e.g. improved efficiency, access to medicines, quality of care, increased job satisfaction, and autonomy ^{30, 41, 42}, predominantly relate to prescribing by nurses and pharmacists, of which there are currently 35,971 nurse and 4,295 pharmacist IP or SPs ^{43, 44}.

Although patients and stakeholders report high levels of satisfaction ^{30, 41, 45-48}, there are on-going concerns surrounding levels of support, governance structures, and barriers caused by organisational and policy restrictions ^{28, 49, 50}. Two NMP surveys included AHPs, however samples were too small (<10 AHPs) to identify issues specific to PPs ^{28, 51}. Reviews on the impact of extended physiotherapist roles reveal research hampered by small numbers of practitioners, role variation and poor role definition ⁵², and

literature dominated by service descriptions and audit with positive reporting bias ^{52, 53}. Whilst PP-SP helps streamline service delivery ^{39, 40, 54}, IP is expected to bring additional benefits in line with nurse and pharmacist prescribing ^{55, 56}, including cost savings, improved access, treatment options and quality of care and more independent forms of service provision ^{1, 34, 35, 57}. An early and comprehensive evaluation of PP-IP was therefore warranted.

This study was commissioned in the wake of this policy change to provide an evaluation of physiotherapist and podiatrist independent prescribing in England. PP-IP training, including conversion for those who were already SPs was introduced in early 2014. This evaluation is the first research to investigate the effectiveness and efficiency of independent prescribing by physiotherapists and podiatrists. The research was conducted between February 2014 and January 2017.

Figure 2.1 Models of medicines supply, administration and prescribing for Physiotherapy and Podiatry the United Kingdom



3 Methods

3.1 Overview of study design and research plan

Informed by the principles of case-study design ⁵⁸ the research enabled key stakeholders to have a voice in the evaluative process and captured context at three levels of analysis:

- 1) Macro level: Literature review (Phase 1)
- 2) Meso level: Survey of trainee PP-IPs, and analysis of key documents to explore physiotherapist and podiatrist independent prescribing at an organisation and delivery level (Phase 2)
- 3) Micro level: In depth analysis of practice settings in which physiotherapist and podiatrist independent prescribing is used within case studies (Phase 3)

Phase 1 and 2 addressed objectives 1) and 2). Phase 3 addressed objectives 1-8.

Case study method encourages the use of multiple data collection methods and recognises the significance of context ⁵⁹. A comparative case study design was utilised (comprising 14 case sites) and multiple data collection methods (including interviews, documentary evidence, patient questionnaires, and observations of practice).

3.2 Phase 1 (Macro level) - Literature Review

3.2.1 Aim

The aim of Phase 1 was to answer the following research questions:

1. What types of services do PP supplementary prescribers (SP) provide?
2. What is the evidence for effectiveness of PP-SP for both patients and organisations?

3.2.2 Objectives

The objectives in this study phase were to:

1. Describe and classify the services provided by podiatrist and physiotherapist (PP) independent prescribers (IP) and
2. Identify factors that inhibit/facilitate uptake and implementation of PP-IP.

3.2.3 Search strategy

Provisional searches identified a lack evidence relating to NMP by PPs ⁵² with reliance on self-reported outcomes rather than experimental design ⁶⁰. Due to the lack of high quality scientific evidence, systematic review was deemed inappropriate and an integrative review, ideally suited to synthesis of all literature types in new and emerging topics ^{61, 62} such as PP-SP, was undertaken. This emerging approach ensures representative literature is systematically reviewed, critiqued, and synthesized such that new frameworks and perspectives on the topic are generated.

3.2.4 Search procedure

The research team undertook the literature search and integrative review at the beginning of the study in July 2014 to provide theoretical underpinning for phases 2 and 3. The search strategy was applied across international electronic databases MEDLINE, CINAHL (via EBSCO) & Cochrane (January 1968 – July 2014) supplemented with hand searching of relevant citations. Further searches were conducted using databases from professional organisations (n=11), and trial registers (n=4). Search terms represented medicines management and prescribing activities across a range of professional roles; and across a range of care settings (**Appendix 2**).

Each database was searched using the unique Index Terms (i.e. MeSH terms) and a combination of Boolean (AND/OR) keywords in the title or abstract. A search of unpublished evidence was also conducted using the database OpenGrey. No limits were placed on clinical speciality, health care setting, or geographical area although due to translation limitations only papers published in English were included. The full example of the search string used is available in **Appendix 2**. Search results were stored and managed using Endnote (v7.2).

Titles and abstracts were screened independently by two authors (JE & FM) using a detailed inclusion and exclusion criteria (full details in **Appendix 2**). Salient points of each piece of evidence including details about the study design, data collection methods, intervention, participant characteristics, any outcome measures, study findings and study limitations were entered into a bespoke data extraction form (DEF). Data were also captured on; service settings/characteristics; medicines management activities (MMA); level of knowledge or attitudes towards prescribing or non-prescribing roles; issues that may impact on medicines management role; any evidence for the effectiveness of these roles. Data in the DEF was analysed thematically; focusing on data which would answer key research questions. If other themes or relationships between the data were identified this information was also noted.

Quality was evaluated using the Mixed Methods Appraisal Tool (MMAT) which permits concomitant appraisal of mixed, qualitative and quantitative study designs⁶³. The inter-rater reliability of the MMAT is 0.94⁶⁴. Two raters (JE & FM) appraised each study. Disagreement was resolved with a discussion in the research team meetings.

During the study period, the research team continued to update on new literature through scanning journals and networking. A second systematic literature search was carried out in May 2016, covering the period August 2014 to May 2016.

3.3 Phase 2 (Meso level): National Survey of trainee PP-IP and analysis of key documents

3.3.1 Introduction

Phase 2 was designed to explore PP-IP implementation at the organisational and delivery level. This longitudinal approach enabled ongoing developments in practice to be explored in order to gain a more generalised description of service development. It also provided a sampling framework for Phase 3 case-sites.

3.3.2 Aim

The aim of Phase 2 was to answer the following research questions:

- 1) How and where is PP-IP being implemented across healthcare organisations?
- 2) What are key drivers for implementation of PP-IP?

3.3.3 Objectives

The objectives in this study phase were to:

1. Describe and classify services provided by PP-IPs and
2. Identify factors that inhibit/facilitate uptake and implementation of PP-IP

3.3.4 Questionnaire development

A longitudinal online-survey explored trainee PP-IPs views and experiences regarding implementation of PP-IP, educational preparation and provided a sampling frame for Phase 3. Two questionnaires were created for completion by trainee PP-IPs at the beginning (Q1) (**Appendix 3a**) and end of (Q2) (**Appendix 3b**) training for IP using Survey Monkey©- an online software tool. Questionnaires were developed between December 2013 and March 2014 with input from members of the research team, project advisory group (PAG) and patient and public involvement (PPI) groups, in addition to professional colleague contacts. Early drafts in word format were revised during a project team meeting in December 2013 after which initial piloting was undertaken by 7 professional volunteers (podiatrists n=6, physiotherapists n=1) identified by team members. Revisions to content, structure and layout were made at subsequent team and PAG meetings over the following three months, and finalised at the 21st March 2014 PAG meeting. Formal piloting, via the on-line survey was completed in March 2014 following which final versions of Q1 and Q2 were agreed.

Questionnaire 1 contained 5 sections, comprising a total of 38, previously validated ²⁸ questions. Section A, B and D were additionally informed by recent UK evaluation of NMP ³⁰ and Section C by DH best practice guidance ¹³ supplemented by work by Nicholls (2009) ⁶⁵. Questions were mainly fixed response options with room for open-ended comments. Question 1 asked participants to confirm that they had read the participant information sheet, had any questions answered and to confirm that they agreed to take part in the study. **Section A** (questions 2-7) collected general demographic information including profession, job title, pay scale, age, hours worked, and educational/academic qualifications. **Section B** (questions 8-14) asked questions on services provided by

participants including type, care setting, geographical location, clinical specialty and service skill mix. **Section C** (questions 15-27) was specific to participant preparation for IP training. Questions included the type and level of IP course undertaken, name of hosting Higher Education Institute (HEI), start and final course work submission dates, reasons for undertaking IP training (list of 10 statements), prior experience in area of practice, specialist training, level of assessment and diagnostic skills, pharmacology and numeracy training, expectation of training, agreed scope of practice, and access to Designated Medical Practitioner (DMP) and NMP lead. **Section D** (questions 28-32) related to the methods of supply, administration and prescribing participants currently used, the number of items provided and areas of therapy in which medicines were currently provided (list of 17 statements) and those anticipated following IP training, and intention to prescribe controlled drugs following training. **Section E** (questions 33-38) sought consent for further participation in the study (questionnaire 2 and/or phase 3), and asked participants to provide details of their initials and date of birth, to anonymously link responses to the next questionnaire, along with their contact details to receive a summary of survey results, if requested.

Questionnaire 2 was divided into five sections, containing 28 questions and designed to explore participant views and experiences of IP training programmes, the adequacy of educational preparation for IP, clinical governance, and the intended use of IP. In addition to literature informing questionnaire 1, the British National Formulary (BNF)⁶⁶, Nursing and Midwifery Council (NMC)²¹, and work by Carey and Stenner⁴² informed Sections A, C and D of questionnaire 2 respectively. Questions 1-3 asked participants to reconfirm their consent to participate provide details of their initials and Date of Birth (DOB) to link the previous questionnaire and to describe what if any changes had occurred to their job title or service since they completed the previous survey. **Section A** (questions 4-5) asked about the extent to which training met learning outcomes and personal learning needs. **Section B** (questions 6-19) asked about the adequacy of educational preparation for prescribing (13 items), the type and duration of course undertaken, extent of employee support during training, and views on preparation for prescribing. **Section C** (questions 20-21) focused on clinical governance arrangements. Participants were asked to indicate, from a list of 11 statements, which aspects of clinical governance were in place in their practice area. A further question containing 9 items examined on-going support systems. **Section D** (questions 22-27) related to participants' intended use of IP. Participants were requested to indicate anticipated therapy areas, intention to issue private prescriptions and/or prescribe controlled drugs, and to estimate the number of items that would be prescribed in a typical week. The final question was on perceived benefits and participants were asked to indicate whether any of 17 potential benefits would result from the ability to independently prescribe medications for patients. **Section E** (questions 28-32) sought consent for further participation in the study (phase 3), along with contact details to receive a summary of survey results, if requested.

3.3.5 Pilot

Formal piloting was performed between February and early March 2014. Twelve experienced PPs (physiotherapists n=8 and podiatrists n=4 with SP annotation) nominated by the research team and PAG members completed the questionnaires. These individuals were sent Participant Information Sheets, with an embedded link to the on-line survey, and requested to fill in an evaluation pro-forma addressing comprehension, length and completion time following questionnaire completion. Free text spaces were included and pre-paid envelopes were provided for return. Respondents found questionnaires easy to complete, comprehensive and of acceptable duration (8-23 minutes). Pilot data were downloaded, exported into a Microsoft Excel © spreadsheet and reviewed by a statistician, who confirmed its suitability for analysis. Questionnaire 1 subsequently went live on 26th March 2014.

Following release of questionnaire 1 and interim review of the first 31 responses in October 2014, the study health economist raised concerns over robustness of data in reporting NHS resource implications of PP-IP. Following further approval by the University of Surrey ethics committee 7 additional items were added (Q1- 3 questions & Q2 4 items), resulting in a total of 41 questions in Questionnaire 1 and 32 questions in Questionnaire 2. These provided additional information on staff time commitments, study leave, DMP mentoring, HEI course-fees and additional expenses incurred by trainee PP-IPs.

Those participants (n=27) who had already completed the questionnaire and had provided contact details were contacted in early November 2014 via email that included an embedded link to a further short online survey and asked to provide this additional information. Responses received (n=17) were linked using participants' initials and DOB.

3.3.6 Participant recruitment

In our original proposal we estimated 50% (n=187) of 374 PP-SPs identified on the 2012 Health and Care Professions (HCPC) register would undertake conversion to IP in 2014/15; 38% (n=140) during study data collection months^{34,35}. Based on the time taken to undertake training and obtain organisational annotation, and the frequency of IP training cohorts per year at each HEI, we estimated an additional 75 PPs would undertake IP training during our data collection period providing a potential population of 215 PP-IPs.

Initial contact with HEIs who provided training for PP-SPs ascertained 28/43 (65%) intended to apply to the HCPC for approval to offer IP training. Recruitment was expected from these institutions to generate a potential sample size of 139 PP-IPs. In line with response rates (52-85%) to our previous online surveys^{28,67,68} a response rate of 50% (n=70) was anticipated.

Questionnaire 1

A purposive sample of PPs undertaking IP training in England was recruited to the survey. Several approaches for identifying individuals including professional registers and strategic health authority (SHA) NMP databases were considered but discounted on the basis the most effective way to identify trainee PP-IPs within the time-frame was via HEI offering training.

NMP programme leads at HEIs who provided training for PP-SPs were initially identified in June 2013 and in January 2014 were asked to confirm HCPC approval for IP training, or intent to seek approval. The type of course (combined NMP/SP conversion), anticipated start dates and numbers of student cohorts were requested. Willingness to facilitate recruitment for the trainee PP-IP survey was also established. Once the survey went live in March 2014, NMP programme leads were emailed copies of Participant Information Sheets and Participant Invitations with embedded links to questionnaire 1 of the online survey, for consecutive distribution to their student cohorts during the start of training. Reminders were emailed to NMP programme leads at the start of each academic term (in total 8 reminders were sent to HEIs over the course of 23 months; approximately every 3 months in January, March, May and September). The online survey was open for recruitment March 2014 to January 2016.

Recruitment was supplemented by study promotion at NMP conferences ⁶⁹, professional newsletters (Frontline; Podiatry Today), University of Surrey study web pages and social media accounts (twitter), and through direct contact to the team from PPs commencing training; these individuals were emailed the participant information sheet and invitation complete with the online link.

Questionnaire 2

Contact details of respondents who indicated that they would be willing to take part in the next phase of the research; questionnaire 2 and/or case site involvement (Phase 3) were consecutively downloaded into a Microsoft Excel© file⁷⁰⁷⁰⁷⁰⁷⁰⁷⁰⁷⁰⁷⁰.

Using information provided in Q1, (question 17) two months following submission date for course work an email invitation with an embedded link to Questionnaire 2 was sent by a University of Surrey researcher, with reminder emails at 4 and 8 weeks.

3.3.7 Data collection and analysis

An online Survey Monkey© account was set up at questionnaire development containing a repository for completed questionnaires, and facility to download data trends as well as individual question responses.

Data were downloaded from Survey Monkey© into a Microsoft Excel© file and imported into SPSS© Version 22. Frequencies and cross tabulations were used to summarise then analyse data. When comparing 3 or more subgroups for normally distributed outcomes

(notably summative scores, such as total number of governance systems in place), a one-way Analysis of Variance (ANOVA) was performed. When 2 subgroups were to be compared, an unpaired t-test was utilised.

When comparing 3 or more subgroups for an ordinal outcome or a non-normally distributed continuous outcome (number of items supplied, administered or prescribed being an example of the latter), the Kruskal-Wallis test was used. When 2 subgroups were to be compared, a Mann-Whitney U test was utilised.

When comparing 2 subgroups (notably Podiatry, Physiotherapy) for a categorical outcome, the Chi-Squared test was used, reverting to a Fisher's Exact test in 2x2 cross tabulations if 1 or more expected cell count was found to be < 5.

3.3.8 Documentary analysis

3.3.8.1 Aim

The aim of the documentary analysis was to review commissioning and provider documentation detailing NMP pathway redesign to explore ongoing developments in practice and current opinion.

3.3.8.2 Recruitment

PPs undertaking IP training who indicated willingness for further research involvement in questionnaire 1 of Phase 2 were contacted by the research team (n=70) to ask if they or their organisation could provide any documentation detailing service redesign or workforce planning as result of PP-IP.

3.3.8.3 Data collection and analysis

Contact details of respondents who indicated that they would be willing to take part in the next phase of the research; questionnaire 2 and/or case site involvement (Phase 3) were consecutively downloaded into a Microsoft Excel© file. Using information provided in Q1, (question 17) an email invitation was sent by a University of Surrey researcher, with reminder emails at 4 and 8 weeks.

Of the 12 people who responded, none were able to provide any documentation detailing workforce planning or service redesign related to PP-IP. Eight people confirmed that their job description had been amended to reflect their IP status, and three power point presentations gave an overview of how each individual was using IP within their organisation. A lack of appropriate documentation meant it was not possible to undertake any further analysis.

3.4 Phase 3: (Micro level) – Comparative Case Study (n=14 sites)

3.4.1 Introduction

Phase 3 of the study aimed to explore at micro level the effectiveness of PP-IP in its real life context. A comparative case study design permitting detailed, in-depth investigation of situational phenomenon was adopted⁵⁹ as PP-IP was considered to involve complex interventions, inter-related with context, which could not be extricated within a controlled trial⁷¹. Comparative case studies, as Goodrick (2014) explains are particularly appropriate for understanding and explaining how context influences the success of an intervention, in this case PP-IP, and how to better tailor the intervention to the specific context to achieve intended outcomes⁷¹. The use of multiple data collection methods from 7 matched sites, including interviews, documentary evidence, patient questionnaires, and observations of practice was based on earlier work by the researchers⁷² and permitted triangulation in data analysis, that is, the use of 2 or more methods to examine the same phenomenon simultaneously or sequentially^{58, 73, 74}.

3.4.2 Aim

The aim of this study phase was to answer the following research questions:

1. How do process and outcome indicators (namely quality of life, satisfaction with services (including access, waiting times) medicines adherence, satisfaction with medicines information, functional health and wellbeing) differ between patients treated by PP-IPs and those treated by non-prescribing (NP)-PPs
2. How does level and extent of involvement in medicines management activities differ between PP-IPs and NP-PPs?
3. What are benefits and drawbacks of PP-IP as perceived by PP-IPs, NP-PPs, team members and patients?
4. How do costs of services provided by PP-IPs differ to those provided by NP-PPs?

3.4.3 Objectives

The objectives in this study phase were to:

1. Describe and classify services provided by PP-IPs
2. Identify factors that inhibit/facilitate the uptake and implementation of PP-IP.
3. Evaluate contribution of PP-IP to patient and carer experience and its impact on choice, access, and self-reported health outcomes
4. Identify medicines management activities that enable PP-IPs to contribute most effectively to successful care outcomes
5. Assess quality, safety, and clinical appropriateness of PP-IP.
6. Evaluate impact of PP-IP on cost, quality, effectiveness and organisation of care
7. Explore prescribing models in current practice, associated resources, and patient utility
8. Evaluate appropriateness and effectiveness of PP-IP educational programmes.

3.4.4 Recruitment of case study sites

3.4.4.1 Case sites

Clinical speciality/service areas in which IP was being undertaken by PPs were identified from contact details provided in trainee PP-IP questionnaire 1, and discussed for representativeness with PAG group members. To ensure IP-PPs in case-sites completed training and implemented IP in time to practice during the study period, case-sites were predominantly selected from PP-SPs who had recently undertaken IP conversion training.

PPs undertaking IP training who indicated willingness for further research involvement in questionnaire 1 of Phase 2 were contacted by the research team (n=70), and participant information sheets and supplementary information on case site involvement provided through email/telephone calls. An additional visit to one site was made on request to discuss involvement. To represent diversity with respect to care setting, geographical location and patient demographics, seven IP-PP sites (4 physiotherapy and 3 podiatry) were selected and matched to similar services delivered by NP-PPs. These were either nominated by IP-PPs, identified through PAG group members or through National Institute of Health Research (NIHR) portfolio enquiry from individual trust Research and Development departments. Matching additionally considered professional role and Agenda for Change banding. NP-PPs, most of whom had been contacted independently by IP-PPs, were approached by University of Surrey researchers to discuss their willingness to participate in research and case study. Those interested were emailed participant information sheets and supplementary information on involvement. On confirmation of intent to participate, both PP-IPs and NP-PPs were requested to ensure organisational managerial authorisation and Research and Innovation department support. Written informed consent was taken from PP-IPs and NP-PPs on the first day of each case site visit, and on-going consent was assured at the beginning of each contact day.

Participants were given the option to consent for consultation observations, consultation audio-recordings and audio-recorded interview. They could choose partial or full involvement.

3.4.4.2 Patients

At each case site a consecutive sample of patients who had scheduled appointments with PP-IPs/NP-PPs were recruited in NHS sites by trained research nurses, and private sites by a study researcher between March 2015 and February 2016. Using clinic lists potential participants (n =563) were identified on arrival and approached by either a local research nurse or study researcher, who explained the study and what involvement would entail. A participant information sheet was provided and patients were advised that they may participate in any of the five study components (observation, audio-recording, questionnaire, patient record audit, follow up questionnaire), and that

declining individual components would not impact other study involvement. A screening log of all patients approached for participation in the study (n=563) was recorded; both those recruited to the study (n=488) and those declining participation (n=75), including hospital/unit medical record numbers, gender and the date of consent, by the local research nurse/ study researcher. Those who agreed to participate were given a consecutive study identification number, relating to the site of recruitment.

3.4.4.3 Team members

At each case site, members of the healthcare team who worked alongside PP-IPs/NP-PPs were invited to participate in face to face interviews with the University of Surrey researcher (n=11). Team members were nominated by PP-IPs/NP-PPs and approached for participation by the researcher.

3.4.5 Observations

3.4.5.1 Aim

Observation of PP-IP/NP-PP service delivery aimed to identify medicine management activities (MMAs) and work related activities that enable PP-IPs to contribute most effectively to successful care outcomes. It also aimed to explore prescribing models in current practice, associated resources and patient utility.

3.4.5.2 Observation diaries

A researcher observed PP-IPs/NP-PPs in real-time service delivery up to 5 working days (37 hours) and collected data on MMAs and activities related to direct and indirect care. Electronic diaries (**Appendix 4**) were custom built using Microsoft Access©. Initial drafts of diaries based on previous validated tools⁷⁵⁻⁷⁷ were made in word format and comments were sought on design and content from the research team and PAG members. Revisions to design/layout and content occurred following discussion at the September 2014 PAG and were finalised for pre-piloting at the January 2015 team meeting. For each observed consultation fifteen items were recorded in electronic diaries. Questions 1-5 related to the consultation type (length, service type, referral source), questions 6-8, and 14 focussed on MMA and prescribing activities and questions 9-13 and 15 related to work activities undertaken by PP-IPs/NP-PPs in relation to care (referrals made, discussion with colleagues). Questions were fixed option and/or free text.

3.4.5.3 Pilot

The electronic diary was piloted in January 2015 at an NHS secondary care rheumatology outpatient clinic in conjunction with a consultant physiotherapist PAG member (not a designated case-site). Trust physiotherapy department and R&D approvals were granted in advance. Eight patient care episodes from two clinics were recorded using the electronic diaries following patient consent. Field notes were taken in conjunction with each patient consultation and diary entry to verify data accuracy. Data were downloaded into Microsoft Excel© files prior to discussion at a research team meeting in February 2015. Subsequently the electronic template layout/design was revised. During a

research team meeting the data were reviewed and discussed and, found to be comprehensive and adequate to address relevant objectives.

3.4.5.4 Sampling

For full details of participant recruitment, see **Section 4.4.2**. Initial sample estimates indicated full-time PP-IPs/NP-PPs would have up to 60 consultations per week, generating data on potentially 840 patient care episodes across 14 sites.

3.4.5.5 Data collection and analysis

Electronic diary data entry, undertaken by one researcher, commenced at the initial point of patient-clinician interaction within the consultation location, this involved following the clinician and or patient if they left the room, and continued until its termination.

Data from the Microsoft Access database© automatically populated into a Microsoft Excel © file was imported into SPSS© Version 22. Qualitative and quantitative responses to the diary items were subsequently coded. Descriptive statistics were reported and quantitative statistics undertaken to analyse data; qualitative comments were used to illustrate the results. Descriptive statistics were also reported where open text data (specifically in relation to Medication Details) had been converted to numeric (count) data.

When comparing 2 subgroups (typically podiatry, physiotherapy) for a non-normally distributed continuous outcome (specifically, number of medications prescribed and consultation times), the Mann-Whitney U test was used. In addition to standard descriptive statistics, the number and percentage of zero values for each subgroup was reported in conjunction with the health economics analysis.

When comparing 2 subgroups (typically podiatry, physiotherapy) for a categorical outcome, the Chi-Squared test was used, reverting to a Fisher's Exact test in 2x2 cross tabulations if 1 or more expected cell count was found to be < 5.

3.4.6 Work Sampling

3.4.6.1 Aim

The aim of work sampling was to explore the amount of time spent on various work activities related to direct, indirect and service related care and determine if and/or how the level of involvement differed between IP-PPs and NP-PPs.

3.4.6.2 Development of work sampling tool

Structured observations of PP-IP/NP-PP work activities in consultations were performed using the work sampling instrument developed by Gardner et al. ⁷⁸ adapted for use in earlier work by the researchers ²⁸.

Paper versions of the work sampling tool (**Appendix 5**) were drafted and reviewed by the research team/PAG in September 2014 and transferred to a Microsoft Excel © file before piloting in January 2015.

The instrument (Appendix 6) composed four sections with 27 numerically coded work activities representing: 1) **direct care** (activities 1-12) with the patient present; e.g. physical assessment, history taking, communicating diagnosis, performs/manages therapeutic procedures, 2) **indirect care** (activities 13-20) where the patient may not be present e.g. computer data entry, documents in progress notes, co-ordinates care, and 3) **service-related care** (activities 21-26), e.g. meetings and administration, research and audit, continuing professional development, and 4) **personal activity** (activity 27), e.g. PP-IP/NP-PP out of the room for personal reasons).

3.4.6.3 Pilot

The ease of collecting work-sampling data over one 95-minute period during daily case site visits was tested at the pilot site because of simultaneous requirement by the researcher to complete observation diaries. The tool was however found workable and it was feasible to perform two recording periods at each case site, affording up to a total of 40 data points/day.

3.4.6.4 Sampling

For full details of participant recruitment, see Section 4.4.2. At the time of recruitment/consent PP-IPs/NP-PPs were advised that practice observation would involve collection of data on general work patterns and medicines management activities.

3.4.6.5 Data collection and analysis

Work activities were recorded at 5 minute intervals over 2 X 95 minute blocks during clinically active times at each site. Blocks were randomly chosen during each daily site visit and to represent different times of the working day (08.00-17.00, Monday-Saturday). The main activity being undertaken at the 5-minute point was identified and categorized by the study researcher. Over 5 days an estimated 200 individual data points were anticipated; (a total of 2,800 across all 14 case sites).

Data in Microsoft Excel© files was imported into SPSS© Version 22. Analysis included both descriptive and inferential statistics using non-parametric Mann Whitney U tests to compare activity in prescribing and non-prescribing sites.

3.4.7 Patient questionnaire

3.4.7.1 Aim

The aim of the patient questionnaires was to evaluate the contribution of PP-IP to patient experience and its impact on choice, access, and self-reported health outcomes.

Data were collected with the intent of exploring patient experience of PP-IP/NP-PP consultations and reporting health economics of costs and returns to PP-IP compared to NP-PP respectively.

3.4.7.2 Questionnaire development

Two patient questionnaires were developed by the team for data collection at the point of PP-IP/NP-PP consultation (Questionnaire 1) and two months following consultation (Questionnaire 2 two month). **Questionnaire 1 (Appendix 6a)** was developed between June 2014 and February 2015 with input from research team members, PAG and PPI groups, in addition to professional colleague contacts. Initial drafts were reviewed in September 2014 at PAG/PPI meetings after which booklet versions underwent piloting and were finalised. **Questionnaire 2 (Appendix 6b)** was implemented under a revised protocol in order to capture additional data.

Questionnaire 1 (Appendix 6a) was designed to capture information on satisfaction with the consultation, satisfaction with advice and information about medicines, attitudes towards PP-IP, quality of life and demographic information. The questionnaire needed to be relevant to patients with a range of acute and long-term conditions who could be attending an initial appointment, a surgical appointment or a follow-up appointment with either a podiatrist or physiotherapist. In addition, the survey required data that could compare patient satisfaction with prescribing and non-prescribing professionals. For these reasons, a generic questionnaire developed to evaluate prescribing by nurses and midwives in the Republic of Ireland ⁷⁹ was selected to adapt for this study. The questionnaire included the following subscales from validated tools:

- the subscales on 'professional care', 'perceived time' and 'overall satisfaction' from the Consultation Satisfaction Questionnaire ⁸⁰⁻⁸²
- the 'compliance intent' subscale of the Medical Interview Satisfaction Survey (MISS) ^{83, 84}
- Questions from the Satisfaction with Information about Medicines Scale ⁸⁵

Amendments were made to make the wording appropriate to consultations with physiotherapists or podiatrists, and additional questions were included on quality of life and satisfaction with services. The questionnaire used a mixture of rating scales, fixed option and open ended questions set out in four sections. **Section 1** asked participants to rate 17 statements related to patient satisfaction with services received at the time of consultation (questions 1-17). Ten questions were based on the previously validated tool Medical Interview Satisfaction scale ^{79, 85}, and 7 additional questions designed to capture information on ease of access to service based on outpatients' opinion of quality of hospital departments questionnaire ⁸⁶.

Section 2a comprised 4 statements measuring patients' attitudes to PP-IP ^{79, 87}. **Section 2b** started with a filter question asking whether participants had been given advice/information on medicines during the consultation. Those indicating "no" were re-

directed to Section 3. Those confirming were asked to complete 14 statements about the advice/information they had received from PP-IPs/NP-PPs during the consultation including side effects, action of use and dose schedule and medicines adherence ^{79, 80, 83, 85}.

Section 3 employed the validated EQ-5D-5L quality of life questionnaire developed by the EuroQoL group ⁸⁸. The EQ-5D composes 5 dimensions with 5 weighted levels affording a single index value score. The standardized extended EQ-5D incorporates a vertical 20 cm visual analogue scale (VAS) rating scale. In response to PPI group members who consistently reported difficulty indicating numerical values for how they felt at any one time point, and because VAS scores were not intended to be taken serially it was decided to exclude this from the questionnaire. **Section 4** related to general demographic information in which 7 questions collected information on age, living arrangements, employment, ethnic group and educational attainment in order to describe respondent characteristics.

3.4.7.3 Pilot

Formal piloting of questionnaire 1 was undertaken in January 2015 in a secondary care based rheumatology outpatient clinic (not designated as a site). Nine consecutive patients were invited to complete the questionnaire and an evaluation pro forma designed to collect feedback on ease of comprehension, ease of completion, length and completion time. Space for free text comments was provided and pre-paid envelopes were provided for return. Confidentiality and anonymity was ensured. Five completed questionnaires were returned with comments indicating that content, layout and design was comprehensive and completion time was of acceptable length, ranging from 9-15 minutes. Pilot data were coded, inputted into a Microsoft Excel© spreadsheet and reviewed by a statistician, who confirmed its suitability for analysis.

Questionnaire 2: (Appendix 6b) following data collection at the first four sites and piloting of the patient record audit in January 2015 (Section 4.4.10) which collected information on health resource in the subsequent 2 months following PP-IP/NP-PP consultations, it became apparent that patient recording systems varied at case sites, and there was inconsistent access to data across primary/secondary care. The limited availability and quality of data rendered it insufficient for economic analysis. The protocol was therefore amended to include direct contact with consenting patients by researchers by telephone or email at the 2-month point September 2015- April 2016.

Dependent on patient preference, 5 questions (questionnaire 2) were asked over the telephone relating to health resource use in addition to a second completion of the EQ-5D-5L, or sent as a word attachment via email for patient completion and return. Questions were modified from the original note audit, made shorter and more succinct for ease of telephone use. Patients were asked if they had, in the 2-month period following consultation received medicines prescribed/recommended by the PP-IP/NP-

PP, undergone diagnostic tests (e.g. radiology, blood tests), returned to the PP-IP/NP-PP for follow-up treatment, been referred to other services/professionals, or received unplanned treatment for the same condition following the initial consultation (list of 10 potential services).

Questionnaire 2 was implemented following data collection completion at the first four sites, and was piloted concurrently at the first site visited (site 3) after its approval. Using a standardised text, questions were asked over the telephone and word versions of the questionnaire completed manually. After the first 10 completed questionnaires, ease of use, consistency and question completion rate were discussed at team meetings; no amendments or changes were required.

3.4.7.4 Sampling

Questionnaire 1

For details of patient participant recruitment for the questionnaires, as well as for the observation, audio-recording, and patient record audit, please see Section 4.4.4.2

Questionnaire 2

Participants who provided consent to be contacted regarding the follow up questionnaire were contacted 2 months after their initial consultation by a study researcher. Those who confirmed that they were still willing to complete Q2 were asked Questionnaire 2 items using a standardised text.

3.4.7.5 Data collection and analysis

Questionnaire 1

Completed copies of questionnaire 1 returned by post were logged at time of receipt into a Microsoft Excel© file and paper word document. Batches were forwarded to statisticians for data inputting into SPSS© Version 22.

Questionnaire 2/ follow up

Contact details of participants agreeing to complete questionnaire 2 were inputted into a bespoke Microsoft Excel© file at the time of consent, and consultation and 2 month follow dates added (n=285). At the 2-month date (or in the ensuing 2-3 days if this fell on a weekend), a researcher contacted participants by telephone (n=214), and a mutually convenient time and date for questionnaire completion agreed. Each question was read verbatim over the telephone and completed by the researcher. For unanswered calls a message was left on voice mail if available, with explanation of contact and a return University of Surrey phone number. On average 3 telephone contact attempts were made over a one-month period. Participants choosing email contact (n=68) were sent a standardised invitation with attached questionnaire to complete, with reminders at 4 and 6 weeks post initial email, as required. Three participants requested the questionnaire by post.

Data analysis

All data obtained from questionnaires was anonymised and entered on a database and analysed. Each participant was given a corresponding study number to allow linkage correlation between the data.

Frequencies and cross tabulations were used to summarise the data. When assessing change in a continuous outcome from Questionnaire 1 to Questionnaire 2, a paired t-test was used. When comparing 3 or more subgroups for normally distributed outcomes (notably change scores from Questionnaire 1 to Questionnaire 2, such as for overall EQ-5D-5L score), a one-way Analysis of Variance was performed. When 2 subgroups were to be compared, an unpaired t-test was utilised.

When comparing 2 subgroups (in particular Prescribing and Non-Prescribing) for an ordinal outcome, a Mann-Whitney U test was utilised. When comparing 2 subgroups (notably Podiatry and Physiotherapy or Prescribing and Non-Prescribing) for a categorical outcome, the Chi-Squared test was used, reverting to a Fisher's Exact test in 2x2 cross tabulations if 1 or more expected cell count was found to be < 5.

3.4.8 Semi-structured Interviews

3.4.8.1 Aim

The aim of semi-structured interviews with PP-IPs/NP-PPs and team members was to explore views about PP-IP, access to medicines and service efficiency, benefits, disadvantages and limitations of PP-IP, and service development. In addition, interviews with PP-IPs aimed to explore governance arrangements and educational preparation for IP. Interview schedules for team members from PP-IP and NP-PP case sites were designed to explore perceptions of service efficiency, benefits and disadvantages, communication, and changes to the organisation of care.

3.4.8.2 Interview schedule development

Findings from a national survey²⁸ and collective case study⁷² involving nurse prescribing were used to develop interview schedules for PP-IPs. Interview schedules contained questions about the extent of use of IP by PP-IPs since qualification, perceived benefits in relation to patients/services/other health professionals/themselves, difficulties experienced or issues preventing IP, effect of IP on service development, adequacy of governance systems, preparedness and impact on wider professional development. Interview guides for NP-PPs contained questions on views on IP, involvement by NP-PPs (if any) in medicines management activities and communication on patient care between different service providers.

Interview schedules for team members from PP-IP and NP-PP case sites were designed around four main topics; perceptions of service efficiency, benefits and disadvantages of IP, communication, and changes to the organisation of care. The role and relationship of

team members to the IP-PPs/NP-PPs was initially established along with their role (if any) in medicines management activities.

3.4.8.3 Pilot

All interview schedules (**Appendix 7**) were reviewed by research team and PAG group members. A second interviewer, experienced in non-medical prescribing research (KS), buddied the main interviewer (JE) for the first two interviews in order to provide guidance and clarify and address any issues with the interview schedule. Following this pilot, minor revisions were made to improve the flow of questions.

3.4.8.4 Sampling

PP-IPs/NP-PPs (n=14) provided verbal consent for interviews, audio-recording and full transcribing prior to onset of audio-recording; written consent was taken during the first day of the case site visit. Team members nominated by IPs/NP-PPs were given participant information sheets and consent forms and recruited at case sites.

3.4.8.5 Data collection and analysis

To facilitate understanding of case site service delivery, interviews with PP-IPs/NP-PPs were carried out by telephone at mutually convenient times prior to the main data collection visits (n=8), on the first site visit prior to the start of consultations (n=5) or at the end of data collection (n=1). Interviews lasted between 12-59 minutes. Team members (n=11) recruited during case site visits provided written consent prior to completing an interview which lasted between 6-25 minutes.

Interviews were transcribed and checked for accuracy against the original recording by an experienced qualitative researcher [KS]. Where necessary, inaudible sections were checked with interviewees. Two researchers [KS, JE] independently coded a sample of 5 transcripts and developed a coding framework. Cross comparison of codes showed high conceptual similarity and minor differences were consolidated through discussion. Using a framework approach ⁸⁹ a coding matrix was developed based on emerging themes and initial research questions. Themes were considered across participant groups and across sites in order to assist explanation building and develop a comprehensive picture. Initial coding and categorising of data were managed by the ATLAS.ti© qualitative data analysis software. The two researchers met to discuss findings and consolidate minor differences through discussion.

3.4.9 Audio recordings

3.4.9.1 Aim

The aim of the audio- recordings was to assess the safety and clinical appropriateness of PP-IP/NP-PP practice.

3.4.9.2 Audio-recording assessment tool development

PP-IP/NP-PP consultation audio-recordings were assessed using a structured tool developed by Latter et al.⁸⁷ adapted for use in previous research for the assessment of video-recorded consultations between nurse prescribers and patients^{56,90}. The original tool was based on nurse prescribing competencies as outlined by the National Prescribing Centre⁹¹. The tool was adapted for use to be relevant to all prescribers by mapping the original NMP competencies against the prescribing competencies laid out in the single competency framework for all prescribers⁹² and the learning outcomes for prescribers^{21,93}. Minor amendments to the wording of statements were made to the tool to align with current competencies and the tool was reviewed for face validity by members of the project team.

The tool (**Appendix 8**) included two sections: assessment and diagnosis (16 items) and communication with the patient (10 items). Assessors were asked to indicate whether or not each item occurred, if relevant to the consultation, and to rate each item as either a) safe practice b) cause for concern or c) unsafe practice. Items relating to various aspects of consultation were assessed using “1” = accurate, confident, safe practice, “2” = cause for concern, partial/insufficient evidence to make judgement, “3” = practice that is unsafe and “N/A” = not applicable to patient/condition or type of consultation.

3.4.9.3 Pilot

The tool was piloted by three independent experts (a doctor, physiotherapist and podiatrist) using two audio-recordings and following training in its use. Minor changes were made to improve the clarity of the instructions for rating items.

3.4.9.4 Sampling

For full details of participant recruitment, see Section 4.4.2. The first person of the day who consented to audio recording was selected until 5 recordings were completed

3.4.9.5 Data collection and analysis

Audio-recordings from up to 5 patient consultations with each podiatrists or physiotherapists and patients were sought at each site (total anticipated n=70). A total of 58 audio recordings were available for assessment, however 3 of these were rejected as they were inaudible due to sound interference that occurred in shared consultation rooms. Each consultation was assessed independently by two assessors with appropriate professional expertise. Assessors were a medical consultant, two physiotherapists, and a clinical lecturer in podiatry. Training was provided on the use of the assessment tool and queries were discussed via email or telephone with a member of the research team to enhance inter-rater reliability.

On initial analysis, a high level of disagreement was evident between assessors. Much of this disagreement occurred where one assessor rated an item as ‘not applicable’ to the

consultation, whereas the other assessor rated it as occurring and 'safe practice'. It was decided to amalgamate 'not applicable' and 'safe practice' ratings in order to remove these areas of disagreement, based on the assumption that if an item was not applicable then the practice was safe.

Recordings were made using the 'Olympus digital voice recorder WS-311M' and downloaded as Windows Media© Audio files. Files were forwarded to assessors with Microsoft Word© copies of the assessment tool for completion and return to University researchers. It was intended that data from audio-recordings would be linked to that in diaries, audit, and patient questionnaires, however as no prescriptions were issued during the audio-recorded consultations, this was not necessary. SPSS© Version 22 was used for data entry and analysis with descriptive statistics.

3.4.10 Patient record audit

3.4.10.1 Aim

The aim of the patient record audit was to:

- Evaluate the impact of PP-IP on cost, quality, effectiveness and organisation of care
- Investigate the extent to which PP-IP affects service delivery and overall prescribing costs

A micro level analysis of quality, safety and clinical appropriateness of PP-IP was not possible because full information linking the various aspects of data for patients were not available.

3.4.10.2 Development of record audit tool

The patient record audit tool (**Appendix 9**), composed of 7 sections was drafted based on researcher's previous work⁷² and items were incorporated in lieu of economic cost-consequences framework analysis. Data included:

Section A – type and quality of source documents available (9 items)

Section B – patient characteristics (4 items)

Section C – recorded allergies, medical history, investigations, tests and results relevant to condition, medicines prescribed (8 items)

Section D - referrals made in relation to the underlying condition (9 items)

Section E – health service resource use in the 2-month period following consultation, re-consultation rates (11 items)

Section F – quality of letters sent to GPs/service providers (12 items)

Section G - possible unintended consequences/adverse events/medication errors (4 items)

Section A included an assessment of the availability of source documents (such as the patient record, medication chart prescribing records, referral letter, admission, progress, and discharge summaries) and a subjective evaluation of the overall quality of the patient

record was scored on a scale of 1 (poor) to 10 (Microsoft Excel ©) ⁹⁴. Additionally section F included an assessment of the quality and standard of letters sent to GPs/other service providers by PP-IPs/NP-PPs ⁹⁵. The checklist included 17 aspects of accurate record keeping (e.g. date of consultation, date of letter, PP-IP/NP-PP contact details, patient name and address).

3.4.10.3 Pilot

The record audit tool was piloted on 8 sets of paper medical records chosen randomly from a NHS consultant physiotherapy led secondary care rheumatology clinic. On average each record took 15-20 minutes to complete. Data for Sections A-C could be identified easily, although it became apparent that only patient care/ clinical activity occurring within one care setting was accessible; record systems did not necessarily traverse different care settings. Hence evidence of health resource use occurring outside the immediate case site setting (Section D) was unobtainable. Likewise, unintended consequences/adverse events/medication errors occurring in the 2-month period may have been unreported outside primary care, and were not recorded in secondary care notes.

It became apparent during the pilot therefore that retrospective data collection at different case sites presented difficulties with potential incomplete data, the range (and combination) of different data systems employed by case sites and subsequently difficulties in gaining institutional access to data systems. In view of this after discussion with DH an amendment to the study protocol was made to include direct contact with patient at the 2-month point (Section 4.4.5).

3.4.10.4 Sampling

A random sample of patients who had consented to an audit of their medical notes was generated using Microsoft Excel© random number generator. A maximum of 15 patients at each site were selected. For full details of participant recruitment, see Section 4.4.2.

3.4.10.5 Data collection and analysis

Patient records were identified at sites in three ways; ordered from medical records by the local research nurse before the 2-month audit visit, identified from filing cabinets by the researcher at the time of the visit, or in the case of electronic patient records, accessed electronically with the assistance of research nurses during the visit. Data were extracted into a paper based version of the audit form, and inputted into SPSS© Version 22.

Descriptive statistics were reported for numeric data and for where open text data (such as Previous Medical History and Requested tests) had been converted to numeric (count) data.

When comparing 2 subgroups for normally distributed outcomes, an unpaired t-test was utilised. When comparing 2 subgroups for non-normally distributed continuous outcomes (specifically number of tests requested or number of co-morbidities), a Mann-Whitney U test was utilised. In addition to standard descriptive statistics, the number and percentage of zero values was reported where relevant to the health economics analysis. When comparing 2 subgroups for a categorical outcome, the Chi-Squared test was used, reverting to a Fisher's Exact test in 2x2 cross tabulations if 1 or more expected cell count was found to be < 5.

3.4.11 Prescription audit

3.4.11.1 Aim

The aim of the prescription audit was to explore the quality and safety of prescriptions issued by PP-IPs.

3.4.11.2 Development of assessment tool

The prescription assessment form was developed from previous research ⁹⁶⁻⁹⁸ and guidelines for prescription writing in the BNF ⁹⁹. The form (**Appendix 10**) assessed prescriptions for accuracy, legibility, correct use of terminology, whether medicines were prescribed generically, preparation details, dose, dose frequency, length of treatment, and instructions regarding the frequency, location and application of topical treatments. Each aspect of the prescriptions was rated by two independent assessors using "1" = Safe practice/accurate, "2" =Unsafe practice/ omitted.

3.4.11.3 Pilot

There was no piloting of the assessment tool as it had been used in previous studies ^{56, 90}.

3.4.11.4 Sampling

Any prescriptions issued during the PP-IP observations were copied and collected.

3.4.11.5 Data collection and analysis

All prescriptions issued by IP-PPs during observed consultations were collected by the study researcher. Prescriptions were made anonymous, photocopied, collected and independently assessed, by a pharmacist and nurse independent prescriber, using a prescription assessment form. Each assessor rated the various aspects of the prescriptions using '1'=safe practice/accurate, '0'=unsafe practice/omitted. Inter-rater reliability was supported by pilot work and discussion between the researchers and two assessors about how to use the assessment form. Disagreements were resolved during discussion between the two assessors (NC & JB).

Microsoft Excel© and SPSS© Version 22 were used for data entry and analysis. Descriptive statistics were used to describe the various aspects of the prescription.

3.5 Economic analysis

The economic analysis examines the cost implications of PP-IP through two main analyses:

- a) A comparison of care delivery at individual patient level of PP-IP and NP-PP from the NHS perspective
- b) Consideration of the costs and benefits of IP training from NHS and private (PT/ PO) perspectives

Patient level care delivery

A cost consequences framework was adopted to capture the multiple effects and costs that the IP v NP comparison involves ¹⁰⁰.

Costs: Seven items were considered in the comparison of PP-IP vs NP-PP from the perspective of the costs to the NHS:

- Frequency and type of new medication (s) recorded as being required during the consultation (see Q6 & Q14 **Appendix 4**)
- Number and type of tests requested during the consultation
- Referrals made during the consultation to other professionals / specialists for treatment (excluding referrals for tests)
- Frequency of planned follow –up consultation to review patient, face to face or by phone
- Consultation duration
- Time of other colleagues taken when PP-IP or NP-PP discussed patient with them during the consultation
- Frequency of unplanned consultations taking place for the same condition within 2 months of the index consultation

Data on each of these items were gathered in various ways as set out in Table 3.1. Suitable variables for analysis were identified based on the completeness of the available data.

Table 3.1 Sources of data for the economic analysis

Cost item	Source of data	Details of item	Data manipulations: Variable for analysis
New medication requirements and types	Observation diary, Q6, Q14	Name, dose, duration, formulation of each medication required	Number of new medications required (Q6) (data on name, dose, duration were incomplete Q14)
Tests requested	Retrospective audit of sample of records	Number and type of tests	Number and type of tests
Referrals	Observation diary, Q11	Referrals to either same professional or medical professional or other	Total number of referrals (details on which professionals were referred to were not available)
Follow up consultations	Observation diary, Q15	When (number of weeks) review was scheduled (if applicable)	Re-coded to Yes / No review scheduled (as timings of follow ups incomplete)
Unplanned consultations	Patient follow up questionnaire (self-report)	Reason for unplanned consultation, professional, location	Consultations unamenable to treatment in index consultation removed (agreed by 2 independent researchers)
Consultation duration	Observation diary, Q1	Time in and time out	Number of minutes calculated
Discussion time	Observation diary, Q9,10	Time discussing with colleagues (same professional, medical professional, other)	Number of minutes. 'Other' re-coded to same (i.e. non-medical or medical professional)

Group level comparisons between IP and NP, for PT and PO separately, were undertaken for each of the seven variables identified. The cost implications (in British pounds 2015) of differences between IP and NP in consultation duration and in colleagues' time spent discussing the patient were examined. Nationally validated unit costs¹⁰¹ were applied pro rata to the mean duration of consultations and the time spent by colleagues discussing the patient. A comprehensive micro level costing analysis at the individual patient level could not be conducted because data on tests and unplanned consultations were only available for a sample of participants, and insufficient details were available on medications, referrals and follow ups (planned and unplanned) to enable unit costs to be ascribed.

Consequences: Two indicators of satisfaction from the post consultation questionnaire were used as the primary outcome measures (satisfaction with the consultation and satisfaction with the advice given by the PP). Patient reported changes in health status between the initial consultation and follow up 2 months later, assessed through change in EQ-5D-5L scores, were explored as a further indicator of outcome. EQ-5D-5L is a widely used and well validated measure of health related quality of life recommended for use in clinical practice by the Chartered Society of Physiotherapy¹⁰². It also forms the basis for calculating quality adjusted life years gained (QALYs), as required by National Institute of Clinical Excellence (NICE) for estimating cost effectiveness¹⁰³. Group mean

changes between baseline and follow up were computed and compared (IP v NP for PT and PO).

Training costs and benefits

The costs and benefits of undertaking IP training were explored from NHS and private perspectives, through the baseline and follow up questionnaires (Appendix 6) sent to PTs and POs enrolled on IP courses in England 2014-2016. From the NHS perspective, in the baseline questionnaire, respondents reported on which HEI they were attending, the fee level and who paid (self, employer/ NHS agency, both, other). They also recorded the grade of their DMP. In the follow up questionnaire, POs and PTs on conversion courses were asked about days in the classroom or distance learning; those on combined IP and supplementary prescribing courses were asked how many of the required 26 taught days were face-to-face. All respondents were also asked to report the number of paid days of study leave. These data were analysed descriptively. Private costs associated with IP training were explored through items on the follow up questionnaire: lost leisure / own time spent studying and out-of-pocket expenditure on travel and materials for the course. Promotion as a motive for undertaking IP training was explored in the baseline questionnaire and considered in the light of private expenditures in a descriptive analysis.

3.6 Triangulation

This was a comparative case study design^{58 59}(comprising 14 matched sites) and multiple data collection methods. Data collected by each of the separate methods (literature review, interviews, document analysis, questionnaires, work sampling, diaries, observation and patient note audit) was initially analysed and reported in individual units. Comparisons between the two professions and between prescribing and non-prescribing groups, where applicable, were made within in each unit of analysis and reported as such in the results (section 6). Detailed notes on individual case sites were summarised and presented in the findings. This was followed by a process of triangulation, whereby consideration was given to convergent evidence across sites and findings as a whole in order to inform the discussion⁵⁸. Triangulation of methods and data sources was used to confirm the accuracy of the data-set and to inform answers to the original study questions and objectives⁷⁴. This process of convergent validation enhances trustworthiness, transferability and rigour, as well as enabling a holistic portrayal of the impact of prescribing and its complexity in real life context^{58 59}.

3.7 Research ethics

NHS Research ethics approval for Phase 3 was obtained from London – Surrey Borders Research Ethics Committee in December 2014, REC Ref No 14/LO/1874. Recommended procedures for recruiting participants and obtaining informed consent were followed. Participants were made aware of right to withdraw and told study participation, or withdrawal, would not affect NHS service provision or employment. Where possible,

study information was sent 1-2 weeks in advance to all potential patient participants. Each site also advertised the study 2 weeks prior to data collection.

3.8 Patient and Public Involvement group (PPI)

A patient and public involvement (PPI) group comprising seven people who had received either podiatry and or physiotherapy services in the Eastbourne area was established in January 2014. However, two service users who attended the initial meeting later withdrew due to ill health.

The PPI group members were additionally invited and encouraged to participate in the wider activities of the Project Advisory Group (PAG). Unfortunately, although they were keen to be involved, they did not wish to participate in the PAG, stating they preferred to meet as a group on their own and that would be able to make a more useful contribution in this environment compared to a large group meeting.

In order to ensure maximum participation throughout the project, small group meetings, the telephone and hard copy documents of relevant study information and newsletter updates were used as key methods of communication to facilitate discussion between the project team and PPI group members.

During small groups meetings, (March and September 2014, March and November 2016), the format was loosely structured and the participants were asked to share with us their views and opinions at the different stages of the study. At the March and September 2014 meetings the group were asked comment on the content, presentation and format of numerous study documents including the two questionnaires used in phase 2: national survey of trainee PP-IPs, and phase 3 case studies; patient information sheet and patient questionnaires. Interim newsletters distributed to PPI members in March and September 2015, and January 2016 provided ongoing updates on study progress during the period of data collection with an invitation for members to provide feedback and comments to the research team. Subsequent meetings in March and November 2016 provided an opportunity for PPI member to discuss study progress and emerging findings.

During the meetings discussions naturally flowed and comments were captured by a member of the research team, who subsequently fed this back to the PAG as outlined in Section 3.3.4. Overall, the PPI group were able to voice their experiences and put forward suggestions to inform our project on some of the key issues affecting them and their families.

4. Results from Phase 1 Literature Review

4.1 Review findings: Overview

Of the 113 full text articles assessed for eligibility, 87 met the inclusion criteria of which 72 related to physiotherapy and 15 podiatry (**see Appendix A2.2.**)

Physiotherapy: Seventeen articles focused on injections^{8, 15, 70, 104-117}, 11 related to physiotherapy IP^{2, 118-127}, 8 related to physiotherapy SP^{124, 128-134}, 12 evaluated medicines administration in extended scope of practice (ESP) roles^{52, 57, 135-144}, 21 were on general Medicines Management Activities (MMA)¹⁴⁵⁻¹⁶⁵ and 3 related to ESP and NMP training¹⁶⁶⁻¹⁶⁸. Literature originated from seven countries; United Kingdom, Australia, New Zealand, North America, Nigeria, South Africa and Canada.

Of the 32 empirical studies identified; 27 were quantitative studies, and 5 qualitative studies^{136, 137, 150, 166, 167}. Quantitative studies included 1 meta-analysis¹¹⁶, 1 randomised controlled trial¹⁴⁴, 1 randomised equivalence trial reporting clinical¹⁴⁰ and cost-effectiveness outcomes¹⁴¹, 1 case-control study¹³⁸, 4 prospective cohort studies^{107, 109, 139, 143}, 3 case-series^{70, 108, 112}, and 15 cross-sectional questionnaire surveys^{57, 120, 145-149, 151-157, 168}.

Four main themes were in the data relating to physiotherapy (**see section 4.1.1**).

These were:

1. Extent of involvement in medicines advice or administration
2. Knowledge levels and training needs relating to role in medicines management or advice
3. Attitudes towards physiotherapist prescribing or extended medicines role
4. Care outcomes and costs

Podiatry: Four empirical papers were identified^{38, 60, 169, 170}, 1 literature review¹⁷¹, 9 editorials/opinions papers¹⁷²⁻¹⁸⁰ and 1 professional body paper¹⁸¹. Empirical studies included 2 qualitative studies^{169, 170} and 2 audits^{38, 60}. Articles were from the UK, Australia and Canada (**see section 4.2**).

4.2 Physiotherapy literature

4.2.1 Extent of prescribing, involvement in administration or medicines advice

4.2.1.1 Administration of medicines

Literature on physiotherapy involvement with medicines commences in 1995 in the UK and reports development of orthopaedic ESP roles in which PTs administered intra-articular injections. Under the remit of skill substitution, doctors locally trained PTs to deliver injections with the primary intent of speeding patient access to specialised services^{108, 109}. Acquisition of injection skills was integral to these new roles, and considered central to the evolution of enhanced or extended scope of practice¹⁰⁴.

Although much of the literature on injections is narrative in the 1990s^{104, 105, 110, 111}, two small cohort studies showed the addition of injection skills enabled ESPs to independently manage up to 72% (n=74) of routine orthopaedic referrals thereby reducing surgeon waiting lists and service waiting times¹⁰⁹. Following official recognition of injection therapy into professional scope of practice in 1995¹⁰⁶ and national accreditation of training, the skill became more widespread in the UK^{104, 111, 113} and by 2009 there were approximately 3000 PTs performing injections¹. Clinicians in rheumatology, primary care Musculoskeletal (MSK) services, private practices and industry adopted injection therapy¹³⁶. Two qualitative studies reported benefits to clinician autonomy and enhanced physical assessment skills through undertaking injection training^{136, 137}. Subsequent experimental studies showed PTs providing injection services could achieve clinical outcomes in line with traditional models of care^{107, 138} and today injection roles have expanded into other areas such as administration of botulin toxin therapy for spasticity management¹⁸² and epidural anaesthesia for back pain¹¹⁵. International role enhancement with respect to injections has not kept pace with early UK developments, and despite recent proposals for its inclusion in physiotherapy in Australia¹²³ and New Zealand¹⁸³, to date injection therapy is exclusively the remit of UK physiotherapists.

Over the last decade, changes in legislation increased administration rights to non-medical health professionals in the UK, giving PTs access to a wider formulary through PGDs. Although this had potential widespread clinical applicability, research evidence mapping the uptake of medicines roles across different specialties is limited and only MSK roles with administration rights to non-steroidal anti-inflammatories (NSAIDs) and analgesics feature in the literature. These were based in emergency departments¹³⁸⁻¹⁴⁰, orthopaedic settings¹⁴⁴ and primary care⁵⁷. Reports after the introduction of SP in 2005 suggested a strengthening and more diverse picture of medicines involvement in physiotherapy across the UK. Maintaining the strong link with ESP, numerous specialist roles with access to a range of different groups of medicines including anti-coagulants, antibiotics, antacids, inhaled medicines, steroids, analgesics and NSAIDs were described

in newsletters. The predominant clinical areas were community respiratory services ¹³¹⁻¹³⁴, intermediate care ¹²⁹, and pain management ¹³² in addition to the more traditional specialties of rheumatology ¹¹⁵, orthopaedic ^{134, 142} and MSK ¹²⁴ services. By July 2016 506 PTs had undergone SP training ¹⁸⁴. Despite a decade since implementation no peer reviewed systematic and high quality evaluation of SP has been published.

Outside the UK, research into involvement with medicines is first evident in Australia in the late 1990s and was conducted in response to national concern that PTs may be practicing outside New South Wales medicines legislation. Alarm was fuelled by reports of over-recommendation of NSAIDs by sports physiotherapists and findings from a New South Wales (NSW) critical care survey in which 40% of PTs were routinely administering POMs ¹⁴⁵. A policy statement advising on the legislation prohibiting administration of Schedule 4 medicines (equivalent to Prescription only medicines (POMs)) had been issued prior to this, bringing MMA under NSW Physiotherapy Board scrutiny. From a subsequent survey of PTs in NSW in 1998 ¹⁴⁵⁻¹⁴⁸, 27% (n=127) and 31% (n=147) confirmed administration of POMs and non-prescription medicines in their clinical practice respectively. Engagement was widespread across specialties and not associated with clinical experience or role enhancement although it was influenced by clinical setting. Private practitioners were more engaged in over the counter (OTC) medicines administration, whilst PTs in public health settings predominantly administered POMs. Most clinicians adhered to physician guidance when administering POMs, although 13% (n=16) determined dose schedule of OTC medicines independently.

Following on from this study, and in lieu of the high numbers of PTs found administering non-prescription medicines, a second South Australian research group surveyed PTs from three different states with respect to use of NSAIDs. Engagement in administration of topical NSAIDs was similar to findings by Lansbury et al ¹⁴⁵ with 20% (n=150) of respondents indicating regular application of topical agents during treatment. Importantly this was against Australian Physiotherapy Association (APA) practice guidance and outside the federal legal framework.

The theme of widespread medicines administration occurring outside enhanced physiotherapy roles also extends to other countries. A decade ago in South Africa, 64% (n=294) of PTs from a range of hospital and primary care settings reported stocking, supplying and administering medicines; activities outside the legal framework ¹⁵². In contrast to Australian practice, administration was associated with clinical specialty; significantly more PTs administered medicines for trauma and respiratory conditions than orthopaedics and sports injuries (p<0.01). Inhalation and topical application were the most common methods of administration. In New Zealand more recent reports also suggest PTs have been administering medicines without conforming to existing administration frameworks giving authority to administer POMs under Standing Orders ¹⁸⁵. Isolated physiotherapy roles travelling with sports teams are commonplace in NZ ¹⁶² and historically these clinicians have been expected to supply and administer NSAIDs,

analgesics, antibiotics as well as a range of other POMs^{161, 162}. Concern that individuals have adopted this responsibility in place of doctors¹⁶¹, without conforming to correct governance arrangements¹⁶² have been expressed.

Outside the UK, the only country where physiotherapy roles were found to affect involvement in medicines administration was North America¹²⁰. In a survey of military and civilian primary contact PTs, with a third comparator of non-primary contact civilian PTs, those providing healthcare at the first point of entry into primary care (primary contact roles) were more frequently involved in OTC medicines administration than those in non-primary contact roles. OTC medicines were administered by 61% (n=50) of military and 38% (n=14) of civilian physiotherapists, mainly for MSK conditions, compared to 6.2% (n=6) of non-primary contact physiotherapists. Establishing a physical therapy diagnosis and prescribing or administering OTC medicines were considered to be important professional tasks in these roles, as was maintaining effective communication with physicians and other healthcare providers.

North America and the UK PTs are unique in being granted authority to prescribe medicines. In the 1970s North America military PTs who completed specialist military neuro-musculoskeletal training could undertake preceptorship for prescribing a limited formulary of OTC and POMS including NSAIDs, analgesics and muscle relaxants¹¹⁹. Credentialing was performed locally by employing hospitals and clinician performance monitored through continuous quality improvement. Uptake of the prescribing roles was 63% (n=85) in one early unpublished survey¹¹⁹, although current levels of involvement are not known. In contrast to North America, extension of IP to physiotherapy in the UK is recent³⁴ and by March 2016, 319 PTs had undertaken training and received HCPC annotation¹⁸⁴.

4.2.1.2 Advising and recommending medicines

A lack of clarity surrounding the legal and professional implications of giving patients advice on medicines is evident amongst PTs in the literature, which is particularly apparent in countries without professional practice guidelines^{149, 150, 160}. Subsequently advising on medicines has been referred to as a “grey area” of physiotherapy practice^{150, 186} and clinicians express uncertainty over their role in relation to giving advice. Nevertheless, direct evidence of PT involvement in provision of advice from Australia^{145-147, 149, 150}, New Zealand^{153, 154}, South Africa^{151, 152} and North America¹⁵⁸ suggests the practice is widespread and takes three main forms; recommending new medicines (either GSL/OTC or POM), giving advice on dose schedule and advising patients on safety information, including contraindications and side effects. Additionally, some studies have investigated recording of medicines during patient assessments and in treatment plans^{145, 148, 151, 186}.

- *Recommending new medicines (either general sales list/OTC or POM),*

Five cross sectional studies investigated recommendation of OTC/general sales list medicines ¹⁴⁷ and named medicines including paracetamol, NSAIDs and analgesics made by MSK PTs ^{153, 154, 158}. In Australia and New Zealand 84% (n=396) and 78% (n=216) regularly made recommendations for OTC NSAIDs, with 77% (n=214) of New Zealand PTs also recommending paracetamol. Named medicines were sometimes stipulated and there was evidence in both countries that medicines were stocked and supplied on the premises. Accompanying advice to seek physician guidance was variable. Recommendations were made at patient request or because PTs considered current dose schedules ineffective or incorrectly given.

An Australian qualitative study of 31 clinicians and individuals involved in physiotherapy policy also expressed role confusion with respect to giving recommendations on NSAIDs ¹⁵⁰. Interviewees expressed beliefs that patients had expectations of knowledge on medicines yet they felt inadequately educated on the role and associated dangers of NSAIDs in MSK conditions. This conflict was more keenly felt by PTs working in first contact practitioner roles in rural and isolated roles. Legal uncertainty was expressed in making recommendations because of recent federal re-scheduling of selected NSAIDs and analgesics to GSL status, and PTs acknowledged that their training on medicines in general was inadequate.

Lansbury and Sullivan's 1998 survey is the only study identifying practice with respect to POMs and it found 74.4% (n=343) of respondents recommended new medicines with patients which were predominantly analgesics (47.7%, n=145), NSAIDs (44.7%, n=136) and general anti-inflammatory agents (40.1%, n=122). Associated with this, 94% (n=379) advised patients to consult a doctor. Clinicians with more clinical experience gave more advice ($\chi^2 = 13.89$, $df=6$, $p<0.05$) and it was delivered for the same reasons; patient request, detection of an ineffective medicines regime and incorrect patient use. Eighty-six per cent (n=399) also instructed patients to seek physician approval.

- *Advice on dose schedule and safety*

Changing any parameter of the dose schedule including stopping medicines is outside the scope of non-NMP trained PTs in the UK ² and no legislation permits these activities in other countries. Despite this a range of advice on medicines dosage and safety has been given by PTs in studies from Australia ^{145-147, 150} and New Zealand ¹⁵⁴, including how much medicine to take ^{146, 147, 150, 154}, when to take it ¹⁴⁶, and how often to take it ¹⁴⁶. Guidance on when to cease using medicines was less frequently given ^{146, 147}. In general, more PTs gave instruction on OTC medicines than POMs. Topical NSAID application for the purpose of electrotherapy and massage was administered by around a quarter of PTs ^{145, 146, 150, 154}, often without patient consent or attention to dose accuracy ^{149, 156} being seen as a medium rather than a medicine ^{145, 150}. Different sources of information were

used to guide PTs, including instructions accompanying medicines, clinical experience, drug directories, condition severity, and information provided by patients or carers ¹⁴⁵.

Safety information given to patients included contra-indications ^{149, 154}, side effects and risks ^{149, 154}, drug interactions ¹⁵⁴, and warnings and precautions ¹⁴⁹. Surveys did not include questions on patient allergies. Fewer PTs gave advice on drug interactions, consistent with poorer knowledge in this area ¹⁵⁴. There were a number of reasons for providing dose schedule and safety information; patients requested it, or because they were incorrectly using their medication ¹⁴⁶. PTs also determined that current regimes were ineffective and believed advice given to some patients by doctors to be poor ¹⁴⁶.

4.2.2 Knowledge levels and training needs relating to role in medicines management or advice

Despite international agreement for standardised, competency-based training in preparation for prescribing and involvement in MMA ^{118, 121, 162}, limited literature was identified on training and provision of education. However, several surveys investigated physiotherapists' pharmacology knowledge of NSAIDs and analgesics ^{136, 148-150, 153, 154, 158}, their understanding of underpinning legislation ^{146, 149, 151, 152, 156, 158} and training resources used to inform MMA ^{145, 147, 152, 158}. Additionally, a recent literature review reported on education and training issues requisite to instituting NMP in Australia ¹¹⁸.

4.2.2.1 Knowledge of pharmacology

PTs internationally reported a need for more comprehensive training in pharmacology ^{145, 148, 149, 152, 154-156} with many considering themselves inadequately prepared to administer or give advice ^{136, 147-150} on medicines. Knowledge of mechanism of actions, dose, side effects and contra-indications of common topical analgesics, anti-inflammatory agents, and antibiotics was uniformly poor across Australia, New Zealand, Nigeria and South Africa. Whilst PTs could identify clinical indications for common oral and topical NSAIDs ^{155, 156} and were aware to some degree of the potential effectiveness of POMs ¹⁴⁹, few perceived themselves able to deal with medicines in all situations ¹⁴⁸ and concern was expressed about giving patients the wrong information, especially with regard to the dangers of NSAIDs ¹⁵⁰. On the whole, PTs recognised the limitations of their pharmacology knowledge although interestingly this did not appear to prevent them from engaging in MMAs. Many agreed that knowledge of pharmacology improved patient care and was therefore relevant to physiotherapy ^{136, 137, 151, 156} and they were keen to have further training ^{136, 145, 156, 157}, especially when taking up specialist roles ¹³⁷.

To explain low levels of self-reported knowledge and reasons for refraining from MMA involvement authors investigated the relationship between pharmacology knowledge and clinical experience or post graduate education. A significant relationship ($p < 0.05$) was found with clinical experience ^{147, 155}, whilst prior exposure to undergraduate

pharmacology training ^{154, 155} did not influence knowledge. This suggests training was inadequate and most PTs acquired knowledge during clinical practice.

4.2.2.2 Knowledge of legislation

The literature indicates a widespread misunderstanding of medicines legislation and entitlement to prescribe or perform MMAs within physiotherapy ^{146, 149, 151, 152, 156, 158} coupled with confusion over the terms 'prescribing' and 'administration' ^{120, 139, 144}. PTs frequently believed they could 'prescribe', administer, stock and supply OTC or POMs outside their country's legal framework ^{149, 150, 152, 154, 156, 162}. There was considerable legal uncertainty over giving verbal guidance on medicines ^{146, 147, 149, 158, 159, 162}. This grey area of physiotherapy practice ^{149, 150, 162} prevented only a small number of clinicians from giving advice ^{146, 147}. Overall there was a paucity of underpinning knowledge on legislation and professional practice rights with regard to medicines within physiotherapy.

4.2.2.3 Sources of education

Early international literature supports the inconsistency of training provided at undergraduate level ¹⁴⁵⁻¹⁵⁰ and identifies alternative sources of information used by PTs to inform MMAs. Discussions with doctors, peers or other health workers, ward rounds and journal articles were most frequently cited ^{145, 151}. Conference presentations and postgraduate courses were least accessed, and some difficulty in sourcing these was expressed ^{147, 148, 150, 152}. Training in drug administration was highly variable with 28% (n=115) to 53% (n=237) having received some form of instruction at some point ^{146, 148, 152}, most commonly in inhaled medicines, topical agents and electrotherapy drugs ^{145, 146}.

The current provision of undergraduate training in different countries is difficult to determine from the literature. In Nigeria in 2012 at least 50% (n=67) of one survey's respondents had received 1- 2 semesters of undergraduate pharmacology training and since 2010 in New Zealand pharmacology and pharmacokinetics has been incorporated into physiotherapy degree courses ¹⁶¹. Whilst NMP and injection training in the UK is specifically post graduate, there is an expectation that newly qualified PTs will have basic knowledge of the role of medicines and are able to give some advice, albeit commensurate to their level of experience ². Since the early reviewed studies identified a need for pharmacology educational and over the past 20 years' roles have expanded and diversified, it appears that more physiotherapy professional bodies are mandating pharmacology education at undergraduate level.

4.2.2.4 NMP educational preparation and continuing professional development

Although little is known about the adequacy of educational preparation of PTs undertaking NMP training, two UK qualitative studies with small PT subsets recently evaluated prescriber preferences for training assessment ¹⁶⁶ and continuing professional development (CPD) ¹⁶⁷.

NMP students at five Scottish higher education institutes along with DMPs and managers were asked their views on a national portfolio based assessment strategy in which a new live systematic and detailed examination in practice (SDEP) replaced a former simulated clinical exam ¹⁶⁶. Students deemed prescribing competency was best demonstrated through assessments that contextualised it to real world practice, within their specialist areas, and ranked SDEP and learning logs most effective. The mandatory requirement to demonstrate SP competence through a clinical management plan was considered redundant and superseded by IP. Managers and DMPs similarly viewed verification of skills by expert prescribers a truer reflection of ability than written evidence based methods.

Following NMP qualification, clinicians expressed personal anxiety over maintenance of competence, especially in relation to accountability, keeping abreast of new drug developments, dosage calculations and drug interactions ¹⁶⁷. CPD was considered a bipartite responsibility for the individual clinician and workplace in order to maintain specialty knowledge, and there was concern that theory learnt during generic NMP training insufficiently addressed requirements of individuals in specialist roles. Prescribers sought peer interaction as a coping strategy for anxiety using it to confirm prescribing decision making and bolster confidence. Similar to findings in Paterson et al. ¹⁶⁶ the predominant choice of CPD learning was face-to face learning, rather than through distance learning media.

4.2.3 Attitudes towards physiotherapist prescribing or extended medicines role

Attitudes to physiotherapy prescribing and/or medicines management activities have been examined by international cross sectional surveys ^{57, 70, 145, 146, 148, 149, 153, 157} and semi-structured interviews with MSK PTs ¹⁵⁰ and ESPs trained in injection therapy ^{136, 137}. Additionally with the advent of NMP in the UK, clinician beliefs about NMP have been increasingly evident in newsletter reports ¹²⁹⁻¹³¹ and opinion papers ^{122, 187}.

4.2.3.1 Views on involvement in medicines administration and advice

Despite being fairly widespread clinical practices views on the role of physiotherapists in giving patient advice and administering medicines were divided in early literature ^{146, 149, 151, 154, 158}. Giving advice was considered outside the core scope of practice ¹⁵⁰ or

equivocally, highly appropriate within the context of first practitioner status ¹⁵⁰ in rural or private settings ¹⁴⁹. MSK practitioners believed NSAIDs and topical agents “*vital*” and complementary to effective and efficient management of acute inflammatory disorders, and a sense of “*responsibility to recognise conditions which may respond favourably to NSAIDs*” was evident ¹⁵⁰. Others were more cautious of the dangers of advising patients on medicines ¹⁴⁶. It was clear from the literature that PTs felt patients expected knowledge and advice ^{146,147,150}, were “*surprised*” when deferred to General Practitioners (GPs) ¹⁴⁶, purportedly wanting a “*one-stop-shop*” service from physiotherapy ¹⁴⁹.

Views on whether PTs should administer medicines also viewed variably, although as a practice assisting drug delivery is seemingly less performed compared to giving information and advice. Some clinicians advocated administration as important and “*integral*” to physiotherapy care ^{147, 152}, such as patient controlled analgesia given to facilitate treatment or when teaching patients to self-medicate ¹⁴⁵; whilst others felt “*vulnerability* and “*insecurity*” over potential side-effects and complications of drugs they administered ^{136, 137}. The main reasons PTs did not administer medicines were lack of education ^{146,148-150}, along with the view that other professionals were better trained and more available ¹⁵². Lack of authorising legislation was not cited.

4.2.3.2 Attitudes towards prescribing

Overall, PTs in South Africa ¹⁵², Nigeria ¹⁵⁶ and the UK ¹³⁶ have supported increasing their role in prescribing. Anticipated benefits of this advanced role included increased quality of care, improved service efficiency, use of skills, and enhanced professional status. Barriers cited included the need for more comprehensive pharmacology training, issues with liability and insurance cover, and resistance to changes to traditional roles ^{57, 136, 152}. Similarly to prescribing by nurses, PTs undertaking extended roles in medicines management are reported to experience an initial lack of confidence and an increased awareness of risks and contraindications ^{136, 167}. Notably, while doctors in the UK are confident in the ability of physiotherapists to diagnose and manage MSK conditions, some are not supportive of them undertaking the prescribing role ⁵⁷.

Rural, sports and first contact PTs in Australia have also been in favour of extending their role for prescribing of NSAIDs, if support is provided from pharmacists ¹⁵⁰. In contrast, evidence suggests that hospital-based PTs are less supportive of increasing their involvement in medicines or prescribing ^{149, 150}. Additionally, concerns have been raised about legality, access to medical records and patient safety ^{145-147, 150}.

The attitudes of UK PTs to prescribing have not been thoroughly explored and only one small survey (n=19) from 2002 ⁷⁰ investigated views of UK ESPs in unspecified roles. These individuals considered prescribing should be restricted to band 7 equivalent roles or above, although experience and competence, were considered the most important prerequisites ⁴. Mentored training with guidelines and protocols for prescribing were

recommended with registration through examination, and a method of maintaining competency. Concerns were expressed over safety, legality and remuneration.

Newsletter reports from the UK suggest implementation of medicines administration and NMP through different legislative frameworks varies in different clinical specialties^{130, 131, 142, 187}. In areas where PTs work in close proximity to doctors such as the Emergency Department (ED), PGDs were considered sufficient in promoting autonomy and enabling administration of the necessary medicines. The additional prescribing capacity of SP or IP was not considered to confer extra benefit¹²². For community or lone workers, dependency on doctor availability rendered SP “bordering on unworkable”¹³⁰. IP was the preferred prescribing model being “more flexible” and enabling “quicker and more efficient” services¹³¹. Despite gaining SP qualification one women’s health PT in secondary care expressed a preference for medicines administration through exemptions since this would avoid the need for IP countersigning and permit more staff to administer medicines¹⁴². Potential barriers to SP training were recognised including study budget and leave issues, difficulty securing medical mentors and potential for drug misadventures¹⁸⁷.

4.2.3.3 Stakeholder views on NMP

Stakeholder views of NMP in physiotherapy have not been explored and limited data were identified from the UK and Australia on views of health professional team members to physiotherapy services with MMA roles^{57, 143, 168}. Thirty eight percent (n=26/70) of GPs in Scotland despite expressing confidence in PTs acting as first contact practitioners including the role of monitoring NSAIDs, did not endorse prescribing to confer patient benefit⁵⁷. The study was carried out before SP and hence lack of exposure to PTs in prescribing roles may have influenced opinion. Significant medical opposition to any involvement in MMA by PTs also featured in Australia¹⁶⁸, based on concerns over safety, lack of underpinning evidence of benefit, training and clinical governance costs and funding restraints.

More recently doctors and nurse practitioners views on a new MSK physiotherapy advanced scope of practice (AoS) service implemented in an Australian ED were explored¹⁴³. The AoS PT was able to assess patient requirement for analgesics (including a schedule 1 narcotic), anti-inflammatories and injections although medicines were discussed and prescribed by doctors. The service was welcomed by doctors and nurse practitioners who considered it improved access to care, reduced workload and acted as a resource for MSK training within the ED.

4.2.4 Care outcomes and costs

Despite a decade since SP legislation came into effect, and IP training programmes commencing in 2014, there have been no experimental evaluations of NMP in physiotherapy, and only one audit reporting data from a collective of AHP supplementary prescribers across one region of north west England in 2009 was identified ³⁸. Data were collected on care outcomes from 209 patient consultations delivered by 19 AHPs, 6 of whom were PTs. Results for individual professional subsets were not presented and as the predominant profession was podiatry (n=12), this study is reviewed in Section 3.4.

Outcomes of physiotherapy-led assessment and management with integral medicines administration roles however, have been investigated by ten studies from the UK. Three randomised controlled trials (RCTs), one retrospective case note review and one prospective cohort study ¹³⁹ compared PT care to routine care delivered by nurses or doctors ^{138, 140, 144, 188}, and one prospective cohort study ¹⁰⁸, one case series ¹⁰⁷ and three retrospective case note reviews ^{109, 112, 113} investigated clinical and/or service outcomes of ESP PTs able to administer NSAIDs/analgesics or perform injections. Economic data were presented by two studies ^{144, 188} and a subsequent paper by McClellan et al. ¹⁴¹ reported cost-effectiveness analysis of an earlier RCT ¹⁴⁰.

4.2.4.1 Comparison of physiotherapy led care to routine care

Physiotherapy led care was compared to routine care delivered by all grades of doctors and/or emergency nurse practitioners (ENPs) in orthopaedic outpatients ¹⁴⁴ and hospital EDs ^{138, 140, 188}. In each study new patient referrals were randomly allocated to assessment and management by ESPs or doctors ¹⁴⁴ and ENPs ^{138, 140, 188}. ESPs delivered the same management options as doctors or ENPs, including intra-articular injections and NSAIDs/analgesic administration under PGDs ^{139, 140}, protocols ¹³⁸, or were able to assess for analgesic requirement but not administer or prescribe ¹⁸⁸.

Most studies collected self-report functional or return to usual activity data up to 6 months following injury/consultation ^{138, 140, 144, 188}. ESP care did not statistically impact recovery compared to routine care, although in one study patients were slower to return to work following injury (differences not reaching statistical significance) ¹⁸⁸. Referral patterns by ESPs for x-ray, surgical review, physiotherapy and issue of supportive equipment (e.g. crutches and splints) were variable between studies, and there was a trend to reduced medicines administration/use ^{138, 140, 188}. Whilst ESPs provided more general advice and reassurance to patients ^{138, 144, 188}, they provided less specific advice on analgesia ^{138, 140, 144, 188}. Three studies were performed before NMP training programmes came into effect in the UK ^{138, 144, 188}, and the ESP providing care in studies

by McClellan et al. ^{139, 140} was working under PGDs, confirmed by the research team and author in May 2014.

Economic data ^{141, 144, 188} on health and social services use and personal costs at treatment and follow-up showed no significant differences ^{144, 188}, and cost-minimisation analysis over an 8 week follow up period indicated that ESPs are at best equivalent, if not more expensive than routine care ¹⁴¹. While indirect costs were equivalent or more expensive, direct costs were equivalent or cheaper for the ESP group, mainly due to preference for supplying supportive equipment than administering medicine ¹⁴¹. Overall, three studies showed ESP care to be equivalent ¹⁴⁴ or non-inferior ¹⁴⁰ to routine care, and one study suggested physiotherapy could incur higher health service costs, largely because of slower to return to work following injury ¹⁸⁸.

4.2.4.2 Patient satisfaction with physiotherapy led care

Four studies investigated patient satisfaction with ESP care using different data collection instruments, taken at the time of consultation ^{139, 143, 188} or at 3 month follow up ¹⁴⁴. In two studies, overall satisfaction with services was significantly greater in patients seen by ESPs than doctors or ENPs ^{139, 188}, particularly for the areas of explanation of assessment, advice/information, and prognosis ¹³⁹. Patients may have been influenced however by shorter waiting times, longer ESP consultations, or overall reduced ED length of stay ¹³⁹. Moreover, ESPs were more likely to provide advice and reassurance ^{144, 188}. Recent qualitative data indicates patients though not always aware of the professional status of clinicians, found consultations thorough and were satisfied with the one-stop-shop nature of care including ability to interpret tests and make referrals ¹⁴³.

4.3 Podiatry literature

Podiatry literature was extremely limited and related predominantly to historical developments in MMA within podiatry in the UK, commencing with the 1968 Medicines Act and extending to recent IP legislation. Most was narrative, spanning a period of fifteen years. Despite potential opportunities for role enhancement and diversity through increased access to medicines granted over the years, only 2 evaluations of SP were identified ^{38, 60}.

A regional audit of 19 non-medical prescriber AHPs (including 12 podiatrists), reporting data on 209 care episodes ³⁸ showed the predominant use of SP was in community clinic settings (65.5%, n= 137), within initial specialist assessment contacts (71%, n=148). Opportunity to perform medicines reviews picked up a non-adherence rate of 26% (n=54). Sixty-nine percent (n=145) of consultations required some form of MMA and a range of prescribing decisions related to safety, dosage and regime were made.

Prescribing rate was 12% (n=25). The main barrier to SP was lack of information on current medicines with clinicians having to rely on patient recall or visible evidence in 46.6% (n=136) of consultations. Allergy information was also not available for 24% (n=51). Prescribing delay, increased episodes of care and prolonged symptoms were reported.

The second, limited evaluation presented data from a cross boundary podiatry service in which 40 clinical management plans (CMPs) were formulated for patients with diabetic foot ulceration in secondary care and subsequently delivered on within primary care ⁶⁰. Thirty-one primary prescription items were given, only 1 of which was non-dressing related (antibiotic). The abstract reports an uncorroborated reduction in the frequency of primary and secondary care visits subsequent to SP, and claims of improved cross boundary working.

4.4 Summary

This review revealed a dearth of literature evaluating NMP. This was the case for both professions, but was more marked in podiatry for which a minimal amount of empirical literature was identified. It can be concluded that NMP as an emerging topic has to date received modest attention. Subsequently, it is impossible to determine with any certainty how and where NMP uptake has occurred in physiotherapy and podiatry, and what its effect (if any) has been on patient care. This is despite almost a decade of SP in the UK.

In physiotherapy outside the UK, there was evidence for international PT day to day involvement in two aspects of medicines management activities; administration of medicines and provision of dose and safety advice. Inhaled medicines, oral analgesics and anti-inflammatories were most often cited, and exclusive to the PTs in ESP roles in the UK, anaesthetic and corticosteroid agents via injection. The main areas of clinical care where medicines were administered were MSK, orthopaedic and sports physiotherapy. Engagement varied, and reticence over the legitimacy of involvement, coupled with poor pharmacology and legislative knowledge was seen. Training insufficiencies, and associated potential safety issues in relation to medicines advice were evident and it was apparent that for some countries the scope of medicines involvement for PTs lacked clarification. In the UK where most literature emerged, there was no evidence of MMA or NMP occurring outside ESP roles, although descriptive research in less experienced, general staff is not available.

In podiatry, where it could be argued that involvement in medicines is more intrinsic to treatment, literature was very limited, largely descriptive, and focussed on legislative developments of medicines access and NMP in the UK and Australia. No literature was identified outside these countries. The extent of supply, administration and NMP in podiatry in the UK is essentially unknown.

PTs are authorised to perform NMP in two countries; the UK and USA military. Training is postgraduate and competency based for both, and a national process of credentialing has been implemented. Neither however, has been systematically empirically described nor evaluated, and therefore do not act as template NMP services for adoption by other countries. Whilst there is some evidence that ESP physiotherapy services achieve clinical and patient reported outcomes equivalent to traditional models of service provision in the UK, particularly in injection therapy, there is urgent need for thorough empirical evaluation of NMP.

Table 4.1 Summary of empirical papers and/or systematic reviews (n=45, physiotherapy n=40, podiatry n=5)

First author, year, (country)	Method	Sample/ Number of Participants/ Response rate	Content of Intervention/Medicines Management or Prescribing Activity	Main outcome measures	Methods used to support reliability and validity	Main Findings	MMAT score
Atkins, ¹³⁶ (UK)	Phenomenological study unstructured interviews	n=11 Convenience sample, MSK PTs (3 ESPs), from primary/secondary care (n=5), private practice (n=5), commercial industry (n=1).	Barriers and facilitators to implementation of injection therapy.	Not applicable.	Transcriptions verified by participants.	Facilitators: physician support, good relationships and communication with GPs and use of PGDs. Barriers: physicians, manager & PT resistance; quality of supervision during training; organizational barriers in setting up PGDs; lack of prescriptive authority. Level of responsibility and potential for adverse reactions linked with anxiety	75%
Ball, ¹³⁸ (UK)	Retrospective case note review	n=643 Patients attending ED March-May 2005 with closed musculoskeletal conditions	Comparison of management of closed musculoskeletal conditions by ESP (n=164)/ENP (n=142) /doctors (SHO n=130) /registrar (n=135)/ consultant (n=72)	Frequency of x-rays, patients given advice, analgesics, bandages or support, & follow-up.	Not stated.	ESPs documented more general advice than other clinicians (p=0.07). ESPs most likely to record giving of advice re analgesia (p=0.001). ESP most likely to suggest follow up (p=0.03).	75%
Birchall, ¹⁰⁷ (UK)	Prospective, consecutive case series with follow up	n=98/ 100 Recruited patients with osteoarthritis in	Patterns of clinical change using repeated measures based on course of 5 x weekly intra-articular knee injections (hyaluronic	<i>Primary:</i> pain, physical functioning and patient global assessment of change	Western Ontario McMaster Universities Osteoarthritis Index (WOMAC)	Significant pain reduction at five weeks, still below baseline at 13 weeks.	100%

First author, year, (country)	Method	Sample/ Number of Participants/ Response rate	Content of Intervention/Medicines Management or Prescribing Activity	Main outcome measures	Methods used to support reliability and validity	Main Findings	MMAT score
		one or both knees referred to PT led clinic, by Hospital consultant (n=56 completed study to 52 weeks)	acid) administered by ESP, with relative rest for 48 hrs & avoidance of strenuous activity & gradual return to normal activities.	@ 0, 5, 13, 26 and 52 weeks. <i>Secondary:</i> oral and topical analgesia, BMI	Likert 3.0 pain (0–20) and physical function (0–68) Outcome Measures in Rheumatology and Osteoarthritis Research Society International (OMERACT-OARSI) used to classify outcome at each follow-up.	Variability in response, and return to baseline levels similar to previous RCTs in this area. Physiotherapy led knee injection service achieved high treatment compliance rates and comparable functional outcomes to those reported in similar RCTs with Doctor led-service.	
Borthwick, ¹⁷⁰ (UK)	Qualitative exploratory study	n=30	Socio-historical analysis of access to medicines within podiatry.	Not applicable	Not stated.	Implications of legislation on medicine administration/prescribing in podiatry. Securing rights to local anaesthetic injections.	25%
Borthwick, ¹⁶⁹ (UK)	Qualitative exploratory study	n=31	Exploration of influence of podiatry specialty interest group on professional attainment of local anaesthetic injections.	Not applicable	Not discussed	Securing administration rights to local anaesthetics has enhanced scope of practice in podiatry	50%
Braund, ¹⁵³ (New Zealand)	Questionnaire	n=278/ 948 (29.3%)	Exploration of current practices regarding recommendation of paracetamol and NSAIDs to	Not applicable	Previous survey (Braund 2006) Pilot testing	> 70% sometimes or often recommended oral NSAIDs or oral paracetamol	50%

First author, year, (country)	Method	Sample/ Number of Participants/ Response rate	Content of Intervention/Medicines Management or Prescribing Activity	Main outcome measures	Methods used to support reliability and validity	Main Findings	MMAT score
		MSK PTs contacted via New Zealand Society of Physiotherapists	patients; knowledge with regards to adverse effects of these classes of medications and patient factors associated with increased risk of adverse effects.			More likely to recommend paracetamol bought direct from supermarket or pharmacy (53%) and to consult a pharmacist or GP about NSAIDs (44%). 83% provide information on side effects, 69% on potential risks, 55.5% recommend dose: i.e. practicing outside general scope of PT practice Variable knowledge regarding potential side effects and risks – 70% identified gastrointestinal upset/bleed, < 31% risks related to respiratory, renal or allergies. PTs who regularly recommended identified significantly more risks (p=0.004)	
Braund, ¹⁵⁴ (New Zealand) <i>Reporting from dataset Braund</i> ¹⁵³	Questionnaire	n=278/ 948 (29.3%) MSK PTs contacted via New Zealand Society of Physiotherapists	Exploration of knowledge of effectiveness, safety and indications for simple analgesics (paracetamol and NSAIDs) for acute MSK conditions.	Not applicable	Previous survey (Braund 2006) Pilot testing	45% could identify indications for NSAIDs in 24-48 hour period post injury. Variable Knowledge re safety profile of NSAIDs and paracetamol.	25%
Cohen, 2002 (UK)	Questionnaire	n=19 (% not stated)	Views on IP in physiotherapy.	Not applicable	Not applicable	Respondents perceived IP to be skill associated with advanced experience/clinical competence	0%

First author, year, (country)	Method	Sample/ Number of Participants/ Response rate	Content of Intervention/Medicines Management or Prescribing Activity	Main outcome measures	Methods used to support reliability and validity	Main Findings	MMAT score
		ESP special interest group members (number unspecified)				Identified barriers: training, safety, legal and remuneration. Acceptance of a prescribing role was dependent upon adequate training, registration through examination, and demonstration of competency through re-examination.	
Daker-White, 1999 (UK)	Randomized controlled trial	n=481 patients (244-Doctor care, 237 PT care) New GP referrals to two secondary care orthopaedic outpatients. Allocation sequence generated by random numbers. (Doctor care: 191/244 (78%), PT 192/237 (91%) completed study)	Assessment and management of newly referred patients by extended scope physiotherapists or doctors Physiotherapists received 1:1 training with consultant and could instigate (but not prescribe) the same management options as doctors, including intra-articular injections, oral NSAIDs and analgesics.	<i>Primary:</i> pain, functional disability and perceived handicap at 4/12 follow up <i>Secondary:</i> Health & psychological status, health related quality of life, self-efficacy, satisfaction with care & GP, resource use a mean 5.6 months' follow-up	Disease Repercussions Profile, Functional disability: Oswestry, back pain questionnaire WOMAC questionnaire, St Michael's Hospital Patient Self Evaluation, Modified American Shoulder & Elbow Surgeons Shoulder Patient Self-Evaluation Form Visual analogue scales	No clinically important differences between the two groups in primary outcome (>0.05). PTs higher level of Satisfaction on the 'perceived treatment quality' (p=0.001). PTs administered equal numbers of intra-articular injections compared to doctors (p=0.70), fewer intra-muscular injections (7 vs. 1, p=0.04) and no NSAIDs or analgesics (p=0.06). PT in-hospital costs were less due to less x-ray requests (p<0.001) & surgical referrals (p=0.005).	75%

First author, year, (country)	Method	Sample/ Number of Participants/ Response rate	Content of Intervention/Medicines Management or Prescribing Activity	Main outcome measures	Methods used to support reliability and validity	Main Findings	MMAT score
					Self-efficacy questionnaire, Hospital Anxiety and Depression Scale (psychological status), SF-36 (general health status measure), EuroQol EQ-5D, process data		
Dawson, ¹³⁷ (UK)	Semi-structured interviews	n=4 Purposive sample; ESPs PTs in orthopaedic outpatient clinic (OOC).	Exploration of ESP PTs' experience of role; perceived problems, responsibilities; and training.	Not applicable	Independent researcher reviewed the data after it was analysed. Pilot.	Consultants provided support, training and affirmation of ESP PTs' in the medical team. No formal training or preparation available for medicines management role. ESP PTs felt frustrated, pressured, anxious and dissatisfied with their new role.	25%
Donato, ¹²⁰ (USA)	Questionnaire	n=222/ 462 (49%) PTs Of which PCC PTs= 212 (n=56.1% were	Exploration of frequency & perceived importance of professional responsibilities, procedures (i.e. tests, measurements &	Not applicable	Content informed by literature review and panel of experts (n-19), and 3 round Delphi technique	Only PC military MSK PTS have prescribing authority in US. OTC medicines were administered mainly for MSK by 50 (61%) military	75%

First author, year, (country)	Method	Sample/ Number of Participants/ Response rate	Content of Intervention/Medicines Management or Prescribing Activity	Main outcome measures	Methods used to support reliability and validity	Main Findings	MMAT score
		primary contact military PTs & 43.9% were primary contact civilian PTs) who were compared to non primary contact civilian PTs (n=103/250).	interventions), and knowledge areas of PTs practicing in primary contact setting with PTs in non PCC settings.		Piloted	PTs, 14 (38%) civilian PTs conditions, and 6 (6.2%) non-primary contact PTs. Non-narcotic medications were administered by 40 (49%) military PTs and 6 (16%) civilian PTs respectively. Significant differences in professional responsibilities between primary and non-primary contact PTs p<0.001	
Grimmer, 149 (Australia)	Questionnaire	n=285/750 (38%) Random sample of registered PTs in South Australia, Tasmania and Australia Capital	Exploration of knowledge, treatment, behaviours and attitudes of regarding the use of NSAIDs in clinical practice	Not applicable	Content informed by 30 semi-structured interviews with PTs. Face, content & construct, validity, processes outlined by Carmines & Zeller (1979); Hunt et al (1982). Piloted	157 (55%) PTs regularly made direct recommendations to patients about use of NSAIDs. Most popular recommendations were for use of OTC topical NSAIDS (83%), followed by oral NSAIDS (78%), often recommended by brand name (61%). 96% gave advice on precautions,> 80% contraindications & side effects and <45% dosage. 64% (n=182) directed patients to their physicians or pharmacists re NSAID purchase.	50%

First author, year, (country)	Method	Sample/ Number of Participants/ Response rate	Content of Intervention/Medicines Management or Prescribing Activity	Main outcome measures	Methods used to support reliability and validity	Main Findings	MMAT score
						<p>Only 26% gave advice on drug interactions.</p> <p>65% recorded discussions with patients regarding.</p> <p>Nearly 90% correctly identified side effects, contraindications and clinical application of oral NSAIDs.</p> <p>> 40 % had poor knowledge of medicines legislation.</p> <p>Private PT strong support for prescribing legislations, but variable in other settings</p>	
Hattam, ¹⁰⁹ (UK)	Prospective cohort study	n=78/84 (93%) Consecutive recruitment of patients on orthopaedic waiting list over 1 year.	Monitoring patients attending the Orthopaedic Screening Service managed by physiotherapist.	Numbers & suitability of patients requiring referral to secondary services; impact on GP consultations; efficacy of injection therapy.	Not stated.	<p>Physiotherapy led OSS able to manage 72.4% patients of surgeon referrals.</p> <p>Injections administered to 12 (16%) of patients.</p> <p>After introduction of OSS; surgeon referrals decreased from 184 to 102.</p> <p>After introduction of OSS; waiting times for secondary care orthopaedics decreased from 11 months to 32 days</p>	25%

First author, year, (country)	Method	Sample/ Number of Participants/ Response rate	Content of Intervention/Medicines Management or Prescribing Activity	Main outcome measures	Methods used to support reliability and validity	Main Findings	MMAT score
Hockin, ¹⁰⁸ (UK)	Case-series	n=189/291 Patients with MSK conditions who completing treatment by ESP	ESP management of secondary care orthopaedic referrals. Administration of injections	Patient reported % improvement. Patient satisfaction. No. of treatments. 6-12 months following discharge.	Not stated.	ESP able to manage 236 (81%) of patients of surgeon referrals. Injections administered to 42 (22%) of patients. 40% improvement achieved in 186 (79%) of patients.	25%
Holdsworth, 2008 (UK)	Questionnaire	n=117/ 161 (73% response rate) Of PTS (n=47/64) and GPs (n=70/97) from 26 general practices in Scotland engaged in pilot physiotherapy self-referral scheme	Exploration of the views of PTs and GPs on self-referral and physiotherapy scope of practice, attitudes to prescribing and monitoring NSAIDs	Not applicable	Content informed by clinician interviews Piloted	70% GPs and 77% of PTs endorsed PTs practising as primary contact practitioners > 80% PTs and GPs supportive of PTs monitoring & prescribing NSAIDs 26(38%) GPs thought prescribing should not be considered, only 7 (10%) believed it would bring definite patient benefit.	50%
Kearney, ¹¹⁶ (UK)	Meta-analysis	n=732 18 peer reviewed RCTs.	Investigation of effects of injection therapies for Achilles tendinopathy.	<i>Primary outcomes:</i> Functional recovery Adverse events <i>Secondary outcomes:</i>	Cochrane's 'Risk of bias' tool	Insufficient evidence from RCTs to draw conclusions on the use of injection therapies for treating Achilles tendinopathy	N/A

First author, year, (country)	Method	Sample/ Number of Participants/ Response rate	Content of Intervention/Medicines Management or Prescribing Activity	Main outcome measures	Methods used to support reliability and validity	Main Findings	MMAT score
		Participants with Achilles tendinopathy.		Patient-reported quality of life Non-validated patient-reported outcomes Pain Return to previous activities Other adverse events Patient rating of satisfaction Resource use		17/18 studies reported adverse events; 1 serious	
Kersten, ⁵² (UK)	Systematic Review	n=152 articles on physiotherapy ESP roles.	Exploration of range and effectiveness of ESP roles in physiotherapy	Not applicable	Reliability of raters assessed. Quality assessed by Cochrane rating tool	Review identified lack of high grade research for ESP; 16/152 (11%) articles rated grade A. ESP roles were under-evaluated; 11/152 (7%) included patient/service outcomes. 100(66%) ESP roles were in MSK/ orthopaedic settings. Drivers for development of ESP roles were local/national service demands, e.g. doctor shortage and increased waiting times.	N/A

First author, year, (country)	Method	Sample/ Number of Participants/ Response rate	Content of Intervention/Medicines Management or Prescribing Activity	Main outcome measures	Methods used to support reliability and validity	Main Findings	MMAT score
						Most frequent model of ESP was role substitution	
Kumar, ¹⁵⁰ (Australia)	Semi-structured interviews	n=30 PTs from South Australia, Tasmania and Australia Capital Territory, Australia	Views on understanding of the role of PTs in the use, recommendation & delivery of NSAIDs.	Not applicable	Transcripts verified by participants (n=3)	High demand from patients for medicines information. PTs regularly asked for advice on NSAIDs Concerns about PT lack of knowledge of pharmacology to support advice given to patients, especially long term use of NSAIDs. Concern about poor access to patient medical records. Rural, sports and first contact PTs in support of PT prescribing of NSAIDs with pharmacist support. Hospital based PTs resistant to PT prescribing.	50%
Lansbury, ¹⁴⁵ (Australia)	Questionnaire	n=472/600 (72.5%). Random sample of 25% registered	PT views on administration, advice on POMs	Not applicable	Content developed in consultation with the NSWPRB	243(51.8%) worked in private practice Musculoskeletal (n=261, 55.9%), sports (n=172, 36.8%) and rehabilitation	50%

First author, year, (country)	Method	Sample/ Number of Participants/ Response rate	Content of Intervention/Medicines Management or Prescribing Activity	Main outcome measures	Methods used to support reliability and validity	Main Findings	MMAT score
		physical therapists in New South Wales, Australia (n=2662)			Piloted-multiple stages	<p>(n=104, 23.3%) predominant specialities.</p> <p>127(27.4 %) PTs administered POMs; (n =48, 40%) on a daily or weekly basis. Frequency varied from daily (13%) to < monthly (49.2%) and the majority were administering the dose prescribed by a physician.</p> <p>Only 248 (41 %) formally trained in administration of POMs.</p> <p>Private practitioners more likely to give POMs (p<0.0001).</p> <p>Common drugs administered: bronchodilators (n = 110, 84.6%) topical agents (n= 38, 29.2%), analgesics (n =21, 16.2%), NSAIDs (n = 9, 6.9%) and antibiotics (6.2%).</p>	
Lansbury, ¹⁴⁶ (Australia) <i>Reporting from Lansbury</i> ¹⁴⁵	Questionnaire	n=472/600 (72.5%). Random sample of 2662 (25%) registered physical	PT experience and views on providing advice on POMs.	Not applicable	Content developed in consultation with the NSWPRB Piloted-multiple stages	<p>399 (85.9%) gave POM advice as patients requested it (n=311, 77.9%) or incorrect usage detected (n=178, 74.9%).</p> <p>Advice given included how to take medicines (n=299, 73.8%), when to</p>	50%

First author, year, (country)	Method	Sample/ Number of Participants/ Response rate	Content of Intervention/Medicines Management or Prescribing Activity	Main outcome measures	Methods used to support reliability and validity	Main Findings	MMAT score
<i>dataset</i>		therapists in New South Wales, Australia.				<p>take (n=215, 53.1%) and frequency (n=109, 26.9%).</p> <p>66(14.2%) did not give advice as considered themselves not responsible, untrained, or not legally entitled to do so.</p> <p>343(74.4%) made recommendations for new drugs, although this was accompanied by advice to consult a doctor (n=330, 94%) of cases.</p> <p>Medicines recommended included analgesics, NSAIDs, general anti-inflammatory medicines and inhalers.</p> <p>The amount of advice given was associated with years of experience (p<0.05) and working in private practice (p<0.05).</p>	
Lansbury, 147 (Australia)	Questionnaire	n=472/600 (72.5%). Random sample of 2662 (25%) registered	PTs views and practice in administration or providing advice on over the counter (OTC) medicines.	Not applicable	Content developed in consultation with the NSWPRB Piloted-multiple stages	OTC MMAs variable (n=358, 82%) gave advice at some point, Providing information on dose schedule, safety & to see pharmacist/GP was common.	50%

First author, year, (country)	Method	Sample/ Number of Participants/ Response rate	Content of Intervention/Medicines Management or Prescribing Activity	Main outcome measures	Methods used to support reliability and validity	Main Findings	MMAT score
<i>Reporting from Lansbury 145 dataset</i>		physical therapists in New South Wales, Australia.				147(33%) administered non-prescription medicines, often independent of physician guidance. Greater pharmacology training required; 35 (10.3%) PTs aware of contraindications or side effects with 80 (18.5%) reporting inadequate pharmacology training.	
Laslett, 183 (New Zealand)	Conference abstract	Not applicable	Proposal for including injection therapy into MSK ESP physiotherapy.	Not applicable	Not applicable	Not applicable	N/A
Lee, 158 (USA)	Questionnaire	n=184/500 (37%) PTs registered in one state.	Knowledge, attitudes and professional use of non-prescription analgesics in physiotherapy.	Not applicable	Not stated.	46 (25%) made recommendations for OTC oral analgesics and 7 (4%) recommended PO oral analgesics. Knowledge of indications for OTC oral analgesics good. Variable knowledge of NSAIDs contraindications 144(78%) believed they were adequately educated on oral analgesics.	25%

First author, year, (country)	Method	Sample/ Number of Participants/ Response rate	Content of Intervention/Medicines Management or Prescribing Activity	Main outcome measures	Methods used to support reliability and validity	Main Findings	MMAT score
						<p>Against legislation, 39 (21%) believed they were able to make analgesics/NSAIDs recommendations.</p> <p>118(64%) considered they should be able to make medicines recommendations.</p>	
Maffulli, ¹¹⁷ (UK)	Systematic review	n=13 peer reviewed RCTs.	Pharmacological interventions (injections) for Achilles tendinopathy.	Not applicable	Quality assessed by Coleman Methodology Score (modified)	Evidence for pharmacological treatment of Achilles tendinopathy inconclusive	N/A
McClellan, ¹³⁹ (UK)	Prospective cohort study	<p>Patient satisfaction n=351/780 (45%) response rate</p> <p>Functional outcome of unilateral ankle soft tissue injury n=91/489 @ 4 weeks.</p>	Evaluating the effect of introducing an ESP in the adult ED, comparing three different practitioners: doctors, emergency nurse practitioners (ENPs), and ESPs.	<p><i>Primary:</i> Patient satisfaction 1 week after ED attendance.</p> <p><i>Secondary:</i> Functional outcome of unilateral ankle STI at 4 and 16 weeks after injury, pain VAS.</p>	Validated SF- 36, piloting of satisfaction questionnaire, Visual analogue scores	<p>ESP > patient satisfaction than for ENPs or doctors for good advice/information (p=0.03), time to ask questions (p=0.05), and explanation of assessment (p=0.01).</p> <p>ESP>overall satisfaction was higher compared to ENP and doctors (p=0.048).</p> <p>ESP< waiting time and longer consultations than doctors or ENPs.</p> <p>Functional outcome scores were comparable across groups. Trend to improved pain and function one month</p>	50%

First author, year, (country)	Method	Sample/ Number of Participants/ Response rate	Content of Intervention/Medicines Management or Prescribing Activity	Main outcome measures	Methods used to support reliability and validity	Main Findings	MMAT score
						after injury in patients seen by ESPs compared to doctors and ENPs.	
McClellan, 140 (UK)	Randomised controlled trial.	n=372 Adult patients with peripheral soft tissue injury <72-hour old were block randomised to receive care from an ESP (n=126), ENP (n=123) or any grade ED doctor (n=123).	To evaluate the clinical effectiveness of soft tissue injury management by ENPs, & ESPs compared routine ED Doctor care.	<i>Primary outcome:</i> Functional recovery @ 2 & 8 weeks <i>Secondary:</i> Health related Quality of Life preference based utility scores, clinician contact time, frequency of treatment types, medicines used, health resource use.	Disability of the Arm, Shoulder and Hand score (DASH) for upper-extremity injuries, & Lower Extremity Functional Score (LEFS) for lower-extremity injuries Validated SF-12v2 and SF-6D,	ESPs achieved equivalent clinical outcomes to routine models of care delivered by ENPs and doctors. Results showed equivalence in functional outcomes and Quality of Life with those treated by doctors at 8 weeks and no difference in recovery rates between the 3 professional groups. ESPs administered fewer analgesics and anti-inflammatories (p<0.001) and had longer consultation times.	75%
McClellan, 141 (UK) <i>Analysis of McClellan 140 dataset</i>	Randomised controlled trial.	n=372 Adult patients with peripheral soft tissue injury <72-hour old were block randomised to receive care from	To evaluate & compare cost effectiveness of treatment of soft tissue injury by ENPs, & ESPs and ED Doctor care	<i>Primary outcomes:</i> cost per hour/ patient contact and cost per patient per hour. <i>Secondary outcomes:</i> direct cost per hour per patient & indirect		Direct costs for ESP are at best equivalent, if not more expensive than routine care. Indirect costs for ESPs were equivalent or cheaper to routine care, mainly due to preference for supplying supportive equipment (e.g. leg crutches, braces) than administering medicine	75%

First author, year, (country)	Method	Sample/ Number of Participants/ Response rate	Content of Intervention/Medicines Management or Prescribing Activity	Main outcome measures	Methods used to support reliability and validity	Main Findings	MMAT score
		an ESP (n=126), ENP (n=123) or any grade ED doctor (n=123).		cost per hour per patient contact based on data collected during 8 weeks following injury			
Morris, ¹¹⁸ (Australia)	Systematic Review	n=9 6 peer reviewed articles, 3 government reports	Identification of issues that should be considered before NMP by PTs is introduced in Australia.	Not relevant	NHMRC hierarchy of evidence.	NMP in Australia following UK experience on safety and prescribing models. Issues that should be considered but are still grey areas: advice on NSAIDs and pain medication; administration of NSAIDs during treatment; homogeneity on medicine training in Australian undergraduate and postgrad programmes.	N/A
Morris, ¹⁸⁹ (Australia)	Prospective cohort study with semi-structured interview follow up.	n=832 Consecutive category 4&5 patients managed by ASoPT in one ED. n=11 patient interviews n=2 staff interviews	Investigate impact of advanced scope of practice PT in ED.	Length of wait/stay. No. radiology requests. No. medications (agreed for prescribing by doctors). National service indicators (4-hour target). Triage category indicators.		AsoPT PT managed median 72 patients /month; offloading 571 (68%) of patients with category 4 MSK conditions. ED performance targets influenced by AsoPT presence; targets met 100% when PT working vs 92.2% when absent. AsoPT discussed n=448 medicines with doctor including NSAIDs, analgesics and local anaesthetics.	50%

First author, year, (country)	Method	Sample/ Number of Participants/ Response rate	Content of Intervention/Medicines Management or Prescribing Activity	Main outcome measures	Methods used to support reliability and validity	Main Findings	MMAT score
				Patient and staff satisfaction. Adverse events.		10/11 patients expressed satisfaction with AsoPT care.	
North West AHP ³⁸ (UK)	Audit	n=19/24 AHPs involved: 12 Podiatrists 6physiotherapists 1 radiographer 209 patient case driven responses over 4 wks. POs: 142; PTs: 65.	How NMP impacts on the delivery of patient care provided by AHPs.	Prescribing rate. Consultation type. Medicines adherence rate. Views on impact of IP over SP.	Not stated.	AHP's have a significant role in specialist assessment (70.81%). Most prescribers were community-based (65.55%). AHPs used SP effectively & prescribed in 29% of overall consultations, but 80% of emergency ones. AHPs used NMP effectively on 95.69%.	N/A
Onigbinde, ¹⁵⁵ (SW Nigeria)	Questionnaire	n=152/ 200 (76% response rate of which 135 analysed). Questionnaire hand delivered to PTs from 5 university teaching hospitals, 2 state, 1 private, 2	Exploration of knowledge of topical medicines in clinical practice.	Not applicable.	Four section questionnaire adapted from Grimmer et al (2002). Piloted.	55 (41%) had recently updated their knowledge on topical medicines, whilst 24 (17.8%) had never updated. Knowledge of topical medicines pharmacology poor; mean score 5.21 (SD 2.52) out of 16. Knowledge of indications, actions and side effects of common topical agents poor: 109 (81%) misunderstood the mechanism of action for topical NSAIDs	50%

First author, year, (country)	Method	Sample/ Number of Participants/ Response rate	Content of Intervention/Medicines Management or Prescribing Activity	Main outcome measures	Methods used to support reliability and validity	Main Findings	MMAT score
		private clinics, and 3 PT training schools.				and 89 (66%) were unable to identify risks associated with topical medicines. Significant association between length of clinical experience and pharmacology knowledge (p=0.03). Limited access to physiotherapy training opportunities in pharmacology identified.	
Onigbinde, 156 (SW Nigeria)	Questionnaire	n=107/150 (71.3%). PTs > 1 year qualified experience from government and private hospitals; clinics and training institutions.	Exploration of knowledge of topical medicines in clinical practice. Views on pharmacology education on topical medications.	Not applicable.	Four section questionnaire adapted from Grimmer et al (2002) & Onigbinde, 2012 Piloted	Respondents had good knowledge of indications of topical analgesics e.g. Diclofenac. 89 (78%) were unable to correctly identify the FTU gram equivalent for topical cream and gel. 59 (55.1%) respondents had received undergraduate pharmacology education. Level of knowledge not associated undergraduate pharmacology training. 70 (65.4%) supported legislation granting authority to prescribe topical Medicines.	50%

First author, year, (country)	Method	Sample/ Number of Participants/ Response rate	Content of Intervention/Medicines Management or Prescribing Activity	Main outcome measures	Methods used to support reliability and validity	Main Findings	MMAT score
Paterson, 166 (UK)	Questionnaire with semi structured interview follow up	n=121 (38%). NMP students from 5 HEIs emailed on-line questionnaire. n=28 interviews: 21 NMP students 4 managers 4 DMPs	Exploration of effectiveness of NMP portfolio training assessments. Investigate whether systematic and detailed examination in practice (SDEP) acceptable alternative to simulated exam.	Not applicable	Piloted	Preferred assessments were contextual to real world prescribing: learning log and SDEP ranked most effective by students, managers and DMPs. Learning log and SDEP directly related to skills and knowledge post qualification. Managers and DMPs ranked written evidence least effective in demonstrating safe effective prescribing practice.	25%
Popadiuk, 190 (UK)	Audit	n=40 Patient CMPs.	Exploration of the benefits of SP within an NHS podiatry setting	Not applicable	Not applicable	36 (90%)CMPs used in diabetes 31 (77%) prescriptions given; 30 (97%) dressings, 1 (3%) antibiotics.	N/A
Richardson 188 (UK)	Randomised Controlled Trial	n=766/844 (91%). Block randomisation in A&E department patients with soft tissue injury without fracture	Comparison of clinical effectiveness and costs of two alternative assessment routes for patients presenting with musculoskeletal problems to an A&E department. Two physiotherapists (III grade) worked A&E day	<i>Primary outcome:</i> Days before return to usual activity. <i>Secondary outcome:</i> Patient satisfaction Quality of life Function Pain levels at 3 and 6 months.	Pilot study Goldstein satisfaction instrument (2000)	Higher satisfaction in physiotherapy arm (89% to 74%, p=0.0001). Higher quality of life at 3 months in physiotherapy arm, no differences at 6 months. Median days before return to usual activities (available for 73% of those randomised) was greater in the	50%

First author, year, (country)	Method	Sample/ Number of Participants/ Response rate	Content of Intervention/Medicines Management or Prescribing Activity	Main outcome measures	Methods used to support reliability and validity	Main Findings	MMAT score
		<p>a) initial assessment and management by a physiotherapist (n=382): return to usual activity n=278 (73%), Satisfaction n=306 (80%), 3 months n=207 (54%), 6 months n=198, (51%).</p> <p>b) routine A&E assessment and management by either a doctor or emergency nurse practitioner (n=384).</p> <p>Return to usual activity n=280 (73%), Satisfaction n=303 (79%), 3 months n=209</p>	shifts for the purpose of the project and were able to request radiographs and prescriptions for analgesia from medical staff.	Economic data collected on use of health and social services and personal costs at treatment and follow-up.		<p>physiotherapist group (41 days compared with 28.5 days; hazard ratio 0.85 p=0.071). not significant.</p> <p>Patterns of service use were different, e.g. the physiotherapy arm saw fewer prescriptions issued but higher referrals to other services but. no significant differences in service related or health & social care costs.</p>	

First author, year, (country)	Method	Sample/ Number of Participants/ Response rate	Content of Intervention/Medicines Management or Prescribing Activity	Main outcome measures	Methods used to support reliability and validity	Main Findings	MMAT score
		(54%), 6 months n=179 (47%).					
Schacklady, ¹¹³ (UK)	Conference abstract	n=324 Patients treated with intra/periarthral corticosteroid injections.	Clinical outcomes of PT administered injection therapy.	VAS for pain (0-5) Range of movement Strength At baseline, 1 week and 1 month.	Not applicable.	Pain reduced 1-month post injection (no statistical analysis).	N/A
Smith, ¹¹² (UK)	Audit	n=60/127 Corticosteroid injections administered by PT.	Administration of corticosteroid only injections under PGDs: outcomes compared retrospectively to combined steroid and anaesthetic injections.	VAS for pain (0-10) baseline, on injection and at 4 weeks.	Not stated.	Main conditions treated: Shoulder (n=36, 60%), plantar fasciitis (n=7, 12%), hand (n=7, 12%). Injections well tolerated by patients. Pain decreased from baseline (VAS 8.7) to 1 month (VAS 3.7) post injection. Outcomes consistent with results of combined injections.	N/A
Stanhope, ¹³⁵ (Australia)	Systematic review	n=12 studies	Systematic review of outcomes of orthopaedic ESP physiotherapy in an orthopaedic outpatient setting (OOS).	Training and supervision for ESP PTs in OOS; effectiveness of ESP PTs in terms of processes, cost	Quality appraisal of included studies using the National Health and Medical Research Council (NHMRC)	Injection therapy one of ESP PTs' tasks. ESP PTs work with a multidisciplinary team e.g. Consultants. Patients mostly referred by GP to OOS.	N/A

First author, year, (country)	Method	Sample/ Number of Participants/ Response rate	Content of Intervention/Medicines Management or Prescribing Activity	Main outcome measures	Methods used to support reliability and validity	Main Findings	MMAT score
				containment, and health outcomes; how literature in this review adds to the findings of Lowe et. al (2008) review.	Hierarchy of Evidence. Most common evaluation designs were Levels III_2 and III_3.	<p>Great diversity in ESP PTs' training & years of experience.</p> <p>Positive results on effectiveness and efficiency of ESP PTs' management – 70.6% appropriate referrals to consultants.</p> <p>Accuracy of ESP PTs' diagnosis-agreed with consultants.</p> <p>ESP PTs decrease waiting times and costs for both patients and setting.</p> <p>Health outcomes benefits-inconclusive.</p>	
Sullivan, 148 (Australia) <i>Reporting from Lansbury 145 dataset</i>	Questionnaire	n=472/600 (72.5%). Random sample of 2662 (25%) registered physical therapists in New South Wales, Australia.	Knowledge of prescription only medicines	Not applicable	Content developed in consultation with the NSWPRB. Piloted-multiple stages	<p>Documentation of medicines history varied; 244 (52.9%) kept a record at every consultation.</p> <p>Only 125 (28.1%) felt adequately trained in POMs most of the time: 57(12.3%) never felt adequately trained.</p> <p>Knowledge of contraindications varied only 179 (38.4%) aware most times.</p>	50%

First author, year, (country)	Method	Sample/ Number of Participants/ Response rate	Content of Intervention/Medicines Management or Prescribing Activity	Main outcome measures	Methods used to support reliability and validity	Main Findings	MMAT score
						Private practice PTs reported greater knowledge of the effectiveness of POMs than PTs in public health settings (< 0.05).	
Unger ¹⁵¹ (South Africa)	Questionnaire	n=448/4480 (10%). Registered PTs	Exploration of medicines management activities in South African PTs.	Not applicable.	3 sections adapted from Grimmer (2002). Piloted	448 (100%) made recommendations to patients regarding medicines with 215 (48%) often recommending OTC medicines. Documentation of medicines history varied; 112 (25%) did not keep records. 116 (26%) stored OTC/prescription drugs contrary to medicines legislation. 121 (27%) had no formal training in administration/pharmacology.	50%
Unger ¹⁵² (South Africa) <i>Reporting from Unger ¹⁵¹ dataset</i>	Questionnaire	n=448/4480 (10%). Registered PTs.	Views on medicines administration and prescribing.	Not applicable	3 sections adapted from Grimmer (2002). Piloted	The inclusion of pharmacological training within undergraduate qualification was reported by 53% of PTs. 60% had never updated this knowledge through formal or informal education, although 90% had sourced drug information in the past 6 months.	50%

First author, year, (country)	Method	Sample/ Number of Participants/ Response rate	Content of Intervention/Medicines Management or Prescribing Activity	Main outcome measures	Methods used to support reliability and validity	Main Findings	MMAT score
						<p>294 (64%) PTs administered medicines including inhalers and NSAIDs. 132 (45%) of those administering medicines considered contraindications.</p> <p>119 (26%) supplied respiratory medicines, contrary to medicines legislation.</p> <p>70% of PTs surveyed and 63% supported a prescribing role.</p> <p>Acceptance of a prescribing role was dependent upon this remaining a voluntary option guided by clearly defined guidelines and scope of practice.</p>	
Weglicki, 167 (UK)	Semi-structured interviews and focus group	n=16 NMP ex-students: 11 nurses 3 PTs 1 pharmacist	Exploration learning needs and preferred mode of CPD to meet demands of prescribing role.	Not applicable.	Not stated.	Prescribers experienced anxiety over competence, accountability, updating on new developments, dosage calculations and drug interactions. Peer interaction sought as coping strategy for anxiety; used to confirm	50%

First author, year, (country)	Method	Sample/ Number of Participants/ Response rate	Content of Intervention/Medicines Management or Prescribing Activity	Main outcome measures	Methods used to support reliability and validity	Main Findings	MMAT score
		1 pharmacy technician				<p>prescribing decision making and bolster confidence.</p> <p>CPD considered dual responsibility of clinician and workplace.</p> <p>Generic NMP training considered insufficient in addressing requirements of specialist roles.</p> <p>Predominant choice of CPD learning face-to face learning, rather than distance learning media.</p>	
Young, 168 (Australia)	Stakeholder consultation: questionnaire, focus groups, interviews, written submissions, consultation workshops.	<p>n=407/444 (69%).</p> <p>Questionnaire: 296 AHPs (including 67 PTs)</p> <p>111 stakeholders</p> <p>n=200 consultation workshops, focus</p>	<p>Consultation to identify: Opportunities for AHP (including PTs) in ESP roles</p> <p>Effective delegation to support workforce</p> <p>Education and governance strategy</p> <p>Funding implications of workforce changes.</p>	Not applicable	Not stated	<p>AHPs indicated they were not practicing at full scope of competence and development of ESP roles would improve service efficiency, health outcomes and patient satisfaction.</p> <p>Identified ESP tasks included working as first contact practitioners, prescribing, administration of medicines, requesting investigations.</p> <p>Barriers to ESP development: cultural, funding, education/training, liability</p>	50%

First author, year, (country)	Method	Sample/ Number of Participants/ Response rate	Content of Intervention/Medicines Management or Prescribing Activity	Main outcome measures	Methods used to support reliability and validity	Main Findings	MMAT score
		groups and interviews.				concerns, legislation and restricted hours of operation.	

Table 4.2 Commentary papers (n=43, physiotherapy n=34, podiatry n=9)

First author, year, (country)	Method	Sample/ Number of Participants/ Response rate	Content of Intervention/Medicines Management or Prescribing Activity	Main outcome measures	Methods used to support reliability and validity	Main Findings	MMAT score
American Physical Therapy Association, ¹⁶⁰ (USA)	Discussion paper	Not applicable	Describes pharmacology knowledge required by PTs for role in medicines management including giving advice and monitoring effects in relation to symptoms. Discusses role of prescribing in military PT.	Not applicable	Not applicable	Not applicable	Not applicable.
American Physical Therapy Association, ¹⁶⁴ (USA)	Position Statement	Not applicable	Position statement on medicines management activities permissible within scope of practice:	Not applicable	Not applicable	Not applicable	Not applicable.

First author, year, (country)	Method	Sample/ Number of Participants/ Response rate	Content of Intervention/Medicines Management or Prescribing Activity	Main outcome measures	Methods used to support reliability and validity	Main Findings	MMAT score
			administration and storage of medicines.				
American Physical Therapy Association, 165 (USA)	Position Statement	Not applicable	Position statement on medicines management activities permissible within scope of practice regulations in domiciliary setting: screening, evaluation, collection of information, identification of adverse events/reactions, and education, storage.	Not applicable	Not applicable	Not applicable	Not applicable.
Anderson, 161 (New Zealand)	Opinion paper	Not applicable	Describes legal provision for administration of drugs and/or changing the dose under instruction provided by Medicines (Standing Orders) Regulations (2002). Examples NZ sports PTs travelling with teams historically prescribing medicines despite lack of appropriate training and risks associated with giving medicines.	Not applicable	Not applicable	PTs administering drugs under standing orders is useful - both doctor and PT should be aware of their legal obligations and act towards patient's best interest. Appropriate training should be provided for the role.	Not applicable.

First author, year, (country)	Method	Sample/ Number of Participants/ Response rate	Content of Intervention/Medicines Management or Prescribing Activity	Main outcome measures	Methods used to support reliability and validity	Main Findings	MMAT score
Anderson, 191 (New Zealand)	Editorial	Not applicable	Information on 'standing orders' for PTs in NZ. PTs not qualified/licensed to prescribe medicines otherwise.	Not applicable	Not applicable	Not applicable	Not applicable.
Anonymous, Canadian Physiotherapy Association, 159 (Canada)	Editorial / opinion paper.	Not applicable	Position statement on legislation/scope of practice for OTC medicines.	Not applicable	Not applicable	Canadian PTs do not have authority to prescribe, dispense/ administer or give advice on medicines. Certain provinces permit administration of medicines prescribed by a physician/ pharmacist, conditional to requisite training.	Not applicable.
Benson, 119 (USA)	Opinion paper	Not applicable	Reports development of USA military neuro-MSK specialist PTs in "physician extender" roles, permitted to prescribe muscle relaxants, NSAIDs and anti-inflammatory medicines.	Not applicable	Not applicable	Not applicable	Not applicable.

First author, year, (country)	Method	Sample/ Number of Participants/ Response rate	Content of Intervention/Medicines Management or Prescribing Activity	Main outcome measures	Methods used to support reliability and validity	Main Findings	MMAT score
			Subject to university pharmacology training and credentialing from local military hospital.				
Borthwick, 179 (UK)	Editorial / opinion paper.	Not applicable	Reports NMP legislation in UK, and use of PGDs by podiatrists in diabetes.	Not applicable	Not applicable	Not applicable	Not applicable.
Borthwick, 172 (UK)	Editorial / opinion paper.	Not applicable	Describes NMP legislation in UK and potential for IP in podiatry.	Not applicable	Not applicable	Not applicable	Not applicable.
Borthwick, 173 (UK)	Editorial / opinion paper.	Not applicable	Discusses NMP legislation in UK and plan for extension of IP to podiatry.	Not applicable	Not applicable	Not applicable	Not applicable.
Borthwick, 174 (UK)	Editorial / opinion paper.	Not applicable	Reports update on NMP legislation in UK.	Not applicable	Not applicable	Not applicable	Not applicable.
Borthwick, 192 (UK and Australia)	Literature review.	Not applicable	Socio-historical account of impact of health policy reform on podiatry in UK and Australasia.	Not applicable	Not applicable	Workforce flexibility /role substitution in response to health policy reform has promoted development of enhance roles in podiatry, including prescribing roles.	Not applicable.

First author, year, (country)	Method	Sample/ Number of Participants/ Response rate	Content of Intervention/Medicines Management or Prescribing Activity	Main outcome measures	Methods used to support reliability and validity	Main Findings	MMAT score
Borthwick, 175 (UK)	Editorial / opinion paper.	Not applicable	Describes UK NMP legislation with exemplar of IP in acute diabetic foot.	Not applicable	Not applicable	Not applicable	Not applicable.
Carlisle, 131 (UK)	Newsletter report	Not applicable	Report on PT community respiratory SP role in oxygen therapy.	Not applicable	Not applicable	Not applicable	Not applicable.
Chartered Society of Physiotherapy, 105 (UK)	Practice development	Not applicable	Background on use of injection therapy after 1989 Representatives Conference approval and rejection by Professional Practice Committee, which concluded: injection therapy was not within scope of PT practice.	Not applicable	Not applicable	Not applicable	Not applicable.
Chartered Society of Physiotherapy, 15 (UK)	Practice development	Not applicable	Update on statutory instrument giving SP rights to PT. Legislation & prescribing framework for SP.	Not applicable	Not applicable	Not applicable	Not applicable.
Chartered Society of Physiotherapy, 7 (UK)	Practice development	Not applicable	Legislation & administration framework and scope of practice for injection therapy.	Not applicable	Not applicable	Not applicable	Not applicable.

First author, year, (country)	Method	Sample/ Number of Participants/ Response rate	Content of Intervention/Medicines Management or Prescribing Activity	Main outcome measures	Methods used to support reliability and validity	Main Findings	MMAT score
			Educational requirements for national injection training programmes.				
Chartered Society of Physiotherapy, ¹⁰⁶ (UK)	Practice development	Not applicable	Injection therapy in PT. Legal background to injection administration, mixing of medicines.	Not applicable	Not applicable	Not applicable	Not applicable.
Chartered Society of Physiotherapy, ⁷ (UK)	Practice development	Not applicable	Legislation & prescribing / administration framework; drug classification; scope & competency in NMP; governance principles. Principles of good prescribing (children, unlicensed medicines, mixing of medicines). Medicines management - storage, disposal, transportation.	Not applicable	Not applicable	Not applicable	Not applicable.
Chartered Society of Physiotherapy, 2013c (UK) ²	Practice development	Not applicable	Medicines and prescribing legislation, classification, supply, and types of prescriber. Scope of practice, training and competence. Medicines pathway, legal administration frameworks.	Not applicable	Not applicable	Not applicable	Not applicable.

First author, year, (country)	Method	Sample/ Number of Participants/ Response rate	Content of Intervention/Medicines Management or Prescribing Activity	Main outcome measures	Methods used to support reliability and validity	Main Findings	MMAT score
Clews, 115 (UK)	Newsletter report	Not applicable	Reports SP in ESP rheumatology clinic for epidural in back pain.	Not applicable	Not applicable	Not applicable	Not applicable.
College of Podiatry, 181 (UK)	Professional Practice Guidance	Not applicable	Legislation & prescribing / administration framework; drug classification; scope & competency in NMP; governance principles. Principles of good prescribing (unlicensed medicines, mixing of medicines).	Not applicable	Not applicable	Not applicable	Not applicable.
Eaton, 132 (UK)	Newsletter report	Not applicable	Report on PT SP role in chronic pain management.	Not applicable	Not applicable	Not applicable	Not applicable.
Gardiner, 104 (UK)	Discussion paper	Not applicable	Description of ESP orthopaedic roles in Stepping Hill Hospital, UK.	Not applicable	Not applicable	<p>“Blanket prescription”: supply of local anaesthetic and steroids for administration of intra- and extra-articular steroid injections.</p> <p>ESP sees all urgent cases, leaving consultant free.</p>	Not applicable.

First author, year, (country)	Method	Sample/ Number of Participants/ Response rate	Content of Intervention/Medicines Management or Prescribing Activity	Main outcome measures	Methods used to support reliability and validity	Main Findings	MMAT score
						Discussion needed to define ESP, Clinical Specialist, and Consultant Physiotherapist.	
Gilheany, 178 (UK/Australia)	Editorial/opinion paper.	Not applicable	Describes NMP developments in podiatry in UK and Australia.	Not applicable	Not applicable	Not applicable	Not applicable.
Gray, 180 (Canada)	Editorial / opinion paper.	Not applicable	Describes podiatry extended scope of practice roles with prescribing rights to antibiotics and steroids in 3 Canadian provinces.	Not applicable	Not applicable	Not applicable	Not applicable.
Hey, 128 (UK)	Opinion paper	Not applicable	Role of SP in physiotherapy management of chronic pain.	Not applicable	Not applicable	Not applicable	Not applicable.
Jennings, 163 (UK)	Opinion paper	Not applicable	NMP in PT; role and scope of practice.	Not applicable	Not applicable	Not applicable	Not applicable.
Kuipers, 123 (Australia)	Discussion Paper	Not applicable	Protocol for setting up AHP intra-muscular injection service for hypertonicity in tertiary brain injury rehabilitation unit.	Not applicable	Not applicable	Not applicable	Not applicable.

First author, year, (country)	Method	Sample/ Number of Participants/ Response rate	Content of Intervention/Medicines Management or Prescribing Activity	Main outcome measures	Methods used to support reliability and validity	Main Findings	MMAT score
Limb, 142 (UK)	Newsletter report	Not applicable	Report on administration of analgesics under PGDs by consultant MSK PT.	Not applicable	Not applicable	Not applicable	Not applicable.
Limb, 129 (UK)	Newsletter report	Not applicable	Report on SP in PT led ESP orthopaedic screening service in primary care.	Not applicable	Not applicable	Not applicable	Not applicable.
Limb, 2006 ¹⁴² (UK)	Newsletter report	Not applicable	Report on SP in PT led intermediate care rehabilitation ward. Prescribed medicines: anti-coagulants, MRSA treatment, antibiotics, antacids, and laxatives.	Not applicable	Not applicable	Not applicable	Not applicable.
McClellan, 122 (UK)	Commentary	Not applicable	Describes development ESP roles in UK emergency departments with medicines administration rights through PGDs. IP reported to confer no additional benefit to patient care over PGDs the ED setting.	Not applicable	Not applicable	Not applicable	Not applicable.

First author, year, (country)	Method	Sample/ Number of Participants/ Response rate	Content of Intervention/Medicines Management or Prescribing Activity	Main outcome measures	Methods used to support reliability and validity	Main Findings	MMAT score
McMillan, 124 (UK)	Newsletter report	Not applicable	Reports SP for injection therapy by ESP PT in emergency department.	Not applicable	Not applicable	Not applicable	Not applicable.
Millett, 134 (UK)	Newsletter report	Not applicable	Reports SP in Rapid Response Community Respiratory Team by ESP PT for complex neurological/respiratory conditions.	Not applicable	Not applicable	Not applicable	Not applicable.
Millett, 125 (UK)	Newsletter report	Not applicable	Reports IP for spinal injections and pre-operative analgesia in ESP orthopaedic role.	Not applicable	Not applicable	Not applicable	Not applicable.
Millett, 126 (UK)	Newsletter report	Not applicable	Reports first PTs undertaking IP training.	Not applicable	Not applicable	Not applicable	Not applicable.
Millett, 127 (UK)	Newsletter report	Not applicable	Reports first PTs prescribing following IP qualification.	Not applicable	Not applicable	Not applicable	Not applicable.
Robinson, 110 (UK)	Editorial	Not applicable	History of inclusion of injection therapy into ESP.	Not applicable	Not applicable	Not applicable	Not applicable.
Saunders, 111 (UK)	Opinion paper	Not applicable	Examines background to injection therapy, clinical effectiveness and the future of the skill.	Not applicable	Not applicable	Not applicable	Not applicable.

First author, year, (country)	Method	Sample/ Number of Participants/ Response rate	Content of Intervention/Medicines Management or Prescribing Activity	Main outcome measures	Methods used to support reliability and validity	Main Findings	MMAT score
Stuart, 176 (UK)	Editorial/opinion paper.	Not applicable	SP and potential role within multi-disciplinary care of diabetic foot in primary and secondary care settings.	Not applicable	Not applicable	Not applicable	Not applicable.
Trueland, 133 (UK)	Newsletter report	Not applicable	Report on SP by PT in Community Respiratory Team.	Not applicable	Not applicable	Not applicable	Not applicable.
White, 8 (UK)	Practice development	Not applicable	CSP expectations for learning and development in injection therapy (reproduces Chartered Society of Physiotherapy, 2010) Scope of practice and legal framework for injection therapy	Not applicable	Not applicable	Not applicable	Not applicable.

5 Results from Phase 2 National Survey of trainee PP-IP

5.1 Questionnaire 1: Physiotherapist & Podiatrist trainee independent prescribers

5.1.1 Response rate

A total of 85 respondents completed questionnaire 1, of whom 56 (66%) were physiotherapists and 29 (34%) were podiatrists.

It is not possible to determine exactly how many trainee PP-IPs received an invitation to participate in the PP-IP trainee questionnaire. In order to estimate the total population who undertook PP-IP training during the period of data collection, March 2014- January 2016, all HEIs who had agreed to collaborate (n=34) were contacted by the team via email and/or telephone at the end of data collection (April- September 2016) and asked if they could confirm the number of PPs who had undertaken IP training during the period of data collection. Of the 21 HEIs who responded (62%), a total of 245 physiotherapists and podiatrists were reported to have undertaken the IP programme. A mean of 11 students per HEI was used to estimate the number missing from the 13 non-responding HEIs (n=143), bringing the total potential population to 388. Therefore, the sample represents around 22% of this target group.

Data provided by the Health and Care Professions Council show that 575 physiotherapists (n=384) and podiatrists (n=191) registered with independent prescribing rights between April 2014 and July 2016 ¹⁸⁴.

5.1.2 Sample demographics

Details of the sample characteristics are provided in Table 5.1. Participants were based in 14 geographical regions across England and were studying at a total of 26 HEIs, representing 76.5% of HEIs collaborating with the project. Just over half the sample (56.5%, n=48) were undertaking a combined independent and SP programme and 40% (n=34) were on an IP conversion course. A higher percentage of podiatrists (59%) were undertaking the conversion programme than physiotherapists (30%). The majority (69.4%, n=59) were studying at masters' level (level 7) as opposed to degree level (level 6, 23.5%, n=20).

Categorised job titles indicate that IP training was predominantly being undertaken by those in senior specialist and consultant roles (n=64, 73%) and were at the higher end of the salary scale (n=49, 57.6% at Agenda for Change or equivalent of band 8 or above), although 41% (n=35) were at band 7 or below. The majority (n=69, 81%) had more than 10 years of experience in their practice area. Just under 50% (n=42) had a Masters or Doctorate level degree, with 70.6% (n=60) having undertaken masters or doctorate level training in their specialist area of practice. Podiatrists had significantly more experience

in their specialist area of practice with a mean of 17.7 years (SD 6.7) compared to 12.9 (SD 6.9) ($p=0.004$), there was no difference in level of educational attainment between the two professions prior to training ($p=0.88$). There was considerable heterogeneity found across both professions in role descriptors and their corresponding Agenda for Change (AfC) bandings, such that no single job title was linked to a specific pay level.

Table 5.1 Physiotherapist and Podiatrist IP Questionnaire 1: Sample demographics

	Physiotherapist n=56		Podiatrist n=29		Total	
	n	% sample	n	% sample	n	% sample
Job title						
Surgeon/Consultant (consultant physiotherapists, consultant podiatric surgeons)	2	3.6%	8	27.6%	10	11.8%
Specialist (e.g. Clinical specialist physiotherapists, clinical specialist podiatrists, clinical lead podiatrists)	39	69.6%	13	44.8%	52	61.2%
General/Private (physiotherapists practitioners, physiotherapists, podiatrists)	10	17.9%	4	13.8%	14	16.5%
Manager/Director (directors, head of service, service managers, clinical directors, professional lead)	5	8.9%	4	13.8%	9	10.6%
Age						
<40	25	44.6%	9	31.0%	34	40.0%
40-50	22	39.3%	10	34.5%	36	42.4%
>51	9	16.1%	8	27.6%	13	15.3%
Missing	-	-	2	6.9%	2	2.3%
Geographic Location (more than one answer possible)						
West London and South West London	1	1.8%	0	0%	1	1.2%
North West	9	16.1%	3	10.3%	12	14.1%
South West	8	14.3%	4	13.8%	12	14.1%
North, Central and East London	8	14.3%	4	13.8%	12	14.1%
Kent, Surrey and Sussex	8	14.3%	3	10.3%	11	12.9%
Yorkshire and the Humber	5	8.9%	4	13.8%	9	10.6%
South London	6	10.7%	3	10.3%	9	10.6%
East Midlands	7	12.5%	2	6.9%	9	10.6%
East of England	4	7.1%	4	13.8%	8	9.4%
North West London	3	5.4%	4	13.8%	7	8.2%
West Midlands	5	8.9%	1	3.4%	6	7.1%
Wessex	2	3.6%	2	6.9%	4	4.7%
Thames Valley	2	3.6%	1	3.4%	3	3.5%
North East	3	5.4%	0	0%	3	3.5%
Berkshire	0	0.0%	1	3.4%	1	1.2%
Agenda for Change pay scale						
Band 9	3	5.4%	3	10.3%	6	7.1%
Band 8b-d	5	8.9%	9	31%	14	16.4%
Band 8a	24	42.9%	5	17.2%	29	34.1%
Band 7	21	37.5%	7	24.1%	28	32.9%
Band 6, 5	3	5.4%	4	13.8%	7	8.2%
Missing	-	-	1	3.4%	1	1.2%

	Physiotherapist n=56		Podiatrist n=29		Total	
	n	%	n	%	n	%
Hours worked						
> 30 hours	42	75.0%	20	68.9%	62	72.9%
<30 hours	14	25.0%	8	27.5%	22	25.9%
Missing	-	-	1	3.4%	1	1.2%
Experience in practice area before becoming IP						
<10 years	21	37.5%	3	10.3%	24	28.2%
10-20 years	29	51.8%	16	55.2%	45	52.9%
>20 years	5	8.9%	8	27.6%	13	15.3%
Missing	1	1.8%	2	6.9%	3	3.5%
Highest level of educational attainment						
Diploma	4	7.1%	3	10.3%	7	8.2%
Degree	24	42.9%	11	37.9%	35	41.2%
Higher degree (Masters or PhD)	28	50.0%	14	48.2%	42	49.4%
Missing	-	-	1	3.4%	1	1.2%
Specialist training in area of practice (more than one answer possible)						
Non-accredited study (e.g. drug company)	38	67.9%	16	55.1%	54	63.5%
Accredited training (i.e. through university)	33	58.9%	17	68.6%	50	58.8%
Diploma level module/s	17	30.4%	6	20.7%	23	27%
Degree level module/s	10	17.9%	7	24.1%	17	20%
Masters level module/s	37	66.1%	21	72.4%	58	68.2%
Professional doctorate	2	3.6%	0	0.0%	2	2.4%

5.1.3 Areas of service provision

5.1.3.1 Total Sample

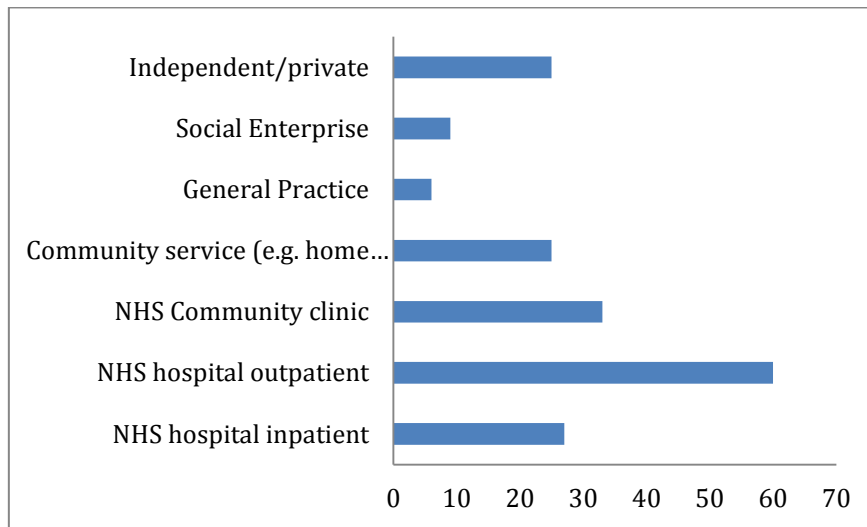
Details of the types of services and care settings in which participants worked are provided in Table 5.2. The pattern of service provision was difficult to categorise as 38% worked across multiple care settings and divided their working time between a median of 2 (range 2-4) settings. Figure 5.1 details all types of services to which participants contributed (including multiple answers), where it can be seen that 87% provided hospital inpatient/outpatient services. Hospital based services were also predominant (57.6%) when service provision was categorised by the principle or dominant service, i.e. the service where the greatest proportion of time was spent (Table 5.2). Community clinics and domiciliary/ homecare services were less well represented at 27% (n=23) of the total sample. Few worked exclusively in private practice (n=3, 3.5%) although 15 (18%) had some additional role within the independent or private sector. In addition, a majority (n=52, 61%) classed their service as multi-professional, involving a median of 3 professions and with some services composed of up to 7 different healthcare professionals (n=3).

Despite considerable diversity amongst the two professions in job title, role, and percentages of time spent on different services, participants could be grouped into five main clinical specialities (Table 5.2). Musculoskeletal and orthopaedics was the largest and only group in which both professions specialised (35%), the other four categories were profession specific (Physiotherapy: respiratory care & pain management. Podiatry: high-risk foot & surgery).

Table 5.2 Physiotherapist and Podiatrist IP Questionnaire 1: Service Provision

Clinical Specialty	Physiotherapists (n=56)		Podiatrists (n=29)		Total (n=85)	
	n	%	n	%	n	%
MSK and orthopaedics (MSK clinics, MSK triage services, MDT orthopaedic spinal surgical team, MCATTS, MMATS, orthopaedic outpatient clinics, spinal orthopaedic clinics, inpatient orthopaedics, facial palsy clinic, MSK headache clinics, outpatient MSK foot clinics, MSK foot and ankle surgery)	25	44.6%	5	17.2%	30	35.3%
High Risk Foot (Diabetes wound care, Charcot, vascular foot care, diabetic foot clinic, non-diabetic wound care, diabetic foot protection, diabetic foot ulcer clinic, foot monitoring clinic, routine podiatry)	0	0.0%	16	55.2%	16	18.8%
Respiratory (COPD, cystic fibrosis, community respiratory, community respiratory & heart failure clinic, oxygen services, inhaler clinics, respiratory assessment service, pulmonary rehabilitation, bronchiectasis, asthma, hyperventilation)	12	21.4%	0.0	0.0%	12	14.1%
Pain (chronic pain management, chronic pain and fatigue, living well with pain).	11	19.6%	0	0.0%	11	12.9%
Surgery (foot and ankle surgery)	0	0.0%	7	24.1%	7	8.2%
Other (neurology (spasticity clinic, stroke ward) amputee rehabilitation, women's' health (pelvic floor dysfunction and continence), medical assessment unit, falls prevention).	8	14.3%	0	0.0%	8	9.4%
Missing	-	-	1	3.4%	1	1.2%
Care Setting						
One or more settings	17	30.4%	15	51.7%	32	37.6%
Secondary care (including tertiary care)	21	37.5%	6	20.6%	27	31.8%
Primary care (intermediate care, home and community care)	16	28.6%	6	20.6%	22	25.9%
Private (exclusively)	2	3.6%	1	3.4%	3	3.5%
Missing	-	-	1	3.4%	1	1.2%
Dominant service provided						
NHS hospital outpatient/ NHS hospital inpatient	31	55.4%	18	62.1%	49	57.6%
NHS community clinic	8	14.3%	8	27.6%	16	18.8%
Community service (home visits, domiciliary care)	5	8.9%	2	6.9%	7	8.2%
Other (social enterprise/Independent/private sector)	11	19.6%	1	3.4%	12	14.1%
General Practice service	1	1.8%	0	0.0%	1	1.2%
Missing	-	-	1	3.4%	1	1.2%
Services provided						
Multi-professional service only	40	71.4%	12	41.4%	52	61.2%
Single professional service only	13	23.2%	9	31%	22	25.9%
Single and multi-professional service	3	5.4%	7	24.1%	10	11.8%
Missing	-	-	1	3.4%	1	1.2%

Figure 5.1 PP-IP questionnaire 1: types of services provided (n=85)



5.1.3.2 Physiotherapists

Making up 66% of the total sample, the mean age of participating physiotherapists was 41.6 years. Fifty-two per cent (n=29) were in band 8a or above posts, and 75% (n=42) worked full time. The largest clinical specialty area was MSK/orthopaedics (n=25, 45%), followed by respiratory (n=12, 21%) and pain management (n=11, 20%). A smaller group (n=8, 14%) practiced in a range of different clinical specialties including neurology (n=3), women's health (n=1), falls prevention (n=1), amputee rehabilitation (n=1), facial palsy (n=1) and in a medical assessment unit (n=1).

More physiotherapists were based in secondary care (n=21, 37%), and worked across one or more care settings (n=17, 30%), with slightly less working in primary care (n=16, 29%). Only two (4%) worked exclusively in private practice, although 7 (12%) others worked in some private capacity in addition to their main role. Based on the dominant role of clinicians (i.e. greatest proportion of time spent in a specific role/service), Table 5.3 shows services provided were NHS secondary care (n=31, 55%), social enterprise/independent sector services (n=11, 20%) and NHS community clinics (14%, n=8). Fewer provided domiciliary care (9%, n=5) or GP services (n=1, 2%).

Most PTs working in MSK/orthopaedics (the largest specialty area) were at band 8/9 (n=20, 80%) and in ESP (n=12, 60%), managerial (n=4) or consultant (n=1) roles. In addition to MSK/orthopaedic outpatient clinics, services included specialist triage (e.g. Intermediate Musculoskeletal Assessment Treatment Team (IMATTS), Musculoskeletal Clinical Assessment and Treatment Service (MCATTS) and condition specific clinics (e.g. headache clinic, spinal surgery clinic). Table 5.4 shows the distribution of clinical

specialties within a broader breakdown of all provided services. MSK/orthopaedics services were predominantly NHS hospital or NHS social enterprise.

Respiratory care was the second largest speciality group in physiotherapy (n=12, 21%). Clinicians from services ranging across the whole trajectory of acute inpatient care to domiciliary long term condition management were undertaking IP training, and were based in every care setting apart from private and social enterprise sectors. All were in respiratory medicine and included hospital inpatient and outpatient services, admission prevention services (domiciliary and Accident and Emergency (A&E)), community clinics, domiciliary care, and community based rehabilitation. Services were either generic to patients with common chronic respiratory diseases (e.g. Chronic Obstructive Pulmonary Disease (COPD), asthma, and bronchiectasis) or specific to one condition (e.g. cystic fibrosis, bronchiectasis, hyperventilation syndrome) or form of therapy (e.g. inhaler clinics, chest clearance clinics, oxygen service).

The third largest clinical speciality within physiotherapy was pain management (n=11, 20%). Most dominant services were secondary care, although some clinicians delivered care in community clinics (n=4) and one individual worked in the community/domiciliary setting. Roles were band 7 (n=5, 45%) and band 8 (n=6, 55%) and patients with chronic pain or chronic fatigue were managed, in either specialist multi-disciplinary pain services (n=9) or within services run alongside MSK clinics (n=2). No clinicians worked in private pain services.

Table 5.3 Dominant type of service provided by physiotherapists

	Physiotherapists (n=56)*				
	NHS Hospital Inpatient/ Outpatient	NHS Community Clinic	Community Service/GP Practice Service	Social enterprise/ private/ independent sector	Total
	n (physiotherapists)				
MSK & Orthopaedics	12	2	1	10	25
Respiratory	7	1	4	0	12
Pain	7	3	1	0	11
Other	5	2	0	1	8
Total	31	8	6	11	56

Table 5.4 All types of services provided by physiotherapists (n=56).

	Physiotherapists (n=56)*						
	NHS Hospital Inpatient	NHS Hospital Outpatient	NHS Community Clinic	Community Service e.g. Home Visits	GP Practice Service	Independent/Private Sector	Social Enterprise NHS Provider
	n (physiotherapists)						
MSK & Orthopaedics	1	13	5	0	2	8	6
Respiratory	6	7	3	10	1	0	0
Pain	0	8	4	1	0	0	0
Other	4	2	3	1	0	2	1
Total	11	30	15	12	3	10	7

*Respondents could indicate multiple responses

5.1.3.3 Podiatrists

Twenty-nine podiatrists completed questionnaire 1, representing 34% of the total sample. Mean age was 46.1 (SD 9.6) years which was significantly older than physiotherapists (mean 41.5, SD 8.5; $p=0.03$). Seventeen (59%) were in band 8a or above posts, and 69% ($n=20$) worked in full time roles. The largest majority of podiatrists worked within high risk foot services ($n=16$, 55%), followed by surgery ($n=7$, 24%) and MSK/orthopaedics ($n=5$, 17%). One podiatrist did not stipulate their speciality. The most common job titles were diabetes specialists ($n=7$, 24%) and surgeons ($n=8$, 27.5%).

Over half ($n=15$, 52%) worked across one or more care setting and equal numbers provided secondary and primary care services ($n=6$, 21%). There were more single profession services represented than in physiotherapy. Tables 5.5 and 5.6 show the range of settings podiatrists were working in. Ten podiatrists (34.5%) worked in some capacity in private practice, one of whom had no other job role.

Looking in more detail at the largest clinical area, high risk foot services ($n=16$), podiatrists were mainly in band 7 ($n=7$) or 8 ($n=6$) roles, and were based across a range of care settings (see Table 5.6); although the greatest majority were in secondary care ($n=13$). Twelve clinicians indicated they dealt with diabetic patients exclusively and 4 worked with non-diabetic conditions. Three provided single professional services, whilst 9 worked in multi-professional services. Services included foot protection clinics, wound care/ulcer clinics for general and/or diabetic patients, limb salvage, dressing clinics, domiciliary home visits, biomechanics evaluations, and footwear provision and orthotics. One podiatrist treated patients specifically with Charcot and other painful neuropathies.

The second largest group of podiatrists were surgeons (n=8), of whom 5 were consultants (one with an additional lecturing role) and 2 were specialist registrars. The median years of experience prior to training was 17 years (range 13 to 25 years). Four worked in the private sector in addition to their main NHS roles. Two were in band 9 roles, the remaining were band 8 a-d.

The third group of podiatrists (n=5) worked in MSK/orthopaedics providing services in hospital in and outpatients (n=6), community clinics (n=2), community services (n=1) and in the private sector (n=3). Services included biomechanics, care of acute MSK injuries and MSK related conditions within rheumatology.

Table 5.5 Care settings worked in by podiatrists

	Podiatrists* (n=28)					
	Primary care	Secondary care	Intermediate Care	Home/Community care	Mental Health	Private
	n					
High Risk Foot	8	13	1	7	1	5
Surgery	4	2	0	1	0	3
MSK and orthopaedics	3	3	0	0	1	2
Total	15	18	1	8	2	10

*Multiple responses possible.

Table 5.6 Services provided by podiatrists

	Podiatrists* (n=28)						
	NHS Hospital Inpatient	NHS Hospital Outpatient	NHS Community Clinic	Community Service e.g. Home Visits	GP Practice Service	Independent/Private	Social Enterprise NHS Provider
	n						
High Risk Foot	8	12	7	8	2	4	1
Surgery	2	5	4	0	0	4	0
MSK and Orthopaedics	2	4	2	1	0	3	0
Total	12	21	13	9	2	11	1

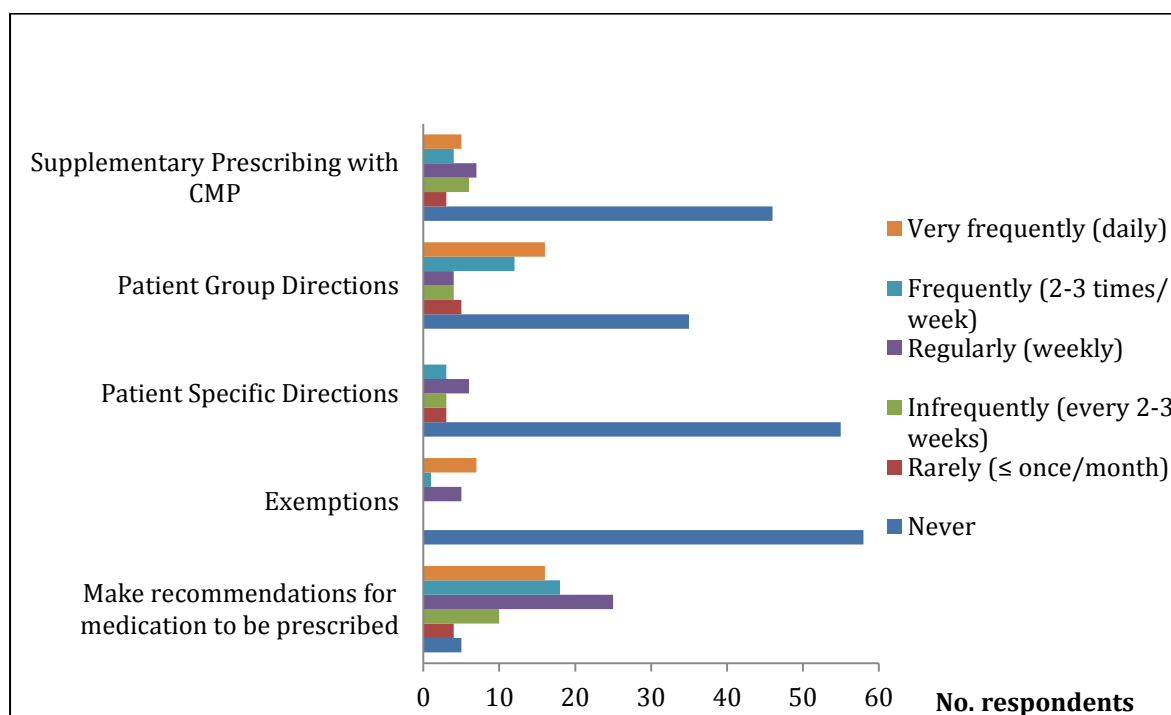
*Multiple responses possible.

5.1.4 Medicines management activity

5.1.4.1 Total sample

Participants were asked about their current and anticipated involvement in medicines management activity. Figure 5.2 shows the methods of medicines administration/prescribing used prior to undertaking IP training. On the whole, both professions were highly active in medicines management; 84% (n=71) reported weekly use of medicinal items, using a median of 2 (range 1-4) different methods to prescribe, administer or supply them. Podiatrists used a significantly greater number of methods (p=0.001); however, this is likely due to use of existing exemptions (there is no legislation for physiotherapists to use exemptions). Almost all participants (n=80, 94%) stated they made written or verbal recommendation to other IPs for medicines to be prescribed, suggesting the majority were heavily involved in making medicines related decisions in their routine clinical practice.

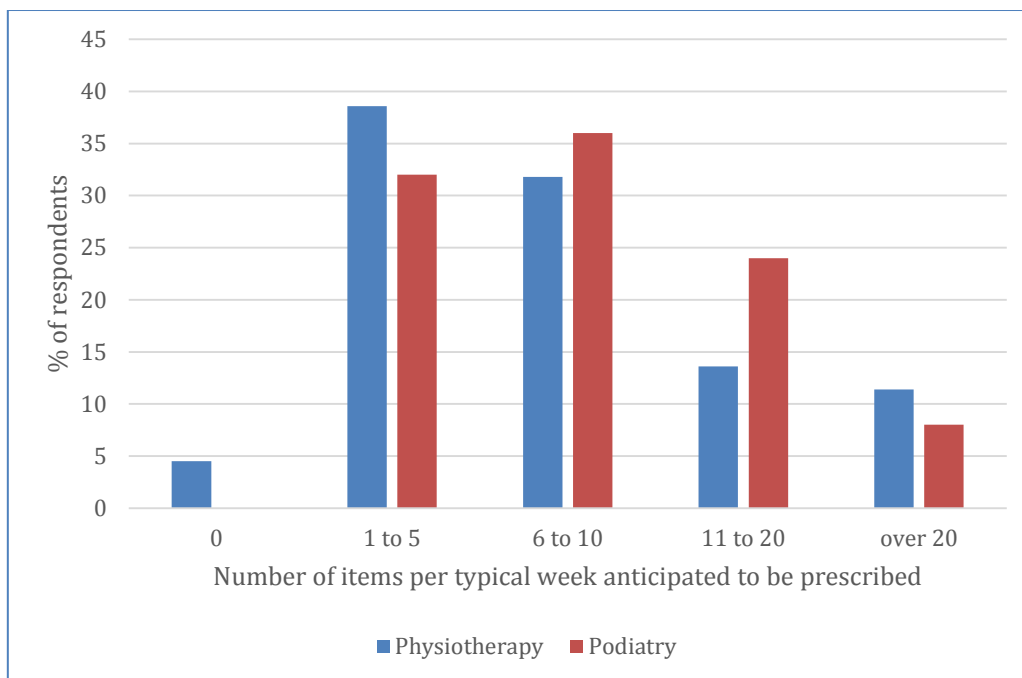
Figure 5.2 Methods used to prescribe, administer or supply medicines for patients by all participants prior to undertaking IP programme (n=85).



Participants estimated that they supplied, administered or prescribed a mean of 8.16 (SD 10.1, range 0-54, median 5) medicinal items within a typical week. It was anticipated that this would rise once able to independently prescribe to 11.14 items per week (SD12.84, range 0-90, median 8). Figure 5.3 shows that the majority (69.5%) anticipated that they would independently prescribe between 1 and 10 items per week. Anticipated use of supplementary prescribing was lower at a mean of 1.83 (SD 4.75. range 0.25, median 0).

Under half (n= 14, 41%) of the 34 participants with a SP qualification were using SP to prescribe, although they additionally reported using other methods to supply and/or administer medicines within their role, with 38% (n=13) using PGDs, 11.8% (n=4) using PSDs and, exclusive to podiatrists, 26.5% (n=9) using exemptions. In a typical week these individuals estimated they prescribed, administered and/or supplied a median of 5.5 items (range 0.0-25.0).

Figure 5.3 Number of items PP-IPs anticipated that they would independently prescribe in a typical week



5.1.4.2 Physiotherapists

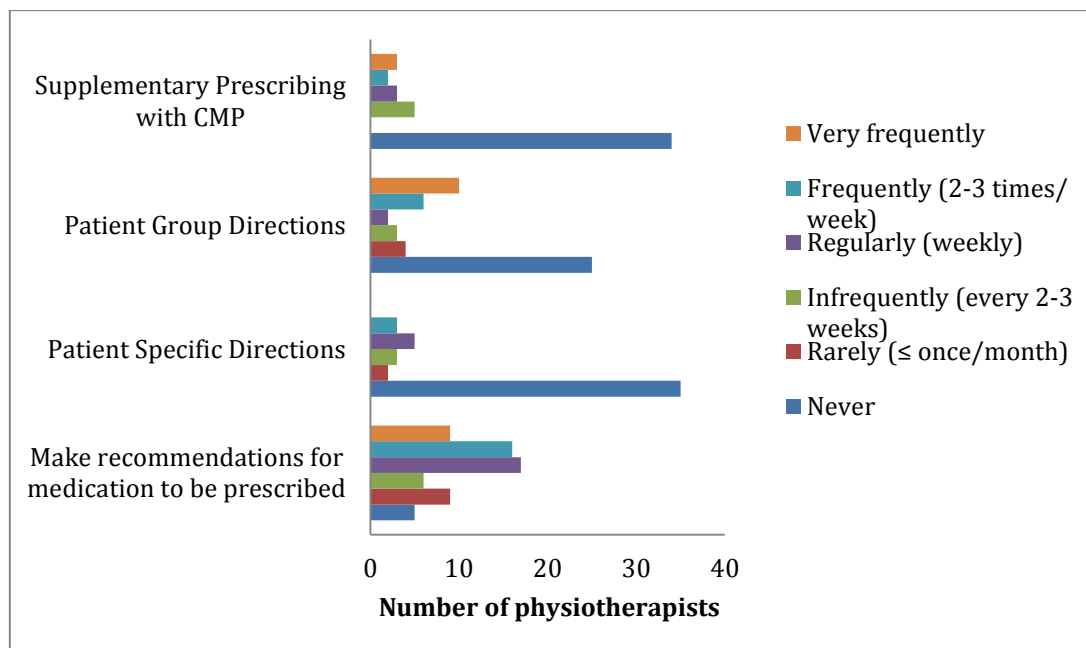
Physiotherapists estimated that they supplied, administered or prescribed a mean of 6.8 (SD 9.38, range 0-50, median 3.0) medicinal items within a typical week. This was anticipated to rise to 11.41 (SD: 15.32, range 0-60, median 6.5) once qualified to independently prescribe. Few, however, expected to use SP (mean 2.54, SD 5.7, range 0-25, Median 0). Figure 5.4 shows the methods used by physiotherapists to supply, administer or prescribe medicines before training.

Of the 17 physiotherapist SPs, 14 (82%) indicated they used SP, ranging from every 2-3 weeks to daily use. A few also reported using PGDs (n=6) and PSDs (n=3), and all made recommendations at some point to other prescribers for medicines. This group estimated that they administered, supplied or prescribed a median of 3 (range 0-25) medicinal items per week. Fourteen (82%) anticipated they would continue to use SP

following IP training, although the number of items they expected to prescribe reduced to a median of 0.5 (range 0.0-25.0).

Of those taking the combined programme (n=39) and thus not able to prescribe through SP, 19 (49%) used PGDs, 10 (26%) PSDs, and 31 (79%) made recommendations for medicines to be prescribed. This group supplied or administered a median of 2.0 (range 0.0-50.0) medicinal items per week.

Figure 5.4 Methods used by Physiotherapists to supply, administer or prescribe medicines prior to training as an independent prescriber (n=53)



5.1.4.3 Podiatrists

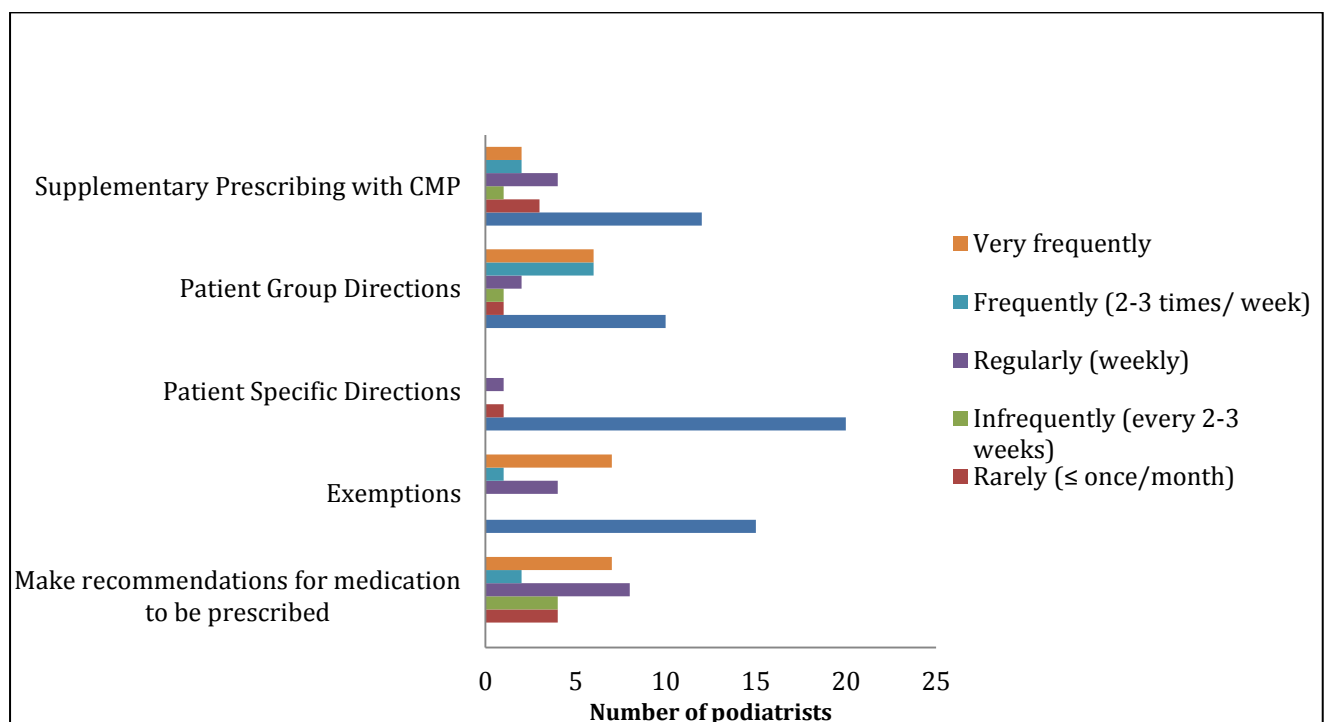
Podiatrists estimated that they supplied, administered or prescribed significantly more items per week than physiotherapists (Mann-Whitney U test: p=0.019), with a mean of 10.75 (SD 9.38, range 0-54, median 6.5). The amount independently prescribed was expected to remain the same (mean 10.68) once qualified, although the median number of items increased to 9 (SD 6.79, range 4-30). Anticipated use of SP was low (mean 0.53, SD 1.34, range 0-5, median 0).

Apart from two individuals who reported no involvement in these activities, podiatrists on the whole were highly active in medicines management. Using a median of 3.0 (range 0.0-50.0) different methods to do so, 16 (55%) and 12 (41%) of podiatrists administered/supplied medicines through PGDs and exemptions respectively, and 12 (41%) prescribed using SP with varying frequency (Figure 5.5). Eighty-six per cent

(n=25) made recommendations for medicines to be prescribed, suggesting a high level of medicines related decision making.

The 17 SPs administered/prescribed a median of 7.5 items in a typical week prior to IP training, although only 3 (18%) anticipated they would continue to use SP following qualification. Of those podiatrists undertaking the combined SP and IP course (n=9) and thus not able to prescribe through SP, 8 indicated they supplied or administered a median of 5.0 (2.0-54.0) medicinal items in a typical week, and none considered they would use SP once qualified.

Figure 5.5 Methods used by Podiatrists to supply, administer or prescribe medicines prior to training as an independent prescriber (n=28).



5.1.5 Therapy areas where treatment is provided

5.1.5.1 Total Sample

Participants were asked which therapy areas they were a) currently involved in providing treatment management and b) intended to independently prescribe within once qualified (Table 5.7). Reflecting the proportions of clinicians working in the 5 clinical specialities, the main treatment/therapy areas where current activity was reported were MSK & joint diseases (NSAIDs and muscle relaxants, n=40, 47.1%), infections (antimicrobials, n=37, 43.5%), central nervous system (CNS) medicines (analgesics and antidepressants, n=25, 29.4%), anaesthesia (local/general, n=26, 31%), skin treatments (emollients, topical preparations, skin cleansing n=19, 22.3%) and respiratory drugs (bronchodilators, corticosteroids, antihistamines, mucolytic, n=13, 15.3%).

Table 5.7 Therapy areas in which physiotherapists and podiatrists currently provide treatment and intend to independently prescribe medication

Therapy area in which providing treatment	Physiotherapists (n=56)		Podiatrists (n= 29)		Total (n=85)	
	Currently involved	Intend to prescribe	Currently involved	Intend to prescribe	Currently involved	Intend to prescribe
	n=					
Gastro-intestinal	9	13	0	3	9	16
Cardiovascular	2	3	3	3	5	6
Respiratory	12	10	1	2	13	12
Central nervous system	18	22	7	10	25	32
Infections	14	15	23	15	37	30
Endocrine	2	2	5	2	7	4
Gynaecological	1	0	0	1	1	1
Urinary tract disorders	2	1	0	1	2	2
Malignant disease	1	0	0	0	1	0
Nutrition	2	3	1	1	3	4
MSK and joints	28	40	12	12	40	52
Eye	2	1	1	1	3	2
Ear, nose, throat	3	2	0	1	3	3
Skin	4	3	15	17	19	20
Immunological	1	0	0	1	1	1
Anaesthesia	10	12	16	5	26	17

5.1.5.2 Physiotherapists

Figure 5.6 shows the main treatment/therapy areas where medicines management was provided by physiotherapists before IP training and where physiotherapists intended to prescribe. Musculoskeletal Disorders was an area that 20% more participants intended to prescribe than were currently providing treatment. Table 5.8 shows use within clinical specialties. Clinicians in each speciality group provided treatment management within a range of groups, although the most frequently used were for MSK & Joint diseases (n=28, 50%), central nervous system (n=18, 33%) and infections (n=14, 26%).

Figure 5.6 Main therapy areas in which Physiotherapists provide treatment and intend to prescribe (IP) (n=56)

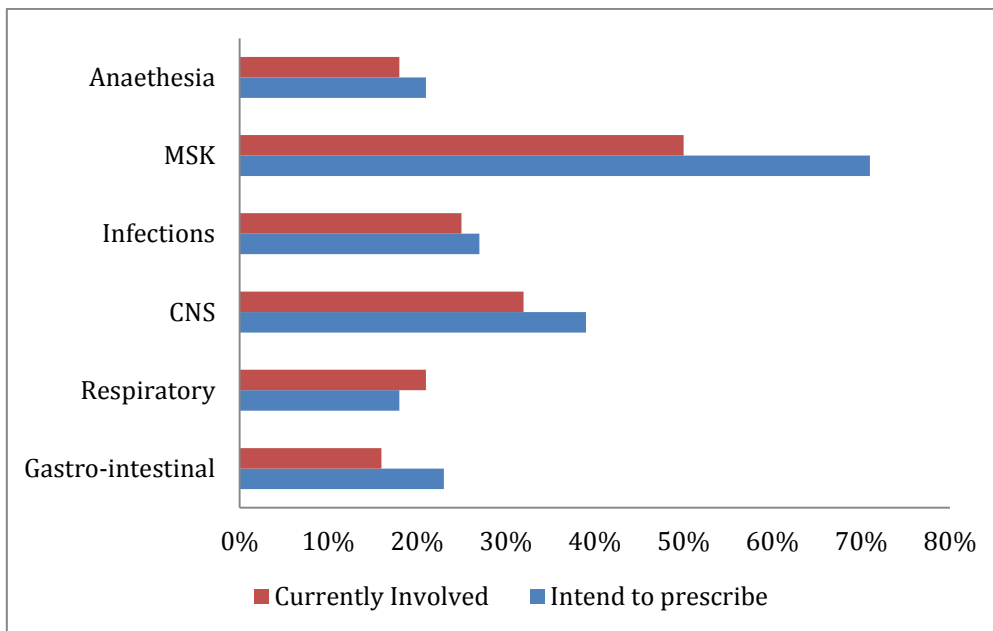


Table 5.8 Treatment/therapy areas used before IP training by physiotherapists within clinical specialties

Clinical Specialties	n	Therapy areas					
		Gastro-intestinal	Respiratory system	Central nervous system	Infections	MSK & Joint diseases	Anaesthesia
MSK & Orthopaedics	25	2	0	6	2	15	9
Respiratory	12	2	11	2	9	2	0
Pain	11	2	1	8	1	9	1
Other	8	3	0	2	2	2	0
Total	56	9	12	18	14	28	10

5.1.5.3 Podiatrists

Figure 5.7 shows the main therapy areas provided by podiatrists before IP training and Table 5.9 shows use within clinical specialties. It is noticeable that fewer podiatrists intended to independently prescribe anaesthesia or medication for infections than were currently involved in treating these areas.

Clinicians in speciality groups used a range of different medicines. Just under 80% (n=23) of podiatrists reported using antimicrobials, 53% (n=16) used anaesthetics and 52% (n=15) used skin preparations. Over all typical weekly use of medicinal items (median 6.5, range 0.0-54.0) was affected by job title, with surgeons and consultant level clinicians prescribing, administering or supplying significantly more medicines than more junior clinical roles or those in managerial roles (p=0.014). Apart from surgery, clinical

speciality, educational attainment, care setting and level of prior experience were not found to have any significant effect on typical weekly use ($p>0.05$).

Figure 5.7 Main therapy areas in which Podiatrists provide treatment and intend to prescribe (IP) (n=29)

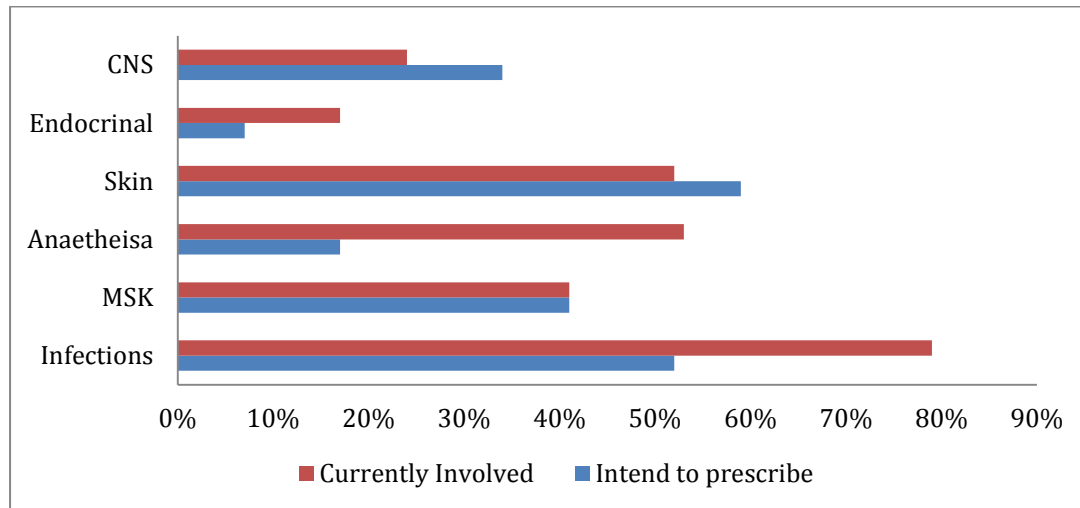


Table 5.9 Main therapy areas used before IP training by podiatrists within clinical specialties

Clinical Specialties	n	Therapy areas					
		Cardiovascular	Skin	Central nervous system	Infections	MSK & Joint diseases	Anaesthesia
MSK & Orthopaedics	5	0	5	2	4	4	5
High Risk Foot	16	1	6	1	12	1	4
Surgery	7	2	4	4	7	7	7
Total	28	3	15	7	23	12	16

5.1.5.4 Controlled drugs

The number of participants intending to prescribe controlled drugs was 22 (26%) with a further 23 (27%) unsure. Of physiotherapists, 19 (34%) indicated they would prescribe controlled drugs, and 17 (30%) were unsure. Of podiatrists, 3 (10%) reported they would and 6 (21%) were unsure.

5.1.6 Barriers and facilitators to IP training

5.1.6.1 Expectations and motivations

Expectations

The majority of participants (n=76, 89%) felt they had a clear idea about what would be expected from them during the IP training programme. A minority (n=7, 8%) did not have clear expectations, including 4 physiotherapists and 3 podiatrists.

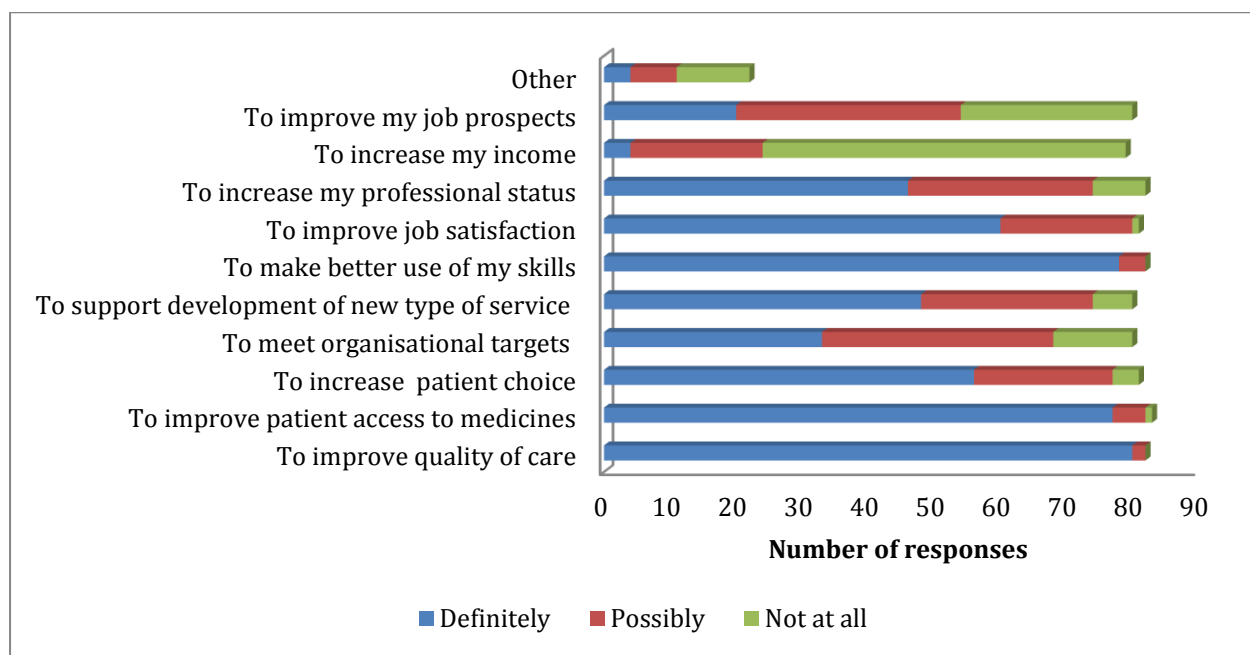
Scope of practice

Having an agreed scope of practice that outlines the types of medication or treatment areas for future prescribing practice is recommended good practice for non-medical prescribers. A majority (n=61, 72%) reported to have an agreed scope of prescribing practice, however 18% (n=15) did not and 7% (n=6) were unsure. Fewer podiatrists (n=17, 65%) had this agreement in place than physiotherapists (n=44, 79%).

Motivation

All participants agreed that improving quality of care was a motivation for becoming an independent prescriber. Figure 5.8 shows the main reasons reported to definitely influence this choice were to improve patient quality of care (n=80, 94%), access to medicine (n=77, 91%) and to make better use of professional skills (n= 78, 92%). Increasing patient choice (n=56, 66%) and improving job satisfaction (n=60, 71%) were also strong motivating factors. At an organisational level, 56% (n=48) reported undertaking training to support development of a new service although fewer (n=33, 39%) stated that it was expected to contribute to meeting organisational targets such as reducing waiting times, hospital admissions or use of emergency services. Although making better use of clinical skills was a strong motivator, fewer considered IP would lead to a definitive increase in professional status (54%, n=46) or offer enhanced job prospects (23%, n=20). However, there was some uncertainty over whether IP had potential to do so, with 33% (n=28) and 40% (n=34) respectively indicating possible professional gains. There was minimal expectation that the additional skill of prescribing would lead to financial remuneration, either definitely (n=4, 5%) or possibly (n=7, 8%). Podiatrists and physiotherapists gave very similar responses.

Figure 5.8 Reasons given by physiotherapists and podiatrists for undertaking IP



Physiotherapists

Sixty-one per cent of physiotherapists (n=34) indicated they were undertaking IP training in order to support development of a new type of service. Overall the ability to prescribe was expected to improve patient access to medicines (n=51, 91%) and contribute to improved care quality (n=56, 100%). However, fewer considered it would impact patient choice (n=39, 70%) or be used to meet organisational targets (n=20, 36%). Although 93% (n=52) of physiotherapists thought becoming IP would make better use of their skills and 73% (n=41) reported it would improve their job satisfaction there was limited expectation that IP would lead improved jobs prospects (25%) or financial reward (n=4, 7%).

Free text comments (n=7) from physiotherapists concerning “other” potential reasons for undertaking IP training included furthering scope of practice (n=3), improving knowledge of medicines (n=3), enhanced role efficiency through avoiding requests for medicines (n=2) and reducing paperwork associated with SP (n=1). Additionally, one respondent indicated that undertaking IP would protect them from giving incorrect advice on medicines and would improve patient safety.

Podiatrists

Podiatrist responses were very similar to that of physiotherapists. Fifty-eight per cent (n=14) were undertaking IP to support a new type of service provision, and 54% (n=13) indicated they were training in order to meet organisational targets. Podiatrists were emphatic that the ability to prescribe would make better use of their skills, and improve both care quality and access to medicines, with over 92% (n=24) indicating definite responses. Whilst 73% (n=19) indicated their reason for becoming an IP was to improve

job satisfaction and 65% (n=17) through it would lead to professional status gain, fewer were undertaking it to improve job prospects (n=6, 23%) and none were doing it to directly prosper from increased income. Only one podiatrist made a free text comment, stipulating an additional reason for undertaking IP was to overcome the rigidity of PGDs, in terms of antibiotic use.

5.1.6.2 Programme specific skills

Despite presenting as a highly qualified group (Table 5.1), educational preparation for prescribing was limited, especially in the areas of numeracy and pharmacology. In general, podiatrists were better prepared in pharmacology (Table 5.10), with 65.4% of those responding (n=17) having undertaken accredited study compared to 25% (n=14) of physiotherapists, and far fewer reliant on experiential training (3.8%, n=1 versus 26.8%, n=15). This may reflect the more intrinsic involvement in medicines associated with podiatry as a profession. As a total sample 46.3% (n=38) of respondents had not been trained in numeracy, with 50% (n=28) of physiotherapists reporting receiving no education compared to 38.5% (n=10) of podiatrists. Respondents undertaking the IP conversion course were better prepared in numeracy as they would already have undertaken this during the SP programme.

Table 5.10 Prior training undertaken by PP-IPs

	Physiotherapists (n=56) n (%)			Podiatrists (n=26) n (%)		
	Assessment & diagnostic skills	Pharmacology	Numeracy	Assessment & diagnostic skills	Pharmacology	Numeracy
Experiential training	10 (17.9%)	15 (26.8%)	10 (17.9%)	2 (7.7%)	1 (3.8%)	3 (11.5%)
Non-accredited	1 (1.8%)	4 (7.1%)	1 (1.8%)	3 (11.5%)	4 (15.4%)	4 (15.4%)
Accredited study	28 (50.0%)	14 (25.0%)	15 (26.8%)	16 (61.5%)	17 (65.4%)	8 (30.8%)
None	1 (1.8%)	17 (30.4%)	28 (50.0%)	1 (3.8%)	1 (3.8%)	10 (38.5%)

5.1.6.3 Funding and support

Funding

The majority of participants (59%) were funded through their employer to undertake the prescribing programme (Table 5.11). A larger proportion of podiatrists (14%) than physiotherapists (5%) were self-funded and a larger proportion of physiotherapist (12.5%) than podiatrists (3.4%) found alternative sources of funding, such as drug companies or charities. More details on costings can be found in the economics section.

Designated Medical Practitioner

Consultants took up the role of designated medical practitioner (DMP) for just over half the sample (54%). Findings were similar across professions, although one physiotherapist had a specialist registrar as a DMP (Table 5.11). Of the total sample, 11 (13%) reported difficulty in finding a suitable person to agree to be a designated medical practitioner (DMP); a requirement of NMP training.

Physiotherapists: Five physiotherapists experienced difficulty finding a DMP and all added free text comments as to why; all approached GPs who refused citing time constraints, lack of capacity due to supervision of other (nurse) trainees, and reluctance to mentor in the private sector. Additionally, one physiotherapist lost their DMP through relocation. Most reported having to approach consultants.

Podiatrists: Six podiatrists reported difficulties securing a DMP, citing time constraints a barrier to both identifying a suitable individual and the potential for this individual to provide the required level of supervision. Moreover, some potential DMPs did not understand what was required of the role. One podiatrist reported difficulty due to a lack of availability of IPs within a single profession service.

Table 5.11 Sources of funding and DMP for participants undertaking IP training

	Physiotherapists (n=56)		Podiatrists (n=29)		Total (n=85)	
	n	%	n	%	n	%
Source of funding						
Employer	34	60.7 %	16	55.2%	50	58.8%
Self-funded	3	5.4%	4	13.8%	7	8.2%
Employer and self-funded	1	1.8%	0	0%	1	1.2%
Other (drug company, charity)	7	12.5%	1	3.4%	8	9.4%
Missing	11	19.6%	8	27.6%	19	22.3%
Profession of designated medical practitioner (DMP)						
Consultant	30	53.6%	16	55.2%	46	54.1%
General Practitioner	15	26.8%	5	17.2%	20	23.5%
Specialist registrar	1	1.8%	0	0%	1	1.2%
Missing	10	17.9%	8	27.6%	18	21.2%

Non-Medical Prescribing Lead

It is recommended good practice for non-medical prescribers to have the ability to contact a local non-medical prescribing lead for advice, support and local monitoring purposes. Most (n=72, 98%) knew how to contact their non-medical prescribing lead, including all podiatrists. A small number of physiotherapists either did not know (n=3) or were unsure (n=2) about who their lead was or how to contact them.

5.2 Questionnaire 2: PP-IP follow-up post-training

5.2.1 Sample demographics

Questionnaire 2 was completed by 39 (56.5%) of the 70 respondents who indicated that they would be willing to take part in further research and provided contact details at the time of questionnaire 1, 25 of whom were physiotherapists and 14 podiatrists.

The ratio of the two professions was similar to questionnaire 1 and there were no major differences between questionnaire 1 and 2 demographics (Table 5.12). Median age was 43 (range 30-70). Equal numbers reported undertaking the conversion (n=18) and combined IP/SP (n=18) programme.

Details of time spent undertaking the training programme and related costs are provided in the economic analysis (Section 7).

Table 5.12 Physiotherapist and Podiatrist IP Questionnaire 2: Sample demographics

	Physiotherapists (n=25)		Podiatrists (n=14)		Total	
	n	%	n	%	n	%
Profession	25	64.1%	14	35.9%	39	100
Job title						
Surgeon/Consultant (i.e. consultant physiotherapists, consultant podiatric surgeons)	1	4.0%	4	28.6%	5	12.8%
Specialist (e.g. Clinical specialist physiotherapists, clinical specialist podiatrists)	18	72.0%	7	50.0%	25	64.1%
General/Private (physiotherapists, podiatrists)	3	12.0%	1	7.1%	4	10.3%
Manager/Director (i.e. directors, head of service, service managers)	3	12.0%	2	14.3%	5	12.8%
Age						
<40	12	48.0%	5	35.7%	17	43.6%
40-50	9	36.0%	4	28.6%	13	33.3%
>51	4	16.0%	5	35.7%	9	23.1%
Geographic Location (more than one answer possible)						
West London and South West London	0	0.0%	0	0.0%	0	0.0%
North West	3	12.0%	1	7.1%	4	10.3%
South West	4	16.0%	1	7.1%	5	12.8%
North, Central and East London	3	12.0%	1	7.1%	4	10.3%
Kent, Surrey and Sussex	3	12.0%	2	14.3%	5	12.8%
Yorkshire and the Humber	2	8.0%	3	21.4%	5	12.8%
South London	2	8.0%	3	21.4%	5	12.8%
East Midlands	4	16.0%	1	7.1%	5	12.8%
East of England	1	4.0%	2	14.3%	3	7.7%
North West London	1	4.0%	1	7.1%	2	5.1%
West Midlands	2	8.0%	1	7.1%	3	7.7%
Wessex	0	0.0%	1	7.1%	1	2.6%
Thames Valley	0	0.0%	1	7.1%	1	2.6%
North East	1	4.0%	0	0.0%	1	2.6%
Berkshire	0	0.0%	1	7.1%	1	2.6%

	Physiotherapists (n=25)		Podiatrists (n=14)		Total	
	n	%	n	%	n	%
Agenda for Change pay scale						
Band 9	1	4.0 %	2	14.3	3	7.7%
Band 8b-d	4	16.0%	3	21.4	7	11.0%
Band 8a	9	36.0%	3	21.4	12	30.8%
Band 7	10	40.0%	5	35.7	15	38.5%
Band 6, 5	1	4.0%	1	7.1	2	5.2%
Hours worked						
> 30 hours	20	80.0%	9	64.3	13	34.2%
< 30 hours	5	20.0%	5	35.7	20	52.6%
Experience in practice area before becoming IP						
<10 years	11	44.0%	2	14.3	13	33.3%
10-20 years	11	44.0%	9	64.3	20	51.3%
>20 years	2	8.0%	3	21.4	5	12.8%
Missing	1	4.0%	-	-	1	2.6%
Level of Educational Attainment						
Diploma	1	4.0%	2	14.3%	3	7.7%
Degree	9	36.0%	6	42.9%	15	38.5%
Higher degree (Masters or PhD)	15	60.0%	6	42.9%	21	53.8%
Specialist training in area of practice (> one answer possible)	n=58		n=40		n=98	
Non-accredited study (e.g. drug company)	16	64.0%	10	71.4%	26	66.7%
Accredited training (i.e. through university)	12	48.0%	10	71.4%	22	56.4%
Diploma level module/s	7	28.0%	5	35.7%	12	30.8%
Degree level module/s	4	16.0%	3	21.4%	7	17.9%
Masters level module/s	18	72.0%	12	85.7%	30	76.9%
Professional doctorate	1	4.0%	0	0.0%	1	2.6%

Areas of service provision

Details of the types of services and care settings in which participants worked are provided in Table 5.13. As in questionnaire 1, service provision was difficult to categorise, with 43.4% (n=17) working across more than one setting, 61.5% (n=21) providing an NHS outpatient or inpatient service, 59% of whom provided a multi-professional service.

Musculoskeletal and orthopaedics was similarly the largest and only group in which both professions specialised (35.9%).

Table 5.13 PP-IP Questionnaire 2 Service Provision

	Physiotherapists n=25		Podiatrists n=14		Total n=39	
	n	%	n	%	n	%
Primary Care Setting						
Secondary care (including tertiary care)	13	52.0%	2	14.3%	15	38.5%
Primary care (intermediate care, home and community care)	5	20.0%	2	14.3%	7	17.9%
Private (exclusively)	0	0.0%	0	0.0%	0	0.0%
More than one care setting	7	28.0%	10	71.4%	17	43.4%
Dominant service provided						
NHS hospital outpatient/ NHS hospital inpatient	15	60.0%	9	64.3%	24	61.5%
NHS community clinic	2	8.0%	4	28.6%	6	15.4%
Community service (home visits, domiciliary care)	4	16.0%	1	7.1%	5	12.8%
Other (social enterprise/Independent/private sector)	4	16.0%	0	0.0%	4	10.3%
General Practice service	0	0.0%	0	0.0%	0	0.0%
Services provided						
Multi-professional service only	17	68.0%	6	42.9%	23	59.0%
Single professional service only	8	32.0%	3	21.4%	11	28.2%
Single and multi-professional service	0.0	0.0%	5	35.7%	5	12.8%
Clinical Specialty						
MSK and orthopaedics (MSK clinics, MSK triage services, MDT orthopaedic spinal surgical team, MCATTS, MMATS, orthopaedic outpatient clinics, spinal orthopaedic clinics, inpatient orthopaedics, facial palsy clinic, MSK headache clinics, outpatient MSK foot clinics, MSK foot and ankle surgery)	11	44.0%	3	21.4%	14	35.9%
High Risk Foot (Diabetes wound care, Charcot, vascular foot care, diabetic foot clinic, non-diabetic wound care, diabetic foot protection, diabetic foot ulcer clinic, foot monitoring clinic, routine podiatry)	n/a	n/a	7	50.0%	7	17.9%
Respiratory (COPD, cystic fibrosis, community respiratory, community respiratory & heart failure clinic, oxygen services, inhaler clinics, respiratory assessment service, pulmonary rehabilitation, bronchiectasis, asthma, hyperventilation)	8	32.0%	n/a	n/a	8	20.5%
Pain (chronic pain management, chronic pain and fatigue, living well with pain)	2	8.0%	n/a	n/a	2	5.1%
Surgery (foot and ankle surgery)	n/a	n/a	4	28.6%	4	10.3%
Other (neurology (spasticity clinic, stroke ward) amputee rehabilitation, women's' health (pelvic floor dysfunction and continence), medical assessment unit, falls prevention)	4	16.0%	n/a	n/a	4	10.3%

5.2.2 Preparation and support for IP training

Course expectations and preparation

Participants were mainly satisfied with their experience of IP training programmes. At course completion, 79.5% (n=31) stated they felt completely or largely prepared to practice IP (Table 5.14).

Table 5.14 Extent to which participants feel prepared for prescribing practice

	Completely prepared	Largely prepared	Prepared a limited extent	Not prepared	Missing	Total
	n=					
Physiotherapists	8	10	4	0	3	25
Podiatrists	6	7	1	0	0	14
Total	14	17	5	0	3	39

Most participants (n=31, 79.5%) thought that the prescribing programme had either largely or fully met the stated learning objectives and 77% (n=30) thought it had met personal learning needs. A minority (n=4, 10%) thought personal and learning objectives had been met to a limited extent and one respondent thought personal learning objectives had not been met (Table 5.15).

Few (n=6) participants expressed difficulty in meeting the learning outcomes of the programme. Details were as follows:

Physiotherapists: Difficulty in meeting learning outcomes was reported by 4 physiotherapists, specifically relating to the volume of work and/or level of academic study. Free text comments (n=8) on the experience of training were mixed, either supportive of training as a positive, engaging and fulfilling experience (n=4) or more negative, stating training was too didactic, onerous (especially reflective practice requirements) and taught at an unnecessarily high (masters) level (n=3). One physiotherapist highlighted the post qualification implementation phase as a stressful time period when little support was given, and delay between qualification and receipt of HCPC annotation preventing prescribing negatively impacted confidence.

Podiatrists: Two podiatrists reported having difficulty during training with numeracy and the required volume of study. Two free text comments suggested improvements might be to replace exams with continuous assessment modules, and increase the number of pharmacology taught days.

Table 5.15 Extent to which the prescribing programme met stated learning outcomes or personal learning needs

	Met completely	Met largely	Met to a limited extent	Not met	Missing	Total
	n=					
Q 4: To what extent did prescribing programme meet stated learning outcomes						
Physiotherapists	15	4	3	0	3	25
Podiatrists	7	5	1	0	1	14
Q 5: To what extent did prescribing programme meet personal learning needs						
Physiotherapists	11	7	3	1	3	25
Podiatrists	5	7	1	0	1	14

Preparation and support

On the whole, participants reported adequate preparation and support from their DMP and employer during the prescribing programme, although around a quarter thought improvements could be made (Table 5.16)

Table 5.16 Preparation and support during IP training

To what extent do you agree/disagree with following statements about preparation and support during the prescribing programme?	n (%) Adequate preparation/support (agree/strongly agree)	
	Physiotherapy (n=25)	Podiatry (n=14)
a) My Designated Medical Prescriber (DMP) was able to provide me with the appropriate learning opportunities	20 (80%)	10 (71.4%)
b) I was able to access the support I required from my DMP	20 (80.0%)	10 (71.4%)
c) I am satisfied with the level of support I received from my DMP	19 (76.0%)	11 (78.6%)
d) My employer was supportive of programme requirements (e.g. study leave)	19 (76.0%)	11 (78.5%)
e) My scope of practice had been sufficiently agreed with my employer	19 (76.0%)	11 (78.5%)
f) I had difficulty meeting the learning outcomes of the programme	3 (12.0%)	1 (7.1%)
Missing	3 (12.0%)	0

Prescribing competencies

Respondents were asked whether the course prepared them adequately for 14 specific competency areas (see Table 5.17). Over 80% reported training programmes adequately prepared them in 10 areas. Physiotherapists were less satisfied with preparation for critically appraising evidence, assessing patients and developing awareness of cross-disciplinary working. Podiatrists were less satisfied with understanding drug actions, effectiveness of clinical supervision and developing a portfolio as a lifelong learner.

Table 5.17 Extent to which IP training prepared physiotherapists and podiatrists in prescribing competency areas

Competency	Physiotherapy n=25	Podiatry n=14	Total n=39
a) Understand and apply relevant legislation to the practice of NMP (including need for HCPC annotation)	21 (84.0%)	14 (100%)	35 (89.7%)
b) Understand the influences that can impact prescribing practice	20 (80.0%)	14 (100%)	34 (87.2%)
c) Understands the ethical dimensions of prescribing	20 (80.0%)	13 (92.9%)	33 (84.6%)
d) Understands roles and relationships of others involved in prescribing, supplying and administering medicines	20 (80.0%)	14 (100%)	34 (87.2%)
e) Critically appraise, sources of information/advice and decision support systems in prescribing practice	17 (68.0%)	13 (92.9%)	30 (76.9%)
f) Understand and apply knowledge of drug actions in prescribing practice	20 (80.0%)	11 (76.9%)	31 (79.5%)
g) Assess and consult with patients/clients and relatives/carers	18 (72.0%)	13 (92.9%)	31 (79.5%)
h) Undertake a thorough history, including medication history and current medication (including OTCC/ alternative / complementary therapies) to inform diagnosis	20 (80.0%)	13 (92.9%)	33 (84.6%)
i) Prescribe safely, appropriately and cost effectively	21 (84.0%)	13 (92.9%)	34 (87.2%)
j) Practice within a framework of accountability and responsibility	22 (88.0%)	13 (92.9%)	35 (89.7%)
k) Develop a clinical management plan within legislative requirements (SP only)	17 (68.0%)	11 (78.6%)	28 (74.3%)
l) Demonstrate an awareness of the need for cross-disciplinary working	18 (72.0%)	14 (100%)	32 (82.1%)
m) Use clinical supervision to critically analyses and evaluate ongoing performance as independent prescriber	20 (80.0%)	12 (85.7%)	32 (82.1%)
n) Make a contribution to your portfolio as a lifelong learner	21 (84.0%)	12 (85.7%)	33 (84.6%)

5.2.3 Clinical governance arrangements

Table 5.18 provides a summary of the extent to which participants reported safety and clinical governance systems were in place following qualification. A median of 9 (range 2.0 to 11.0) governance systems were reported to be in place.

Whilst 87% of the total sample had access to relevant drug alerts and safety notices, access to the BNF, and contact details for a NMP-lead, less than 50% were involved in developing local prescribing formularies guidelines or had access to their own prescribing data. Although numbers are small, physiotherapists had fewer systems in place with a median of 8.5 (2.0 to 11.0) compared to a median of 9 (range 4.0 to 11.0)

reported by podiatrists. Eight physiotherapists had not provided specimen signatures to employers/local pharmacists and 3 did not have an agreed scope of prescribing practice. However, more physiotherapists reported being involved in clinical audit of prescribing practice than podiatrists. All podiatrists reported having access to relevant clinical information concerning safety/hazards and were aware of their NMP Lead contact details.

Table 5.18 NMP clinical governance systems

To what extent are the following aspects of NMP clinical governance in place in your area of practice?	n, % stating "yes" (vs. no/unsure)		
	Physiotherapy (n=25)	Podiatry (n=14)	Total (n=39)
a) An up-to-date non-medical prescribing policy	19 (76%)	12 (85.7%)	31 (79.5%)
b) Specimen signature provided to employer/local pharmacist	14 (56.0%)	12 (85.7%)	26 (66.6%)
c) Access to all relevant clinical information e.g. Patient Safety Notices, Drug Alerts and Hazard Warnings	20 (80.0%)	14 (100.0%)	34 (87.2%)
d) Access to each edition (either electronic or print version) of the British National Formulary	21 (84.0%)	13 (92.9%)	34 (87.2%)
e) An agreed scope of practice	19 (76.0 %)	10 (71.4%)	29 (74.4%)
f) Non-medical prescribing lead contact details	20 (80.0%)	14 (100.0%)	34 (87.2 %)
g) Access via employer/trust/independently) to continued professional development (CPD) to support me in prescribing role	19 (76.0 %)	13 (92.9%)	32 (82.0%)
h) Involvement, now or in the future, with regular clinical audit and review of my clinical services	18 (72.0 %)	9 (64.3 %)	27 (69.2%)
i) Involvement, now or in the future, in the development of local formularies and guidelines	10 (40.0 %)	7 (50.0 %)	17 (43.6 %)
j) Access to regular data to monitor my prescribing practice	12 (48.0%)	8 (57.1 %)	20 (51.3%)
k) Access to my own prescribing data (via prescribing analysis and cost tabulation (PACT) or otherwise)	9 (36.0%)	9 (64.3 %)	18 (46.1%)
Missing	3 (12.0 %)	0(0%)	3 (7.7 %)

There were similarities in provision of governance systems between care settings (Table 5.19), and no statistical difference was found between them in the total number of systems in place (ANOVA $p=0.40$). This suggests newly qualified PP-IPs were equally supported irrespective of work location. Along with scope of practice, which was not established for around a fifth of respondents across care settings, PPs reported difficulty accessing prescribing data suggesting a lack of focus on self-monitoring. However, access

to CPD to support prescribing was reported by all respondents apart from those within secondary care suggesting an overall culture of continuous learning.

Table 5.19 Numbers of respondents reporting governance systems in different care settings

N.B participants working across care setting had one more than one response	Primary care*	Secondary care*	Home and community care*	Private*
	(n=14)	(n=23)	(n=5)	(n=9)
	Total number of responses =51 n (%)			
a) An up-to-date non-medical prescribing policy	11 (78.6%)	21 (91.3%)	4 (80.0%)	8 (88.9%)
b) Specimen signature provided to employer/local pharmacist	11 (78.6%)	16 (69.6%)	3 (60.0%)	8 (88.9%)
c) Access to all relevant clinical information e.g. Patient Safety Notices, Drug Alerts and Hazard Warnings	14(100.0%)	22 (95.7%)	5 (100.0%)	9 (100%)
d) Access to each edition (either electronic or print version) of the British National Formulary	12 (85.7%)	22 (95.7%)	4 (80.0%)	8 (88.9%)
e) An agreed scope of practice	11 (78.6%)	18 (78.3%)	4 (80.0%)	7 (77.8%)
f) Non-medical prescribing lead contact details	13 (92.8%)	22 (95.7%)	5 (100.0%)	9 (100 %)
g) Access via employer/trust/independently) to continued professional development (CPD) to support me in prescribing role	14(100.0%)	19 (82.6%)	5 (100.0%)	9 (100%)
h) Involvement, now or in the future, with regular clinical audit and review of my clinical services	10 (71.4%)	17 (73.9%)	5 (100.0%)	6 (66.7%)
i) Involvement, now or in the future, in the development of local formularies and guidelines	7 (50.0%)	10 (43.5%)	2 (40.0%)	5 (55.6%)
j) Access to regular data to monitor my prescribing practice	10 (71.4%)	11 (47.8%)	3 (60.0%)	5 (55.6%)
k) Access to my own prescribing data (via prescribing analysis and cost tabulation (PACT) or otherwise)	9 (64.3%)	10 (43.5%)	1 (20.0%)	5 (55.6%)

5.2.4 Intended use of prescribing

In order to investigate whether IP training clarified or changed expectations of use of prescribing in practice, sections from questionnaire 1 were repeated in questionnaire 2 on intended prescribing methods and therapy areas, estimated prescribing rates and intention to prescribe controlled drugs. As PP-IPs were invited to complete questionnaire 2 at the end of their IP programme, it is unlikely that they would have started to prescribe in practice due to the time required to certify qualifications and register as a prescriber. The questions therefore ask about intended use of prescribing.

Methods of prescribing

The most common anticipated use was in making recommendations to GPs for medicines to be prescribed (91%), followed by recommending OTC products (74%) and amending / modifying existing prescribed medicines (71%) (Table 5.20). Recommending to another prescriber was the main method in primary and secondary care settings, whereas in home/community care and private practice, recommending OTC medicines dominated.

Physiotherapists providing hospital care services (n=15) who completed questionnaire 2 indicated they would use IP to perform all prescribing activities, although the main method in other settings was to make recommendations for medicines to be prescribed. Those providing community clinics or community services stipulated using fewer methods. For podiatrists, making recommendations via hospital notes for medicines to be prescribed was most frequently indicated by podiatrists providing hospital based services (n=8) whilst recommending patients to buy OTC medicines was the dominant method in community clinics (n=4).

Table 5.20 Intended use of IP by physiotherapists and podiatrists following training

	Physiotherapists (n=21)	Podiatrists (n=14)	Total (n=35)
	n, %		
Amend prescribed medication (i.e. stop, alter or correct dosage)	16 (76.2%)	9 (64.3%)	25 (71.4%)
Make recommendations to GP for medicine(s) to be prescribed	20 (95.2%)	12 (85.7%)	32 (91.4%)
Make recommendations via hospital notes for medicine(s) to be prescribed	6 (28.6%)	10 (71.4%)	16 (45.7%)
Make recommendations to patient to buy medication(s) over the counter	14 (66.6%)	12 (85.7%)	26 (74.3%)
Medication review	14 (66.6%)	9 (64.3%)	23 (65.7%)
Remote prescribing by telephone, email etc.	3 (14.3%)	4 (28.6%)	7 (20.0%)
Issue private prescriptions	3 (14.3%)	6 (42.8%)	9 (25.7%)
Missing	4 (19.0%)	0 (0.0%)	4 (11.4%)

Controlled drugs and private prescriptions

The proportion of participants intending to prescribe controlled drugs rose from 26% (n=22) in questionnaire 1 to 44% (n=17) in questionnaire 2, and less were unsure (Questionnaire 1 n=23, 27%, questionnaire 2 n=5, 13%). This may reflect greater clarification over the role of controlled drugs following training, during which time the regulations for physiotherapist and podiatrist prescribing of controlled drugs were announced. Numbers are too small to distinguish clear differences between professions (Table 5.21).

Those PP-IPs who affirmed their intention to prescribe were additionally requested to identify the drugs they intended to use. Of 33 medicines stipulated, 18 were strong opioid analgesics, 7 were weak opioids and 8 were Benzodiazepines. Of the 12 physiotherapists who intended to prescribe controlled drugs, these included benzodiazepines (n=4), weak opioids (n=9) and strong opioids (n=4). Podiatrists intending to prescribe controlled drugs stipulated strong opioids (n=9), including tramadol, fentanyl, morphine and Oramorph along with benzodiazepines (n=4) and weak opioids (n=3) were drugs of choice.

Intention to issue private prescriptions was more common amongst podiatrists (n=6, 46%) than physiotherapists (n=3, 12%).

Table 5.21 Do you intend to prescribe controlled drugs?

	Physiotherapists (n=25)	Podiatrists (n=14)	Total (n=39)
	n(%)	n(%)	n(%)
<i>Do you intend to prescribe controlled drugs?</i>			
Yes	12 (48.0%)	5 (35.7%)	17 (43.6%)
No	5 (20.0%)	6 (42.8%)	11 (28.2%)
Unsure	3 (12.0%)	2 (14.3%)	5 (12.8%)
Missing	5 (20.0%)		5 (12.8%)
<i>Do you intend to issue private prescriptions?</i>			
Yes	3 (12.0%)	6 (42.8%)	9 (23.1%)
No	17 (68.0%)	8 (57.1%)	25 (64.1%)
Unsure	0 (0.0%)	0 (0.0%)	0 (0.0%)
Missing	5 (20.0%)	0 (0.0%)	5 (12.8%)

Prescribing rates

Following training, participants anticipated supplying, administering or prescribing a median of 6 items (range 0.0 to 40.0) in a typical week using IP. This was lower than reported in questionnaire 1 (8.0 items, range 0 to 90), suggesting training led to some clarity of the scope of IP. Anticipated use of SP also reduced with only three physiotherapists expecting to use it to supply, administer or prescribe a median of 2 items (range 1.0 to 5.0) and no expected use amongst podiatrists.

Therapy areas

There was little change between questionnaire 1 and 2 in the key therapy areas in which participants reported either currently activity, or intention to independently prescribe. There was an indication of a slight drop in estimated prescribing of antibiotics amongst physiotherapists, and a slight increased interest by podiatrists in use of MSK and endocrinal medications, however the numbers are too small to be conclusive (Table 5.22).

Table 5.22 Comparison of treatment management areas used by physiotherapists and podiatrists at the beginning and end of IP training

Which of the following areas do you currently provide treatment management and intend to independently prescribe once qualified?	Physiotherapists Q1 n=56 Q2 n=25				Podiatrists Q1 n=29 Q2n=14			
	Currently Involved		Intend to Prescribe		Currently involved		Intend to prescribe	
	Q1	Q2	Q1	Q2	Q1	Q2	Q1	Q2
Gastro-intestinal (<i>antacids, laxatives</i>)	9 (16.1%)	3 (12.0%)	13 (23.2%)	5 (20.0%)	0 (0.0%)	2 (14.2%)	3 (10.3%)	0 (0.0%)
Cardiovascular (<i>diuretics, anti-hypertensives</i>)	2 (3.6%)	1 (4.0%)	3 (5.4%)	3 (12.0%)	3 (10.3%)	3 (21.4%)	3 (10.3%)	2 (14.2%)
Respiratory system (<i>bronchodilators, corticosteroids, antihistamines, mucolytic</i>)	12(21.4%)	6 (24.0%)	10 (17.8%)	4 (16.0%)	1 (3.4%)	1 (7.1%)	2 (6.9%)	1 (7.1%)
Central nervous system (<i>hypnotics, antidepressants, analgesics</i>)	18(32.1%)	6 (24.0%)	22 (39.3%)	8 (32.0%)	7 (26.0%)	8 (57.1%)	10 (34.5%)	6 (42.9%)
Infections (<i>anti-bacterial, anti-fungal, anti-viral</i>)	14(25.0%)	7 (28.0%)	15 (26.7%)	4 (16.0%)	23 (79.3%)	13 (92.9%)	15 (51.7%)	8 (57.1%)
Endocrine system (<i>diabetes, drugs, thyroid, sex hormones</i>)	2 (3.6%)	0 (0.0%)	2 (3.6%)	1 (4.0%)	5 (17.2%)	2 (14.3)	2 (6.9%)	4 (28.6%)
Obstetrics, gynaecology (<i>prostaglandins, contraception</i>)	1 (1.8%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (3.4%)	1 (7.1%)
Urinary tract disorders (<i>erectile dysfunction, urinary frequency</i>)	2 (3.6%)	0 (0.0%)	1 (1.8%)	1 (4.0%)	0 (0.0%)	0 (0.0%)	1 (3.4%)	1 (7.1%)
Malignant disorders & Immunosuppression (<i>e.g. cytotoxic</i>)	1 (1.8%)	0 (0.0%)	0 (0.0%)	1 (4.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (7.1%)
Nutrition and blood (<i>anaemia, fluids and electrolytes, oral and IV nutrition</i>)	2 (3.6%)	1 (4.0%)	3 (5.4%)	1 (4.0%)	1 (3.4%)	1 (7.1%)	1 (3.4%)	1 (7.1%)
Musculoskeletal & Joint diseases (<i>NSAIDS, gout, muscle relaxants</i>)	28 (50.0%)	10 (40.0%)	40 (71.4%)	11 (44.0%)	12 (41.3%)	9 (64.3%)	12 (41.3%)	8 (57.1%)
Eye (<i>antibacterial, antifungals, steroids, glaucoma</i>)	2 (3.6%)	0 (0.0%)	1 (1.8%)	0 (0.0%)	1 (3.4%)	0 (0.0%)	1 (3.4%)	1 (7.1%)
Ear, nose & oropharynx (<i>ear infections, nasal decongestants, mouthwash</i>)	3 (5.4%)	2 (8.0%)	2 (3.6%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (3.4%)	1 (7.1%)
Skin (<i>emollients, topical preparations, acne, parasitic infections, skin cleansing</i>)	4 (7.1%)	3 (12.0%)	3 (5.4%)	2 (8.0%)	15 (51.7%)	13 (92.9%)	17 (58.6%)	7 (50.0%)
Immunological products & Vaccines	1 (1.8%)	1 (4.0%)	0 (0.0%)	1 (4.0%)	0 (0.0%)	1 (7.1%)	1 (3.4%)	0 (0.0%)
Anaesthesia (<i>local and general</i>)	10 (17.8%)	4 (16.0%)	12 (21.4%)	4 (16.0%)	16 (55.2%)	9 (64.3%)	5 (17.2%)	4 (28.6%)
Other	5 (8.9%)	3 (12.0%)	6 (10.7%)	2 (8.0%)	3 (10.3%)	0 (0.0%)	4 (13.8%)	0 (0.0%)

5.2.5 Expected outcomes of IP

5.2.4.1 Total Sample

To determine expected outcomes of independent prescribing, a series of 21 statements were presented on potential benefits, to which respondents were requested to stipulate agreement (yes/no) or uncertainty (Table 5.23).

Of the 34 participants who completed this question, all agreed that IP would reduce treatment delay. Over 90% of both professions agreed with the benefits of streamlining services and reducing time taken to arrange prescriptions with a doctor. Over 90% also agreed that IP would increase the ability to select the most appropriate choice of medication, improve medicines management, safety and reduce unnecessary prescriptions, as well as improve PP-IP knowledge, job satisfaction and communication with patients about medicines.

Physiotherapists were less inclined than podiatrists to think IP would impact on reducing waiting times, hospital admissions, hospital stay or use of emergency services. This probably reflects differences in the aims of service provision in the two professions. Podiatrists were more inclined to think that IP would enable them to provide services when there is no doctor available, again probably reflecting the higher concentration of single profession practices.

Table 5.23 Anticipated benefits of independent prescribing

Which of the following benefits, if any, do you anticipate will result from your ability to independently prescribe medication for patients?	n (%) stating "yes" (vs. no/unsure)		Total (n=34)
	Physiotherapy (n=21)	Podiatry (n=13)	
<i>Service outcomes</i>			
Reduced treatment delay	21 (100%)	13 (100%)	34 (100%)
Streamline services, i.e. fewer patient appointments with fewer health professionals	19 (90.5%)	13 (100%)	32 (94.1%)
Reduced waiting times for patients once at the appointment	15 (71.4%)	12 (92.3%)	27 (79.4%)
Prevention of hospital admissions	10 (47.6%)	12 (92.3%)	22 (64.7%)
Reduced use of emergency services, such as ambulance, A&E visit, out of hours' service	9 (42.8 %)	12 (92.3%)	21 (65.6%)
Reduced length of hospital stay	6 (28.6 %)	5 (38.5%)	11 (32.3%)
<i>Medicine management activities</i>			
Time saved arranging prescription from doctor or other prescriber	20 (95.2%)	13 (100%)	33 (97.1%)
Increased ability to select the most appropriate medication for the patient	21 (100%)	12 (92.3%)	33 (97.1%)
Able to offer prescription when doctor not available or offer different services (such as out-of-hours, community)	15 (71.4 %)	12 (92.3%)	27 (79.4%)
Reduce unnecessary prescriptions	20 (95.2%)	12 (92.3 %)	32 (94.1%)
Improved medicines management	20 (95.2%)	12 (92.3%)	32 (94.1%)
Improved specificity and responsiveness of prescribing (e.g. better placed to adapt or change treatment, titrate doses and reduce exposure to risk or side effects)	19 (90.5 %)	11 (84.6%)	30 (88.2%)
<i>Patient satisfaction</i>			
Increased patient choice with regards to health care professionals access and convenience	17 (80.9 %)	11 (84.6%)	28 (82.3%)
More holistic care	16 (76.2 %)	11 (84.6%)	27 (79.4%)
Increased patient satisfaction	20 (95.2%)	11 (84.6%)	31 (91.2%)
<i>Prescriber knowledge/job satisfaction</i>			
Increased team working	18 (85.7%)	12 (92.3%)	30 (88.2%)
Improved knowledge (e.g. understanding of pharmacology and prescribing)	20 (95.2%)	13 (100%)	33 (97.1%)
Increased job satisfaction	20 (95.2%)	12 (92.3%)	32 (94.1%)
<i>Safety</i>			
Improved communication with patients about medicine	20 (95.2%)	13 (100%)	33 (97.1%)
Improved safety	19 (90.5%)	12 (92.3%)	31 (91.2%)
Clarify lines of accountability and responsibility for treatment decisions	17 (80.9%)	11 (84.6%)	28 (82.3%)

6 Results from Phase 3 Comparative Case Studies

6.1 Overview of case sites

A total of 14 individual case sites were recruited, comprising 7 pairs of matched sites, of which 3 were podiatry sites and 4 physiotherapy sites. Sites were based across 8 Academic Health Science Networks in England: Kent Surrey and Sussex (n=6), London (including Health innovation London and Imperial) (n=3), Wessex (n=2), Oxford, North East, North Cumbria, and Northwest Coast (n=1 each). Sites comprised a mix of female (n=8) and male (n=6) podiatrists and physiotherapists, who generally (n=13) worked full time (> 30 hours per week), had an average age of 47.5 years (range 38-71 years) with most (n=12) having completed either Masters or PhD level of academic study.

In each pair, an independent prescriber was matched with a non-prescriber in a separate site. Matching was primarily based on the type of service, clinical role and care setting. Other considerations for matching included geographical location, patient demographics and agenda for change banding. The 14 case study sites are summarised below in Table 6.1.

Table 6.1 Characteristics of case study sites

Pair	Case study site	Profession	Status	Job Title	Setting	Location in England *
1	1	PO	IP	Private Practitioner	Private residential hospital	London
	2	PO	NP	Private Practitioner	Private clinic	London
2	3	PO	IP	Team leader, Diabetes specialist	Secondary care, NHS In/out patient	Wessex
	8	PO	NP	Senior Podiatrist	NHS primary & secondary (& private)	Kent, Surrey, Sussex
3	10	PO	IP	Consultant Podiatric Surgeon	NHS secondary (& private)	Oxford
	6	PO	NP	Consultant Podiatric Surgeon, Clinical lead	NHS secondary	North East & North Cumbria
4	7	PT	IP	Clinical lead	Community	London
	4	PT	NP	MSK Clinical Lead/ESP lead	NHS Primary, Community care	Kent, Surrey, Sussex
5	9	PT	IP	Orthopaedic practitioner (spinal lead) (ESP)	Primary, community Social enterprise	Kent, Surrey, Sussex
	5	PT	NP	Consultant Physiotherapist	Tier 2 NHS ESP assessment service	Wessex
6	11	PT	IP	ESP spinal/ Clinical Therapy Manager	Acute Foundation Trust	Northwest coast
	12	PT	NP	Consultant spinal physio/ MSK Clinical lead	NHS secondary care	Kent, Surrey, Sussex
7	13	PT	IP	MSK Clinical lead	NHS primary & community Social enterprise	Kent, Surrey, Sussex
	14	PT	NP	ESP Orthopaedic Practitioner	Primary & community Social enterprise	Kent, Surrey, Sussex

* According to Academic Health Science Network regions : (London = Health Innovation and Imperial College)

A summary about the case sites is provided below, with a more detailed overview provided in **Appendix 11**.

6.1.1 Podiatry sites

Pair 1: Sites 1 and 2 offered general podiatry services in private practice. The IP was based in private residential hospital and the NP in a private clinic.

Pair 2: Sites 3 and 8 offered NHS podiatric services with a specialist focus on diabetic complications. The IP was a diabetes team leader based in secondary care with a case load that included patients with diabetic complications. The NP was a senior podiatrist specialising in wound care and diabetes, providing services in primary and secondary care. The NP also offered private practice, however did not consent to observation of private practice.

Pair 3: Sites 10 and 6 were consultant podiatric surgeons offering day case and outpatient surgery to NHS patients in secondary care. The IP also offered private practice, however did not consent to observation of private practice.

Of the independent prescribers, the podiatric surgeon (site 10) was prescribing on a daily to weekly basis, the podiatrist in the diabetes outpatient foot clinic (site 3) prescribed when there was no consultant or doctor available (which was occurring on an increasingly regular basis) and the private podiatrist (site 1) prescribed regularly in a private clinic but had no agreement to prescribe in a private hospital setting

6.1.2 Physiotherapy sites

Pair 4: Sites 7 and 4 were physiotherapy clinical leads offering NHS services in community or primary care settings. The IP worked in a multidisciplinary community response service providing supported discharge and admission prevention (mainly via home visits) for patients with a range of MSK condition and complex physical and social needs. The NP worked in an MSK clinical assessment service for adults with complex spinal and MSK conditions based in community clinics.

Pair 5: Sites 9 and 5 were extended scope practitioner (ESP) physiotherapists specialising in spinal conditions and working in clinical assessment services in multiple sites. The IP worked in a primary/community social enterprise as spinal lead/orthopaedic practitioner in a multidisciplinary assessment and referral service. The NP worked as a consultant ESP in a tier 2 multidisciplinary NHS assessment service for adults with a range of MSK spinal and limb conditions.

Pair 6: Sites 11 and 12 were similar to pair 5 in their focus on NHS orthopaedic and spinal patients. The IP was an ESP clinical therapy manager in an acute trust, multi-disciplinary spinal surgical team for patients requiring specialist opinion/surgery. The NP was a consultant spinal physiotherapist and MSK clinical lead working in a spinal triage clinic in a secondary care outpatient/physiotherapy department.

Pair 7: Sites 13 and 14 provided NHS MSK clinical assessment services. The IP was a MSK clinical lead in primary and community based social enterprise service, providing MSK assessment/orthopaedic triage and assessment. The NP was an ESP orthopaedic practitioner working in an intermediate, primary and community based social enterprise service, providing MSK clinical assessment to adults with a range of MSK conditions.

Of the independent prescribers, one (site 11) was not prescribing and the others were prescribing on a weekly to monthly basis.

Table 6.2 below provides an overview of the data collection at each site.

Table 6.2 Data collected at each case site

Pair	Case study site	No. Patients Recruited (n=489)	No. Visits (n=78)	Hours observed	Patient Questionnaire 1	Follow up-Patient Questionnaire	Work sampling (90 minute each)	Audio recorded consultations
1	1	49	5	21.5	40	N/A	10	3
	2	46	7	29.5	35	N/A	12	5
2	3	33	9	31.75	22	19	14	3
	8	37	5	26.5	25	22	11	4
3	10	51	5	26.5	32	38	9	5
	6	42	7	23.5	26	23	9	5
4	7	6	4	19.5	25	N/A	11	5
	4	11	2	7	25	N/A	11	5
5	9	42	6	30	2	2	8	0
	5	38	7	25.5	6	3	4	3
6	11	41	6	35.5	27	29	12	5
	12	35	5	19.5	19	23	9	5
7	13	21	4	14.25	8	16	5	2
	14	36	6	34	23	20	11	5
Totals		489	78	344.5 hours	315	195	136	55

6.2 Observations

Observation of PP-IP/NP-PP service delivery aimed to identify medicine management activities (MMAs) and work related activities that enable PP-IPs to contribute most effectively to successful care outcomes. It also aimed to explore prescribing models in current practice, associated resources and patient utility. It was anticipated that a

researcher would observe PP-IPs/NP-PPs in real-time service delivery up to 5 working days (37 hours) and collect data on MMAs and activities related to direct and indirect care. However, due to large differences in the configuration of working patterns and clinician availability, there was variation in the number of site visits (range=2 to 9), the number hours spent in observation of clinical practice (range= 7 to 34 hours) and number of patients recruited at each site (range=6 to 51). See Table 6.3. (See **Appendix 12** for site availability for observations of clinical practice).

Data from the observations were analysed in two ways: a) narrative analysis of medicine management activities, overall advice given to patient about medication, description of colleague discussions, colleague referrals, and review arrangements; b) economic analysis of number of different medications prescribed, consultation time, time spent in discussion with colleagues, and time spent referring to colleagues. Please see Section 7 for details of the economic analysis.

6.2.1 Sample profile

A total of 474 patient consultations were observed. These comprised participants from 222 physiotherapist and 252 podiatrist consultations.

6.2.1.1 Overview of all observed consultations

Nearly all (n=473, 99.8%) the consultations were face-to-face, the majority of which were either in NHS outpatients (n=186), NHS community clinics (n=119) or in the independent private sector (n=96), with only 6 (1.3%) in a community service, duration 2 to 203 (median-19) minutes. Consultations with physiotherapists were significantly longer than podiatrists (median 22:16 minutes respectively) (p<0.001). There was considerable variation in the location of services. For example, all NHS community clinics consultations were undertaken by NP-PPs (n=119), all private practice (n=96) by podiatrists, all social enterprise (n=21) by PT-IPs, with 96% (n=43) of general practice consultations undertaken by physiotherapists (PT-IP & PT-NP).

Over two-thirds (69.4%, n=329) of participants had been referred via general practice 11% (n=55) via the independent private sector, and 8% (n=40) self-referrals. There was also considerable variation in sources of referral. For example, all self-referrals and those for private practice related to podiatry. There were relatively few referrals made via NHS community clinics (n=19), hospital inpatients (n=10), or outpatients (n=19), with only one local authority referral made to a podiatrist non-prescriber

Two thirds of the observed consultations (66.0%, n=313) were follow-up appointments, 33.5%, (n=159) initial routine appointments, with only one (0.02%) emergency observed at a physiotherapist prescriber site. The majority (82.1%, n=207) of consultations with podiatrists (PO-IP & NP-PO) were for follow-up compared to only 47.7% (n=106) of those with physiotherapists.

Table 6.3 Case site consultations: service type, consultation mode, referral source and type of consultation

Consultations observed n (%)	Physiotherapist			Podiatrist			Complete sample
	Independent Prescriber	Non-Prescriber	Total	Independent Prescriber	Non-prescriber	Total	Total
	n=107	n=115	n=222	n= 128	n=124	n=252	n=474
Length of Consultation mins, median (range)	24.0 (7.0-86.0) ¹	19 (3.0-56.0) ¹	22.0 (3.0-86.0) ²	16.0 (2.0-203)	16.0 (3.0-56.0)	16.0 (2.0-203.0) ²	Median =19 (range 2-203)
Service type - number of consultations observed (%)							
• Community service	5 (4.7%)	0 (0.0%)	5 (2.3%)	0 (0.0%)	1 (0.8%)	1 (0.4%)	6 (1.3%)
• General Practice	43 (40.2%)	0 (0.0%)	43 (19.4%)	0 (0.0%)	3 (2.4%)	3 (1.2%)	46 (9.7%)
• NHS community clinic	0 (0.0%)	46 (40.0%)	46 (20.7%)	0 (0.0%)	73 (58.9%)	73 (29.0%)	119 (25.1%)
• NHS hospital outpatient	38 (35.5%)	69 (60.0%)	107 (48.2%)	78 (60.9%)	1 (0.8%)	79 (31.3%)	186 (39.2%)
• Social enterprise	21 (19.6%)	0 (0.0%)	21 (9.5%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	21 (4.4%)
• Independent private sector	0 (0.0%)	0 (0.0%)	0 (0.0%)	50 (39.1%)	46 (37.1%)	96 (38.1%)	96 (20.3%)
Consultation mode							
• Face-to face	107 (48.2%)	115 (51.8%)	222 (100.0%)	128 (100.0%)	123 (99.2%)	251 (99.6%)	473 (99.8%)
• Telephone	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (0.4%)	1 (0.4%)	1 (0.02%)
Referral Source							
• General Practice	81 (75.7%)	108 (93.9%)	189 (85.1%)	64 (50.0%)	76 (61.3%)	140 (55.6%)	329 (69.4%)
• NHS community service	8 (7.5%)	1 (0.9%)	9 (4.1%)	8 (6.3%)	2 (1.6%)	10 (0.8%)	19 (4.0%)
• NHS hospital inpatient	7 (6.5%)	1 (0.9%)	8 (3.6%)	2 (1.6%)	0 (0.0%)	2 (0.8%)	10 (2.1%)
• NHS hospital outpatient	11 (10.3%)	4 (3.5%)	15 (6.8%)	4 (3.1%)	0 (0.0%)	4 (1.6%)	19 (4.0%)
• Independent private sector	0 (0.0%)	0 (0.0%)	0 (0.0%)	50 (39.1%)	5 (4.0%)	55 (21.8%)	55 (11.6%)
• Local authority	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (0.8%)	1 (0.4%)	1 (0.02%)
• Self-referral	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	40 (32.2%)	40 (15.9%)	40 (8.4%)
Type of consultation							
Initial routine	49 (45.8%)	66 (57.4%)	115 (51.8%)	26 (20.3%)	18 (14.5%)	44 (17.5%)	159 (33.5%)
• Follow-up	57 (53.3%)	49 (42.6%)	106 (47.7%)	101 (78.9%)	106 (85.5%)	207 (82.1%)	313 (66.0%)
• Emergency	1 (0.9%)	0 (0.0%)	1 (0.5%)	1 (0.8%)	0 (0.0%)	1 (0.4%)	1 (0.02%)

¹p<0.0005 between physiotherapy prescriber and non-prescriber

²p<0.0005 between physiotherapy and podiatry

Colleague discussions and referrals

PP-IP (n=32) and PP-NP (n=10) had discussions with other colleagues regarding 42 (8.9%) participants whose consultations were observed, the majority (n=27, 62.7%) of which were with a Doctor. Of the 17 discussions with colleagues from the same profession 16 (94.1%) were to another podiatrist.

The majority of participants (n=432) did not require referral to a colleague. Of the 125 (26.4%) who were, this was mainly to Doctors (n=94, 75%) or colleagues from the same profession (n=24, 19%), with a small number (n=7) to both. Physiotherapists, both prescribers and non-prescribers made more referrals than podiatrists (PO-IP & PO-NP) (39%: 15% respectively) (See Table 6.4).

Table 6.4 Colleague discussions and referrals

Consultations observed n (%)	Physiotherapist			Podiatrist			Complete sample
	Independent Prescriber	Non-Prescriber	Total	Independent Prescriber	Non-prescriber	Total	Total
	n=107	n=115	n=222	n= 128	n=124	n=252	n=474
Discussion with other colleagues							
Same profession only	1 (0.9%)	0 (0.0%)	1 (0.5%)	7 (5.5%)	9 (7.3%)	16 (6.3%)	17 (3.6%)
Medical profession only	16 (15.0%)	0 (0.0%)	16 (7.2%)	8 (6.3%)	1 (0.8%)	9 (3.6%)	25 (5.2%)
None	90 (84.1%)	115 (100%)	205 (92.3%)	113 (88.3%)	114 (91.9%)	227 (90.1%)	432 (91.1%)
Referral to colleague							
Same profession only	9 (8.4%)	8 (69.6%)	17 (7.8%)	6 (4.7%)	1 (0.8%)	7 (2.85)	24 (5.1%)
Medical profession only	32 (29.9%)	32 (27.8%)	64 (28.8%)	24 (18.8%)	6 (4.8%)	30 (6.3%)	94 (19.8%)
Same & medical	4 (3.7%)	2 (2.6%)	6 (2.7%)	1 (0.8%)	0 (0.0%)	1 (0.4%)	7 (1.5%)
None	62 (57.9%)	73 (63.4%)	135 (60.8%)	97 (75.8%)	117 (94.4%)	214 (84.5%)	349 (73.6%)

Review arrangements

Arrangements were made to review 326 (68.7%) of those whose consultations were observed. Review arrangements varied considerably, and ranged from on the same day-365 days (mean 32 days) after the consultation and tended to be longer for non-prescribers (mean =42 days) compared to PP-IPs (mean=23.5 days). Plans were made to review 16 patients (n=3.4%) via the telephone and six weeks for one patient who attended a podiatrist prescriber (see Table 6.5).

Table 6.5 Review arrangements

Consultations observed n (%)	Physiotherapist			Podiatrist			Complete sample
	Independent Prescriber	Non-Prescriber	Total	Independent Prescriber	Non-prescriber	Total	Total
	n=107	n=115	n=222	n= 128	n=124	n=252	n=474
Follow up time days mean (range)	17.5 (0.0-120.0)	42.0 (7.0-120.0)	Mean=29.75	28.0 (3.0-180.0)	42.0 (1.0-365.0)	Mean=35	Mean=32
No follow up	53 (49.5%)	64 (55.6%)	117 (52.7%)	18 (14.1%)	13 (10.5%)	31 (12.3%)	148 (31.2%)
Follow-up	46 (42.9%)	50 (43.4%)	96 (43.2%)	109 (85.2%)	104 (83.8%)	213 (84.5%)	309 (65.2%)
Telephone follow up	8 (7.4%)	1 (0.8%)	9 (4.1%)	0 (0.0%)	7 (5.6%)	7 (2.8%)	16 (3.4%)
6 weeks' review	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (0.8%)	0 (0.0%)	1 (0.4%)	1 (0.2%)

6.2.1.2 Observation of Physiotherapist consultations

There were 222 (46.8%) observations of physiotherapist consultations (PT-IP=107 (48.2%), PT-NP=115 (51.8%)), all of which were face to face which lasted 3-86 (median=22) minutes. Consultations with prescribers were slightly longer duration than non-prescribers (median 24:19 minutes respectively) ($p < 0.001$). The majority of observations were undertaken in either NHS outpatients (n=107), NHS community clinics (n=46) or general practice (n=43), with only 5 (2.3 %) in a community service for physiotherapist prescribers. There was variation in the location of the services with all PT-NP consultations undertaken in either NHS hospital outpatients (n=69) or community clinics (n=46). The majority of PT-IP services were undertaken in general practice (n=43) or NHS hospital outpatients (n=38) with services in social enterprise (n=21) and the community (n=6) also observed. No observation of PT-IPs was undertaken in NHS community clinics or private practice for either PT-IPs or PT-NPs.

The vast majority (85.1%, n=189) of participants had been referred via general practice, with 6.8% (n=15) referred via NHS hospital outpatients. There were only a small number of referrals made via NHS community service (n=9) or hospital inpatients (n=8). Nearly all (93.9%, n=108) referrals to PT-NPs arose via general practice. No self-referrals or those via the private sector, or local authority had been made to either physiotherapist prescribers or non-prescribers.

Observations were split between initial routine appointments (n=115, 51.8%) and follow-up (n=106, 47.7%) with one (0.09%) emergency observed at a physiotherapist prescriber site, with only a small difference between physiotherapist prescribers and non-prescribers. (See Table 6.3).

Colleague discussions and referrals

Physiotherapists had discussions with other colleagues regarding 17 (7.7%) participants whose consultations were observed. All of the discussions were held by prescribers, the majority (n=16, 94.1%) of which, were with a Doctor.

The majority of participants (n=135) did not require referral to a colleague. Of the 87 (64.4%) who did, this was mainly to a Doctor (n=64, 73.5%), with 17 made to a professional colleague. Similar numbers of referrals were made by both prescribers and non-prescribers (51.7%: 49.3 % respectively) (See Table 6.4).

Review arrangements

Review arrangements were made for 102 (46.0%) of those whose consultations were observed, 9 (8.8%) of via the telephone. Follow-up arrangements were similar for both prescribers and non-prescribers with 49.5% and 55.6% respectively requiring no follow-up and 42.9% and 43.4% having follow-up arrangements made. Plans were only made to review one (0.8%) participant who attended a non-prescriber compared to 8 (n=7.4%) who consulted a PT-IP. Review arrangements varied, and ranged from on the same day-120 days (mean 29.75 days) after the consultation and tended to be shorter for prescribers (mean =17.5 days) compared to non-prescribers (mean=42.0 days) (see Table 6.5).

6.2.1.3 Observation of Podiatrist consultations

There were 252 (46.8%) observations of podiatrist consultations (PO-IP=128 (50.7%), PO-NP=124 (49.3 %)), 251 (n=99.6%) of which were face to face, with one telephone consultation in a non-prescribing site, lasting 2-203 (median=16) minutes. Duration of consultations between prescribers and non-prescribers were similar, but extended to 203 minutes for a podiatrist prescriber. Mean consultation time for PO-IP was reduced from 24.3 to 22.8 minutes when the outlier consultation time of 203 minutes was removed, but the median time remained the same at 16.0 minutes.

The majority of observations were undertaken in either the private sector (n=96), NHS outpatients (n=79), or NHS community clinics (n=73), with only 3 (2.4%) in general practice and one a community service for podiatrist non-prescribers. Those in the private sector were evenly split between prescriber and non-prescriber (50:46 respectively). There was no observation of prescribers in community service, general practice, or NHS community clinics, and none for either PO-IPs or PO-NPs in social enterprise.

Over half (55.6%, n=140) of participants had been referred via general practice, with 21.8% (n=55) referred via private practice, and 15.9% (n=40) self-referrals. There were only a small number of referrals made via NHS inpatients (n=2) or hospital outpatients (n=4). Nearly all (90.1%, n=50) referrals from private practice were to PO-IPs. No self-referrals or via local authority were made to PO-IPs were received via local authority or self-referral or by NHS inpatients or outpatients to non-prescribers.

Observations were mainly follow-up appointments (n=207, 82.1%) with only a few initial routine consultations observed (n=44, 17.5%), with little difference between podiatrist prescribers and non-prescribers (See Table 6.3).

Colleague discussions and referrals

Podiatrists had relatively few discussions (n=25, 9.9%) with other colleagues. The majority (n=15) of discussions were held by prescribers with either a professional colleague (n=7) or Doctor (n=8).

The majority of participants (n=214) did not require any referral. Of the 38 (17.8%) who did, 30 (78.9%) were to a Doctor, the majority of which were made by prescribers (n=24, 63.2%). Few referrals were made to professional colleagues (n=8). Less referrals were made by non-prescribers compared to prescribers (7: 31 respectively) (See Table 6.4).

Review arrangements

Review arrangements were made for 220 (87.3%) of those whose consultations were observed, 7 (3.2%) of which were for non-prescribers via the telephone. Follow-up arrangements were similar for both prescribers and non-prescribers with 85.2% and 83.8% respectively of those consulting requiring follow-up arrangements, while only 14.1% and 10.5% did not require any follow-up arrangements to be made. Review arrangements varied, and ranged from 28-365 days (mean 35 days) after the consultation and tended to be shorter for prescribers (mean =28.0 days) compared to non-prescribers (mean=42.0 days). Plans were only made to review one (0.4%) participant who attended a prescriber in 6 weeks compared to 8 (n=7.4%) who consulted a PT-IP (see Table 6.5).

6.2.2 Medicines Management Activity

During observations, data were collected on all instances where a medication was supplied, administered, prescribed, recommended or adjusted.

Overview of all medicines management activity

Medicines management activities were recorded in 115 (24%) of consultations, with physiotherapists (n=67, 30%) exhibiting proportionally more activity than podiatrists (n=48, 19%).

Overall, more medicines management activity (MMA) was recorded in the prescriber than the non-prescriber groups in both physiotherapy (PT-IP n=39, 36%, PT-NP n=28, 24%) and podiatry consultations (PO-IP n= 35, 27%, PO-NP n=13, 10%). Prescribers were more active in most methods of MMA, with the exception that non-prescribing physiotherapists made more recommendations to other providers for medication use and non-prescribing podiatrists made slightly more adjustments to medicines (Tables 6.6 and 6.7 for details).

(Activity is reported here for the number of patients for whom MMA occurred rather than the number of items of medicines. More than one medication was involved in 8 of the consultations listed and these have been included in the economic evaluation.)

Physiotherapist medicines management activities

By profession, n=39 (36%) of patients received MMA in physiotherapist prescriber sites compared to n= 28 (24%) in non-prescriber sites (Table 6.6). The extent of MMA varied considerably across sites. Almost all MMA within physiotherapy sites was related to pain and movement control, either via pain medication or through injection therapy (Table 6.7). There was one incident where a patient was advised to alter contraception use following surgery. Prescribers were most active in administering injection therapy via PGD, whereas non-prescribers more often recommended patients to another provider for injection therapy. All prescriptions issued related to pain control.

Table 6.6 Medicine management activity observed within physiotherapy case sites

Observed Medicines Management	Physiotherapist IP Site					Physiotherapist NP Site					Total IP + NP
	9	7	11	13	Total IP	5	4	12	14	Total NP	
Observations	42	6	38	21	107	34	10	35	36	115	222
NO change observed	23	4	24	17	68	30	8	25	24	87	155
YES, change in MMA observed	19	2	14	4	39	4	2	10	12	28	67
Recommend to another prescriber	0	1	8	1	10	4	1	8	3	16	26
Issue prescription	3	0	0	3	6	0	0	0	0	0	6
Provide via PGD	16	0	0	0	16	0	0	1	9	10	26
Recommend OTC	0	1	2	0	3	0	1	1	0	2	5
Adjust dose	0	0	4	0	4	0	0	0	0	0	4

Table 6.7 Type of medication by method of medicines management activity in Physiotherapy sites

	Physiotherapist Prescriber	Physiotherapist non-prescriber
Method	Medication type (n=)	
Recommend to another prescriber	Injection therapy (2) Pain medication (7)	Injection therapy (9) Pain medication (7)
Issue Prescription	Pain control medication (6)	-
Provide via PGD	Injection therapy (16)	Injection therapy (10)
Recommend OTC	Paracetamol or NSAIDs (3)	Paracetamol or NSAIDs (2)
Adjust dose	Stopped pain med (3) Contraceptive med post-surgery (1)	-

Observation data on whether or not clinicians discussed a) how the medication/treatment worked, b) how or when to take the medication and c) potential side effects of medication, was analysed for all instances where MMA activity occurred (Table 6.8). Physiotherapist prescribers were more likely than non-prescribers to provide information to patients about how the medication works and when to take it. Information on when to take medication was provided less often in both groups; however, this would not be relevant to consultations where the medication is

administered to the patient during the consultation (e.g. providing injections). In all instances where a prescription was issued, physiotherapist IPs provided information to patients on all three aspects with the exception of side effects which were not discussed on one occasion. It should be noted that when providing injection therapy, patients were routinely asked to sign consent for treatment form that contained details of possible side effects.

Table 6.8 Information provided to patients about medication during Physiotherapy consultations

Physiotherapy	How medication works	When to take medication	Potential side effects
	n (%)	n (%)	n (%)
PT-IP MMA instances (n=39)	31 (79.5%)	13 (33.3%)	30 (77%)
PT-NP MMA instances (n=28)	18 (64.3%)	11 (32.3%)	15 (53.6%)

Podiatrist Medicines Management Activities

Within podiatry sites, n=35 (27%) of patients received MMA in prescriber sites compared to n=13 (10.5%) in non-prescriber sites (Table 6.9). In one non-prescribing site (site 8), no MMA was observed in any of the 36 consultations. Prescribing podiatrists were more active in all methods of MMA with the exception of adjusting medication, however the numbers are small. A wider range of medication types were provided than was seen in physiotherapy sites (Table 6.10), the most common being anti-microbial/anti-fungal topical creams. All prescriptions issued were for antibiotics.

Table 6.9 Medicine management activity observed within Podiatry case sites

Observed Medicines Management Activity: PODIATRY	Podiatry Prescriber Site			Total IP	Podiatry non-prescriber Site			Total NP	Total IP +NP
	1	3	10		2	8	6		
Number of Observations	50	29	49	128	46	36	42	124	252
Medication change required for that patient: No	40	14	39	93	42	36	33	111	204
Medication change required for that patient: YES	10	15	10	35	4	0	9	13	48
Recommend to another prescriber	4	3	0	7	0	0	2	2	9
Issue prescription	0	6	4	10	-	-	-	-	10
Provide via exemption	5	3	2	10	3	0	3	6	16
Provide via PGD	0	0	4	4	0	0	0	0	4
Recommend OTC	1	1	0	2	0	0	2	2	4
Adjust medication	0	2	0	2	1	0	2	3	5

Table 6.10 Type of medication by method of medicines management activity in Podiatry sites

	Podiatry prescriber Sites	Podiatry non-prescriber sites
Method	Medication type (n=)	
Recommend to another prescriber	Antimicrobial cream (1) Emollient (1) Ibuprofen gel (1) Antibiotics (4)	Injection therapy (1) Antibiotic (1)
Issue Prescription	Antibiotics (10)	-
Provide via exemption	Topical antimicrobial/bacterial cream (8) Analgesia (2)	Topical antimicrobial (3) Injection (2) Pain medication (1)
Provide via PGD	Injection therapy (4)	-
Recommend OTC	Emollient (1) Paracetamol (1)	Paracetamol (2)
Adjust dose	Insulin (1) Stopped antibiotic (1)	Pain medication (2) antifungal (1)

Medicines Information

Observation data on whether or not clinicians discussed a) how the medication/treatment worked, b) how or when to take the medication and c) potential side effects of medication, was analysed for all instances where MMA activity occurred (Table 6.11). Non-prescribing podiatrists were more consistent in providing information about medications to patients and when to take medication. Where prescriptions were issued (n=10), only 2 patients verbally received information from the podiatrist about how the medication worked, 4 received information about when to take medication and 2 received information about potential side effects. However, in one site (site 10) prescriptions were for IV antibiotics given on the day of surgery and treatment would have been discussed at the initial consultation. Few patients receiving medication via exemptions (e.g. application of topical creams or local anaesthetic) were provided with any information about the medication by podiatrists.

Table 6.11 Information provided to patients about medication during Podiatry consultations

Podiatry	How medication works	When to take medication	Potential side effects
	n (%)	n (%)	n (%)
PO-IP MMA instances (n=35)	10 (28.6%)	12 (34.3%)	8 (23%)
PO-NP MMA instances (n=13)	7 (64%)	9 (82%)	2 (18.2%)

6.3 Work sampling

6.3.1 Results

A total of 2720 data points were recorded during 136 periods of observation (Physiotherapist n=71, Podiatrist n= 65) in the 14 case sites. Each observation period lasted for 90 minutes. However, due to large differences in the configuration of working patterns and clinician availability, there was variation in the number periods of work sampling collected from each site (range 5-14). The total number of observation periods undertaken at prescribing sites was 69 and for non-prescribing sites 67 (for work sampling data collected from each site see Table 6.2 from section 6.1.2)

6.3.2 Analysis of work activities

a) *Combined groups of activity* (direct, indirect and service related care)

The number of activities recorded in each of the main domains of activity (direct care, indirect care and service related care) for IP and NP sites were compared within professional groups using the Mann-Whitney U Test. Details are shown on Table 6.12. Significantly more indirect care activities were recorded in the podiatry prescribing group than the podiatry non-prescribing group (p=0.029). There were no significant differences between IP and NP groups by profession for either direct care activities or service related activities.

Table 6.12 Main grouped work activities performed by physiotherapist and podiatrist prescribers and non-prescribers

Activity group	Physiotherapy Prescribers (n=36)	Physiotherapy Non-prescribers (n=35)	Podiatry Prescribers (n=33)	Podiatry Non prescriber (n=32)
	Mean (SD)		Mean (SD)	
Direct care	8.92 (3.96)	9.74 (2.61)	9.36 (3.43)	9.59 (2.78)
Indirect care	3.28 (2.66)	2.26 (1.54)	2.88 (1.57)	2.03 (1.63)
Service related	7.11 (4.17)	7.29 (2.52)	7.06 (3.28)	8.00 (2.98)

b) *Individual items*

Activity recorded in prescribing and non-prescribing sites was compared by profession on an individual item basis using the Mann-Whitney U Test. Details are shown on Table 6.13 and Figures 6.1 and 6.2.

Physiotherapy

PT-NP: In the non-prescribing physiotherapy sites, more activity was recorded around: history taking (Mann-Whitney U Test: $p=0.030$), discussing diagnosis ($p=0.003$), documenting patient notes during consultation ($p=0.0005$), and computer use outside of consultation ($p=0.001$).

PT-IP: More activity in the prescribing physiotherapy sites was recorded around performing or managing therapeutic procedures ($p<0.0005$), prescribing medicine ($p=0.044$), interacting with patients/carers ($p=0.003$), coordinating care ($p=0.013$), referring to guidance on medicines ($p=0.044$), travel ($p=0.012$). Activity around investigating diagnostic tests and procedures was higher but not statistically significant ($p=0.078$).

Podiatry

PO-NP: More activity was reported in the non-prescribing podiatry sites around: performing or managing therapeutic procedures ($p=0.047$), preparing the room ($p=0.007$), computer use outside of consultation ($p=0.006$)

PO-IP: More activity was reported in the podiatry prescribing sites around care planning ($p=0.001$), computer data entry ($p=0.0005$) and data retrieval during consultation ($p=0.001$)

6.3.3 Differences between Physiotherapy and Podiatry

The pattern of work activity appeared to differ slightly between podiatric and physiotherapy sites. Podiatrists exhibited more activity around providing therapeutic procedures whereas physiotherapists were more active in undertaking physical examination, history taking and discussing diagnosis. A very low percentage of activity was recorded where podiatrists requested diagnostic investigations (1 instance with Podiatrist IP), in contrast this activity was recorded more frequently in physiotherapy sites. There were no instances recorded where diagnostic tests or procedures were performed.

Table 6.13 Work activities performed by physiotherapist and podiatrist prescribers and non-prescribers

	Physiotherapy prescriber (n=36)	Physiotherapy Non-prescriber (n=35)	Podiatry prescriber (n=33)	Podiatry Non-prescriber (n=32)
	mean (SD)	mean (SD)	mean (SD)	mean (SD)
Direct Care				
Physical assessment	1.97 (1.29)	2.14 (1.26)	2.03 (1.68)	1.50 (1.19)
History taking	3.25 (2.02)	4.20 (1.71)	1.48 (1.48)	1.00 (0.91)
Communicates diagnosis	1.19 (1.19)	2.14 (1.33)	0.85 (1.50)	0.66 (1.00)
Requests diagnostic investigations or procedures	0.31 (0.78)	0.06 (0.23)	0.03 (0.17)	0.00 (0.00)
Performs diagnostic investigations or procedures	0.0 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Analyses or interprets diagnostic investigations	0.83 (1.34)	0.80 (0.96)	0.33 (0.73)	0.31 (0.64)
Performs/manages therapeutic procedure	0.97 (1.34)	0.06 (0.33)	4.21 (3.79)	6.03 (3.60)
Prescribes medications (via computer/face-to face)	0.14 (0.42)	0.00 (0.00)	0.12 (0.69)	0.00 (0.00)
Administers medicines	0.25 (0.77)	0.34 (0.80)	0.30 (0.585)	0.09 (0.39)
Indirect Care				
Interacts with patients/family/caregiver	0.89 (1.90)	0.06 (0.23)	0.39 (0.55)	0.44 (0.75)
Teaching, information exchange and advice (medicines management lifestyle)	1.31 (1.58)	1.14 (1.06)	1.09 (1.10)	0.91 (1.44)
Care planning (discussing/planning next appointment, referral to other service)	1.08 (1.20)	1.06 (1.08)	1.39 (1.11)	0.69 (1.40)
Service Related				
PT out of room	0.67 (1.30)	0.46 (0.70)	0.45 (0.79)	0.88 (1.45)
Fills in standardised form	0.28 (0.51)	0.17 (0.45)	0.12 (0.41)	0.13 (0.42)
Documents in progress notes/charts	0.03 (0.16)	0.83 (1.31)	1.33 (1.19)	1.81 (1.80)
Computer data entry (patient related)	1.64 (1.64)	1.74 (1.59)	1.55 (2.00)	0.19 (0.47)
Computer data retrieval (patient related)	1.06 (1.35)	1.00 (1.23)	1.15 (1.67)	0.22 (0.65)
Coordinates care e.g. discussion with doctor)	0.72 (1.68)	0.09 (0.37)	0.48 (0.83)	0.34 (0.65)
Used references for patient (e.g. BNF, electronic/text)	0.17 (0.56)	0.00 (0.00)	0.12 (0.33)	0.06 (0.24)
Sets up, prepares room	0.28 (0.51)	0.26 (0.70)	0.30 (0.58)	0.91 (1.14)
Travel	0.81 (2.01)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Computer data retrieval/entry: service	0.50 (1.29)	1.86 (2.19)	0.06 (0.24)	1.38 (2.37)
Research and audit	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.16 (0.57)
Meetings and admin	0.94 (2.50)	0.66 (1.55)	0.97 (1.92)	1.53 (2.47)
Continued professional development: self	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.06 (0.24)
Continued professional development: others	0.03 (0.18)	0.23 (0.80)	0.52 (1.56)	0.34 (1.00)
Personal	0.28 (0.77)	0.03 (0.16)	0.24 (0.93)	0.22 (0.79)

Figure 6.1 Podiatrist: Number of time activity was recorded in 95-minute observation period

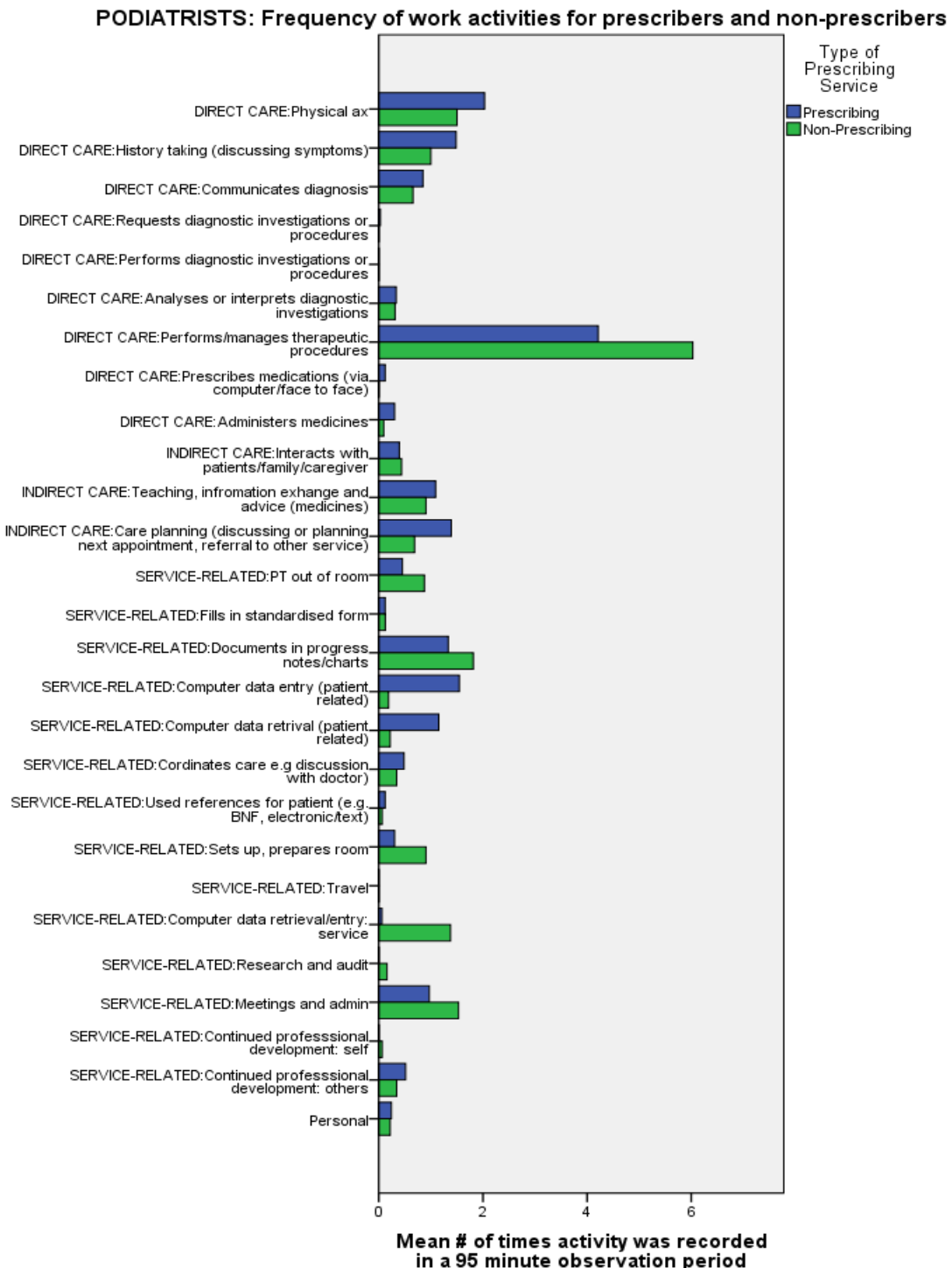
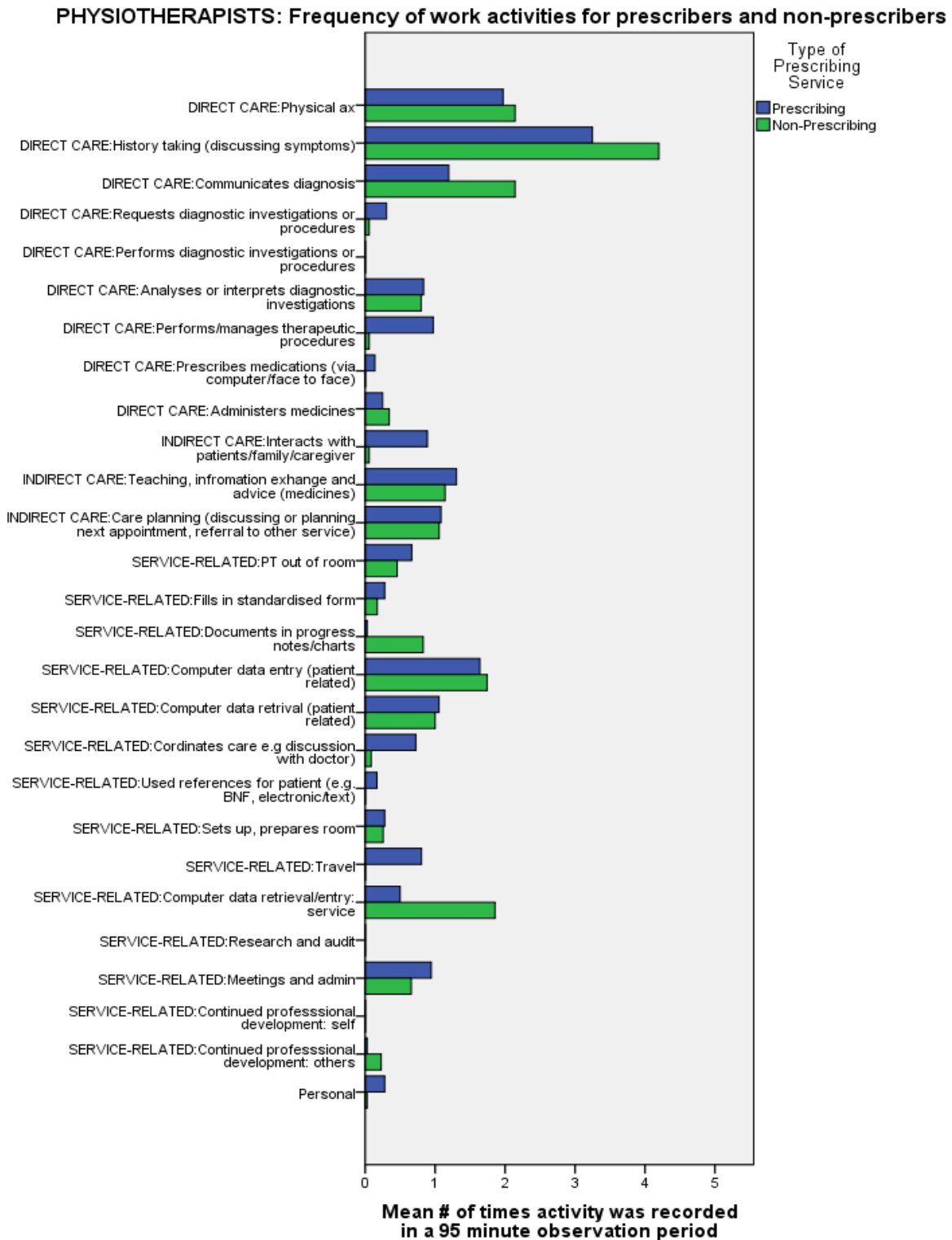


Figure 6.2 Physiotherapists: Number of time activity was recorded in 95-minute observation period



6.4 Patient Questionnaire

6.4.1 Patient Questionnaire 1

6.4.1.1 Participant profile

Overview of sample and response rate

Of the 488 patients who participated in the study, 468 consented to participate in the patient questionnaire and 315 patient questionnaires were returned: a response rate of 67.3%. Of the 315 questionnaires, 49.5% (n=156) were from prescribing and 54% (n=159) from non-prescribing sites. There were more participants from podiatry sites (57%, n=180) than physiotherapy sites (43%, n=135), due to incomplete data collection at 3 physiotherapy sites owing to staff sickness, lack of clinician availability and/or small numbers of patients numbers at one site. The majority of questionnaires (98%, n=288) were completed by the patient, the remainder were completed on behalf of a child (0.7%, n=2), a spouse or partner (0.7%, n=2) or another person (0.7%, n=2).

Demographic overview

The sample was predominantly female (65%, n=165) with a mean age of 63.8 years. The majority were living with other adults (71.6%, n=184), in an owner occupied house/flat (72.8%), were retired (56.9%, n=149) and had not continued formal education beyond 18 years (70%, n=191). The sample was predominantly white (98%), which is surprising considering the diversity of locations and geographical spread of case sites. Full details of the sample characteristics are provided in Table 6.14.

Differences were found between participants in the podiatry and physiotherapy groups in relation to living arrangements, accommodation and employment group. This was mainly due to the inclusion of a case site in a residential care home, which increased the number of retired care home residents in the podiatry group. The podiatry group were also significantly older with a mean of 67.09 compared to 59.73 years in the physiotherapy group (Unpaired t-test: $p < 0.0005$).

There were a number of differences in sample characteristics when prescribing (PP-IP) and non-prescribing (PP-NP) sites were compared. There were fewer males in the non-prescribing sites (27.5%, n=38) compared with the prescribing site (44%, n=51) (chi square $p = 0.009$ with continuity correction). Just under 20% of participants in the prescribing group were care home residents (18.3%, n=22), compared to none in the non-prescribing group. This was due to the inclusion of a residential care home in the PP-IP group and also accounted for differences in accommodation status, as more PP-IP participants lived in residential home rather than owner occupied housing. Other than this, the samples were similar terms of age, employment status, level of formal education, or ethnic group ($p > 0.05$).

Table 6.14 Demographic details: Patient Questionnaire 1- whole group (n=315)

	Physiotherapy n (%)	Podiatry n (%)	Total n=number of responses	% of total sample
Professional group				
Which professional consulted	135 (42.86%)	180 (57.14%)	315	100%
Gender			n=254	
Male	34 (30.4%)	55 (38.7%)	89	35%
Female	78 (69.6%)	87 (61.3%)	165	65%
Age				
Physiotherapy group: n= 111, mean 59.7, SD 16.6, (range 17.6-100.98)				
Podiatry group: n=139, mean 67.1, SD 16.16, (range 3.17-94.32)				
Total: n=250, mean 63.8, SD 16.7				
Living arrangements			n=257	
Live alone	19 (17.4%)	32 (21.6%)	51	19.8%
Live with other adult(s)	90 (82.6%)	94 (63.5)	184	71.6%
Care home resident	0	22 (14.9%)	22	8.6%
Type of accommodation			n=276	
Owner occupied house/flat	97 (82.2%)	104 (65.8%)	201	72.8%
Privately rented house/flat	12 (1.02%)	12 (7.6%)	24	8.7%
Local authority/housing association/cooperative	9 (7.6%)	13 (8.2%)	22	8%
Residential or care home, hospice	0	29 (18.4%)	29	1.05%
Employment group			n=262	
In paid or voluntary employment	46 (41.1%)	40 (26.7%)	86	32.8%
Unemployed/student/at home/sick	15 (13.4%)	12 (8%)	27	10.3%
Retired	51 (45.5%)	98 (65.3%)	149	56.9%
Educated beyond 18 years			n=274	
Yes	32 (27.4%)	51 (32.5%)	83	30.3%
No	85 (72.6%)	106 (67.5%)	191	69.7%
Ethnic group			n=283	
White	117 (96.7%)	160 (98.8%)	277	97.9%
Other	4 (3.3%)	2 (1.2%)	6	2.1%

6.4.1.2 Key findings

6.4.1.3 Results

Participants were asked about their satisfaction with the care received from the physiotherapist or podiatrist on the day that the questionnaire was administered. Patient satisfaction with services was assessed by 17 statements with a 5-point rating scale ranging from strongly disagree to strongly agree. Findings are reported for total sample and for sub group analysis by profession and by prescribing status. Mann-Whitney U tests were used to compare findings from PP-IP and PP-NP groups. In the following results, categories of agree/strongly agree and disagree/strongly/disagree are combined to show the percentage of participants with a positive or negative response to each question.

Satisfaction with services and advice received

Of the 17 items designed to assess patient satisfaction with services (section 1), levels of satisfaction for the sample as a total were high, with over 60% positive agreement on all items other than ability to contact the service in an emergency (44.4%, item 15). See Table 6.15 below for detailed findings on satisfaction with services.

Significantly greater levels of satisfaction were reported in 8 areas by respondents in PP-IP sites ($p \leq 0.05$). On further investigation by profession (see table 6.15), significant differences in satisfaction between PP-IP and PP-NP groups remained for both podiatry ($p=0.020$) and physiotherapy ($p=0.021$) sites for one statement: 'I will follow the advice of this physiotherapist/podiatrist because I think she/he is right' (statement 3). Three statements (items 8, 9, 10) retained higher significantly satisfaction ratings for IP groups within physiotherapy sites only, relating to: understanding the treatment ($p=0.025$), showing interest in the participant as a person ($p=0.033$) and being completely satisfied with the advice received ($p=0.019$). Three statements (items 11, 14, 15) relating to ease of making an appointment ($p=0.028$), being able to contact someone by phone for advice ($p=0.020$) and making emergency appointments ($p=0.001$), showed significantly higher satisfaction ratings for IP groups within podiatry sites only. Item 6 'Some things about the consultation with the physiotherapist could have been better' showed significant differences between IP and NP groups only when results from physiotherapy and podiatry were combined, however the direction of the difference was not clear.

Table 6.15 Patient views and experience of satisfaction with care received from physiotherapist or podiatrist

Patient views and experience of consultation with physiotherapist or podiatrist (R) indicates reverse score item	Physiotherapist Independent Prescriber (n=62)		Physiotherapist Non-prescriber (n=73)		p	Podiatrist Independent Prescriber (n=94)		Podiatrist Non-prescriber (n=86)		p	Total n=315	
	Strongly Agree/Agree (compared with strongly disagree/disagree/no opinion)					Strongly Agree/Agree (compared with strongly disagree/disagree/no opinion)					Strongly Agree/Agree	
	n	% response	n	% response		n	% response	n	% response		n	%
1. Overall I was satisfied with the consultation from this physiotherapist or podiatrist	59	95.1%	67	91.2%		85	90.4%	80	93.0%		291	92.4%
2. The physiotherapist or podiatrist was very careful to check everything when carrying out my care	60	96.8%	69	94.5%		82	87.2%	77	89.5%		288	91.4%
3. I will follow the advice of this physiotherapist or podiatrist because I think she/he is right	59	95.1%	64	87.7%	0.021	81	86.2%	75	87.2%	0.020	279	88.6%
4. The time I was able to spend with the physiotherapist or podiatrist was a bit too short (R)	46	74.2 %	61	83.6%		68	81.0%	59	68.6 %		234	74.3%
5. The physiotherapist or podiatrist explained the reasons for the advice given	56	93.3%	67	91.2%		79	94.0%	72	83.7%		274	87.0%
6. Some things about the consultation with the physiotherapist or podiatrist could have been better (R)	46	74.2 %	53	63.0 %	0.166	68	72.3%	60	69.8%	0.120	227	72.1%
7. The physiotherapist or podiatrist listened very carefully to what I had to say	57	91.2%	68	93.2%		79	94.0%	74	86.0%		278	88.3%
8. I understand my treatment much better after seeing this The physiotherapist or podiatrist	54	87.1%	54	74.0%	0.025	68	72.3%	61	70.9%		237	75.2%
9. The physiotherapist or podiatrist was interested in me as a person not just my illness	50	80.1%	56	76.7%	0.033	77	81.9%	65	75.6%		248	78.7%

Patient views and experience of consultation with physiotherapist or podiatrist (R) indicates reverse score item	Physiotherapist Independent Prescriber (n=62)		Physiotherapist Non-prescriber (n=73)		p	Podiatrist Independent Prescriber (n=94)		Podiatrist Non-prescriber (n=86)		p	Total n=315	
	Strongly Agree/Agree (compared with strongly disagree/disagree/no opinion)					Strongly Agree/Agree (compared with strongly disagree/disagree/no opinion)					Strongly Agree/Agree	
	n	% response	n	% response		n	% response	n	% response		n	% response
10.I am NOT completely satisfied with the advice received from this physiotherapist or podiatrist (R)	46	74.1 %	61	83.6%	0.019	75	79.8%	67	78.0 %	0.455	249	79.0%
11.It was easy to make an appointment with the physiotherapist or podiatrist	35	56.5%	49	67.1%		74	78.7%	60	69.8%	0.028	218	69.2%
12.There was an acceptable time lapse to obtain an appointment	30	48.4%	43	58.9%		67	71.3%	57	66.3%		197	62.5%
13.It was possible to obtain an appointment on a convenient day or hour	40	64.5%	49	67.1%		70	74.5%	62	72.1%		221	70.2%
14.I can contact someone in the service by phone for help or advice in case of problem	38	61.2%	47	64.4%		70	74.5%	56	65.1%	0.020	211	67.0%
15.In an emergency I can get a quick appointment/consultation at this service	19	30.6%	25	34.2%		60	63.8%	36	41.9%	0.001	140	44.4%
16.I saw the physiotherapist or podiatrist at the appointed time	42	67.7%	62	84.9%		74	78.7%	73	84.9%		251	79.7%
17.The waiting time was acceptable	45	72.5%	64	87.7%		80	85.1%	71	82.6%		260	82.5%

Findings indicate that the impact of IP differed according to the type of service. In physiotherapy, IP improved aspects of the quality of patient experience and satisfaction with advice, whereas in podiatry, improvements related to access to appointments and ability to contact someone when a problem arises.

Patient attitudes towards prescribing by physiotherapists and podiatrists

Attitudes towards PP-IP were generally positive. The majority (75.9%, n=239) of respondents were in agreement that PP's should be able to prescribe medicines for patients. When asked about preferences as to whether a doctor or physiotherapist/podiatrist prescribed their medicine, 62.9% (n=198) agreed/strongly agreed that they had no preference. When asked if they would prefer a doctor to prescribe their medicine, 37.5% (n=118) disagreed, 23.2% (n=73) agreed they would prefer a doctor and 31.4% (n=99) had no opinion. The majority (38.1%, n=120) had no opinion on whether they would prefer a podiatrist or physiotherapist to prescribe medication, with a further 36.5% (n=115) expressing a preference for PP-IP prescribing and 16.2% (n=51) would prefer a doctor to prescribe.

There were no significant differences between prescribing and non-prescribing groups in responses to these statements.

Advice and information about medicines

The number of respondents who reported that the physiotherapist or podiatrist had provided advice or information about medicines during the consultation on that day was 30.1% (n=95), which amounts to around 1 in 3 patients. A significantly higher proportion of the PP-IP group (37.2%, n=58 Vs 23.3%, n=37) reported to have received medicines advice or information during the consultation ($p = 0.005$).

Of those who had received advice about medicines, there were varying levels of satisfaction about advice/information received (Table 6.16). Significantly more patients in the PP-IP group ($p=0.017$) agreed that they had received information on how often to take medicines. Patients of physiotherapy prescribers were significantly more likely than those of PT-NPs to be told when ($p=0.03$) and how often ($p=0.002$) to take their medicine, were more likely to intend to take their medicine ($p=0.022$) and less likely to find it hard to follow the physiotherapists advice ($p=0.038$).

The statements receiving the highest level of agreement across both groups related to giving time to clarify questions about medicines (89.2%, n=75), ease of following advice given (83.8%, n=57) and receiving information on the purpose of medicine (80.0%, n=60). While, only 65% (n=41) agreed that they had received information on medicines side effects, only 12.3 (n=9) reported that they would have liked to have received more medicines information. The least positive response was in relation to receiving information on what to do if a dose of medicine was missed (20.8% agree/strongly agree, n=10).

Table 6.16 Patient views and experience of medicines management advice and information provided by physiotherapist or podiatrist

Patient views and experience of medicines management advice and information provided by physiotherapist or podiatrist	n (excluding not applicable)	Physiotherapist Independent Prescriber (n=27)		Physiotherapist Non-prescriber (n=24)		p	Podiatrist Independent Prescriber (n=31)		Podiatrist Non-prescriber (n=13)		p	Total	
		Strongly Agree/Agree					Strongly Agree/Agree					Strongly Agree/Agree	
		n	%	n	%		n	%	n	%		n	%
1. The physiotherapist or podiatrist gave me time to clarify questions I may have had about my medicine	84	24	96.0%	19	86.4%	0.47	21	84.0%	11	91.6%	0.48	75	89.2%
2. The physiotherapist or podiatrist told me when to take my medicine	64	11	73.3%	6	40.0%	0.03	19	82.6%	9	81.8%	0.82	45	70.3%
3. The physiotherapist or podiatrist told me how often I should take my medicine	61	12	85.7%	5	35.6%	0.002	19	86.4%	9	81.8%	0.97	43	70.5%
4. The physiotherapist or podiatrist provided me with information on the purpose of my medicine	75	16	73.7%	14	70.0%	0.43	19	82.6%	11	84.6%	0.70	60	80.0%
5. The physiotherapist or podiatrist provided me with information on how to use my medicine	59	11	73.3%	5	45.5%	0.06	16	80.0%	10	91.0%	0.36	42	71.2%
6. I expect that it will be easy to follow the physiotherapist's or podiatrist's advice about my medicine	68	12	75.0%	10	66.7%	0.19	22	91.7%	11	84.6%	0.465	57	83.8%
7. The physiotherapist or podiatrist told me the name of my medicine	71	17	85.0%	9	60.0%	0.13	18	75.0%	9	75.0%	0.50	53	74.6%

Patient views and experience of medicines management advice and information provided by physiotherapist or podiatrist		Physiotherapist Independent Prescriber		Physiotherapist Non-prescriber			Podiatrist Independent Prescriber		Podiatrist Non-prescriber			Total	
		Strongly Agree/Agree					Strongly Agree/Agree					Strongly Agree/Agree	
	n (excluding not applicable)	n	%	n	%	p	n	%	n	%	p	n	%
8. The physiotherapist or podiatrist explained the side effects of my medicine	63	11	68.8%	12	70.6%	0.76	13	59.1%	5	50.0%	0.30	41	65.0%
9. I would have liked to have received more information about my medicine from the physiotherapist or podiatrist	73	3	13.6%	3	17.6%	0.49	0	0.0%	3	25.0%	0.21	9	12.3%
10. The physiotherapist or podiatrist provided me with information on what to do if I missed a dose of my medicine	48	3	25.0%	3	27.3%	0.795	3	21.4%	1	9.1%	0.21	10	20.8%
11. It may be difficult for me to do exactly what the physiotherapist or podiatrist told me to do in relation to my medicine	56	0	0.0%	1	9.1%	0.038	5	23.8%	1	9.1%	1.00	7	12.5%
12. I'm not sure it will be worth the trouble to take the medicine advised by the physiotherapist or podiatrist	62	2	13.3%	1	8.3%	0.28	1	6.7%	1	8.3%	0.91	5	8.1%
13. Receiving a prescription for medicine from my physiotherapist or podiatrist reduced my waiting time today	40	4	30.8%	1	16.6%	0.919	6	46.1%	6	75.0%	0.59	17	42.5%
14. I am likely to take the medicine prescribed for me today	47	7	36.8%	2	28.5%	0.022	13	72.2%	11	100.0%	0.32	33	70.2%

EQ-5D

Indications were that the prescribing group seemed to have slightly more patients who were less mobile, however there was no statistically significant difference between PP-IP and PP-NP groups on either individual items or overall score (Table 6.17). The sample compares favourably compared to 2013 UK and 2016 England standardised EQ-5D-L scores ¹⁹³.

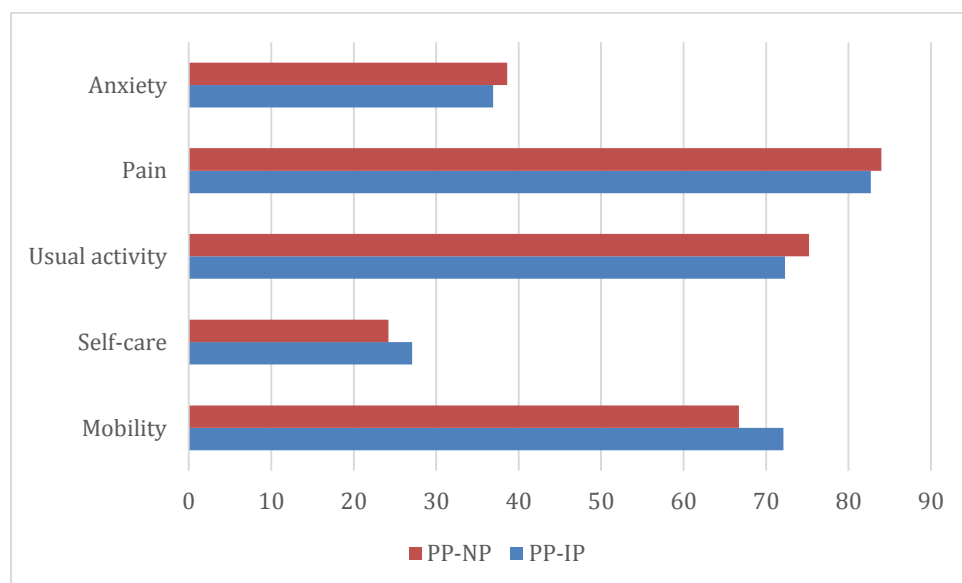
When data from podiatry and physiotherapy groups were analysed separately, there were no statistically significant differences in the individual EQ5D dimension scores between IP and NP groups at baseline, however patients of Physiotherapy NPs scored higher (i.e. reported fewer health problems) than those of physiotherapy IPs on overall EQ5D score (p=0.04).

Table 6.17 Patient Quality of life EQ5D dimension score percentages by prescribing group

EQ5D Dimension	Level	Prescriber group %	Non-prescriber group %	Total %	P value
Mobility	1	28	33.3	30.7	0.239
	2	25.9	20.3	23	
	3	21.7	32	27	
	4	19.6	12.4	15.9	
	5	4.9	2	3.4	
Self-Care	1	72.9	75.8	74.4	0.507
	2	10.4	9.8	10.1	
	3	9.7	10.5	10.1	
	4	6.3	3.9	5.1	
	5	0.7	0	0.3	
Usual activities	1	27.8	24.8	26.3	0.554
	2	24.3	33.3	29	
	3	26.4	25.5	25.9	
	4	16.7	11.8	14.1	
	5	4.9	4.6	4.7	
Pain/discomfort	1	17.4	15.9	16.6	0.716
	2	23.6	26.5	25.1	
	3	35.4	36.4	35.9	
	4	17.4	18.5	18	
	5	6.3	2.6	4.4	
Anxiety/depression	1	63.2	61.4	62.3	P=0.737
	2	16.7	25.5	21.2	
	3	13.2	12.4	12.8	
	4	4.2	0	2	
	5	2.8	0.7	1.7	

Figure 6.3 shows the percentage of patients in the PP-IP and PP-NP groups reporting problems related to quality of life on each of the scales (combined levels 2-5).

Figure 6.3 Patients (%) reporting problems in the 5 quality of life domains



6.4.2 Patient Questionnaire 2

6.4.2.1 Respondent profile

Response rate

Patient questionnaire 2 was introduced following data collection at the first four sites (1, 2 PO, 5, 9 PT) and an amendment to the protocol in June 2015 so participants from these four sites (n=175) are excluded from the response rate. Of the remaining 311 participants, 285 (91.6%) consented to follow-up, however contact details were incorrect or missing for 18 participants, leaving 267 (85.9%) eligible to participate, of which 197 (73.7%) responded.

Of the 197 respondents, 104 were from the podiatry group (57 IP, 47 NP) and 93 from the physiotherapy group (47 IP, 46 NP).

Participant demographics

Demographic details of participants were collected in questionnaire 1. Demographic details are not available for those who only responded to questionnaire 2 (n=68). Therefore, the overview of the participant demographics below (see Table 6.18) only relates to the 129 participants (77%) who completed both questionnaire 1 and questionnaire 2.

Patient demographics were similar across professional groups and prescribing status groups, making comparison across the groups viable, although low numbers prohibited use of statistical tests on some questions. There were no significant differences between podiatry and physiotherapy groups, or by PP-IP and PP-NP groups for any demographic variables (gender, living arrangements, type of accommodation, employment group, level of education, ethnic group or age). Mean age was 64.51 years.

Table 6.18 Participant demographics - Patient Questionnaire 2- whole group

	Physiotherapy	Podiatry	Total n=number of responses	% of total sample
Professional group				
Which professional consulted	54	75	129	
Gender				
Male	11 (20.4%)	20 (26.6%)	31	24.0%
Female	38 (70.4%)	45 (60.0%)	83	64.3%
Age				
Physiotherapy group: n= 49, mean 63.42, SD 15.07 (range 28-100)				
Podiatry group: n=67, mean 65.31, SD 13.62 (range 27-94)				
Total: 116 (missing 13), mean 64.51, SD 14.21 (range 27-100)				
Living arrangements			n=116	
Live alone	7 (12.9%)	51 (68.0%)	22	17.0%
Live with other adult(s)	41 (75.9%)	53 (70.6%)	94	72.8%
Care home resident	0	0	0	0%
Type of accommodation			n=116	
Owner occupied house/flat	44 (81.5%)	55 (73.3%)	99	76.7%
Privately rented house/flat	3 (5.5%)	6 (8.0%)	9	6.9%
Local authority/housing association/cooperative	2 (3.7%)	6 (8.0%)	8	6.2%
Residential or care home, hospice	0	0	0	0%
Employment group			n=119	
In paid or voluntary employment	15 (27.7%)	17 (22.6%)	32	24.8%
Unemployed/student/at home/sick	6 (11.1%)	17 (22.6%)	13	10.1%
Retired	29 (53.7%)	45 (60.0%)	74	57.4%
Educated beyond 18 years			n=117	
Yes	17 (31.5%)	17 (22.6%)	34	26.3%
No	32 (59.3%)	51 (68.0%)	83	64.3%
Ethnic group			n=119	
White	48 (88.8%)	68 (90.6%)	116	89.9%
Other	1 (1.85%)	2 (2.6%)	3	2.3%

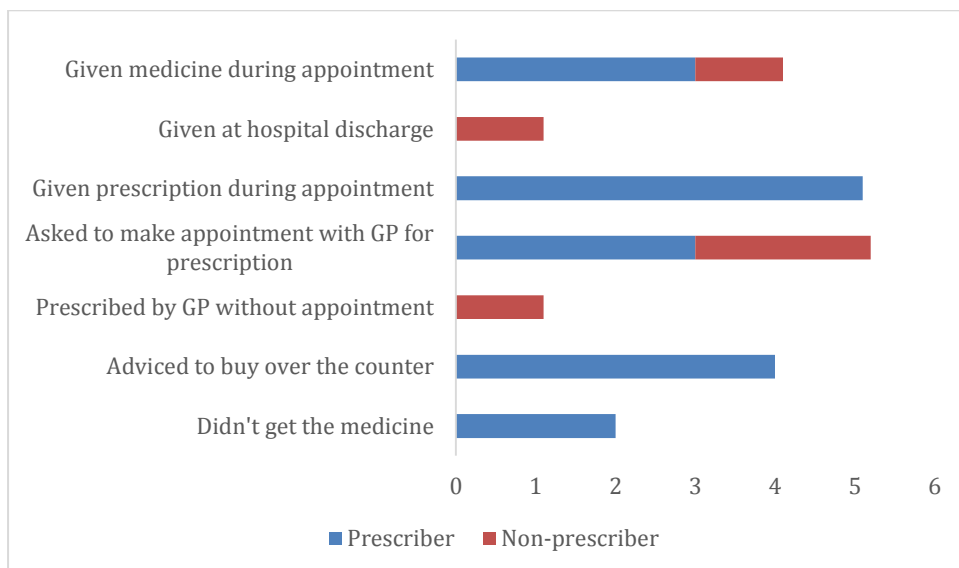
6.4.2.2 Results

The following results relate to all participants who completed questionnaire 2 (n=197).

Approximately a fifth (19.3%, n=38) reported that the podiatrist or physiotherapist had either prescribed or recommended medicine during the consultation. This included 22 from the PP-IP group and 16 from the PP-NP group. The following graph (Figure 6.4) illustrates how participants reported to have obtained the medicine prescribed or recommended at the time of the consultation, if they did so. Patients consulting with PP-IP reported that were issued prescriptions directly (n=5), advised to buy medicine over the counter (n=4), given medicine during the appointment (n=3), or advised to see a GP for a prescription (n=3). Patients of non-prescribers were asked to see a GP for a prescription either with (n=2) or without (n=1) an appointment, given medication during the appointment (n=1), or were given medication at discharge from hospital (n=1). Two of the patients who saw a prescriber said that they did not obtain their medication.

The data indicates that there is more activity around medicines management (including recommending, administering or supplying medicine) in the prescribing group than the non-prescribing group.

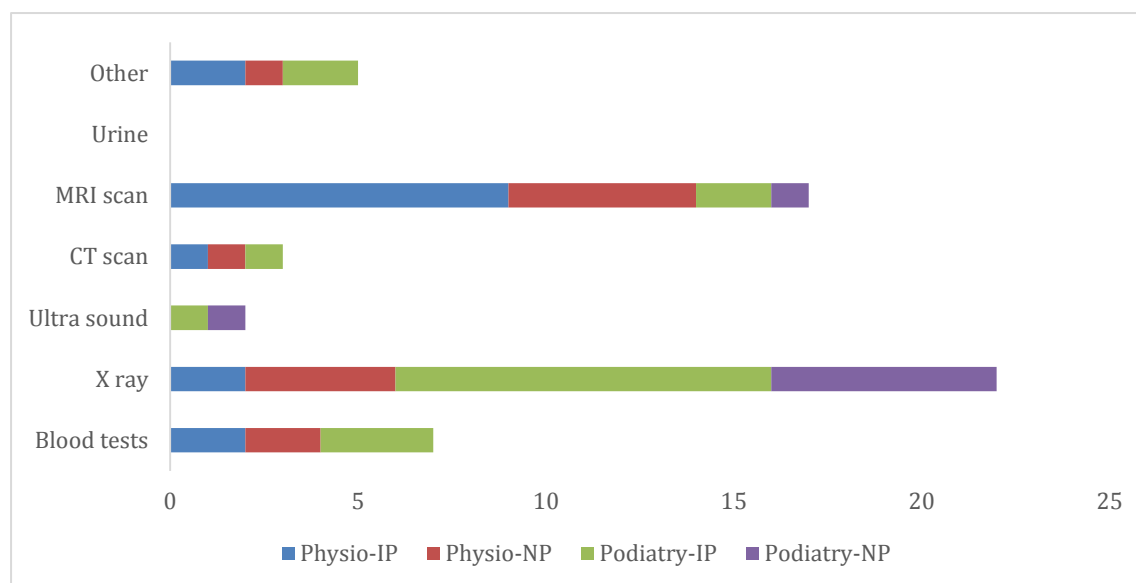
Figure 6.4 Methods used by patients to obtain medication recommended during consultation with physiotherapist or podiatrist



Referral for further diagnostic tests

There were slightly higher levels of referral for diagnostic tests in the PP-IP group (27.9%, n=29) than in the non-prescribing group (21.5%, n=20). The most common tests that patients were referred for were x-ray (n=22), followed by MRI scan (n=17) (see Figure 6.5). Other included: 'shock wave treatment and scan', nerve test, pain clinic, pre-operative assessment and wound swab.

Figure 6.5 Patients referred by physiotherapist or podiatrist for diagnostic tests



Request for follow-up appointment

Just over 60% of participants (61%, n=119) said that they had been requested by the physiotherapist or podiatrist to make a follow-up appointment at the service to review their condition. This occurred more often in the podiatry group (72.7%, n=75), than in the physiotherapy group (47.7%, n=75).

Referral to another practitioner

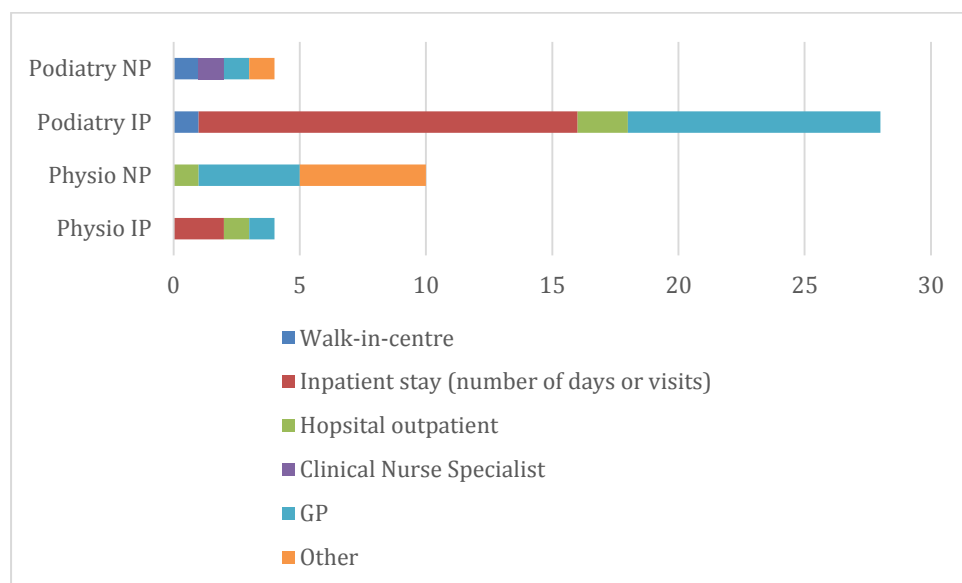
Just under 30% (28.9%, n=57), of participants said they had been referred by the podiatrist/physiotherapist to another practitioner for the same condition. Referrals were more common in the PP-IP group than the PP-NP group and findings indicate that prescribers referred patients to a wider range of professionals, the most common being referral to a hospital consultant. No patients reported that they were referred to social services, community nurse or to a pharmacist.

Further treatment for the same condition

A small number of patients (14.2%, n=28) reported to have had treatment for the same condition that had not been planned during the initial consultation with the physiotherapist/podiatrist. This included 12.5% (n=13) participants from the PP-IP group and 16.1% (n=15) from the PP-NP group. Figure 6.6 shows the number

of visits recorded for different types of treatment. Most visits were reported by patients in the podiatry prescribing group (N.B. this included multiple visits from the same participant). Other visits included: acupuncture (3), physiotherapy (2), Pilates class (1), indicating that responses may not represent traditional notions of ‘unplanned’ treatment, but rather indicate treatment that occurred in addition to the visit to the podiatrist or physiotherapist.

Figure 6.6 Number of subsequent visits for treatment not planned in initial consultation



Quality of life EQ-5D

There were 118 patients who completed the EQ-5D at baseline and at 2-month follow-up (Table 6.19). Index values were calculated to study effect of treatment on health status.

Results showed improved quality of life scores in both PP-IP and PP-NP groups (Table 6.19) between baseline and follow-up. The greatest improvement was seen in the prescribing group (increase of 0.08, $p=0.019$), however differences between the PP-IP and PP-NP group were not statistically significant (UK 2013 or England 2016). Within group analysis showed an improvement (increase of 0.8) in the physiotherapy prescriber group, however this did not reach statistical significance. It is noticeable that the Physiotherapy prescriber group had lower EQ5D scores at baseline than the non-prescribing group which may influence the results. Podiatry prescriber and non-prescriber groups showed significant improvement in quality of life scores, with greater improvement in the non-prescriber group (increase of 0.10). Further analysis of this data can be found in the economic analysis section (7).

There was no statistically significant difference in change in EQ-5D (UK 2013 or England 2016) when comparing gender, living arrangements (alone/with other adult(s)/care home), employment status (retired/working/at home) or university educated (yes/no). Finally, there was no association between change in EQ-5D (UK 2013 or England 2016) and the patient's age.

Table 6.19 EQ5D index scores baseline and follow-up

	From the 129 completers	Baseline for 116 with EQ5D in BOTH data sets only	Follow-Up for 116 with EQ5D in BOTH data sets only		
	Number of patients completing BOTH sets of EQ5D questions	EQ5D-5L England ¹⁹³ Mean (SD)	EQ5D-5L England ¹⁹³ Mean (SD)	Change from Baseline (95% CI)*	Paired t-test p-value
PT IP	25	0.56 (0.31)	0.64 (0.27)	0.08 (-0.04 to 0.19)	0.194
PT NP	28	0.73 (0.19)	0.73 (0.22)	0.001 (-0.07 to 0.07)	0.973
PO IP	33	0.70 (0.26)	0.78 (0.20)	0.08 (0.003 to 0.16)	0.042
PO NP	30	0.66 (0.26)	0.76 (0.28)	0.10 (0.03 to 0.16)	0.004
All IP	58	0.64 (0.29)	0.72 (0.24)	0.08 (0.01 to 0.14)	0.019
All NP	58	0.69 (0.23)	0.75 (0.25)	0.05 (0.003 to 0.10)	0.036
All PT	53	0.65 (0.26)	0.69 (0.25)	0.04 (-0.03 to 0.10)	0.266
All PO	63	0.68 (0.26)	0.77 (0.24)	0.09 (0.04 to 0.14)	0.001

*[Positive change indicates mean improvement in health at Follow-Up]

6.5 Semi-structured interviews

Semi-structured interviews were conducted with podiatrists, physiotherapists and team members, and then analysed thematically.

The following themes were identified in relation to podiatry: 1) Views on the impact of independent prescribing in podiatry (improving access to medicines, cost saving and service efficiency; improved quality of medicines management activity and advice; contribution to Patient Experience), 2) Impact of IP on personal and professional development (personal impact; professional reputation; impact on communication in teams), 3) Innovation and implementation issues (service innovation and future development; concerns and unexpected consequences; factors influencing the uptake and implementation of

IP; patient related barriers; governance and support), 4) views on the independent prescribing programme.

The following themes were identified in relation to physiotherapy: 1) Views on the impact of independent prescribing in physiotherapy (improving access to medicines; cost savings and service efficiency; improved quality of medicines management activity and advice; contribution to patient experience; legalising medicines management activity), 2) Impact of IP on personal and professional development (personal impact; professional reputation), 3) Factors affecting the uptake and implementation of IP (deterrents to undertaking IP qualification; barriers to implementation; concerns and unexpected consequences; governance and support), 4) Service innovation and future development, 5) Views on the independent prescribing programme.

6.5.1 Participant profiles

Please see Table 6.20 below for details of interview participant profiles.

Table 6.20 Case site interview data

Pair	Case study site	Profession	IP/NP interview	Team member Interviews
1	1	PO	IP	0
	2	PO	NP	2
2	3	PO	IP	0
	8	PO	NP	1
3	10	PO	IP	1
	6	PO	NP	1
4	7	PT	IP	1
	4	PT	NP	0
5	9	PT	IP	1
	5	PT	NP	2
6	11	PT	IP	2
	12	PT	NP	0
7	13	PT	IP	0
	14	PT	NP	0
Total n= 25			n=14	n=11

6.5.2 Podiatry

Quotations have been included to illustrate findings. In order to protect the anonymity of participants, codes have been used to indicate the case site and status of participant as follows: X = case site number, Po-IP = podiatrist prescriber, Po-NP = podiatrist non-prescriber, team = team member and number of participant where relevant.

6.5.2.1 Views on the impact of independent prescribing in podiatry

A. Improving access to medicines, cost saving and service efficiency

All participants from podiatry case sites agreed that independent prescribing had the potential to improve access to medicine for patients. There was less agreement

over the *extent* to which improvements had, or could be made. This was because existing arrangements for supplying and administering medicine through PGDs and exemptions were considered by most participants to be adequate for the majority of patients. For patients requiring medicines that were beyond the remit of PGDs/exemptions, requests for prescriptions had to be made to a doctor and sometimes required an additional GP appointment. All participants saw potential for IP to improve service efficiency in these cases, examples of which included patients requiring specific antibiotics for diabetic wound care, and patients unable to take regular analgesia prior to podiatric surgery. The frequency that this occurred ranged from weekly to daily.

Streamlining services: PP-IPs and team members highlighted considerable savings to be made in relation to time taken by PPs, GPs and secretaries to organise a prescription, in addition to extra journeys, appointments and delays in treatment for the patient.

I think it would enhance patient care. It would certainly make the pathways quicker, because if we are having to ask patients to see GPs for things that we can't prescribe, then that obviously makes their journey a bit longer, and it's complicated if GPs won't prescribe what we require because then we might have to modify the surgery or not do the surgery at all. (6 team.2)

Independent prescribing was considered an important tool in meeting the challenge of providing a prompt service for the increasing numbers of patients requiring wound care and facilitating rapid response for patients in urgent need of antibiotics.

The amount of wound care we are doing now, which is what we generally ask antibiotics for, is going up and up and up at an exponential rate. (8 Po-NP)

In secondary care, IP had facilitated flexible working, enabling clinics to run when the consultant was absent:

It has changed the service in that there is an extra person within the clinic that, should they be required to, can prescribe for patients. So if suddenly my consultant was taken away, for example, onto the ward with an emergency, I could step into the role and keep the clinic running. (3 Po-IP)

In private settings, IP had provided the impetus for gaining access to online patient medical records in one residential hospital. This achievement had in itself made the service run more smoothly even though the podiatrist did not prescribe there. The rate of prescribing in private practice was low and infrequent, but was seen as most valuable on weekends when patients could not access GP surgeries.

Limitations of PGDs: The approach of the health trust in facilitating the use of PGDs was a key factor that influenced the extent to which IP could enhance efficiency. For the following podiatric surgeon, independent prescribing had surpassed previous arrangements in terms of efficiency:

I had PGDs for years until it became almost impossible to review them through a bunch of administrative and technical considerations ... in the end I gave up trying

to get them through the Trust after about three years and I used to run around the outpatient clinics asking for doctors to prescribe antibiotics for my patients who were on the operating table or trying to get them pre-prescribed. (10 Po-IP)

In contrast, a non-prescribing podiatric surgeon reported that use of PGDs and exemptions were supported in the Trust and worked well in most cases, however, considerable time saving could occur for the cases that could not be managed via PGDs.

I would say for 90% plus, yes, for the patients that generally just need routine analgesia, x [name of drug], antibiotics, we have those [PGDs or exemptions]. It's if there's something different, the patient can't take ibuprofen or codeine, and it's quite clear that paracetamol alone will not be adequate for their procedure, it's then that it's not easy. It means an extra visit to the GP for the patient, it means close liaison with us. It takes up a lot of our time, just one small thing like that takes up a huge amount of our time, making sure that on the day of surgery the patient has the appropriate pain relief. (6 Po-NP)

Within secondary care, IP reduced the administrative workload and enabled more efficient working across sites where support for PGDs was inconsistent.

I was already taking clinics in the absence of the medics and consultant podiatrist before, but I was utilising patient group directives, which particularly at one site, at one hospital, we only have three available, at the other site we have ten available, because they have different pharmacy regulations and things. Particularly at the lower site it meant I was very restricted and I constantly had to go and find a doctor to then ask them to come and review the patients... By becoming a non-medical prescriber I've cut all of that paperwork and length of time for the patients out. (3 Po-IP)

B. Improved quality of medicines management activity and advice

Enhanced treatment options: IPs had the flexibility to offer more treatment options to patients and include medications considered more appropriate than those available via PGD or exemption. Non-prescribers were restricted to the medications available, or were reliant upon GPs to prescribe the type of medication recommended for the patient.

When we send the letters to the GPs after we've pre-op'd a patient, say they needed {drug name} or something like that, more of the controlled medicines, then generally there's a chase-around. The patient doesn't come in on the day of the surgery with the medicines we've asked for, so we are then ringing the GPs, etc... (6 team.1)

Continuity from advice to treatment: Reducing the gap between advising patients about medicine and prescribing that medicine was also considered to improve communication, understanding and, potentially, adherence. It was considered beneficial for patients to receive a prescription from the same professional who had assessed and provided treatment advice. It was noted that podiatrists often develop specialist knowledge and understanding of the conditions that they treat and that prescribing built upon and added to this specialist professional knowledge.

It means we know that patients are getting the best evidence-based care and we are able to prescribe that using, obviously, our kind of skilled knowledge and it's instant as well and we can really clarify to the patient how to take it, the reactions they can get from it, document everything and, because we see them so regularly, it's an ongoing discussion with them, so I feel they get much better follow-up care and therefore compliance has definitely improved. (3 team)

Enhanced specialist knowledge: Undertaking the prescribing course had enhanced most PO-IPs knowledge and understanding of. This in turn was thought to enhance the advice given to patients and might reduce the need for additional GP appointments.

I'm available to give patients a lot more in-depth advice... probably answer their questions rather than them having an extra appointment at the GP or waiting for the doctor in their clinic.... [that] makes things quicker and more streamlined. (3 Po-IP)

Impact on patient safety was mentioned in relation to heightened awareness of potential harm.

It's changed my patient care, in that I've got a great depth of knowledge and great breadth of knowledge... I'm actually more proactive now at stopping antibiotics. I am less inclined to say we need antibiotics. I think my assessment skills have changed, in that I'm far more aware of the perils and pitfalls of prescribing (3 Po-IP)

I do think that your knowledge is reduced when there's just a PGD. But now with independent prescribing, of course, we're seeing it from the other side and we're hearing thing from the other side. When you go to conferences, you actually realise what it is that you don't know. (6 Po-NP)

C. Contribution to Patient Experience

Prescribing was perceived to have had a positive impact on the patient experience, ameliorating the frustration, delay and personal cost involved in going to a doctor for a prescription. Podiatric surgeons reported that patients generally expected this:

They expect me to be able to prescribe. I don't think it ever entered anybody's mind prior to this that I would be taking somebody and was able to cut into their bones, but I couldn't give them an antibiotic. (10 Po-IP)

There was a perception that other patients were initially surprised that podiatrists can prescribe medicine, and PIPs were engaged in educating patients about NMP:

They are surprised... I have a sheet that I give them that tells them about me and what I am... particularly the new patients that come through, I will sit down and say... "I'm a podiatrist... I'm not a doctor in the clinic, I have an extended role. I've done a special course that's enabled me to prescribe. (3 Po-IP)

IP was anticipated to be more convenient for patients, providing more holistic care and continuity, which was seen to be particularly beneficial for the elderly, those with cognitive decline or urgent need of medication. It was also seen to build confidence and trust in the profession and increase the use of evidence-based care.

I think the patients would trust us more [and] would start holding us in slightly higher esteem... we see them twice a week, we'll be checking with their doctors and their consultants and everybody else, yet we can't give them antibiotics... sometimes... you get a funny look from them as if to say, well you can do all this, but you can't even do that, so where are you in the chain of command? (8 Po-NP)

6.5.2.2 Impact of IP on personal and professional development

A. Personal impact

Undertaking IP training had exposed participants to new learning experiences, including from other professions in settings in which they did not usually practice. The course had increased depth of knowledge, assessment skills, attention to risk, and consideration of potential for drug based interventions.

A lot of my treatments are mechanical. I remove calluses, I make insoles, I put extra soles on the bottom of their shoes to level up their hips and it's very.... So I had to consciously start thinking 'include medicines, include medicines'. So, for instance, if someone comes in with a sort of arthritic ankle, rather than just making an insole for them, I might well say to them 'Have you tried using that gel that you put on the skin?' (1 Po-IP)

Greater autonomy over clinical decisions, job satisfaction and facilitation of advancing roles were all important aspects of IP. Prescribing had added interest to the job, making it more rewarding and opening up new opportunities.

Every time I write a prescription there's a little smile on my face, absolutely. And that's because I haven't been able to do that for the first X years. So when I'd think oh I need to prescribe something, I write out that little piece of paper, I think well that's just great, this is the way it should be, it makes me very happy, absolutely. (10 Po-IP)

B. Professional reputation

It was widely considered by team members and P-IPs that prescribing would enhance the reputation of podiatry as a profession.

I think people would have a better view of our profession. They would look on us as more professional and not [just] toenail cutters. (6 team.1)

The previous inability of podiatric surgeons to practice independently from doctors was identified as a key factor in preventing advancement of the profession. Gaining IP opened the doors to offering a more complete package of care, including complications.

One of the main criticisms that was levelled against me [and]... every podiatric surgeon was you can't prescribe; you can't manage complications. You can't deal with problems, and so the minute something goes wrong, you have to include us, and if doctors are helping you guys you shouldn't be doing it... But getting access to drugs is absolutely a huge step forward for us becoming complete practitioners. (10 Po-IP)

For one podiatrist team member, the protective value of IP was seen as a potential benefit in terms of job stability in an unpredictable market:

I think it would be a good step forward, especially when... people being reviewed and down-banded... [and] you think, well maybe I should have something extra

behind my name... I think it makes people more confident about their positions.
(8 team)

C. Impact on communication in teams

IPs benefited from adopting a prescribing role and subtle changes were reported.

It's actually good PR for the practice because there you are, talking to a doctor who thinks podiatrists just cut toenails and you are having this high level medical conversation with them and they go "Oh! Those podiatrists actually know what they are talking about". (2 Po-NP)

IP was thought to increase respect and confidence in the profession. In addition, providing education and CPD for other professionals was mentioned as a means by which participants increased awareness of PIPs.

6.5.2.3 Innovation and implementation issues

A. Service innovation and future development

The research was undertaken soon after the introduction of IP and there was a sense that PO-IPs were just starting to consider the possibilities that IP could bring for future service innovation. Those qualified had made small changes to the way that services were run or organised but could see potential for greater change. There was little evidence of deliberate strategic service planning around IP, instead the services developed piecemeal as opportunities offered by IP became apparent. In site 3, for example, plans for an additional diabetic foot clinic were further enhanced because IP would enable the clinic to run independently of junior doctors.

The reason I became the prescriber was to help with the service and extend the service in future. But there are pressures on our medical colleagues, in that they've had the number of juniors reduced in the team which has meant that they are not always available to cover clinics when the consultants aren't there. It's by chance it's worked out that way, but in actual fact it's [IP] been one of the driving forces. (3 Po-IP)

Participants were very positive about IP. Most of those podiatrists not yet qualified to prescribe were considering IP as an option and identified a number of areas where it could be used in the future, including prescribing antibiotics and facilitating the extension of services.

I think it would facilitate our delivery of the service because there are instances where, for instance, at the moment, if I'm here on my own, because I haven't got my clinical pharmacology module, I, for instance, can't issue antibiotics. If a patient had come in with an infection that needs antibiotic cover, then I have to send them to the doctor, and if it was a Saturday that makes life a lot, lot harder. (2 team.1)

I would be very, very happy to do the training. And I think that is the plan, because X [podiatric consultant] isn't always around, she's in meetings and things like that, and if we have emergencies, then sometimes we need that extra knowledge to be able to deal with that emergency. (6 team.1)

There was some uncertainty over the value of IP in general podiatry; however, there was general agreement that IP suited specialist podiatric roles and that for

these roles, undertaking IP training was likely to be mandatory in the future. IP was seen as crucial to the future of podiatric surgery and podiatrist-led diabetic foot care, and considered an important tool for managing increasing demand:

I don't think independent prescribing [is] right for all bands, you need to be a senior member of staff and a more advanced member of staff, so I would say Band 6 and above... to have that level of knowing what you don't know. (3 Po-IP)

The way podiatry is going, I think we are going to have to [IP] in order to keep up... And if the number of diabetics are going to go up like they are, we are going to be hit with all this wound care, and GPs are under enough pressure, and if there's anything we can do to take that pressure off, I think we need to be actively doing it. (8 Po-NP)

Everybody who is going to train as a podiatric surgeon will need to do it. The day will come that you will not be able to get a consultant job unless you are an independent prescriber. (10 Po-IP)

B. Concerns and unexpected consequences

There was general agreement that podiatrists need a high level of experience prior to becoming a prescriber, and that regulation need to be upheld to ensure that only those with the necessary experience undertake the course. There were concerns that if these regulations were breached and errors occurred, this would damage the reputation of podiatry as a profession.

I worry about people going a little bit gung-ho and the profession being brought into disrepute (2 Po-NP)

I can see the problems of inappropriate prescribing and the fuss at the moment over the number of antibiotics that GPs are prescribing, they are being hammered, and I can see us being tarred with the same brush. But we don't tend to take it lightly. I mean, from my own team, we don't tend to ask for antibiotics on a whim, we are quite careful. (8 Po-NP)

Non-prescribers recognised that they lacked the level of knowledge and experience to prescribe in some areas, particularly for patients with complicated requirements, or that involved polypharmacy.

I think we would have to increase our knowledge... if we are prescribing different things then the drugs we already prescribe we would obviously need to increase our knowledge base and make sure they don't interact with any medications patients who are already taking. (6 team.2)

A further concern and potential unexpected consequence was that podiatrists could be expected to take on a consultant role for cost savings as opposed to quality of care:

I wonder if they would try and replace the consultant with someone who is prescribing... I don't think that should happen necessarily... you are being paid a lot less money to do what they are doing and they've got a much greater knowledge than we have. That would be my concern... knowing what the NHS is like, unfortunately, it's a cost-saving measure. (8 team.1)

C. Factors influencing the uptake and implementation of IP

Those working in private practice identified a number of barriers to IP, including resistance from GPs, gaining mentorship support, the perceived adequacy of the existing system, difficulties accessing medical records and test results, isolation, and the need to restructure services to allow time to prescribe.

The problem with private practice is, because you don't have access to patient records, you are very dependent on a patient remembering what tablets they've got. And we still get "Well I take a little pink one for my legs" and you have to guess, you know. If you happen to know then that's fine, but if you don't you are stumped... and people do forget what they take. And that worries me and the pharmacology side of it and not having access in private practice to that complete patient record before you start. (2 Po-NP)

I'd need to change the way I practice. I'd need to see less patients or work more days there. Because, the consultations would have to be longer, I'd have to wait for blood tests, x-rays and all that sort of thing, which at the moment... They kind of do it all in-house already... the GP likes very much to be in charge of that sort of thing. (1 Po-IP)

As the number of podiatric prescribers was low, isolation and poor access to support was an issue for some. One podiatrist in private practice lacked access to a doctor to act as a mentor on the prescribing course. Other barriers included difficulty organising a prescribing budget, and identifying funding and the time to undertake the course, particularly within small teams. The following participant was reluctant to take on responsibility for high level clinical decisions:

My concern would be a little bit to do with antibiotics. I think for your ingrowing toenail or something like that, fine, but when it becomes complicated... then that becomes more of an issue, and for the pay scale that I'm on, to take on that responsibility of those antibiotics, that would be my concern and I would rather, in some ways, be in the diabetic foot clinic and the doctor say, 'This is the antibiotics,' because he gets paid a lot more than me and he knows a bit more than me. (8 team)

In other sites, few barriers were envisaged or had been experienced in setting up IP, although there were challenges in aligning with varying prescribing policy arrangements for those participants working in multiple trusts.

D. Patient related barriers

The transition from PGDs/exemptions to prescribing raised some practical difficulties as it was believed that some patients would incur the cost of the prescription directly rather than being supplied with the medication on site. This also had implication for costs and responsibility for onward care.

At the minute, no patients pay for anything they receive from us, and of course if we've got independent prescribing, that would change for a proportion of patients. (6 Po-NP)

It becomes quite difficult in the home situation, in the domiciliary situation because of course it costs for them, doesn't it? And so if they've got something like an infected ulcer, it's going to want dressings every week. So the better thing for them is to pass them on to the district nurse or something like that. (1 Po-IP)

By issuing a prescription rather than supplying medicine, the onus of responsibility for obtaining the medicine is passed to the patient. The non-prescribing podiatric surgeon raised a concern that the service would have to rely on the patient to obtain the medication prescribed and bring it to clinic for use in surgery.

When you give [patients] something, they've got it there and then. If you're prescribing something, you're relying on them to make sure they get it... whereas when we're issuing it we know they're going to get it and leave that day with it. (6 Po-NP)

In addition, prescribers were involved in managing expectations and explaining how prescribing works to patients and staff. One participant discussed how they learned to address patient expectations around what podiatrists can and cannot prescribe:

One patient in particular... wanted me to prescribe something that wasn't within my prescribing rights, a controlled drug, and I wasn't prepared to... and that was quite a tricky situation but we got through that - good communication skills and setting out the boundaries of what I am allowed and aren't allowed to prescribe (3 Po-IP)

Similarly, there had been some misunderstandings between specialist podiatrists and doctors over prescribing for diabetic foot conditions:

They [doctors] might not necessarily agree with the high doses that we give our patients because they don't necessarily understand the risk of the diabetic foot like we do, and so sometimes, no matter how much you try and communicate that across, there will be a doctor, obviously, who understands resistance risks and so that will be their priority, where our priority is quite different. (3 team.1)

E. Governance and support

In general, governance and support was reported as satisfactory by prescribing podiatrists. The podiatric consultant prescriber reported attending prescribing CPD forum, using trust protocol, had access to support from microbiology for advice on antibiotics, and was planning an audit. Within private practice, the podiatrist (site 1) was required to organise her own CPD, kept records of prescriptions issued and attended CPD and group clinical supervision at a local hospital. In secondary care, the podiatrist prescriber reported good support in terms of governance, CPD and support for prescribing from colleagues. They also reported auditing and keeping meticulous records of their prescribing practice.

Isolation was an issue for most podiatrists, having little contact with other prescribers due to the low numbers.

I'm very lucky, in that I work alongside my consultant podiatrist... we are the only two podiatrists, independent prescribers in the whole of the county and so we support each other (3 Po-IP)

Confidence in prescribing was said to develop over time but was a challenge at first:

It [the prescribing programme] was very hard, very difficult. I do struggle sometimes with my confidence with it, but that's coming now I've been a year in, and I'm a lot more confident in my sort of decisions. (3 Po-IP)

6.5.2.4 Views on the independent prescribing programme

Participants valued and had mainly enjoyed the experiences gained through the IP training, although the course itself was reported as difficult.

The course requires you to do kind of cradle-to-grave stuff and because our practice there is very narrow, it's just elderly men basically - so in order to get experience of people that aren't elderly men I spent a lot of time at a walk-in centre, which is wonderful. (1 Po-IP)

It was huge content in a very small amount of time, so it's a very highly pressured course... I had been out of learning for... quite a long time, so it was a real steep learning curve... to becoming an active learner again.... But I very much enjoyed the hands-on, the 70 hours of practice I had to do wasn't a problem because I was doing these clinics, because I was using patient group directives. I did ward rounds... And I found it really interesting, I learnt loads. (3 Po-IP)

A couple of participants were concerned at the apparent variation in the amount of pharmacology covered in different course offerings.

The lack of harmonisation between the training... The vast array of courses that are on offer, some people say it's just a complete doddle and it's all about ethics and prescribing in practice... when I did a lot of pharmacology, which is now completely different to the other courses ... and to some people it's almost completely remote e-learning and other people it's face-to-face for many hours. I think this is crazy. I think that the course needs to be rationalised so everybody gets similar training. It seems somehow inappropriate that some people get the qualification having done virtually no pharmacology and others have to do a lot. (10 Po-IP)

In the future, it was suggested that training be more tailored to the needs of podiatrists, perhaps involving podiatrist prescribers in mentoring trainees.

6.5.3 Physiotherapy

Quotations have been included to illustrate findings. In order to protect the anonymity of participants, codes have been used to indicate the case site and status of participant as follows: X = case site number, Ph-IP = physiotherapist prescriber, Ph-NP = physiotherapist non prescriber, team = team member and number of participant where relevant.

6.5.3.1 Views on the impact of independent prescribing in physiotherapy

A. Improving access to medicines, cost savings and service efficiency

Streamlining services: One of the key benefits of IP identified by physiotherapists was that it facilitated a one-stop-shop service, thereby preventing additional appointments with GPs and the long delays that this sometimes entailed. Participants were predominantly assessing and treating patients with musculoskeletal conditions (such as spinal injury, back pain, upper and lower limb

conditions and arthritis), many of whom required prescriptions for pain or injection therapy as part of their treatment plan.

The benefit is in speed of access. Increasingly, people are telling me that they have great difficulty in getting an appointment with their GP, and so being able to see them and then say, 'I think this will help,' and to do that there and then, so by the end of that day they may actually be taking the full medication, that's going to help them (13 Ph-IP)

In some cases, non-prescribing physiotherapists were making recommendations to GPs up to 3 times a day and it generally took 2 weeks for the patient to receive the requested prescription. IP was seen as a way to improve service efficiency and save costs.

I think there will be direct cost implications. The cost will come down because it will not end up being additional GP consultations. If you look at 13 patients a day clinic, at the end of the day you're looking at a good 50 patients - and we are about eight or nine clinicians. That is a massive workload for GPs as well, and that will help them to drop that cost, possibly pressure on the GP clinics as well. (14 Ph-NP)

Rapid access to GPs was identified as a problem for patients across most sites.

I think there's variance, so you get people where they are really good and the GP will do a telephone consultation, but no, it's a pain in the backside. (5 Ph-NP)

An audit conducted by one service identified that some patients would resort to A&E if they could not get rapid access to medication, indicating a high level of cost saving if access to treatment could be improved.

I think around the whole vision of being this one-stop shop, really. Because that's one of the questions we asked: 'Where would you go if we weren't able to prescribe today?'... Some people were saying A&E. So, it's all about a health economy, isn't it? (9 Ph-IP)

The extent to which patients were reliant on GPs to prescribe medicine that physiotherapists recommended varied; in some areas GPs had already prescribed relevant medication prior to referring patients to physiotherapy services, whereas in other areas GPs were less consistent in doing so.

Our service has been up and running for such a long time that the GPs are really quite aware of neuropathic medication, and we often find a lot of them are on it when they come to us anyway. (9 team2)

There have been problems with some local GPs - that they don't act on what we ask them to. (11 Ph-IP)

Reducing delay in treatment: The importance of starting patients on appropriate pain medication early on in the treatment journey was emphasised in MSK and spinal physiotherapy. Early access to medication was considered to enhance the effectiveness of treatment overall, potentially reducing time to rehabilitation.

It basically means that patients can be assessed and treated and then perhaps rehab can follow much quicker than it was able to previously. You get the full package right from the moment that you step in the door... So in terms of timely

and effective care, and continuity of care, seeing the same face, it's amazing. It's brilliant. (Phys 7 Ph-IP)

IP was also expected to improve service efficiency in areas such as oxygen therapy for respiratory patients, injection therapy, and neurological physiotherapy. While injection therapy could largely be undertaken via PGDs, there were restrictions reported around the mixing of medicines and use of some medications that could be overcome by IP.

One of my shoulder colleagues has just got his qualification, and whereas he had to work through a PGD, he will be able to independently prescribe and inject, so that's going to enhance his clinic times... And that's our focus for the spinal injections eventually... We have respiratory colleagues who are independent prescribers here, that's certainly enhanced their service, by being able to do the oxygen therapy independently. Equally, when I did my training, there was a physiotherapist who was going to use Botox with neuro patients, so that's going to enhance her rehab skills. It's just another tool that sits alongside our specialist skills. (11 Ph-IP)

Team-working: For non-prescribing participants, having access to prescribing colleagues within their service was anticipated to enhance access to medication for all patients in the service, with team members benefiting from their up-to-date knowledge.

They are all a lot more knowledgeable about medicines generally... if I've come across something I'm not sure what it is, then I can ask, and that's quite nice, and it also keeps us very up to date... from an education point of view, it's really useful. (9 team2)

B. Improved quality of medicines management activity and advice

Enhanced treatment and safety: Changes brought about by IP were reported to enhance the quality of care that patients received, facilitating evidence-based practice and improving learning around the effectiveness and safety of different medications.

I'm obviously much more aware of what somebody's taking, thinking about interactions and things like that, and engaging in discussions with patients about their tablets and yeah, it's given me a bit more armour... armoury, really. (9 Ph-IP)

I find in prescribing I have a much more quantitative mind set on than when I'm using, say, acupuncture or manual therapies, because in prescribing you *have* to follow protocols and guidelines, not only for your own safety but actually for the health and safety of the patient (13 Ph-IP)

Increased knowledge gained through the programme was reported to have changed practice, improving identification of drug errors, greater discussions with patients about medicines and in considering risks when making recommendations to GPs.

I pick up an awful lot of drug errors. (7 Ph-IP)

My knowledge of medications has improved, the interactions between different medications... how to look for those interactions... and being aware of more risks... say, for example, suggesting a neuropathic medication, appreciating that

some patients may certainly not be suitable for that, then not making that recommendation to the GP, which I think, perhaps in the past, it might have been recommended without that prior knowledge of risks and benefits. (11 Ph-IP)

Continuity from advice to treatment: Continuity of care was improved in that patients would receive a prescription from the same professional who had assessed and provided treatment advice, and sometimes follow-up treatment.

As a method of change, you want things to start to happen straight away. So if you had that discussion, that's their prime time if you're looking to change their behaviour, you want to do it there and then. (5 Ph-NP)

Making the most of the window of opportunity to act on a 'treatable moment' and initiate pain treatment without delay was expected to reduce the time needed for rehabilitation and improve quality of care. It was also believed that the specialist knowledge and skill of physiotherapist when coupled with prescribing would mean they were best placed to provide enhanced pain services.

Enhanced specialist knowledge: It was said that IP contributed to the physiotherapists' specialist professional knowledge.

In terms of working in a Tier 2 service, there is some real obvious benefits in terms of the management of certain pain disorders, for neuropathic pain disorders... We are best placed to manage those patients, the GPs don't commonly see them in the way that we do and I think that would be an enhanced practice. (5 Ph-NP)

Enhanced experiential learning (i.e. from observing use of medications) was also reported around the effectiveness of specific drugs and the related costs.

There is awareness that these decisions do have a cost behind them, and actually you've got to be thoughtful and mindful about it, really. But... you've got to try these things, because you've got to start to build up that feeling about what works and what doesn't work for your patient, and it's only with experience that you can do that. (9 Ph-IP)

C. Contribution to patient experience

The opportunity to improve the patient experience was an important driving force for physiotherapists when considering IP. Improved convenience and continuity, reduced costs for patients and the option of more holistic care, were highlighted as benefits.

I think that's a good change in our profession. I think we are expanding our remit, if you like, and I think that can only be a positive thing both for our profession and I think, ultimately, delivery of care to the patients. (5 team.1)

In addition, it was thought that patients would have greater trust and confidence in physiotherapists.

Some of my patients... have been reassured when I've told them I'm a non-medical prescriber... 'Oh, you must know a little bit of something, then'. (11 Ph-IP)

We write a letter to the [GP]... and the GP has their own views. If they're not happy it will not happen... there is a discrepancy between what we have discussed and

what ends up happening.... Independent prescriber training would eliminate a lot of [this] (14 Ph-NP)

There were mixed views about how patients responded to physiotherapist prescribing; patients were either surprised, or already expected physiotherapists to be able to provide appropriate treatment and advice.

I think the patient's view is that they are here in a hospital, and we should see any record that is available.... We should be able to write them all sorts of prescriptions ... You know, their expectation, quite rightly, is "I'm here, manage me." (5 Ph-NP)

[Patients] don't come with an expectation that I could prescribe, because that's not what has historically... happened... I'm sure in the future, as more of us prescribe, patients... will have that expectation more. (9 Ph-IP)

D. Legalising Medicines Management Activity

An important contribution of the IP qualification for many participants was that it legalised activities that physiotherapists engage in that were considered 'grey areas' in legislative terms.

The primary problem we have is we have to rely on PGDs to be able to use the drugs to inject. Being an independent prescriber, that will make life a lot easier. As you are aware of licensed drugs, that means that it is very common to mix either saline and drug or saline and a local anaesthetic prior to injection. That has been a big problem for the physiotherapists being non-prescribers because it becomes illegal to do that. Being a prescriber, that would enable us to be able to use that off-license, even if it's not recommended by manufacturers, but there are no widespread safety issues highlighted. We do volumise a drug. It would be helpful if we can do that, and on our own accountability. The biggest legal issues arising from injection practice will be resolved by being an independent prescriber. (14 Ph-NP)

All participants, including non-prescribers, were involved in assessing and providing advice to patients in relation to medication or undertaking medication reviews. For some, IP provided a legal framework to enable physiotherapists to directly advise or recommend medication to patients; however, some non-prescribing physiotherapists also provided specific advice to patients about medicine use.

I constantly advise patients with regard to enhancing their pain relief. I've changed in how I've contacted GPs, and obviously now can legally advise those patients, rather than saying, "You need to see your general practitioner." (11 Ph-IP)

Most physiotherapists were also making recommendations to GPs or other practitioners to prescribe medication. For a practitioner without the prescribing qualification, there was uncertainty over how specific the advice and recommendations they make should be. Having the IP qualification increased confidence in the legality of providing advice and changed the nature of recommendations to GP, being more direct and specific.

[Interviewer]: "If you recommended rather than prescribed, would you ask for a specific drug and a specific dose schedule for it or not?"

As a prescriber I would, yes. And that's the subtle difference between writing to a GP and saying "I wonder if this person would benefit from neuropathic meds" to actually saying "this person has tried x, y, z in the past, I'd be grateful if you would consider prescribing them" I don't know "nortriptyline on a titrating dose" (13 Ph-IP)

It makes it much more tidy and gives us greater authority to take the responsibility of the managing of the conditions (14 Ph-NP)

6.5.3.2 Impact of IP on personal and professional development

A. Personal impact

Undertaking prescribing had extended participants' knowledge and understanding of pharmacology and drug interactions, which in turn had increased the confidence of some participants. For the following participant, having the qualification had improved practice even though they did not issue prescriptions for patients.

I think I use it every day, but I don't mean that that means I physically use a prescription, at all actually, it's more that the knowledge... and the confidence that I've gained from it has informed my practice a lot... [in] the way that I will screen the notes. (7 Ph-IP)

The prescribing qualification was welcomed as an additional tool to facilitate extending specialist roles in physiotherapy, enhancing job satisfaction and pride in the profession.

There's always that drive, isn't there, to push your own boundaries a little... we're always evolving and changing... taking on more bits and pieces, aren't we? (9 Ph-IP)

It's given me a sense of... we are always autonomous practitioners, but more autonomy really. I feel quite proud to be an independent prescriber. (7 Ph-IP)

B. Professional reputation

Participants embraced independent prescribing as a positive acknowledgment of the growing reputation of physiotherapy as a profession.

I think it's great. It's partly seizing an opportunity, I think, to expand the role of physio and develop the profession. I've been doing ESP work for 15 years, it's been around for longer than that, but actually a lot of things that we never thought we'd be doing we are doing lots of now... This is about taking on the whole patient and managing the whole patient. Almost offering a one-stop shop. (12 Ph-NP)

Further benefits to the profession included helping to reduce barriers in communication, facilitate the building of relationships and raising confidence in the abilities of physiotherapists amongst doctors, colleagues and patients.

It will strengthen the role... "Look, these are qualified clinicians. They are entitled to give the advice and it is evidence-backed." (14 Ph-NP)

People say, when they are talking about the team, "We've got independent prescribers in the team," and people know that that means they've got advanced practitioners... and I will speak to GPs and say, "I'm an independent prescriber," and instantly that sort of takes barriers down. (7 Ph-IP)

6.5.3.3 Factors affecting the uptake and implementation of IP

A. Deterrents to undertaking IP qualification

Adequacy of existing service: While participants mainly had positive attitudes towards prescribing, existing mechanisms for recommending or administering medicines were considered adequate for the majority of patients.

I think if my role was to change, then I would look at the possibility of doing it [IP course] but at the moment, I don't feel there's enough patients I see that, yes, prescribing some analgesia would be a real big change for that patient. (5 team.1)

I've done it for so long now that I don't feel I need to do it [IP course], but I think my colleagues would disagree. But I don't particularly feel I need it at all, no. (9 team)

Time commitment: The time commitment required to undertake the IP qualification was a deterrent for some when weighed against the rewards, and some managers would not support training for this reason.

At the moment it's a bit limited as to what they can and can't do, and it seems an awful lot of training and effort and money for very little reward at the moment. [9 team]

They won't support it because they don't think there's a need in the service. [5 team.2]

It was a generally tough course, and very time-consuming, which I think is the major thing that is putting off my colleague doing it. [11 Ph-IP]

Within services where IP training was welcomed, the additional resources required to support IP meant that team members had to wait to go on training to avoid overloading the service.

B. Barriers to implementation

Three out of the four physiotherapist prescribers were prescribing medicines for patients, ranging from a weekly to monthly basis. Factors that constrained prescribing practice included: poor access to medical records, lack of budget, limited ability to follow-up the outcome of medications initiated, controlled drug restrictions and prescribing for patients with complex needs.

Access to medical records: Access to medical records was reported as a barrier within an integrated community service where agreement to share records had to be secured.

The other real problem is access to medication and full access to medical records. So some of our GPs are really excellent, and there's certain boxes on the system [name of] that they have to tick, which says Access to Full Medication Records and Full Medical Records, and others that keep it closed, which means I spend an awful lot of my time ringing to get that full access before I can prescribe. And sometimes it ends in me not prescribing because, of course, I don't want to put my own registration at risk if I haven't got full access to records (7 Ph-IP)

Patient follow-up: In most MSK services patients were seen once or twice only. For some, this meant that services were not set up to facilitate follow-up

appointments with patients that would be required for the safe prescribing of some medications. This was the main reason why the participant in site 11 did not issue prescriptions.

I didn't initially imagine that I would be prescribing within clinic. Very few of our consultants prescribe... my main holding back... is that I'm advising in a field that GPs should take... I haven't got the facility within our working practice to actually review that patient appropriately... I haven't pushed to actually prescribe within clinic. (11 Ph-IP)

For others, lack of follow-up did not prevent physiotherapists from initiating medicine; however, it required careful communication with the GP.

We write to the GP on the day that we prescribe, to keep them informed, and repeat prescribing is done through the GP. I can count the numbers on one hand, that I've done more than one prescription for a patient... Most of the time I'm initiating some medication and then the GP will either continue with it or... they will stop it. [Laughs] [13 Ph-IP]

If I've prescribed and then I'm not there to always follow it up, I have to refer my patient on to another prescriber or a GP to maybe then follow them up. (7 Ph-IP)

In addition, it was not considered appropriate to prescribe for patients with ongoing complex needs within a tertiary service.

The types of patient mix that we see are really quite complex, with psychosocial... as well as... medical issues... I personally feel that the prescriptions in my particular role, and where we sit in a tertiary centre, are better delivered by the GP. (11 Ph-IP)

Time and resources: In order to use IP, changes to the clinic set up and lengths of appointments were considered necessary by some.

All the time constraints.... I've not felt that in my half-hour session of what we have to do, actually allows for safely prescribing. (11 Ph-IP)

Prescribing within the service as opposed to making recommendations to GPs was recognised as incurring a cost to the service. Mechanisms had been put in place to cover the budget for IP in those services where participants prescribed, however changes to the way budgets are managed could restrict prescribing in the future:

We do have a limited drugs budget at the moment, and we've discussed that because obviously, the more of us that come on board, the more of us that are going to be prescribing. It's more around the neuropathic medicines, like X is really expensive... data [is] collated and looked at in our meetings and eyebrows are raised! (9 Ph-IP)

The prescribing lead is telling us that the way prescriptions are being charged is going to change, they won't be coming off the GP budgets, it's going to come off our own budget, and I can see that as being problematic, so it may be that we'll be doing less prescribing and more recommending in letters [13 Ph-IP]

Controlled drugs: During the study period, legislation was passed to enable physiotherapists to independently prescribe from a list of seven controlled drugs, however some commonly used controlled drugs were not included. There were mixed feelings amongst participants about the need to prescribe controlled drugs.

We've been quite limited... with controlled drugs and the restriction on that. So we've still had to refer some patients into pain management services, but they generally tend to be the more complex patients, and I think we'll probably continue to do that to some degree anyway, but we might get people started with something, (9 Ph-IP)

There is still a debate going on about how much a controlled drug can be accessible to physios... I think as the profession progresses into more experienced prescribers the community would benefit over the long-term changing the limitations. [14 Ph-NP]

While efficiency savings were reported in sites where physiotherapists could prescribe, IPs continued to make recommendations to GPs for medications that they were not able to prescribe, particularly around controlled drugs for neuropathic pain.

In terms of wanting to be a one-stop shop for our patients, prescribing seemed to be the next big thing to tackle, because a lot of the patients we've been seeing, we're sending back to the GPs, for neuropathic medication, primarily, and analgesic review. (9 Ph-IP)

Resistance and misunderstanding: In some sites, no delays or barriers had been experienced (11) or were envisaged. In other sites, a number of issues had hampered prescribing practice. One prescriber working in a community based integrated care service had experienced general lack of awareness of physiotherapist prescribing from colleagues, resistance from GPs in gaining access to medical records, and delays due to lack of recognition of their prescribing status by pharmacists.

On a few occasions when I have prescribed, the prescription hasn't gone through because the pharmacist has thought that this might be an illegal document. So there's been many phone calls back and forth saying, "No," and then they've ended up calling HCPC to check that I've been registered and then there's been phone calls back saying, "I really apologise," which has of course delayed the whole point of prescribing at the first place of contact to improve patient care. (7 Ph-IP)

Other participants experienced varied levels of support for physiotherapist prescribing:

I have four consultants that I work alongside... [one was] supportive of me going training, but he was not supportive of me discussing medications in his clinic for my CPD time, whereas the other three were... he believes [we] should be doing surgery, and not doing the more holistic management of the patient, or the pain management. (11 Ph-IP)

There was also variation in the resistance anticipated by non-prescribing participants:

I don't think GPs [and] the consultant surgeons will like it. (5 team.2)

There might be some barriers from GPs, potentially, but I don't think it will be a big issue here, not locally, because people, they've been very accepting of my role. (12 Ph-NP)

C. Concerns and unexpected consequences

Overall, there were few concerns raised in comparison to the number of benefits.

Over-medicalisation: Two non-prescribing participants thought that care should be taken to preserve the holistic traditional identity of physiotherapy.

Making sure that not all physios are pushed towards being extended scope physios who are prescribing... otherwise we'll lose our identity and we'll lose what we're good at... I don't want to become a medic. And I think some physios might want to do that, they'll become pretend doctors, and we've got plenty of those. (12 Ph-NP)

Increased responsibility: There was acknowledgement that prescribing roles come with additional responsibilities and liabilities.

It's taking on that extra responsibility and what that may mean and whether some people would feel more vulnerable as a clinician as a consequence of that. So I think it all depends on the support network that you have and the training you have. (5 team)

D. Governance and support

Participants agreed that adequate governance and support for the prescribing role is essential in order to ensure safe practice and to build confidence and competence. IP participants reported that their organisation/management had been supportive and that ongoing clinical governance support for prescribing was available to them, including CPD, clinical supervision, and access to NMP forum or meetings.

So we are really fortunate really because we have a GP in our team every day, and I use them still all the time. And I'm very lucky that I have two independent prescribing nurses, one who has been doing it for a long, long time.... So even now, I will call them up and have a chat and be like, 'I'm going to do this, this is their past medical history,' they'll have a look, 'this is what I'm thinking, what do you think? Great.' And I think, for me, that's really important, and I think I'll probably be doing that for a while still (7 Ph-IP)

We've set up a face-to-face forum that meets every two to three months. We are starting to invite speakers, but we also bring cases to that and we also email around, questions to those which are other prescribers, so, you know, 'I have this patient on x, y, z, considering doing this, what are your views on that?' [13 Ph-IP]

There was general agreement that IP is not appropriate for all physiotherapists and should be reserved for those practicing at advanced or specialist levels.

6.5.3.4 Service innovation and future development

There was little evidence of strategic planning for the use of IP, or that IP had instigated any major change to the way that services were structured or operated at the time of the study. Participants in sites 9 and 11 reported little or no change to the way the service was organised, were still mainly using PGDs and often referred patients on for analgesic medication. Participants in site 7 and 13 reported a gradual increase in referrals requiring medicines management and prescriptions.

I think my colleagues are starting to use me more. They tend to send people to me if they feel that they are not getting sufficient pain management. (13 Ph-IP)

Plans were in place for the future expansion of IP within teams, and for further development of advanced roles and services that were reliant on the IP qualification.

I think there's two of us that have qualified, another person qualified but still waiting annotation - to be on the professional register... but the vision is that in time we'll all be prescribers, so we can offer equity of service to all of our patients that we see. (9 Ph-IP)

... writing a proposal for one of the team do deliver spinal injections... (11 Ph-IP)

There was an expectation that those working at band 8A and above would be required to have the IP qualification in the future. No opinions were given as to whether this development may have negative consequences.

Now all 8As are expected to be independent prescribers. (14 Ph-NP)

Prescribing was also expected to enhance service delivery and care in: injection therapy for spinal pain, shoulder pain, peripheral and neurological pain, and oxygen therapy for respiratory conditions. Prescribing within first contact services in primary care was also seen as a potential means of improving patient care in the future.

We don't want a patient to wait till secondary care to get the right medication. So there's something about actually are we just papering over the cracks, whereas what we need to do is actually go back and educate the GPs, who are normally the first port of call... or we go out to primary care - that's where I think it will be more transformative. (12 Ph-NP)

6.5.3.5 Views on the independent prescribing programme

The prescribing programme was generally accepted as being sufficiently challenging and required substantial time commitment to undertake.

I feel I've benefitted significantly from the training... it's enhanced my skills, I think [and] I believe that my knowledge has improved. It was a generally tough course, and very time-consuming. (11 Ph-IP)

Participants benefited from improved pharmacological training and from learning alongside different healthcare professionals and in different settings. The broad exposure to a range of conditions in the course was seen as beneficial by some and the experience had also enhanced decision-making and consultation skills.

I had the opportunity of sitting in with our Out-of-Hours service... I spent a lot of time working with GPs... it was nice to... see how they managed consultations, but also how they come to their decision making. (13 Ph-IP)

Because the course is very wide spectrum in terms of what it teaches you, and with lots of differently health professionals you have to learn about everything really. (7 Ph-IP)

One thing it has certainly enhanced is the knowledge around anaphylaxis, and reactions to medications, certainly with the injections, because we list for injections. (11 Ph-IP)

6.5.4 Summary and comments

According to participants, the advent of PP-IP is of benefit to patients, health services and health professionals. IP was reported to contribute to reducing GP appointments, streamlining the patient journey, improving choice of treatment and enhancing the quality of advice and information given to patients about their medication. It also enabled services to continue when a doctor was not available. Benefits were similar to those previously reported in relation to prescribing by nurses and pharmacists ^{42, 76}.

The perceived need for IP within services was dependent upon the effectiveness of other methods to supply and administer medicines. Existing methods, particularly PGDs and exemptions, were considered adequate for the majority of patients seen by podiatrists and physiotherapists. These mechanisms continued to be used by participants regardless of their prescribing status. Rates of prescribing were low in comparison to the amount of medicines management activity undertaken within case sites, as confirmed by the observation data. While a minority of patients benefited from direct prescribing activity, the impact in terms of efficiency savings and outcomes was considered by interviewees to be considerable.

Barriers to IP included: problems accessing patient medical records, lack of patient follow-up, restricted time within appointments and the need for a prescribing budget. The time commitment required to undertake the course was also a deterrent. Along with requiring the necessary training and governance for IP, isolation from other prescribers, difficulty finding mentorship, and resistance from other health professionals, were mentioned as concerns. In addition, there were concerns about over-medicalised roles, increasing responsibilities and the potential that IP could be used as a cost saving initiative rather than for patient benefit.

Independent prescribing was widely welcomed for its positive impact on the reputation of podiatry and physiotherapy as professions and for facilitating advanced practice roles. Within physiotherapy especially, IP helped to resolve legislative 'grey areas' around existing practices. It was predicted that IP will become an essential qualification for senior and specialist roles, such as podiatric surgeons. Participants who had undertaken the training felt that they and their patients benefited from their improved knowledge around medicine management and safety. IP was also thought to bring the profession more in line with patient expectations, particularly around the role of surgeons and specialists in providing medicines management and advice.

Arrangements for clinical governance of prescribing were reported to be working well. At this early stage in the development of PP-IP, evidence of strategic planning was minimal, however IP was reported to be at the heart of future plans for service expansion and innovation in models of service delivery.

6.6 Audio Recorded Consultations Assessment

6.6.1 Data profile

A total of 55 audio recorded consultations were assessed.

Faulty recordings and staff illness resulted in fewer than the anticipated 5 recordings at 3 podiatry and 2 physiotherapy sites (Table 6.1). As a result, there were 32 assessments of non-prescribing sites and 23 of prescribing sites. Of the podiatry consultations, 3 were initial and 22 were follow-up consultations. Of the physiotherapy consultations, 22 were initial and 8 were follow-up consultations.

There were 22 items (out of a total of 26) where assessors agreed there was 'cause for concern/limited evidence that an item occurred', 17 of which occurred within PP-NP consultations and the remaining 5 occurred within PO-IP consultations. There was one item with an agreed rating of 'unsafe practice'; this was within a PO-NP consultation (Tables 6.21 to 6.26).

6.6.2 Physiotherapy consultation assessment results

There were 9 incidents where both assessors agreed that there was a 'cause for concern' and no agreed 'unsafe practice' identified in any physiotherapy consultation. All agreed incidents of 'cause for concern' were identified in consultations of non-prescribing physiotherapists (Tables 6.21 and 6.22)

6.6.2.1 Assessment and diagnosis

The majority of PT-IP consultations were rated as safe on most aspects of assessment and diagnosis; however, there was disagreement on 50% of consultations over the extent to which physiotherapists adequately explored current prescribed medication. Within PT-NP consultations, cause for concern was raised on 7 items: adequate exploration of current prescribed medicines, past medical history, previous episodes of the presenting problem, requesting relevant diagnostic tests and in one instance failing to identify a chief complaint. In addition, there was less than 50% agreement of safe practice on 4 items: exploring medical history, previous episodes of presenting problem, past family history and current prescribed medication.

Combining 'not applicable' and 'safe' ratings reduced disagreement on some items, in particular, whether or not use of over the counter or herbal medicines was discussed and the extent to which known allergies were determined.

Analysis of comments

Comments made by the assessors revealed that there was a single agreed instance where there was no evidence in the audio recording that the physiotherapist had identified a chief complaint or requested relevant diagnostic tests for a patient referred for injection therapy. However, both assessors noted that this information may have been present in the referral letter or discussed on a previous occasion.

Concern was raised in 3 different consultations over partial exploration of past medical history or of current medication use. This included lack of further exploration of a patient reporting to be unable to take some analgesia because of hypertension, a patient on medication for leukaemia and another patient taking gabapentin. A further concern was raised where the physiotherapist did not fully explore the previous episodes of the presenting problem.

6.6.2.2 Communication

The majority of PT-IP consultations were rated as safe on most aspects of communication; however, there was 50% or higher disagreement over the extent to which clear instructions were given about medicines and whether patients were provided self-management support. The majority of PT-NP consultations were rated safe on all aspects of communication, however there was agreed cause for concern on 2 items: working with the patient to make an informed choice and identifying and respecting patient values. Both concerns were raised in the same PT-NP consultation. There was 100% agreement of safe practice in respect to adapting to meet the needs of different patients in PP-IP and PP-NP sites.

Table 6.21 Physiotherapy independent prescriber consultation assessments

PT-IP consultation assessments (n=12)	Safe		Concern		Unsafe		Disagree	
	Count	%	Count	%	Count	%	Count	%
1. Identifies a chief complaint	10	83.3	0	0	0	0	2	16.7
2. Explores presenting symptoms	7	58.3	0	0	0	0	5	41.7
3. Explores management of problem to date	8	66.7	0	0	0	0	4	33.3
4. Determines previous episode of problem	10	83.3	0	0	0	0	2	16.7
5. Explores past medical history	9	75.0	0	0	0	0	3	25.0
6. Explores family/social history	9	75.0	0	0	0	0	3	25.0
7. Determines any known allergies	11	91.7	0	0	0	0	1	8.3
8. Explores current prescribed medication	6	50.0	0	0	0	0	6	50.0
9. Explores use of OTC/herbal products	10	83.3	0	0	0	0	2	16.7
10. Makes working diagnosis	8	66.7	0	0	0	0	4	33.3
11. Identifies a relevant physical examination	10	83.3	0	0	0	0	2	16.7
12. Considers psychosocial factors for treatment	7	58.3	0	0	0	0	5	41.7
13. Considers non-pharmacological treatment	8	66.7	0	0	0	0	4	33.3
14. Requests or interprets relevant diagnostic tests	10	83.3	0	0	0	0	2	16.7
15. Selects most appropriate treatment for patient	10	83.3	0	0	0	0	2	16.7
16. Establishes a treatment plan	10	83.3	0	0	0	0	2	16.7

Communication	Safe		Concern		Unsafe		Disagree	
	Count	%	Count	%	Count	%	Count	%
1.Explains nature of condition	8	66.7	0	0	0	0	4	33.3
2.Respects patients values and expectations	9	75.0	0	0	0	0	3	25.0
3.Works with patient to make informed choice	10	83.3	0	0	0	0	2	16.7
4.Supports patient to self-manage condition	6	50.0	0	0	0	0	6	50.0
5.Provides lifestyle advice or support	8	66.7	0	0	0	0	4	33.3
6.Adapts to needs of different patients	12	100.0	0	0	0	0	0	0.0
7.Gives clear instructions about medicines	5	41.7	0	0	0	0	7	58.3
8.Gives clear instructions about side-effects	10	83.3	0	0	0	0	2	16.7
9.Identifies care planning	9	75.0	0	0	0	0	3	25.0
10.Checks patients understanding	10	83.3	0	0	0	0	2	16.6

Table 6.22 Physiotherapy non-prescriber consultation assessments

PT-NP consultation assessments (n=18)	Safe		Concern		Unsafe		Disagree	
	Count	%	Count	%	Count	%	Count	%
1. Identifies a chief complaint	15	83.3%	1	5.6%	0	0%	2	11.1%
2. Explores presenting symptoms	15	83.3%	0	0.0%	0	0%	3	16.7%
3. Explores management of problem to date	12	66.7%	0	0.0%	0	0%	6	33.3%
4. Determines previous episode of problem	7	38.9%	1	5.6%	0	0%	10	55.6%
5. Explores past medical history	6	33.3%	2	11.1%	0	0%	10	55.6%
6. Explores family/social history	9	50.0%	0	0.0%	0	0%	9	50.0%
7. Determines any known allergies	16	88.9%	0	0.0%	0	0%	2	11.1%
8. Explores current prescribed medication	7	38.9%	2	11.1%	0	0%	9	50.0%
9. Explores use of OTC/herbal products	15	83.3%	0	0.0%	0	0%	3	16.7%
10. Makes working diagnosis	16	88.9%	0	0.0%	0	0%	2	11.1%
11. Identifies a relevant physical examination	15	83.3%	0	0.0%	0	0%	3	16.7%
12. Considers psychosocial factors for treatment	13	72.2%	0	0.0%	0	0%	5	27.8%
13. Considers non-pharmacological treatment	12	66.7%	0	0.0%	0	0%	6	33.3%
14. Requests or interprets relevant diagnostic tests	16	88.9%	1	5.6%	0	0%	1	5.6%
15. Selects most appropriate treatment for patient	14	77.8%	0	0.0%	0	0%	4	22.2%
16. Establishes a treatment plan	17	94.4%	0	0.0%	0	0%	1	5.6%

Communication	Safe		Concern		Unsafe		Disagree	
	Count	%	Count	%	Count	%	Count	%
1.Explains nature of condition	13	72.2%	0	0.0%	0	0.0%	5	27.8%
2.Respects patients values and expectations	16	88.9%	1	5.6%	0	0.0%	1	5.6%
3.Works with patient to make informed choice	13	72.2%	1	5.6%	0	0.0%	4	22.2%
4.Supports patient to self-manage condition	14	77.8%	0	0.0%	0	0.0%	4	22.2%
5.Provides lifestyle advice or support	13	72.2%	0	0.0%	0	0.0%	5	27.8%
6.Adapts to needs of different patients	18	100.0%	0	0.0%	0	0.0%	0	0.0%
7.Gives clear instructions about medicines	15	83.3%	0	0.0%	0	0.0%	3	16.7%
8.Gives clear instructions about side-effects	16	88.9%	0	0.0%	0	0.0%	2	11.1%
9.Identifies care planning	15	83.3%	0	0.0%	0	0.0%	3	16.7%
10.Checks patients understanding	14	77.8%	0	0.0%	0	0.0%	4	22.2%

6.6.3 Podiatry consultation assessment results

There were more areas of agreed 'concern' within podiatry consultations compared to physiotherapy consultations. These occurred for both prescriber (5) and non-prescriber (9) consultations. There was also a higher level of disagreement between podiatry assessors.

6.6.3.1 Assessment and diagnosis

There was over 70% disagreement as to whether PO-IPs or PO-NPs adequately explored known allergies or family/social history (Tables 6.23 and 6.24). In PO-IP consultations, there was less than 50% agreement over the extent to which podiatrists explored the presenting problem to date, discussed use of OTC medicines, or made a working diagnosis. Concerns related to assessment and diagnosis within prescriber consultations (n=3) arose in relation to: considering psychosocial factors, determining known allergies and exploring past medical history.

There was a lack of agreed safe practice on many (10 out of 16) items in PO-NP consultations, in particular in exploring use of OTC medicine, past medical history and current prescribed medicine. Concerns within podiatrist non-prescriber consultations arose in 4 items: selecting the most appropriate treatment, considering psychosocial factors, identifying a relevant physical examination and exploring past medical history.

Analysis of comments

Cause for concern was raised in relation to 3 items within a single Pod IP follow-up consultation for a patient with foot pain requiring surgery. Exploration of past medical history was partial (as evidenced on recording) and it was inconclusive as to whether an allergy to penicillin was acknowledged by the clinician. More attention could have been paid to the patient's anxiety about the risks involved in undergoing surgery within the consultation.

Within podiatry NP consultations, cause for concern was raised in three separate consultations. A partial exploration of medical history was a concern where the patient mentioned to the podiatrist that they had 'cured their diabetes'. There was a concern over whether a relevant physical examination was identified for a diabetic patient who had received their diabetic foot check from a practice nurse; however, the results of this were not discussed in the routine podiatric appointment. In another consultation by the same podiatrist, it was agreed that more attention could have been paid to psychological, social, environmental factors and the implication of verruca treatment for a patient who regularly played football. For the same patient, the podiatrist did not explore alternative treatment options or explain implications or risks of future surgery if the current treatment was unsuccessful.

6.6.3.2

Communication

Consultations with PO-IPs showed more agreed safe practice than those of PO-NPs. There was over 50% disagreement over the extent to which PO-IPs provided lifestyle support. In contrast, there was 50% or more disagreement in six items within PO-NP consultations, in particular providing lifestyle support, making informed choice and checking patients understanding.

Concerns relating to communication within PO-IP consultations (n=2) were in providing appropriate lifestyle advice and explaining the nature of the condition. In non-prescriber consultations, 4 communication concerns were raised: identifying future care needs, supporting patients to self-manage their condition, and working with patients to make informed choices. In addition, cause for concern and potentially unsafe practice issues were raised in podiatry non-prescriber consultations in relation to explaining the nature of the condition to the patient.

Analysis of comments

Comments from assessors on the 'unsafe' rating were for poor communication by the non-prescribing podiatrist who failed to provide a follow-up exploration or discuss the potential causes of a painful toe in a patient attending for routine podiatric care. Other comments on non-prescriber consultations related to providing partial information about treatment options and taking the opportunity to reinforce the importance of self-management and lifestyle advice for high risk patients with diabetes.

Comments on prescriber consultations were in relation to missed opportunities to provide lifestyle advice and support and explaining to patients the risks of inappropriate footwear and potential foot problems for patients with diabetes.

Table 6.23 Podiatry independent prescriber consultation assessments

PO-IP consultations (n=11)	Safe		Concern		Unsafe		Disagree	
	Count	%	Count	%	Count	%	Count	%
1. Identifies a chief complaint	8	72.7%	0	0.0%	0	0.0%	3	27.3%
2. Explores presenting symptoms	8	72.7%	0	0.0%	0	0.0%	3	27.3%
3. Explores management of problem to date	5	45.5%	0	0.0%	0	0.0%	6	54.6%
4. Determines previous episode of problem	6	54.5%	0	0.0%	0	0.0%	5	45.5%
5. Explores past medical history	5	45.5%	1	9.1%	0	0.0%	5	45.5%
6. Explores family/social history	3	27.3%	0	0.0%	0	0.0%	8	72.7%
7. Determines any known allergies	2	18.2%	1	9.1%	0	0.0%	8	72.7%
8. Explores current prescribed medication	7	63.6%	0	0.0%	0	0.0%	4	36.4%
9. Explores use of OTC/herbal products	4	36.4%	0	0.0%	0	0.0%	7	63.6%
10. Makes working diagnosis	5	45.5%	0	0.0%	0	0.0%	6	54.6%
11. Identifies a relevant physical examination	8	72.7%	0	0.0%	0	0.0%	3	27.3%
12. Considers psychosocial factors for treatment	6	54.5%	1	9.1%	0	0.0%	4	36.4%
13. Considers non-pharmacological treatment	8	72.7%	0	0.0%	0	0.0%	3	27.3%
14. Requests or interprets relevant diagnostic tests	10	90.9%	0	0.0%	0	0.0%	1	9.1%
15. Selects most appropriate treatment for patient	9	81.8%	0	0.0%	0	0.0%	2	18.2%
16. Establishes a treatment plan	8	72.7%	0	0.0%	0	0.0%	3	27.3%

Communication	Safe		Concern		Unsafe		Disagree	
	Count	%	Count	%	Count	%	Count	%
1.Explains nature of condition	6	54.6%	1	9.1%	0	0.0%	4	36.4%
2.Respects patients values and expectations	7	63.6%	0	0.0%	0	0.0%	4	36.4%
3.Works with patient to make informed choice	7	63.6%	0	0.0%	0	0.0%	4	36.4%
4.Supports patient to self-manage condition	6	54.6%	0	0.0%	0	0.0%	5	45.5%
5.Provides lifestyle advice or support	3	27.3%	1	9.1%	0	0.0%	7	63.6%
6.Adapts to needs of different patients	10	90.9%	0	0.0%	0	0.0%	1	9.1%
7.Gives clear instructions about medicines	11	100.0%	0	0.0%	0	0.0%	0	0.0%
8.Gives clear instructions about side-effects	10	90.9%	0	0.0%	0	0.0%	1	9.1%
9.Identifies care planning	8	72.7%	0	0.0%	0	0.0%	3	27.3%
10.Checks patients understanding	7	63.6%	0	0.0%	0	0.0%	4	36.4%

Table 6.24 Podiatry non-prescriber consultation assessments

PO-NP consultations (n=14)	Safe		Concern		Unsafe		Disagree	
Assessment and Diagnosis	Count	%	Count	%	Count	%	Count	%
1. Identifies a chief complaint	6	42.9%	0	0.0%	0	0.0%	8	57.1%
2. Explores presenting symptoms	4	28.6%	0	0.0%	0	0.0%	10	71.4%
3. Explores management of problem to date	6	42.9%	0	0.0%	0	0.0%	8	57.1%
4. Determines previous episode of problem	8	57.1%	0	0.0%	0	0.0%	6	42.9%
5. Explores past medical history	1	7.1%	1	7.1%	0	0.0%	12	85.7%
6. Explores family/social history	3	21.4%	0	0.0%	0	0.0%	11	78.6%
7. Determines any known allergies	3	21.4%	0	0.0%	0	0.0%	11	78.6%
8. Explores current prescribed medication	2	14.3%	0	0.0%	0	0.0%	12	85.7%
9. Explores use of OTC/herbal products	0	0.0%	0	0.0%	0	0.0%	14	100.0%
10. Makes working diagnosis	10	71.4%	0	0.0%	0	0.0%	4	28.6%
11. Identifies a relevant physical examination	9	64.3%	1	7.1%	0	0.0%	4	28.6%
12. Considers psychosocial factors for treatment	5	35.7%	1	7.1%	0	0.0%	8	57.1%
13. Considers non-pharmacological treatment	11	78.6%	0	0.0%	0	0.0%	3	21.4%
14. Requests or interprets relevant diagnostic tests	12	85.7%	0	0.0%	0	0.0%	2	14.3%
15. Selects most appropriate treatment for patient	8	57.1%	1	7.1%	0	0.0%	5	35.7%
16. Establishes a treatment plan	4	28.6%	0	0.0%	0	0.0%	10	71.4%

Communication	Safe		Concern		Unsafe		Disagree	
	Count	%	Count	%	Count	%	Count	%
1.Explains nature of condition	7	50.0%	1	7.1%	1	7.1%	5	35.7%
2.Respects patients values and expectations	8	57.1%	0	0.0%	0	0.0%	6	42.9%
3.Works with patient to make informed choice	2	14.3%	1	7.1%	0	0.0%	11	78.6%
4.Supports patient to self-manage condition	5	35.7%	1	7.1%	0	0.0%	8	57.1%
5.Provides lifestyle advice or support	3	21.4%	0	0.0%	0	0.0%	11	78.6%
6.Adapts to needs of different patients	11	78.6%	0	0.0%	0	0.0%	3	21.4%
7.Gives clear instructions about medicines	11	78.6%	0	0.0%	0	0.0%	3	21.4%
8.Gives clear instructions about side-effects	7	50.0%	0	0.0%	0	0.0%	7	50.0%
9.Identifies care planning	5	35.7%	1	7.1%	0	0.0%	8	57.1%
10.Checks patients understanding	3	21.4%	0	0.0%	0	0.0%	11	78.6%

6.7 Patient record audit

6.7.1 Source documents and demographics

6.7.1.1 Overview

The audit data provides details of the evidence that was available within physiotherapy and podiatry sites. This data is therefore limited and should be regarded as indicative, rather than a complete representation of service use.

The records of 153 patients (n=66 PP-IP, n=87 NP-PP) were reviewed (Table 6.25). The majority of participants were female (68.6%, n=109), age ranged 18-94 years (mean=58 years), with variable numbers of co-morbidities (range 0-6, mode= 0). The general quality of patient records and availability of source documents was mixed with only 45.2% (n=58) rated as good or very good and 23.4% (n=30) rated as barely adequate. PT and PO specific patient records were identified for 87.6% (n=134), whereas only 59.5% (n=91) included a copy of the GP letter sent following the PT or PO consultation. There was more evidence of PT and PO specific letters, and GP letters in records of those who had consulted PP-IPs (96.9% n=64), (74.2% (n=49) compared to NP-PPs (80.1%, n=70), (48.3% (n=42)) respectively.

Table 6.25 Patient record Audit: by profession and prescriber/non-prescriber

n (%)	Physiotherapist			Podiatrist		
	Prescribing n=42	Non- Prescribing n=44	Total n=87	Prescribing n=24	Non- Prescribing n=43	Total n=66
Source Documents available						
Referral letter	19 (45.2%)	40 (90.1%)	59 (68.7%)	24 (100%)	14 (32.6%)	38 (56.7%)
Physiotherapist/ podiatrist specific patient record	40 (95.2%)	43 (97.7%)	83 (96.5%)	24 (100%)	27 (62.8%)	51 (76.1%)
Letter sent to GP	32 (76.2%)	40 (90.1%)	72 (83.7%)	17 (70.8%)	2 (4.7%)	19 (28.4%)
Quality of available records (n=128) barely adequate	n=39 9 (21.4%) 10 (23.8%)	n=42 7 (15.9%) 11 (25%)	n=81 16 (19.8%) 21 (25.9%)	n=22 2 (9.1%) 7 (31.8%)	n=25 12 (48%) 12 (48%)	n=47 14 (29.8%) 14 (29.8%)
• fair	4 (9.5%)	19 (43.2%)	23 (28.4%)	0 (0%)	1 (4%)	1 (2.1%)
• good	16 (38.1%)	5 (11.4%)	21 (25.9%)	13 (59.1%)	0 (0%)	13 (27.7%)
• very good						
Patient Demographics						
Age, years, <i>mean (SD)</i>	54.5 (14.8)	52.9 (13.6)	53.7 (14.2)	66.2 (13.3)	62.8 (15.9)	64.5 (14.6)
<i>Gender</i>	19 (45.2%)	14 (31.8%)	33 (38.7%)	8 (33.3%)	7 (16.3%)	15 (22.4%)
Male						
Female	23 (54.8%)	30 (68.2%)	26.5 (61.3%)	16 (66.7%)	36 (83.7%)	52 (77.6%)
No. comorbidities, <i>mode (range)</i>	0 (0.0-1.0)	0 (0.0-2.0)	0 (0.0-2.0)	0 (0.0-6.0)*	0 (0.0-4.0)*	0 (0.0-6.0)
Medication						
Allergy status recorded	17 (40.4%)	4 (9.1%)	23 (26.7%)	11 (45.8%)	9 (20.9%)	20 (29.8%)
<i>Requested investigations/ tests</i>						
Blood test	1 (2.4%)	2 (4.5%)	3 (3.4%)	2 (8.3%)	0 (0.0%)	2 (3.0%)
X-ray	2 (4.8%)	1 (2.3%)	3 (3.4%)	2 (8.3%)	0 (0.0%)	2 (3.0%)
Ultrasound	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (8.3%)	0 (0.0%)	2 (3.0%)
MRI (magnetic resonance image)	6 (14.3%)	6 (13.6%)	12 (14.0%)	1 (4.2%)	0 (0.0%)	1 (1.5%)
NMR (nuclear magnetic resonance image)	0 (0.0%)	1 (2.4%)	1 (1.2%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Pathology (swab)	2 (4.8%)	0 (0.0%)	2 (2.3%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
No. medications listed at point consultation, <i>mean (range)</i>	3.0 (0.0- 10.0)	3.6 (1.0-12.0)	3.3 (1.0- 12.0)	5.1 (0.0-12.0)	2.9 (0.0- 10.0)	4.0 (0.0-12.0)
Referrals made in relation to condition						
Consultant specialist	n=28 9 (32.1%)	n=25 4 (16.0%)	n=53 13 (24.5%)	n=11 1 (9.1%)	n=0 0 (0.0%)	n=11 1 (9.1%)
Clinical nurse specialist/nurse consultant	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
General Practitioner	1 (3.6%)	1 (4.0%)	2 (3.8%)	2 (18.2%)	0 (0.0%)	2 (18.2%)
GP based practice nurse/nurse practitioner	1 (3.6%)	0 (0.0%)	1 (1.9%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Community nurse	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (18.2%)	0 (0.0%)	2 (18.2%)
Pharmacist	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Other healthcare professionals (e.g. dietician, podiatrist, physiotherapist, plaster technician, orthotics, & psychologist)	11 (39.2%)	12 (48.0%)	23 (43.4%)	6 (54.5%)	0 (0.0%)	6 (54.5%)
Social Services	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Radiology	6 (21.4%)	8 (32.0%)	14 (26.4%)	0 (0.0%)	0 (0.0%)	0 (0.0%)

Unintended consequences/adverse events/medication errors						
<i>Is there documentary evidence of:</i>						
	Physiotherapist			Podiatrist		
	Prescribing n=42	Non- Prescribing n=44	Total n=86	Prescribing n=24	Non- Prescribing n=43	Total n=67
Deterioration of condition/ symptoms	0 (0%)	0 (0%)	0 (0%)	1 (4.2%)	0 (0.0%)	1 (1.1%)
Additional/alteration of prescription following initial consultation	0 (0%)	0 (0%)	0 (0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Adverse drug reaction (ADR)	0 (0%)	0 (0%)	0 (0%)	n=1	n=0	1 (1.1%)
ADR described	N/A	N/A	N/A	1 (100%)	0 (0.0%)	1 (100%)
Suspected drug identified	N/A	N/A	N/A	1 (100%)	0 (0.0%)	1 (100%)
Yellow card completed & submitted	N/A	N/A	N/A	0 (0.0%)	0 (0.0%)	0 (0.0%)
Copy in notes	N/A	N/A	N/A	0 (0.0%)	0 (0.0%)	0 (0.0%)
Duration of medication	N/A	N/A	N/A	0 (0.0%)	0 (0.0%)	0 (0.0%)
Does not meet yellow card criteria	N/A	N/A	N/A	0 (0.0%)	0 (0.0%)	0 (0.0%)
Reported to GP or service provider	N/A	N/A	N/A	1 (100%)	0 (0.0%)	1 (100%)
Change in prescription following ADR	N/A	N/A	N/A	1 (100%)	0 (0.0%)	1 (100%)
Quality of letters sent to GP/service providers. <i>Is there documentary evidence of:</i>	n=33	n=39	n=72	n=17	n=2	n=19
Date consultation	33 (100%)	39 (100%)	72 (100%)	17 (100%)	2 (100%)	19 (100%)
Date letter	33 (100%)	39 (100%)	72 (100%)	17 (100%)	0 (0.0%)	17 (89.4%)
PP name/contact details	17 (51.5%)	25 (64.1%)	42 (58.3%)	16 (94.1%)	0 (0.0%)	16 (84.2%)
Recipient name/address	31 (94.0%)	38 (97.4%)	69 (95.8%)	17 (100%)	1 (50%)	18 (94.7%)
Patient record number	33 (100%)	39 (100%)	72 (100%)	17 (100%)	0 (0.0%)	17 (89.4%)
Patient name	33 (100%)	39 (100%)	72 (100%)	17 (100%)	2 (100%)	19 (100%)
Patient contact address	33 (100%)	39 (100%)	72 (100%)	17 (100%)	0 (0.0%)	17 (89.4%)
Patient date of birth	33 (100%)	37 (94.9%)	70 (97.2%)	17 (100%)	1 (50%)	18 (94.7%)
Summary of consultation findings	30 (90.1%)	38 (97.4%)	68 (94.4%)	17 (100%)	2 (100%)	19 (100%)
Treatment plan	28 (84.5%)	39 (100%)	72 (100%)	17 (100%)	2 (100%)	19 (100%)
Review date	3 (9.1%)	3 (7.7%)	6 (8.3%)	9 (52.9%)	0 (0.0%)	9 (47.3%)
Number of words, mean (SD)	339.1 (183.1)	316.3 (117.0)	327.7 (150.1)	157.7 (56.5)	34.0 (5.6)	95.9 (31.1)

6.7.1.2 Professional group

Physiotherapist

The records of 86 patients (n=42 prescriber (PT-IP), n=44 non-prescriber (PT-NP)) who consulted a physiotherapist were reviewed. The majority of participants were female (61.6%, n=46), age ranged 18-81 years (mean=54.5 years), with variable numbers of co-morbidities (range 0-2, mode= 0). There was no significant differences in the general quality of patient records and availability of source documents between PT-IP and PT-NP which were mixed: Of the 81 records that were assessed 54.6% (n=24) PT-NP and 47.6% (n=20) PT-IP were rated as good or very good and 15.9% (n=7) PT-NP, 21.4% (n=9) PT-IP records rated as barely adequate. Nearly all (97.7% (n=43) PT-NP, 95.2% (n=40), PT-IP) included a physiotherapist specific patient record. The majority (n=40, 90.1%) of those attending PT-NP included a referral letter, and copy of the GP letter sent following the consultation compared to only 45.2% (n=19), 76.2% (n=32) of those who attended a physiotherapist prescriber.

Podiatrist

The records of 67 patients (n=24 prescriber (PO-IP), n=43 non-prescriber (PO-NP)) who consulted a podiatrist were reviewed. The majority of participants were female (77.6%, n=52), age ranged 24-94 years (mean=64.5 years), with variable numbers of co-morbidities (range 0-6, mode= 0). Patients attending the PO-IP had a statistically greater number of co-morbidities than those attending the PO-NP (p=0.016).

The general quality of patient records and availability of source documents was considerably higher in the PO-IP records. Of the 47 records assessed 59.1% (n=13) PO-IP were rated as very good compared to only 4% (n=1) of PO-NPs. Forty-eight percent (n=12) of PO-NP records were rated as barely adequate or fair.

Referral letters were identified in all PO-IP (n=24, 100%) records but only 32.6% (n=14) were found in PO-NP records. Similarly, a copy of the GP letter sent following the consultation was found in the majority (70.8%, n=17) of records in those who attended a PO-IP compared to only 4.7% (n=2) of those who had attended a podiatrist non-prescriber.

6.7.2 Medication

6.7.2.1 Overview

Participants were on a variable number of medications at the point of consultation (range 0-12, mean =3.5.5), with only 41 (26.8%) recording the allergy status of patients. A total of 27 tests/ investigations were requested, the majority (n=13, 48.1%) of which were for Magnetic Resonance Imaging (MRI) and 18.5% for either a blood test (n=5) or x-ray (n=5).

6.7.2.2 Professional group

Physiotherapist

Participants were on a variable number of medications at the point of consultation (range 1-12, mean =2.5). The allergy status of patients was poorly documented with evidence found in only 9.1% (n=4) PT-NP, and 40.1% (n=17) of PT-IP records. A total of 21 tests/ investigations were requested, the majority (n=12, 57%) of which for both NP-PT (n=6) and PT-IPs (n=6) were for MRI. No requests for ultrasound were made by either PT-NP or PT-IPs.

Podiatrist

Participants were on a variable number of medications at the point of consultation (range 0-12, mean =4) (PO-IP=5.1-PO-NP=2.9). The allergy status of patients was relatively poorly documented with evidence found in only 20.1% (n=9) NP-PO, and 45.8% (n=11) of PO-IP records. Only 7 tests/ investigations were requested, all of which were made PO-IPs. No requests for pathology or NMR were made by either PO-NPs or PO-IPs.

6.7.3 Referrals

6.7.3.1 Overview

A total of 64 referrals were made 14 (21.8 %) of which were for either a consultant specialist or radiology, and 43 (45.3%) to other healthcare professionals (e.g. dietician, podiatrist, physiotherapist, plaster technician, orthotics, psychologist). No referrals were made to clinical nurse specialists, pharmacist or social services.

6.7.3.2 Professional group

Physiotherapist

A total of 53 referrals were made (n=28 PT-IP, n=25 PT-NP), 14 (26.4%) of which were for radiology n=6 PT-IP, n=8 PT-NP). PT-IPs requested 9 (69.2%) of the 13 consultant specialist referrals. Of the 23 (43.4%) referrals made to other health care professionals (e.g. dietician, physiotherapist, or psychologist), similar number were made by PT-IPs (n=11, 39.2%) and PT-NPs (n=12, 48%). No

referrals were made to clinical nurse specialists, community nurses, pharmacists or social services.

Podiatrist

Only 11 referrals were made all of which were by PO-IPs, 6 (54.5%) were to other healthcare professionals (e.g. dietician, podiatrist, plaster technician, or psychologist). Two referrals each were made to GPs (18.2%) and community nurses (18.2%). No referrals were made to clinical nurse specialists, GP based nurses, pharmacists, radiology or social services.

6.7.4 Quality of GP letters

6.7.4.1 Overview

The quality of 91 (n=50 PP-IP, n=41 NP-PP) letters sent to GP/ service providers were available for assessment, 98.6% (n=88) of which were written electronically. All of the letters (n=91, 100%) included the consultation date, and patient name, and 89 (97.8%) letter date, patient record number, and address with only 63.7% (n=58) including the PP name/ contact details and 16.4% (n=15) a review date.

6.7.4.2 Professional group

Physiotherapist

The quality of 72 (n=33 PT-IP, n=39 PT-NP) letters sent to GP/ service providers were available for assessment. All of the letters (n=72, 100%) included the consultation date, letter date, patient record number, patient name and address and treatment plan. Details of the physiotherapist name and contact details was identified less frequently (n=17 (51.5%) PT-IP, n=25 (64.1%) PT-NP), with review dates found in only a few letters (n=3 (9.1%) PT-IP, n=3 (7.7%) PT-NP).

Podiatrist

Only 28.4 % (n=19) of records reviewed contained a letter that had been sent to GP/ service providers (n=17 PO-IP, n=2 PO-NP) and were assessed. The quality of the PO-IP letters was high and all (100%, n=17) included details the consultation date, letter date, recipient name/ address, patient record number, patient date of birth, name and address, a summary of the consultation and treatment plan whereas only 52.9% (n=9) contained information about a review date.

The two letters in records related to PO-NP consultations were much less complete with neither containing information on letter date, PO contact details, patient record number, patient contact address or review date.

6.7.5 Unintended consequences

One (1.5%) episode of deterioration of symptoms was identified and also recorded as an adverse drug reaction in a PO-IP site. The suspected drug was identified, reported to the GP and the patient's prescription then changed. However, there was no evidence as to whether this Adverse Drug reaction (ADR) met the yellow card criteria or if a yellow card had been submitted.

6.8 Prescription audit

6.8.1 Sample profile

Prescriptions were issued for 17/235 patient consultations with PP-IPs, 15 of which were collected and assessed from 4 sites, 9 prescriptions from two podiatrist IPs (Site 3 & 10) and 6 from two physiotherapy IPs (site 9 & 13). Faulty images meant that 2 prescriptions that were issued were not available for assessment.

6.8.2 Results

Prescriptions

Seventeen medicines, i.e. an average of 1.1 items per prescription, were issued. All prescriptions were hand written (FP10=6, Hospital prescriptions=9). The majority, 9 were for antibiotics, 3 non-steroidal anti-inflammatory drugs, 2 proton pump inhibitors and 3 neuropathic (2 tricyclics and 1 antiepileptic).

Conditions/Products prescribed

The majority of products, 52.9% (n=9) were antibiotics, 17.6% (n=3) non-steroidal anti-inflammatory drugs, and neuropathic (2 tricyclics and 1 antiepileptic) and 11.7% (n=2) proton pump inhibitors

Prescribing documentation

All prescriptions (100%, n=15) were hand written on the appropriate documentation, used correct terminology and written generically (see Table 6.25).

Drug Dosage and duration information

100% (n=15) provided information on dosage number. Accurate product information (i.e. strength and preparation) was included on nearly all items prescribed (94.4%, n=16) and confirmed using field notes from each of the case sites.

Only 60% (n=9) provided information on the dosage frequency, with 81.8% (n=9) providing details on either the quantity to be supplied or the number of days of treatment required (4 prescriptions being excluded from this aspect due to poor quality of the copied prescriptions used for assessment).

Instructions for patients

All provided clear and accurate instructions regarding the timing and frequency of medicines (see Table 6.26).

Table 6.26 Assessment of Prescriptions

	Yes	%	No	%	Disagree	%	Level of agreement
Dosage number	15	100%	0	0.0%	0	0.0%	100%
Appropriate generic prescribing	15	100%	0	0.0%	0	0.0%	100%
Uses appropriate prescription form	15	100%	0	0.0%	0	0.0%	100%
Clear & accurate instructions re (frequency, and timing of treatment)	15	100%	0	0.0%	0	0.0%	100.0%
Accurate, appropriate product dose and preparation	14	93.3%	1	6.7%	0	0.0%	100%
Correct terminology	14	93.3%	1	6.7%	0	0.0%	100%
Written legibly in ink	14	93.3%	1	6.7%	0	0.0%	100%
Number of days stated or quantity to be supplied	9	81.8%	2	18.2%	0	0.0%	100%
Dose frequency in words	6	40.0%	9	60.0%	0	0.0%	100%

7 Economic analysis

7.1 Patient level care delivery

Service delivery: Comparison of IP and NP on the key indicators of service delivery selected for the costing analysis is shown in Table 7.1.

Physiotherapists: PT-IPs had significantly longer consultation duration and consulted colleagues about patients significantly more often than PT-NPs (17.8% vs 0.9%). There were differences in propensity for new medications to be required (administered or prescribed), order tests and to refer between IP and NP across the PT sites. Patients requiring new medications (25.2% of patients of IPs, 20.0% of patients of NPs) received just over one medication each (mean 1.11, SD 0.42 from IPs, mean 1.04, SD 0.21 from NPs).

Podiatrists: Data indicate that frequency with which new medications were required and tests ordered during the consultation were significantly higher for IP than for NP. There was a trend for the consultation duration to be higher for IP than NP ($p=0.073$). One quarter of the patients of IPs required medications (mean 1.22, SD 0.61 medications / patient) compared to less than 10% of the patients of NPs (mean 1.27, SD 0.47 medications / patient). According to the audit sample, PO-IPs ordered tests for 29.2% of patients, whilst PO-NPs did not order any tests. Consultation durations of PO-IPs were longer than NPs by over 7 minutes (23.4 vs 16.9 minutes). IPs also did more referring, although the numbers for both groups were small and the difference was not significant.

Planning of follow up consultations was higher in PO than PT but within the professions, there was no significant difference between IP and NP. After removing unplanned consultations reported by patients in the two months after the original consultation that were considered (by 2 independent reviewers) to be unamenable to the treatment delivered in the index consultation, only four items of unplanned service utilisation remained across the whole sample of PO and PT. All of these related to obtaining treatment for pain.

Table 7.1 Comparison of independent prescribers and non-prescribers, by profession, on variables used in the cost analysis

Professional group	Prescribing status		Number of new medications required (Observation Q6)	Number of tests requested / patient (Sample audit)	Consultation time in minutes / patient (Observation Q1)	Discussions with colleagues in minutes/ per patient (Observation Q9,10)	x	Patients receiving referral (not for tests) (Observation Q11)	Patients with planned follow up (Observation Q15)	Patients reporting verified unplanned consultations within 2 months (Patient questionnaire)
PODIATRY	Independent prescriber (IP)	N	128	24	128	128	N	128	128	57
		Missing	5	109	5	5	Yes N	17	110 (0 by phone)	0
		N, % of zeros	93, 72.7%	17, 70.8%	0	109, 85.2%	Yes %	13.3%	85.9%	0%
		Mean	0.328	0.375	24.27	0.976				
		SD	0.616	0.647	24.32	2.682				
		Median	0	0	16	0				
		IQR	0 to 1	0 to 1	11 to 27.75	0 to 0				
	Non prescriber (NP)	N	124	32	123	124	N	124	124	47
		Missing	3	95	4	3	Yes N	6	111 (7 by phone)	1
		N, % of zeros	114, 91.9%	32, 100%	0	111, 89.5%	Yes %	4.8%	89.5%	2.1%
		Mean	0.105	0	16.88	0.726				
		SD	0.379	0	9.86	2.867				
		Median	0	0	16	0				
		IQR	0 to 0	0 to 0	10 to 23	0 to 0				
	Significant difference (p)		MWU 0.001	MWU <0.0005	MWU 0.073	MWU 0.349		Chi Sq 0.20	Chi Sq 0.387	FE 0.452
PHYSIO-THERAPY	Independent prescriber (IP)	N	107	42	107	107	N	107	107	47
		Missing	9	74	9	9	Yes N	32	54 (8 by phone)	1
		N, % of zeros	75, 70.1%	32, 76.2%	0	88, 82.2%	Yes %	29.9%	50.5%	2.1%
		Mean	0.327	0.262	27.64	1.802				
		SD	0.546	0.497	14.10	5.585				
		Median	0	0	24	0				
		IQR	0 to 1	0 to 0.25	18 to 34	0 to 0				
	Non prescriber (NP)	N	115	44	115	115	N	115	115	46
		Missing	7	78	7	7	Yes N	34	51 (1 by phone)	2
		N, % of zeros	87, 75.7%	33, 75.0%	0	114, 99.1%	Yes %	29.6%	44.3%	4.3%
		Mean	0.252	0.250	20.83	0~				
		SD	0.456	0.438	10.46	0~				
		Median	0	0	19	0				
		IQR	0 to 0	0 to 0.75	14 to 28	0 to 0				
	Significant difference (p)		MWU 0.336	MWU 0.949	MWU <0.0005	MWU <0.0005		Chi Sq 0.956	Chi Sq 0.361	FE 0.617

Costs: Differences in costs of consultation duration were calculated IP v NP for podiatry and physiotherapy groups using validated unit costs¹⁹⁴ applied to the Agenda for Change (AfC) band 8a. Hourly rates applied pro-rata to the mean consultation duration for each group, showed that, compared to the cost of a NP consultation, the IP consultation is, on average, £8.62 for podiatry and £7.95 more costly for physiotherapy (Table 7.2). The grade 8a band (AfC role of principal) was used as the basis for the comparison between IP and NP because an analysis of the bandings across the case study sites showed variability, but that grade 8a was the ‘average’ for podiatrists and the most common band for physiotherapists. Amongst the podiatrists, the IPs were at band 7 (advanced / team leader), 8a (principal) and 9 (consultant), whilst two of the NPs were band 9 and the third was band 6 (specialist). Participating physiotherapists were all band 8a, except one NP was band 8c, and one IP was band 7. The salary of a grade 9 professional is twice that of grade 8a, so at that higher level, the differences in the cost of consultations between IP and NP would be doubled. Use of grade 7 instead of grade 8a would reduce the differences between IP and NP by about £1.20 per consultation.

Table 7.2 Comparison of consultation costs IP v NP, by professional group

Professional group	Prescribing status	Mean consultation time (minutes)	Unit cost, £ 2015, AfC grade 8a*	Mean consultation cost £, 2015	Difference cost IP v NP £, 2015
PODIATRY	Independent prescriber	24.27	£70/hour	£28.31	£8.62
	Non prescriber	16.88	£70/hour	£19.69	
	Significant difference	MWU p= 0.073			
PHYSIOTHERAPY	Independent prescriber	27.64	£70/hour	£32.25	£7.95
	Non prescriber	20.83	£70/hour	£24.30	
	Significant difference	MWU p<0.0005			
MWU: Mann Whitney U test * Unit costs of health and social care 2015 (Curtis & Burns 2015) based on AfC band 8a nurses because unit costs for POD and PT not provided, but annual basic salary of band 8a nurses and band 8a allied health professionals are shown as similar.					

Consultation costs of POs and PTs are increased when they take the time of colleagues to discuss their patients. POs engaged other colleagues in discussions for over 10% of patients (14.8% of patients of IPs, 10.5% of patients of NPs, difference not significant). These discussions were reported to have lasted around 7 minutes. The IPs discussed a higher proportion of their patients with a medical colleague, rather than a colleague in the same profession, thereby likely to be

incurring higher costs (Table 6.28). The information on colleagues consulted is not precise however, so firm conclusions cannot be drawn from this analysis. Some POs were band 9 (consultant), so reporting discussions with 'same' professional would imply higher costs than are indicated in the table, which are based on AfC band 8a. The IPs in the PT group consulted colleagues about patients significantly more often than the NPs (17.8% vs 0.9%), and most discussions were with medical colleagues, averaging 9.5 minutes per discussion (Table 7.3).

Table 7.3 Discussion with colleagues about patient

Professional group	Prescribing status	Number and % of all patients seen for whom discussion occurred with colleague	Mean (SD) minutes in discussions with colleague per patient	Discussion with same professional n, mean (SD) minutes	Same colleague cost / discussion* (£, 2015)	Discussion with medical professional n, mean(SD) minutes	Medical colleague cost / discussion* (£, 2015)
PODIATRY	Independent prescriber	19 (14.8%)	6.89 (3.20)	11, 6.8 (3.6)	£7.93	8, 7.0 (2.8)	£15.98
	Non prescriber	13 (10.5%)	6.92 (6.14)	12, 7.3 (6.3)	£8.52	1, 3.0 (0.0)	£6.85
	Significant difference	p=0.299~	p=0.493^				
PHYSIOTHERAPY	Independent prescriber	19 (17.8%)	10.61 (9.68)	3, 19.5 (14.8)	£22.75	16, 9.5 (8.9)	£21.69
	Non prescriber	1 (0.9%)	0 (n/a)	1, time missing	Not known	0, n/a	0
	Significant difference	p<0.0005#	n/a				
# Fishers Exact test; ~ Chi squared test; ^ Mann Whitney U test							
* Unit costs of health and social care 2015 (Curtis and Burns 2015), pro rata based on £70/ hour for same professional i.e. AfC band 8a, as in Ec2 above, and £137/ hour for medical consultant							

Costs could not be estimated for the other elements of activity considered relevant to the comparison of IP and NP. A breakdown of tests ordered is shown in Table 7.4 with the unit costs presented. However, the tests data were drawn from the audit (a small sample of records in each site) and should thus be treated with caution. Data on the type and dose of new medications required and referrals were incomplete, so costs could not be calculated. The data on frequency of planned follow up was incomplete so accurate costings could not be calculated, but the follow up rates (yes vs no follow up scheduled) were very similar within professions so it might be acceptable to assume that this element would not be a major source of difference between the costs of IP and NP. There were only four unplanned re-consultations for the same problem across the whole sample (after re-consultations judged unavoidable were removed). These all related to patients (3 from NPs, 1 from IP) seeking further pain relief. Such small numbers do not provide an accurate basis for drawing conclusions about differences between IP and NP other than to suggest that costs associated with this factor are small for both groups.

Table 7.4 Number and type of tests by profession and prescriber status

Professional group	Prescribing status	Number and % of all patients seen having tests	Mean (SD) tests per patient	Blood tests	X-ray	Ultra sound	MRI	Bone scan	Swabs
PODIATRY	Independent prescriber	7 (29.2%)	1.29 (0.49)	2	2	2	1	0	2
	Non prescriber	0 (0%)	n/a	0	0	0	0	0	0
	Significant difference	p=0.001#	n/a						
PHYSIO-THERAPY	Independent prescriber	5 (11.9%)	1.10 (0.32)	1	2	0	8	0	0
	Non prescriber	3 (6.8%)	1.0 (0)	2	1	1	6	1	0
	Significant difference	p=0.898~	p=0.294^						
Unit costs from NHS national schedule of reference costs 2014-15*				£3.00	£12.00	£57.00	£137.23	£200.71	£7.00
# Fishers Exact test; ~ Chi squared test; ^ Mann Whitney U test * Blood tests: DAPS08; X-ray: Interventional radiology WF01C; Ultra sound: Vascular ultrasound RD472; MRI: 19 years and over one area without contrast RD01A; Bone scan: 19 years and over nuclear bone scan RN16A; Swabs: microbiology DAPS06.									

Consequences: Patient satisfaction with the consultation and with advice received during the consultation was high for IP and NP in both the PO and PT groups. There was no significant difference in satisfaction measures between the IP and PT and NP for POs, or for the PT regarding satisfaction with the consultation. Compared to the patients of the PT-NPs, however, the patients of PT-IPs were significantly more satisfied with the advice they received. Satisfaction with advice was similar between patients of PO-IPs and PO-NPs (Table 7.5).

Analysis of changes in the self-reported health status of the patients between baseline and follow up at 2 months using EQ-5D-5L found no significant difference in change scores, IP v NP, for either PO or PT (Table 7.5). It is notable, however, that the health status at baseline of patients of PO- IP and PO-NP were similar, but patients of PT-IP reported significantly lower health status than those of PT-NP. Follow up EQ-5D-5L scores were available for only a small number of participants reducing the validity of the change score comparisons for this sample.

Table 7.5 Consequences – Satisfaction after the consultation; Baseline health status (EQ-5D-5L) with changes over 2 months - comparison of IP v NP, by professional group

	POD IP			POD NP			Sig diff (p)#	PT IP			PT NP			Sig diff (p)#
	N	Mean	SD	N	Mean	SD		N	Mean	SD	N	Mean	SD	
Overall satisfaction with consultation [^]	87	4.72	0.50	81	4.63	0.62	0.277	59	4.68	0.47	69	4.54	0.68	0.167
Satisfaction with advice [^]	86	4.36	0.97	79	4.32	0.86	0.758	60	4.52	0.62	70	4.13	0.99	0.010
ED-5D-5L Baseline*	82	0.7445	0.25	82	0.7581	0.25	0.731	57	0.5836	0.30	69	0.6856	0.24	0.040
EQ-5D-5L Follow-up*	39	0.7934	0.19	34	0.7678	0.26		26	0.6540	0.27	28	0.7278	0.22	
EQ-5D-5L Change [~]	33	0.0797	0.22	30	0.0978	0.17	0.716	25	0.0763	0.29	28	0.0012	0.18	0.253
QALY gained		0.04513			0.04643				0.03577			0.03948		
*Based on all available observations; ~ where both baseline and follow up data available														
[^] Likert scale scored from 1 (Strongly dissatisfied) to 5 (Strongly satisfied); # Unpaired t-test														

7.2 Training costs and benefits

Regarding costs to the NHS associated with PP-IP training, PPs who responded to the baseline questionnaire came from seven different HEIs (PO) and 23 different HEIs (PT). Most (76%) stated their employer or an NHS agency paid the fees; others self-funded. A large range of fee levels were reported, with a mean cost for the IP conversion course of £686, SD £743 (n=12) and £1598, SD £334 (n=9) for the combined independent and SP programme. Those undertaking the IP conversion course reported an average of 6.75 (PO) and 8.10 (PT) days of either face-to-face teaching or distance learning, whereas those undertaking the combined independent and SP programme are required to complete the equivalent of 26 days. Paid study leave was reported, with a mean of 5.44 (SD 8.05) (n=9) days for those on the IP conversion course and 17.33 (SD 9.22) days (n=12), for those undertaking the combined independent and SP programme.

It was not possible to ascertain from the data the exact amount of time that PPs spent away from practice (vs. giving up own time) to undertake IP training. The majority of trainee PP-IPs reported that their DMP was a consultant (76.3%, POs and 65.2% PTs), and most of the rest were supervised by a GP. Respondents on the IP conversion course (n=15) reported a mean of 30.13 (SD 22.08) hours of supervision, whereas those on the combined independent and SP programme (n=17) reported a mean of 49.71 (SD 27.57) hours of supervision with their DMP.

From the private perspective, respondents reported a mean of 23 days PO and 17 days PT in lost leisure time from studying, but the variability was very large (range 0 to 95 PO, 0 to 100 PT). Most respondents reported no out-of-pocket expenses associated with the training programme. Across the 15 trainee PP-IPs who did report incurring costs for travel and books, the mean was £192, and maximum £500 (reported by four individuals). Four trainee PO-IPs (19.0% of respondents) and three trainee PT-IPs (6.7%) stated they self-funded the IP course. For both POs and PTs, increase in income was the least important reason given for undertaking IP training. Slightly higher proportions, especially amongst PTs, recognised the potential for improving job prospects from obtaining the IP qualification. Most important reasons for undertaking IP training were improving patient access to medicines and making better use of their skills. Improving job satisfaction and, to a lesser extent professional status, were also important reasons that were reported (Table 7.6).

7.3 Summary

The available data from the case sites suggest that for both podiatrists and physiotherapists in this study, care delivery by independent prescribers was more resource intensive and costly than by non-prescribers. This arose through longer consultation duration, more discussions with colleagues (PTs), and a higher

frequency of requiring new medications and ordering of tests (POs). Patient satisfaction levels were high in all groups but, compared to the patients of PT-NPs, the patients of PT-IPs were significantly more satisfied with the advice they received. The analysis provides a first assessment of the economics aspects of this policy initiative, but more research is needed.

Table 7.6 Stated reasons for undertaking IP training

Reason	Podiatrists								Physiotherapists							
	n	Definitely		Possibly		Not at all		n	Definitely		Possibly		Not at all			
		n	%	n	%	n	%		n	%	n	%	n	%		
Improve quality of care	26	24	92.3	2	6.7	0	0	56	56	100	0	0	0	0		
Improve patient access to medicines	27	26	96.3	1	3.7	0	0	56	51	91.7	4	7.1	1	1.8		
Improve patient choice	25	17	68.0	8	32.0	0	0	56	39	69.6	13	23.2	4	7.1		
Meet organisation targets	24	13	54.2	10	41.7	1	4.2	56	20	35.7	25	44.6	11	19.6		
Support development of new type of service	24	14	58.3	8	33.3	2	8.3	56	34	60.7	18	32.1	4	7.1		
Make better use of own skills	26	26	100	0	0	0	0	56	52	92.9	4	7.1	0	0		
Improve job satisfaction	25	19	76.0	6	24.0	0	0	56	41	73.2	14	25.0	1	1.8		
Increase own professional status	26	17	65.4	7	26.9	2	7.7	56	29	51.8	21	37.5	6	10.7		
Increase income	24	0	0	8	33.3	16	66.7	55	4	7.3	12	21.8	39	70.9		
Improve own job prospects	24	6	25.0	7	29.2	11	45.8	56	14	25.0	27	48.2	15	26.8		

8 Discussion

Objective 1: Describe and classify the services provided by Physiotherapist and Podiatrist independent prescribers

Results from our national survey of trainee PP-IPs and work sampling indicate that the first wave of physiotherapists and podiatrists to undertake IP training were mainly highly qualified, experienced practitioners working in specialist or senior roles. While it appears that PP-IP is developing in line with original policy intention, that it would improve access and quality of care in range of settings ^{13, 18, 195}, there is considerable variation in service configuration between and within professions. A number of points are highlighted for further consideration.

Profile of Physiotherapist and Podiatrist Independent Prescribers

Our data indicate that the first wave of PP-IPs has more than 10 years of experience in their area of practice (82%), are employed on Agenda for Change (or equivalent) band 8 or higher (58%), with a Masters or PhD level qualification (50%), providing acute care services. Our data indicate that PPs planned to prescribe on a regular basis, with an overall volume of prescribing suggestive of 1-2 items per day (11 items per week). There was however, uncertainty over the extent to which PP-IPs would be involved in prescribing controlled drugs or mixing of medicine, this was largely due to the uncertainty of the legislation at the time of the survey. Under a third (23%) anticipated that if the legislation changed they would prescribe controlled drugs.

These results are consistent with what might be expected from early pioneers undertaking a new initiative such as independent prescribing ¹⁹⁶. A similar demographic profile was found when independent prescribing rights were originally introduced for all nurses ^{13, 22}, in that the first wave reported high levels of experience and prescribed frequently ^{87, 197}. The highest level of educational qualification reported by PP-IPs is in line with that reported by nurse prescribers in specialist pain roles⁶⁸. As IP has become more embedded, evidence suggests that more recent cohorts of nurses undertaking NMP training tend to have less experience prior to undertaking the prescribing role ²⁸ and report lower volumes of prescribing ^{28, 30, 198}.

Classification of services

Results highlight that the majority of PP-IPs, worked in multi-professional services, particularly physiotherapists, across multiple sectors of care, with a small number working in private practice. There was however, a high level of

variation in the types of services provided, making it difficult to classify models of care. A lack of evidence relating to models of prescribing practice and medicines management activities, particularly in podiatry was similarly confirmed in our review of the literature. The diverse nature of service delivery is in line with previous studies in nurse prescribing^{67,197,199} which have reported the challenges associated with identifying the most efficient and acceptable models of care²⁰⁰. These findings are perhaps not surprising given that variations and inconsistencies in AHPs roles have previously been reported²⁰¹ as has the commissioning and provision of physiotherapy services nationally²⁰².

Our results suggest that PP-IPs work across a range of clinical specialty areas. Physiotherapist IPs predominantly worked in musculoskeletal services (MSK), (including MSK assessment and treatment services), orthopaedics, respiratory care and pain management. The key therapy areas for which physiotherapists intended to prescribe medicines related to pain and MSK conditions, respiratory conditions and infections. The literature review identified similar key areas of clinical care where medicines were administered by physiotherapists, including MSK, orthopaedic and sports physiotherapy. Podiatrist IPs specialised in high risk feet, foot and ankle surgery (podiatric consultants) and MSK/orthopaedics. Intended prescribing practice for both physiotherapists and podiatrists reflected clinical specialities, with both professions indicating that they were likely to prescribe medicines for pain and MSK conditions.

Differences in clinical practice between the two professions were reflected in the patterns of work activity identified through work sampling. For example, podiatrists exhibited greater activity around therapeutic procedures whereas physiotherapists were more active in physical examination, history taking and communicating the diagnosis. Differences between PP-IP and PP-NP work activities were identified on a number of individual items, however it is difficult to interpret this in a meaningful way. For example, PO-IP sites were significantly more involved in activities related to indirect care i.e. care planning whereas PO-NP sites were more actively involved in room preparation and providing treatment. PT-IPs were found to be more actively involved in activities related to medicines management and treatment, whereas PT-NPs were more likely to engage in discussions with patients.

The emerging picture suggests a mixed and varied pattern of service configuration and work activities reflecting the diverse nature of care provided by PPs across England. Other than the specialist areas of practice noted above, there was little evidence of a clear model of PP-IP implementation. Clinical specialities traverse the acute and long-term nature of conditions that are associated with regular physiotherapist and podiatrist practice. It is likely that the above differences reflect natural variation within the specialist services provided by each

profession. Consequently, the association to independent prescribing, if any, is unclear. Now that this study has identified the key areas of prescribing practice, a more focussed exploration within each profession would provide greater insight into the services provided by PP-IPs, for example, to explore the role of IP within podiatric surgery, or first contact physiotherapy services. However, in order for this to accurately reflect the true impact of prescribing, IP would need to be more embedded within each profession and current provider services.

Objective 2: Identify the factors that inhibit/facilitate the uptake and implementation of Physiotherapist and Podiatrist independent prescribing.

Overall, the study results identify several factors that can inhibit or facilitate the uptake and implementation of PP-IP. Results from our literature review, documentary analysis, trainee PP-IP survey, patient questionnaire and interviews indicate that PP-IP is largely acceptable with few barriers identified. However, there is a lack strategic planning to support more wide scale implementation of PP-IP. The implications of this are discussed in more detail below.

Facilitators to the uptake and implementation of PP-IP

Findings from our literature review and the PP-IP trainee survey indicate that both professions were frequently involved in medicines management activity, particularly providing medicines information. Results from the patient questionnaire indicated that the majority (81.5%) generally accepted that physiotherapists and podiatrists should be able to prescribe medicines for their condition, with preference for a doctor reported by a quarter of respondents. Patient's high level of acceptance of the prescribing role has been consistently reported in studies reporting on nurse and pharmacist prescribing ^{30, 79, 203, 204}. Patient's additionally report that they prefer NMP when they have an established relationship with the prescriber and are confident in their level of specialist knowledge and experience in treating their condition ²⁰³⁻²⁰⁵. Stakeholder interviews also indicated general support for the PP-IP role and is consistent with high levels of support reported by GPs and physiotherapists for greater involvement by physiotherapists in monitoring and prescribing medicines for patients in Scotland ⁵⁷.

Our data indicate that the majority of trainee PP-IPs used several methods (range 1-4) to administer, supply or prescribe an average of 1-2 items per day (8 items per week), with 94% involved in making recommendations to other healthcare professionals to prescribe medicines, prior to undertaking IP training. Low existing and intended use of supplementary prescribing reported in the PP-IP questionnaire, and confirmed during interviews with PP-IPs, reaffirms findings of

the scoping review¹ that SP is not an appropriate method for most NMPs and has limited use in practice ^{28, 206, 207}.

Improving efficiency, quality of patient care, access to medicines, and making better use of professional skills were reported to be key motivating factors to undertaking IP training. Questionnaire data also indicated that respondents believed that IP would have additional benefits including increasing their ability to select the most appropriate choice of medication, reduce unnecessary prescriptions, and improve medicines management, safety, knowledge, job satisfaction and communication with patients about medicines. In this respect, findings regarding motivations of PP-IPs are similar to those reported by nurse prescribers ^{208, 209}. Interview findings highlighted that in addition to improving knowledge and skills, IP training was widely welcomed for its positive impact on the reputation of podiatry and physiotherapy as professions and for facilitating advanced practice roles. It was predicted that IP would become an essential qualification for senior and specialist roles, such as podiatric surgeons. Within physiotherapy especially, IP helped to resolve legislative 'grey areas' around existing practices, such as mixing of medicines for injections. Similar complications around the legality of different practices were reported by nurses prior to changes in the regulation of controlled drugs²¹⁰.

These results reinforce the important role of medicines management activity within the two professions and demonstrate a clear potential for independent prescribing to improve efficiency, and continuity of care. This is in line with previous studies exploring the implementation of nurse prescribing, where combining aspects traditionally associated with specialist roles (i.e. having a good relationship with patients and sound knowledge of treatment options), with the ability to prescribe, was reported to enhance the quality care provided ^{90, 211 209}. The potential safety improvements mentioned are consistent with those previously reported by nurses working in pain management, diabetes and a specialist children's hospital ^{207, 212, 213}. Findings indicate that IP training improves knowledge, which is of particular importance given that our literature review identified gaps in the knowledge and skills base to prepare physiotherapists for involvement in MMA ⁵⁷.

Barriers to the uptake and implementation of PP-IP

Results from interviews and documentary analysis showed minimal evidence of strategic planning to incorporate IP within services or to use it as a driver to expand or develop new services. This would suggest that PP-IP is currently being driven by individual practitioners, a number of whom were already supplementary prescribers, to support existing services rather than a more

strategic approach to developing the workforce to fill gaps in service provision or to plan ahead to meet future service needs.

Three years after the introduction of current legislation enabling physiotherapists and podiatrists to prescribe independently, there has been a 53% increase in the number of physiotherapists and podiatrists with prescribing rights in England^{184, 214}. At the end of July 2016 there were 384 physiotherapists and 191 podiatrists with an annotation as independent prescriber, with a further 124 physiotherapists and 82 podiatrists with just supplementary prescribing¹⁸⁴. This represents about 0.75% of the physiotherapist workforce who are qualified to prescribe medicines independently and, 1.5% of the podiatrist workforce. These rates are somewhat lower than those reported for nurses (2.5%) and pharmacists (3%) four years after changes to legislation enabling them to prescribe independently from virtually the entire BNF³⁰. While it is important to acknowledge the early stage at which this evaluation was conducted, and that interview findings emphasized that participants were aware of planned service developments, evidence suggests that adopting a strategic approach can mean that greater consideration is given to ongoing support needs, workforce planning and organisational preparation for NMP^{50, 215}. It is possible that the lower rate of uptake of IP by PPs, compared to nurses and pharmacists, does reflect the lack of strategic approach that was identified and is something that should be considered when extending prescribing rights to other professions i.e. dieticians, paramedics/ radiographers^{1, 216}. However, it is also important to note that original policy^{34, 35} recommended that only clinicians working at a highly skilled and specialist level, in a relevant clinical/service area should progress to independent prescribing. It is possible therefore that the current uptake of PP-IP reflects this finite number of people compared to other professional groups, i.e. nurses and pharmacists, where prescribing is relevant to a larger proportion of the workforce.

Our results suggest that the perceived need for IP within services is dependent upon the effectiveness of other methods to supply and administer medicines. Data from the PP-IP questionnaire indicated that both professions used a number of existing methods to supply and administer medicines, including PGDs and exemptions within their current practice. Subsequent, case site data indicated that existing methods, particularly PGDs and exemptions, were considered adequate for the majority of patients and continued to be used by PP-IPs regardless of their prescribing status. This is in line with previous reports that NMPs have ongoing involvement in a number of medicines management activities, rather than just relying on prescribing to supply and administer medicines^{28, 30, 217}. It is therefore important to acknowledge and record these various activities if we are to understand the full benefits of PP-IP to service delivery.

The extent to which clinical governance systems were reported by PP-IP questionnaire respondents varied, with fewer systems reported to be in place by physiotherapists. Governance arrangements were reported to be lacking with respect to the development of local formularies or guidelines, access to individual prescribing data, auditing prescribing practice, providing a specimen signature and having an agreed scope of prescribing practice. However, PP-IPs who were interviewed reported no problems with clinical governance suggesting implementation of IP had led to clarity regarding these arrangements. This pattern of clinical governance support is similar to that reported by non-medical prescribers in a survey undertaken in one area of England in 2011 ²⁸. However, our findings suggest that trainee PP-IPs may need greater support and advice re the clinical governance systems within which NMPs work whilst preparing to undertake the IP role.

Interviews findings identified a number of organisational issues that acted as barriers to the implementation of PP-IP including problems accessing patient medical records, lack of patient follow-up, restricted time within appointments and lack of prescribing budget. These barriers are shared with other NMPs ²¹⁸, particularly those providing community services ²⁸. Isolation and access to ongoing CPD was a concern mentioned by podiatrist non-prescribers. Problems in identifying an appropriate person to act as a DMP were also reported in the PP-IP questionnaire. However, it is important to note our results only reflect those that had overcome these problems and had managed to be accepted on the programme. It is possible that other PPs were unable to register on the programme due to problems securing the support of a DMP during the application stage. These concerns have consistently been reported in the literature on nurse and pharmacist independent prescribing, particularly for those not based in acute care ^{28, 206, 219}. Additionally, they are known to be largely overcome when trusts have a structured approach to selecting students for training, an NMP lead is in place and once IP has become more embedded within organisations^{50, 215}. While, HEIs tend provide support and guidance for DMPs through meetings and practice visits, the only official guidance for the DMP role is now over 15 years old ⁹¹ and does require updating²²⁰. This will become increasingly important if policy directives to increase the number of NMPs, such as the 'GP 10 point plan' ²²¹, and 'General Practice Forward View' ²²² are to be realised.

Objective 3: Evaluate the contribution of physiotherapist and podiatrist independent prescribing to the experience of patients and carers and its impact on choice, access, and self-reported health outcomes.

Overall our findings from the trainee PP-IP survey, observations of clinical practice, patient questionnaire, audit and case site interviews suggest that PP-IP did have a positive effect on patient experience, choice, access and self-reported health outcomes.

Patient experience

The majority of respondents (98.3%) who consulted both PP-IPs and PP-NPs were satisfied with the care they received. Characteristics of the sample were generally comparable between professions, although the overall sample was predominantly female (65%). Those in the podiatry group were generally older (67 years), attending for follow-up consultations (82%) compared to those in the physiotherapy group (59 years), who were more likely to attend for an initial consultation (53%). Additionally, patients who attended PT-IPs had lower overall EQ5D scores at baseline than the non-prescribing group.

More detailed exploration of patient views on their consultation indicated that those attending a PP-IP were more satisfied with MMAs advice and information provided and were more likely to follow the advice received than those attend PP-NPs. Across both professions, patients attending an IP were more likely to report that they had received information on how often to take the medicine, and had greater intent to follow the advice of the PP compared to those attending a NP-PP ($p<0.05$). The main differences in patient's views regarding their consultations with a PP-IP or PP-NP were found within physiotherapy, where respondents reported greater satisfaction with advice received, were more likely to be told when and how often to take their medicine, had better understanding of their treatment, found it easier to follow instructions regarding their medicines and more often intended to take their medication ($p<0.05$). These findings echo those of previous research in to independent prescribing by nurses and pharmacists^{30, 56, 79, 90} and studies reporting role substitution of doctors with nurses^{223, 224}. Courtenay et al.⁷² in a comparative case study reported that 131 patients with diabetes attending the nurse prescriber were more satisfied overall than those attending a non-prescriber ($n=83$). Similar high levels of satisfaction have consistently been reported where nurses substitute the role of doctors^{72, 224}, where longer consultations times, as in this study, may help to explain the higher levels of satisfaction. The impact of PP-IP on satisfaction is important given that satisfied patients are more likely to cooperate with treatment, maintain a continuing relationship with a practitioner, and enjoy better health outcomes^{86, 223, 224}. Systematic reviews have additionally established that there is an

association between greater patient satisfaction and outcomes such as adherence to medication or recommended treatment and patient safety ^{225, 226}.

Differences between professions were also noted; for example, physiotherapy IP was found to improve aspects of the quality of patient experience and satisfaction with advice, whereas in podiatry, improvements related to access to appointments and ability to contact someone when a problem arose. We do not know why these differences occurred but this possibly reflects professional differences and the type of consultations observed as part of this study. For example, over half of patients attending a physiotherapist did so for an initial consultation, as part of an MSK assessment and treatment service, which would typically involve provision of information and advice. In comparison, the majority of podiatry patients attended for a review appointment, where notable improvements reflected concerns regarding the ongoing management of their condition.

Impact on choice

Views of physiotherapist and podiatrists who completed the trainee PP-IP survey and from case site interviews with PPs and team members were similarly positive about the potential benefits of PP-IP to patients, health services and healthcare professionals. Anticipated gains focused on improving efficiency, by reducing delays and streamlining services, increasing choice, as well as improving clinician knowledge, job satisfaction and team working. Patient questionnaire data indicated an overall reduction in waiting time for prescriptions, but the low number of responses, means that caution should be used when interpreting this result.

Participants who had undertaken IP training felt that they and their patients benefited from improved knowledge around medicines management and safety. IP was reported to contribute to reduce appointments with general practitioners, improving choice of treatment and enhancing the quality of advice and information given to patients about their medication. It also enabled services to continue when a doctor was unavailable. IP was considered to better align professional roles with patient expectations with regards to medicines management and advice, particularly around the role of specialists within each profession, and podiatric surgeons. There was some evidence from interview findings that IP enables PPs to select the most appropriate medicines for patients, thus improving patient choice. These benefits are similar to those previously reported in relation to prescribing by nurses and pharmacists ^{30, 42}. This suggests that greater autonomy over prescribing enables NMPs to overcome inadequacies in the traditional healthcare system, increasing the convenience and speed with which patient's access their medicines.

Impact on access

Data from observations, the patient questionnaire and audit indicate that PP-IPs were more actively involved in medicines management activities (including recommending, administering or supplying medicine) than NP-PPs. Providing information or advice about medicines was more likely to be observed in PP-IP consultations ($p=0.05$) and was reflected in patient questionnaire responses. The frequency of prescribing, providing medication via PGD/exemption, making a recommendation to GP or to patient to buy over the counter, and referral for diagnostic tests and or to another practitioner were all higher in those who attended a PP-IP. It is not clear if this is because patients of NP-PPs required less in the way of medication or because NP-PPs are less likely to be involved in medicines management activities and so patients seek these services elsewhere. This is in contrast to Courtenay et al. (2015) ⁷² who found no significant difference with regards to the medicines management activities of nurse prescribers to non-prescribers in their consultations for patients with diabetes.

However, most PP-IPs and PP-NPs were involved to some extent in MMA, and one in three patients reported to have received advice or information about medicines during their consultation, indicating that this is common practice in these professions. What is difficult to ascertain is whether the higher level of medicines management activity in the PP-IPs was present prior to undertaking the prescribing programme. While there is some indication from interview data and the PP-IP survey that this might be the case, caution must be used when interpreting this result. This would suggest, as mentioned above, that PP-IP is currently being driven by individual practitioners who have a high level of involvement in MMA, rather than to develop the workforce to fill gaps in service provision. This presents a challenge in that it is therefore difficult to attribute any change in outcomes to being a direct result of independent prescribing.

Impact on self-reported outcomes

Respondents who consulted with PP-IPs and PP-NPs were found to have similar health related quality of life at baseline (as measured by the EQ-5D-5L), although those in the PT-IP group had significantly lower overall scores. Although health related quality of life (as measured by the EQ-5D-5L) improved for patients in both IP and NP groups between baseline and 2 month follow-up, the differences between IP and NP groups did not reach a level of statistical significance, and the sample for which data were available at both time points was relatively small.

The heterogeneity of patients recruited to the study, and variation in service provision meant it was not feasible to compare specific outcomes related to the individual treatments provided by physiotherapists and podiatrists. Without a

clearer indication of improved patient outcomes, and hence a measure of success, it is not possible to provide a full answer to this question.

Objective 4: Identify the medicines management activities that enable podiatrist and physiotherapist independent prescribers to contribute most effectively to successful care outcomes.

Results from the trainee PP-IP survey, observations of clinical practice, case-site interviews and patient questionnaires confirmed that most PP-IPs and PP-NPs were involved to some extent in MMA and used a number of methods to supply and administer medicines regardless of their prescribing status.

The qualitative findings from case-site interviews indicated that the perceived need for IP within services was dependent upon the effectiveness of other available methods to supply and administer medicines. Participants expected that rates of prescribing would be low in comparison to the amount of medicines management activity undertaken within case sites, and this was confirmed by the observation data and the small number of prescriptions issued during the study (n=17). This is in line with previous reports^{28, 30}, that rather than just relying on prescribing NMPs welcome the flexibility that prescribing offers and they continue to have ongoing involvement in a number of medicines management activities. In addition, wider aspects of organisational and inter-organisational arrangements, such as access to prescribing budgets, are known to influence whether NMPs prescribe directly or make recommendations to another service to prescribe^{210, 219}. Increased levels of patient satisfaction with elements of PP-IP consultations and information provided about medicine, do however indicate that in addition to prescribing there may be some wider impact of IP on PPs knowledge and skills that improve patient experience of PP-IP medicines management activities. Previous studies have found that nurses described improved safety resulting from an increased awareness of the responsibility associated with being a prescriber, ensuring patients were provided with information about their medicines, and less misunderstanding and mistakes in communicating recommendations to other prescribers^{213 48 207}.

The impact in terms of efficiency savings and outcomes was considered by interviewees, and PP-IP survey respondents to be considerable despite the small number of patients who benefited from direct prescribing activity. The ability to prescribe autonomously without the need to involve a doctor should result in shorter patient journeys, however observation and audit data did not support this assumption and if anything, showed greater involvement of other professionals within the PP-IP groups. For example, consultation times for patients attending PP-IPs were on average 7 minutes longer, and tended to involve more discussions with colleagues than those for NP-PPs. This may be explained by the contextual

differences between the PP-IP and NP-PP case sites, whereby PP-IP case sites included more multi-disciplinary services and may therefore reflect differences in service configuration rather than IP.

Objective 5: Assess the quality, safety and clinical appropriateness of physiotherapist and podiatrist independent prescribing.

Overall, the study results provide an inconclusive picture with respect to this objective. Results from the trainee PP-IP survey, prescription audit, audit of patient records and qualitative data indicate PP-IPs prescribe safely and appropriately. However, our ability to link each of the various aspect of patient data (i.e. observation, medicines management activities, patient questionnaires, patient record audit, audio recorded consultations, and prescription) was very limited as participants had the option to select which aspects of data collection they agreed to.

Our findings indicate that prescriptions issued were generally safe and of a high quality, but a number omitted to include information on dose frequency. This is in line with previous studies by Courtenay et al. (2008) and Carey et al. (2009)^{97, 98} who reported prescriptions issued by nurses caring for patients with dermatology and diabetes were generally accurate and safe but were similarly less consistent in providing information regarding dose frequency^{97, 98}. Patient questionnaire findings confirmed that the majority felt that they had received clear information about their medication and its purpose. However, fewer patients in both PP-IP and PP-NP groups received information about what to do if a dose was missed, although this would not be relevant for medication administered at the time of consultation such as an injection. The lack of consistency by nurse prescribers to provide patients with information has previously been reported^{56, 90, 227}. It is important to acknowledge in addition to the frequency of MMAs, differences in the types of patients and services provided will also influence the type and amount of information provided. For example, most of the podiatrist consultations were review appointments which may explain the different types of MMA recorded. However, given that the estimated costs of unwanted and unused medicines is estimated to cost £300 million a year²²⁸ and that a lack of information is known to affect medication adherence²²⁹ it is also important that PP-IPs do not make assumptions about patient's ability to understand and remember information they have been given.

Results from our analysis of the audio-recorded consultations indicated high levels of disagreement between assessors of physiotherapist and podiatrist consultations, which was notably higher for the podiatrist consultations. The reason for the disparity is not clear. It is possible that these results reflect a

heightened discrepancy in the views about the expected role of podiatrists in medicines management activities as these consultations were assessed by a medical consultant and a podiatrist independent prescriber. For example, the PO-IP assessor appeared to have different expectations to the medical consultant regarding consultation content, i.e. reviewing current medications with patients, and if there was no evidence that information was discussed or sought within that appointment was more inclined to mark as “cause for concern” or “unsafe practice”, on the basis that they believed that information on medicines taken, allergies etc. should be revisited at each consultation. The medical consultant assessor was however more inclined to indicate that an action was not applicable to the podiatric consultation, or that there was insufficient information to base a decision (based on the consultation being a review appointment, and that such details may have been included in unseen notes or covered on a previous occasion). By comparison, physiotherapy consultations were assessed by two physiotherapists and therefore a higher level of agreement over the professional role of physiotherapists in medicines management activity may therefore have been expected. While the challenges of assessing consultations of nurse^{30, 56} and pharmacist prescribers have previously been reported³⁰ these results do warrant further investigation.

The majority of audio-recorded consultations involved the administration or recommendation of medicines, hence it is reasonable to expect that practice of PP-IPs and PP-NPs would be similar. There was some indication that PP-IPs were more consistent in addressing key aspects of the consultation related to assessment, diagnosis and communication; however, these findings were overshadowed by the high level of disagreement between assessors. Our results suggest that there is currently a lack of agreement within podiatry and physiotherapy regarding the nature of consultations that involve medicines management activities, and a lack of evidence in this area, as indicated in our literature review. Additionally, they highlight the need for further examination, discussion and agreement regarding the changes that independent prescribing has had on professional practice.

Objective 6: Evaluate the impact of physiotherapist and podiatrist independent prescribing on cost, quality, effectiveness and organisation of care.

There was consensus between findings from the PP-IP questionnaire and qualitative findings regarding the many anticipated benefits of adopting the prescribing role e.g. improving access to treatment, quality of care, service efficiency and appropriateness of medication, and reducing the number of appointments required.

The available data, however, suggest that for PPs in this study, care delivery by IP is more resource intensive and costly than NP. This arises through longer consultation duration, more medicines administration and prescribing ordering of tests (POs), and discussions with colleagues (PTs). The indicators of outcomes suggest that the patients of IPs are more satisfied with the advice they receive than the patients of NPs (PTs only), however, no differences were found in health status change of patients of IPs and NPs in the 2 months after the consultation for POs or PTs. An analysis of effectiveness was not possible because, due to the generic nature of the study, data were not collected on specific indicators of change in the index condition.

It is important to note, that there are many limitations to the analysis so these findings should be treated with caution. The analysis has not controlled for possible differences in the client groups of IPs and NPs. In the case of PT, the baseline EQ-5D-5L data suggest that the patients of IPs had worse self-reported health status than the patients of NPs, although no difference was found in the health status of the patients attending PO-IPs and PO-NPs. Reliance on the observed change in health status after 2 months is also compromised by the small sample of participants for whom follow up data are available.

Whilst the original intention had been to undertake a patient level micro costing analysis in order to calculate total costs per patient, incomplete information made this impossible, and only a partial costing analysis could be completed. In particular, data on all services utilised for the index condition during the two months after the initial consultation were only available in sites where patient records were linked to other databases i.e. hospitals. Similarly, intentions to conduct regression modelling to explore the independent impact of prescribing status (IP vs NP) on total costs, controlling for patient age, gender, and baseline health status was not possible due to inability to calculate a total cost figure at the individual patient level.

The most complete data were available for consultation duration, and the calculation of associated costs showed IPs to incur slightly higher consultation costs than NP in both the PO and PT groups (£8.62 and £7.95 respectively).

Removal of an outlier PO-IP consultation duration of 203 minutes reduced the mean from 24.3 to 22.9 minutes, and cost difference between IP and NP to £6.99. Projected across a year in any one practice, and then nationally, these relatively small differences would have a significant impact, and there is little to suggest from this study that there might be off setting savings elsewhere in the system. It needs to be born in mind, however, that the consultation costs are dependent on the banding of the staff used in the calculation. In this study, band 8a (AfC principal level) was used as the reference case; use of band 9 unit costs would have doubled the cost differences between IP and NP, use of band 7 would have reduced the differences by about £1.20 per consultation. Across the case sites, there was large variability in the grading of the IPs (from band 7, advanced practice / team leader to 9, consultant) and NPs (from band 6, specialist to 9, consultant). This indicates that IP can be undertaken by lower band staff and holding an IP qualification is not necessarily a reason for career advancement. Similarly, there was no evidence that not having an IP qualification was a reason for not being on a higher pay band. Another concern in the interpretation of consultation durations and associated costs is that the times recorded may be driven by clinic practices. If services set fixed appointment durations (e.g. 20 or 30 minutes per patient), this may influence practice. Work sampling, for example, showed that podiatrist NPs were more often completing computer-based tasks outside of the consultation, whereas podiatrist IPs undertook this activity within the consultation. Whilst time spent with individual patients may vary, practitioners may work to fit all booked patients into a session, and the average observed may simply reflect the time allowed.

There is limited evidence available with which to compare our study findings ^{72, 230-232}. Other studies have reported cost savings associated with IP through estimates of: number of patients who would have required a GP appointment to obtain medicine provided by PP-IP, discontinuation of medicines by IPs (e.g. ineffective pain medication); avoidance of extra appointments, surgical procedures, hospital admissions and unplanned care due to IP's ability to prescribe the appropriate medicine; reduced recovery time from improved access to medicines. Self-reported data from podiatrist and physiotherapist supplementary prescribers collected during North West NMP AHP audit indicate that although the frequency of these types of cost saving actions are low, the cumulative impact can be substantial (up to £1,500 per NMP participant during the audit month)²³⁰. However, such analyses are largely speculative, and the conclusions are thus subject to significant uncertainty and should be interpreted with caution.

A study reported by Courtenay et al. (2007) and Carey et al. (2008) ^{231, 232} demonstrated that when a diabetes specialist nurse prescriber introduced a systematic approach to care, where all patients were reviewed, length of stay

reduced by 2-days and medication errors by 50%, saving £500,000 over one year. By comparison, a more recent study by Courtenay et al. ⁷² identified higher employment costs of nurse prescribers, but similar clinical outcomes to non-prescribing nurses managing people with diabetes. Nurse prescribers had longer relationships with their patients, and longer consultation durations, which possibly contributed to an observed higher satisfaction with care reported by the patients of prescribers. However, these findings ⁷² are, similarly to the this study, not based on a full economic analysis.

As previously discussed, the emerging picture infers that PP-IPs are involved in a mixed and varied pattern of service delivery which is likely to affect resource use and costs. The complexity of these arrangements means that the differences in cost that could equally reflect service differences which could exist regardless of IP status. For example, the time spent in discussion with colleagues may reflect the multi-professional service that many case sites provided. Multi-professional, or team, working is a fundamental component of health care delivery in the UK and central to current government policy ²³³⁻²³⁵. There is increasing emphasis on establishing systems, rather than single episodes of care, that dissolve traditional boundaries ^{236, 237} to support the increasing number of people with long-term conditions. Whilst this study focussed on individual patient episodes of care, more research, including a full economic analysis, is needed to explore how team configurations affect care delivery, patient outcomes and costs.

Objective 7: Explore the prescribing models in current practice, their associated resources, and patient utility.

Overall the study findings suggest current PP-IP practice comprises of two main prescribing models: i) single professional service, ii) multi-professional service which rely on existing medicines management activities including exemptions, PGDs and making recommendations to another prescriber.

Model 1: Single professional service: Our data indicate 31% of podiatrist and 23% physiotherapist questionnaire respondents worked in a single professional service. Of the 22 (26%) respondents providing a single professional service, several podiatrists worked exclusively in private practice. Results from the PP-IP questionnaire and case-study data suggest that prescribing is mainly used in this model of practice to improve convenience and access to medicines for a minority of patients where existing methods are not appropriate e.g. antibiotics and wound care products.

Model 2: Multi-professional service: Nearly two thirds (61%) of PP-IP questionnaire respondents, 71 % physiotherapists and 41% podiatrists worked in a multi-professional service. Within this model, prescribing was found to underpin existing methods of medicines management activities, improved efficiency and provided IPs with increased flexibility and options regarding treatment management. Knowledge and capacity within teams were also reported benefits of this model, as IPs were able to share improved pharmacology knowledge and understanding with colleagues. Decisions surrounding the most appropriate method of MMAs, including prescribing, were affected by service configuration, organisational issues, convenience and access to a prescribing budget. Examples were provided in interview data where IP was used within teams only when an alternative prescriber (Doctor) was not available, i.e. it was used to fill a gap in existing services rather than as a routine aspect of role.

It has been suggested that NMP should supersede the use of PGDs in practice ^{238, 239}. PGDs, first introduced in 2000 ²³⁹ provide a legal framework for health professionals to supply and administer a specified medicine to a pre-defined group of patients, and it is recommended that use should be reserved for situations in which this offers an advantage to patient care. Additionally good practice recommends separation of prescribing and administration of medicines ^{36, 240}. Despite reports in our qualitative data that PGDs are onerous and time consuming, it would appear that there is currently an over-reliance on their use in PP-IP practice. Concerns have previously been raised that a lack of funding, and staff commitment may have contributed to the unnecessary or inappropriate development of PGDs, which should not be seen as a direct substitute for independent prescribing ²³⁸. While it is important to acknowledge that reducing the use of PGDs in PP-IP practice could have implications in terms of team configuration, costs and access to medicines, in order for this to happen organisations and commissioners need to ensure that PP-IPs have improved access to prescribing budgets. Pooled budgets that combine funds from different organisations, as outlined in the Better Care fund framework ^{233, 234}, is one way that this could potentially be achieved. Prescribing allows PPs to work autonomously, taking responsibility for decisions and suggestions that are made during each episode of care, reducing the potential for misunderstanding ^{48, 68, 219}. There is some evidence from nurse prescribing in an emergency department setting that IP practice is safer than PGDs and more often enables nurses to independently complete episodes of care ²¹⁷. While PGDs can be useful in services where assessment and treatment follow a clearly predictable pattern (e.g. immunisation, family planning) recent guidance reiterates that they should only be used with caution for some categories of medicines including antibiotics, off license drugs, and controlled drugs ²³⁹. In order to understand why PP-IPs, who have prescriptive authority and autonomy to make decisions, continue to rely on this method of MMA further exploration is required.

Resources and staff costs

Responses by trainee PP-IPs revealed that around three quarters were sponsored by their NHS employer or other agency through payment of fees. Additional costs to the NHS arise in the form of lost days practice during training, and time spent (by consultants and GPs) in supervision of practice of the trainees. It was not possible from the data to establish precise time away from practice. Similarly, the cost of DMP supervision could not be estimated because it was not clear if the reported time was totally dedicated to supervision or if other tasks were being undertaken at the same time. This study had a broad remit, and data were gathered by means of a questionnaire to trainees. A full analysis of costs to the NHS of training would require the collection of more detailed data on resource inputs at source. Moreover, computation of the rate of return on investment in training would involve establishing productivity implications.

There was a lot of variability reported in the extent to which trainee PP-IPs committed their own resources to training with some paying for the course and making out of pocket expenditures of up to £500. Even so, such expenditure is relatively small in the context of career earnings. Most respondents, however, stated that increase in income was not a motive for gaining the qualification. Somewhat contradictorily a quarter cited improved job prospects as a reason for undertaking training. Overall, however, the main motives were 'psychic' income (making better use of own skills, improved job satisfaction and professional status) and desire to improve quality of care for patients.

Data from responses to the PP-IP questionnaires and interview findings indicated that the majority of participants believed that IP would generate service efficiencies that would ultimately have a positive impact on resources and staff costs. Although comparison of IP and NP in the case study analysis suggests that IP may be more resource intensive, limited conclusions can be drawn regarding the relationship between IP, and service costs. The study was conducted in a limited number of sites which may not be typical of PP-IP practice. Moreover, an holistic analysis of the practice settings in which POs and PTs were practicing was not undertaken such that substitutability between professional groups could not be assessed. Future research on PP-IP prescribing models should explore activities as part of a multi-disciplinary, whole systems approach to providing care and meeting service demands, rather than in isolation ^{219, 234}.

Qualitative findings identified that IP supported more streamlined services, and created opportunities for PPs to overcome previous inadequacies of the traditional healthcare system, whereby they were less dependent on the availability of doctors, and are able to work more efficiently and increase the

speed with which patients receive their medicines. This is consistent with previous studies exploring nurse and pharmacist prescribing^{48, 208, 209, 218}.

Objective 8: Evaluate the appropriateness and effectiveness of physiotherapist and podiatrist independent prescribing educational programmes.

High levels of satisfaction with key elements of the IP programme were identified from the trainee PP-IP questionnaire and case site interviews with PP-IPs with the majority reporting that they had clear expectations and felt adequately prepared to start prescribing. This picture from a wide range of HEIs across England reflects earlier work on the educational preparation of nurse and pharmacist independent and supplementary prescribers^{30, 48, 79, 219}.

Survey findings suggested that PPs were aware of the legal framework surrounding prescribing as reflected in the largely unchanged therapy areas of their current and intended scope of practice. Data from the audio consultations suggested that IP training can improve the level of skills and knowledge required by physiotherapists to support medicines management activity in general. The effectiveness of the training may be evident in the increased patient satisfaction with the consultation and ratings of aspects of information provided to patients about medication. However, the high level of disagreement between assessors means that caution should be used when interpreting this result.

Although the overall evaluation of the educational programme was satisfactory, our results indicate there are several issues that may warrant further attention by the professional and regulatory bodies. Our findings indicate a lack of standardised formal training in key skills required for good prescribing practice in line with earlier studies in this area^{30, 87, 219, 241}. For example, despite high levels of clinical experience and qualification, physiotherapists were less prepared than podiatrists in terms of prior accredited training in numeracy, pharmacology and, to a lesser extent, assessment and diagnosis, with podiatrists reporting limited evidence of accredited numeracy training. A similar picture emerged from our literature review in that physiotherapists were regularly involved in MMA but sometimes lacked preparation in terms of relevant knowledge and understanding. The ad-hoc nature of AHP training and education in general has been noted in previous reviews^{53, 201, 219}. Attention needs to be given to the adequacy of PP pre-course numeracy, assessment and diagnostic skills and a consistent approach to ensuring that pre-course requisites are met by supporting managers and NMP leads. While, some organisations have adopted a robust application process and HEIs provide support and guidance to IP applicants, earlier studies in this area have suggested that the approach varies between organisations and hence can be inconsistent^{50, 215}. Additionally, the abolition of strategic health authorities (SHAs)

and introduction of provider services in the last few years has meant that the role of the NMP lead has diminished in some areas so there may be little support during the NMP application process. As further cohorts of PPs enter IP training, and prescribing rights are extended to a greater range of professions, this area will need close monitoring to ensure that applicants have the necessary pre-course requisites and educational programmes continue to meet the needs of future non-medical prescribers.

Just over half of trainee PP-IPs (56.5%) were undertaking the combined independent and SP programme. Qualitative findings from PP-IPs interviews identified that although the course was found to be challenging, it was enjoyable, in particular learning alongside other healthcare professionals, reflecting previous trends in the provision of multi-professional programmes reported by Latter et al. (2010)³⁰. Similar to previous work on nurse and pharmacist prescribing ^{30, 48, 87} a small number of trainee PP-IPs reported that they had difficulty with meeting the course objectives, mainly due to the volume and level of work required, with concerns regarding the consistency of course requirements in different HEIs also noted. Concerns regarding course requirements, and variation in the level of academic study have been addressed in some parts of the country, more notably in Scotland who several years ago introduced a harmonised approach to NMP courses ²⁴² whereby each institution now offers the same amount of academic credit.

9 Study strengths and limitations

9.1 Phase 1: Literature review

This is the first review of the PP literature to integrate all document types, and describe and address the impact of NMP. This approach enabled a wide range of literature to frame the topic, identify existing practices where possible and highlight research deficiencies. Some insight into countries with well-established PP professions was possible, however, the exclusion of non-English speaking literature limited wider international knowledge of the subject. Additionally, many studies were over a decade old, and do not necessarily reflect today's practices.

9.2 Phase 2: National Survey of trainee PP-IP and analysis of key documents

This is the first survey of PP prescribing in England. A longitudinal online-survey, with two data-collection points, enabled understanding of the PP-IP experience across time and also provided a sampling frame for Phase 3. Responses were received from trainee PP-IP's attending HEIs across England providing indication of emerging national picture, and the response rate for questionnaire 2 was good. Two comprehensive questionnaires were developed, building on previous national surveys, and following input from key stakeholders, including the Project Advisory Group. The extent to which use of controlled drugs or mixing of medicines could be explored was limited due to uncertainty regarding the legislation during data collection and therefore warrants specific future exploration

9.3 Phase 3: Comparative Case Study

The selection of 14 case sites supported an in depth evaluation and comparison of PP-IP to PP-NPs using multiple methods of data collection.

The sample of sites are diverse with respect to care setting, geographical location and patient demographics, with the seven IP-PP sites (4 physiotherapy and 3 podiatry) being selected and matched to similar services delivered by NP-PPs including NHS services in community, primary care, secondary care and private podiatric practice. Sites were geographically spread across England and are therefore likely to be indicative of current PP-IP models and practice. While the

representativeness of the sample is strengthened by this design, it was not possible to include all of the key practice areas in which PPs worked. In particular, we were unable to recruit physiotherapists providing respiratory care or pain management, which were identified as key areas of physiotherapy practice.

PP-IP participants were selected from the large proportion (n=70) who completed the trainee PP-IP survey and indicated that they would be willing to be involved in further research, suggesting that they were not significantly atypical from the wider sample. The diversity of service settings, roles, and patient needs, between and within the two professions created challenges with respect to initial matching of case sites.

There were methodological challenges associated with using the same evaluation measures on two different professional groups for whom separate measures might have been more appropriate. Our ability to link each of the various aspect of patient data (i.e. observation, medicines management activities, patient questionnaires, patient record audit, audio recorded consultations, and prescription) was very limited as participants had the option to select which aspects of data collection they agreed to. As a result, it was not possible to match patients across the different data sets, or to complete some of the intended analysis i.e. assessment of the clinical appropriateness of PP-IP.

A key strength of the mixed methods design is that it included an observational component. Observational research is acknowledged to be an effective way of learning about what actually happens in the clinical workplace. A potential limitation is that there was no standardised tool available for recording observations. However, the tool which was developed was based on previously validated tools with revisions to design and content informed by feedback from both the research team and PAG members.

This study also included the first survey of patients consulting with physiotherapist and podiatrist prescribers. A potential limitation was that there was no pre-existing validated questionnaire that enabled comparison of outcomes for patients of prescribing and non-prescribing clinicians. Where possible we used questions drawn from previous surveys and piloted new questions to cover areas not addressed in prior studies. Response rates to both questionnaires were good. A further key strength of this research was the use of semi-structured interviews to complement other data sources. The subsequent thematic analysis reached saturation, suggesting that a comprehensive picture was obtained for the type of practices included. While sufficient numbers of podiatrists and physiotherapists were interviewed, practical difficulties (e.g. lack of availability) led to low numbers of team member interviews, meaning that the team members' perspectives may have only been explored to a limited extent.

Due to resource constraints, interviews with patients and carers were not included in the study design, however, further exploration of patient and carer perspectives is recommended as a priority for future research.

This was the first time that the consultation assessment tool has been used to compare prescribing and non-prescribing clinicians. The level of disagreement between assessors, who were blinded to group allocation, was higher than that experienced in previous studies of nurse prescriber consultations^{56, 90}. While this may be indicative of a lack of agreement over the role of PPs in MMA, the extent of disagreement detracts from our ability to evaluate the safety of consultations and reflects on the reliability of the tool. Pilot work was conducted with individual assessors and application of the tool was discussed with the research team. For future use it is recommended that training involves a group discussion with assessors in order to highlight and resolve areas of disagreement prior to assessment. Further work to refine the tool is also recommended.

By contrast the patient record audit tool was based on a tool developed in previous work undertaken in the area of medication safety^{94, 243}. Difficulty occurred in gaining access to patient records, due to governance issues, availability of patient records and practical problems (e.g. research nurse not always present at point of data collection). As a consequence, the collected data were only partial and is only indicative as it may not include service use other than that delivered in the clinics.

The prescription assessment tool had also been validated in previous studies and a satisfactory level of inter-rater reliability, consistent with other studies, was achieved. However, because no prescriptions were written during audio-recorded consultations we were unable to link the findings from the prescription audit with those of the audio recordings.

The economic analysis was limited by paucity of data. In particular, no information on patient outcomes for the index condition was available, and follow up data on generic health related quality of life was only available for a small sample of participants. Hence, self-reported satisfaction was used as a proxy indicator of effectiveness. The analysis of costs was based around consultation duration and actions, without controlling for patient acuity. Research is needed on the use of PP-IPs, compared to PP-NPs at a more holistic level, to take account of overall team size and structure, and the potential for substitution of roles between different professional groups. The analysis of returns to IP training from the NHS and private perspectives was descriptive, and a more detailed investigation of investment and consumption benefits is warranted.

10 Further Research

The study indicates a number of issues related to physiotherapist and podiatrist independent prescribing that may warrant further investigation. We recommend:

1. A more focussed longitudinal exploration within each profession with targeted outcome measures as this would enable a more robust comparison of the impact of PP-IP across the United Kingdom.
2. A more extensive evaluation of patient and carer views as experience with PP-IP increases.
3. Further exploration of the wider benefits of improved knowledge gained from NMP training on quality of care and services provided by PP-IPs.
4. A more detailed analysis of the medicines management activities of PP-IPs would help improve understanding regarding the true value of PP-IP with respect to patient outcome and efficiency of care processes. This would be further enhanced by using technology to support data capture at the level of the individual clinician.
5. Further development of the work sampling tool so it is more sensitive to PP-IP clinical practice. Additional research to develop a larger data set would also improve understanding about the effects of IP on PP clinical practice.
6. Further development and evaluation of the consultation assessment tool so it is more sensitive to communication skills used in PP-IP clinical practice. This work should feedback in to educational programmes to strengthen preparation for PP-IP.
7. Further research into the cost effectiveness of PP-IP, taking account of alternative team structures in order to estimate the impact of substitution of roles.
8. Further exploration regarding the mixing of medicines and use of controlled drugs in PP-IP practice.

11 Recommendations

These recommendations designed to improve access to medicines and quality of care in a range of settings^{13, 18, 195}, improve patient safety and quality of care^{12, 13, 19, 234, 244} and in line with original policy intention^{34, 35 245}, are applicable to physiotherapists and podiatrists working across all health and social care settings. They also support current government policy initiatives to develop the UK workforce to meet the increasing demands upon the NHS^{222, 233}. An indication of to whom each recommendation is primarily directed towards can be found in Table 11.1.

It is recommended that:

- 1) Physiotherapists and podiatrists who are involved with medicines management activities and working in specialised and advanced clinical practitioner roles, are supported to adopt the independent prescribing role
- 2) The impact that independent prescribing has had on professional practice be reviewed, and practitioners provided with recommendations for clinical practice.
- 3) A more strategic approach to the physiotherapist and podiatrist independent prescribing workforce planning together with support for the greater use of the non-medical prescribing role is adopted.
- 4) There is a need to establish robust systems to capture data on physiotherapist and podiatrist independent prescriber involvement in medicines management activities to support ongoing evaluation and clinical audit.
- 5) Current professional preparation programmes are reviewed with respect to improving the integration of basic pharmacology within this provision.
- 6) The use of patient group directions (PGDs) in physiotherapist and podiatrist independent prescribing practice is reviewed in more detail with a view to providing updated guidance for clinicians with respect to medicines management activity.
- 7) Those involved in service redesign and delivery (including newly commissioned services) should reconsider where they can maximise the benefits of physiotherapist and podiatrist independent prescribing.

8) A full economic evaluation is required in order to better understand the impact of team configuration on the costs and effects of physiotherapist and podiatrist independent prescribing for patients and the NHS.

9) A more detailed understanding regarding the impact and experience of physiotherapist and podiatrist independent prescribing on services users and carers is required.

Table 11.1: Recommendations for stakeholder groups

	Stakeholder group									
	Regulatory bodies (i.e. HCPC)	Professional bodies (i.e. CSP, CoP)	Commissioners	Service Providers	Higher Education Institutes	STPs	Health Education England	Individual clinicians	Academic Researchers	Department of Health/ NHS England
Recommendation										
1		X	X	X		X				
2	X	X						X		
3		X	X	X		X	X			
4			X	X		X		X	X	
5	X	X			X					X
6	X	X								
7			X	X		X				X
8	X	X	X	X	X	X	X	X	X	X
9	X	X	X	X	X	X	X	X	X	X

12 Conclusions

The evaluation has indicated that there are many potential benefits to independent prescribing by physiotherapists and podiatrists. Physiotherapist and podiatrist independent prescribing practice appears to comprise of two main prescribing models: i) single professional service, ii) multi-professional service which rely on existing medicines management activities including exemptions, PGDs and making recommendations to another prescriber. Physiotherapist and podiatrist independent prescribing is acceptable to the majority of patients and findings indicate benefits to patients in terms of intention to follow treatment, satisfaction with information provided about medicine and, to some extent, access to services. Evidence at this early stage of implementation and from the case sites in this study suggest that care delivery by physiotherapist and podiatrist independent prescribers is more resource intensive than that of physiotherapist and podiatrist non-prescribers, but this study is limited and its findings needs to be verified through further research, including a full economic analysis. Overall evaluation of the educational programme was satisfactory. No safety issues were detected directly resulting from physiotherapist and podiatrist independent prescribing, although improvement could be made in the completeness of prescription writing and the consistency of information exchange with patients about medicines use and potential side effects, as is the case for all prescribers.

References

1. DH. Allied Health Professions Prescribing and medicines supply mechanisms scoping project report. London: DH2009.
2. Chartered Society of Physiotherapy. Information Paper: Medicines, prescribing and physiotherapy2013; PD019: Available from: <http://www.csp.org.uk/publications/medicines-prescribing-physiotherapy-3rd-edition>.
3. The College of Podiatry. Good practice in prescribing and medicines management for podiatrists. London: The College of Podiatry and the Institute of Chiropodists and Podiatrists2013.
4. Chartered Society of Physiotherapy. Extended Scope Practitioners clinical interest group. 2012:<http://www.csp.org.uk/professional-networks/esp>.
5. Pharmaceutical Society of Northern Ireland. Medicines for Human Use: POM, P, GSL & General Pharmacy Regulations: A guide for pharmacists in Northern Ireland2010.
6. National Prescribing Centre. Non-medical prescribing (by nurses, optometrists, pharmacists, physiotherapists, podiatrists and radiographers): A Quick Guide for Commissioners: NPC 2010.
7. Chartered Society of Physiotherapy. Information Paper: CSP expectations of educational programmes in Injection Therapy for physiotherapists2011; PD071: Available from: <http://www.csp.org.uk/publications/csp-expectations-educational-programmes-injection-therapy-physiotherapists>.
8. White P. Chartered Society of Physiotherapy expectations of educational programmes in injection therapy for physiotherapists: supporting good governance in neurological and musculoskeletal injection therapy. Journal of the Association of Chartered Physiotherapists in Women's Health. 2011;109:21-9.
9. National Prescribing Centre. Moving Towards Personalising Medicines Management: Improving outcomes for people through the safe and effective use of medicines. Liverpool, UK: NPC; 2008.
10. National Institute of Care and Health Excellence. Medicines practice guidelines: Patient Group Directions.UK. . 2014 [Accessed 11 January 2015]; Available from: <https://www.nice.org.uk/guidance/mpg2/resources/guidance-patient-group-directions-pdf>
11. Department of Health. Supplementary Prescribing by Nurses, Pharmacists, Chiropodists, Podiatrists, Physiotherapists and Radiographers within NHS in England. A Guide for Implementation. London: The Stationery Office2005.
12. DH. Extending the practice of allied health professionals in the NHS. Briefing paper. London: NHS Service Delivery and Organisation: Research and Development2006.
13. DH. Improving Patients' Access to Medicines: A Guide to Implementing Nurse and Pharmacist Independent Prescribing within the NHS in England. London: DH; 2006.
14. Department of Health. Supplementary Prescribing for Nurses and Pharmacists within the NHS in England. In: DH, editor. London: DH; 2003.
15. Chartered Society of Physiotherapy. Prescribing rights for physiotherapists: an update PA58. London: CSP2005.

16. Department of Health. Making a Difference. Strengthening the Nursing, Midwifery and Health Visiting Contribution to Healthcare. London: DH; 1999.
17. DH. Meeting the Challenge: A Strategy for the Allied Health Professions: Arts Therapists, Chiropodists and Podiatrists, Dietitians, Occupational Therapists, Orthoptists, Paramedics, Physiotherapists. Prosthetists and Orthotists, Diagnostic Radiographers, Therapeutic Radiographers, Speech and Language Therapists. London: DH2000.
18. DH. Equity and excellence: Liberating the NHS. London: DH2010.
19. DH. The Chief Health Professions Officer's Ten Key Roles for allied health professionals. London: DH2004.
20. DH. Framing the contribution of allied health professions: delivering high quality healthcare. London: DH2008.
21. NMC. Standards of Proficiency for nurse and midwife prescribers. London: NMC2006.
22. DH. Extending Independent Nurse Prescribing within the NHS in England: A guide for Implementation. London: DH2002.
23. Home Office. Home Office circular 009/2012: Nurse and pharmacist independent prescribing, 'mixing of medicines', possession authorities under patient group directions and personal exemption provisions for Schedule 4 Part II drugs. London: accessed on line 30th April 2012 : <http://www.homeoffice.gov.uk/about-us/corporate-publications-strategy/home-office-circulars/circulars-2012/009-2012/>2012>.
24. Medicines and Healthcare products Regulatory Agency (MHRA). Revised Statement on Medical and Non-Medical Prescribing and Mixing Medicines in Clinical Practice. London: MHRA2009.
25. Department of Health. Supplementary Prescribing by Nurses, Pharmacists, Chiropodists, Podiatrists, Physiotherapists and Radiographers within NHS in England. A Guide for Implementation. London: The Stationery Office2005.
26. DH. Optometrists to get independent prescribing rights (Press Release). London: DH2007.
27. Brown J. Non-medical prescribing: a national perspective. Non-medical prescribing: Continuing Professional Development -1 day conference; March 27; LSBU, London:2012.
28. Courtenay M, Carey N, Stenner K. An overview of non-medical prescribing across one strategic health authority: a questionnaire survey. BMC Health Services Research. 2012;12(38).
29. Cooper RJ, Anderson C, Avery T, Bissell P, Guillaume L, Hutchinson A, et al. Stakeholders' views of UK nurse and pharmacist supplementary prescribing. Journal of Health Services Research and Policy. 2008;13(4):215-21.
30. Latter S, Blenkinsopp A, Smith A, Chapman S, Tinelli M, Gerard K, et al. Evaluation of nurse and pharmacist independent prescribing: Department of Health Policy Research Programme : University of Southampton & Keele University2010.
31. DH. Millions of patients to benefit from easier access to medication and fewer trips to hospitals: Press release August 2013: DH2013.
32. DH. Summary of Public Consultation on proposals to introduce independent prescribing by Podiatrists. London: Allied Health Professions Team, DH2012.

33. DH. Summary of Public Consultation on proposals to introduce independent prescribing by Physiotherapists. London: Allied Health Professions Team, DH2012.
34. DH. Proposals to introduce independent prescribing by physiotherapists: Impact Assessment. London: DH2012.
35. DH. Proposals to introduce Independent Prescribing by Podiatrists: Impact Assessment. London: DH2012.
36. Nursing and Midwifery Council. Standards of Proficiency for nurse and midwife prescribers. . London: NMC2006.
37. Department of Health. Allied health professions prescribing and medicines supply mechanisms scoping project report. London: DH2010.
38. North West NMP AHP Audit. North West NMP AHP Audit. 2009 [04/10/2009]; Available from: <http://www.ahpnw.nhs.uk/?page=197>.
39. Popadiuk S, Rhajbhandari S. Benefits of non-medical prescribing within an NHS podiatry service. *Journal of Foot and Ankle Research*. 2010;3(1):20.
40. Ramaswamy B. Physiotherapist supplementary prescriber reducing hospital stays duration in an intermediate care, therapy-led bed service: Example of implementation of NMP. Derby: Derbyshire Community Health Services2009.
41. Latter S, Maben J, Myall M, Young A, Baileff A. Evaluating prescribing competencies and standards used in nurse independent prescribers' prescribing consultations. *Journal of Research in Nursing*. 2007;12(1):7-26.
42. Carey N, Stenner K. Does non-medical prescribing make a difference to patients? *Nursing Times*. 2011;107(26):14-6.
43. NMC. Information request regrading number of Nurse Independent Supplementary Prescribers: Personal Correspondence: NMC2016.
44. General Pharmaceutical Council. Information requests regarding the number of Pharmacist Independent Prescribers: Personal Correspondence Oct 2016: General Pharmaceutical Council 2016.
45. Jones K, Edwards M, While A. Nurse prescribing roles in acute care: an evaluative case study. *Journal of Advanced Nursing*. 2010;67(1):117-26.
46. Bissell P, Cooper R, Guillaume L, Anderson C, Avery A, Hutchinson A, et al. An Evaluation of Supplementary Prescribing in Nursing and Pharmacy; Final Report for the Department of Health: Universities of Sheffiled, Nottingham, South Australia & Flinders, Adelaide2008.
47. Stewart D, George J, Bond C, Cunningham S, Iack H, McCaig D. Exploring patients perspectives of pharmacist supplementary prescribing in Scotland. *Pharmacy World and Science*. 2008;30(6):892-7.
48. Watterson A, Turner F, Coull A, Murray I. An evaluation of the expansion of nurse prescribing in Scotland. Edinburgh: University of Stirling2009.
49. Lim RHM, Courtenay M, Fleming G. Roles of the non-medical prescribing leads within organisations across a Strategic Health Authority: pereceived function and factors supporting the role. *International Journal of Pharmacy Practice*. 2012:doi:10.1111/j.2042-7174.2012.00224.x.
50. Courtenay M, Carey N, Stenner K. Non-medical prescribing leads views on their role and the implementation of non-medical prescribing from a multi-organisational persepective. *BMC Health Services Research*. 2011;11(142):doi:10.1186/472-6963-11-142.

51. Hacking S, Taylor J. An evaluation of the scope and practice of Non Medical Prescribing in the North West: For NHS North West: School of Nursing & Caring Sciences, University of Central Lancashire 2010.
52. Kersten P, McPherson K, Lattimer V, George S, Breton A, Ellis B. Physiotherapy extended scope of practice - who is doing what and why? *Physiotherapy*. 2007;93:235-42.
53. McPherson K, Kersten P, George S, Lattimer V, Breton A, Ellis A, et al. A systematic review of evidence about extended roles for allied health professions. *Journal of Health Services Research and Policy*. 2006;11(4):240-7.
54. Gordon T, Furner R, Otter S. Medicines Management in Podiatry Clinics. *Podiatry Now*. 2010;November:18-22.
55. Carey N, Stenner K, Courtenay M. Stakeholder views on the Impact of Nurse Prescribing on Dermatology Services. *Journal of Clinical Nursing*. 2010;19:498-506.
56. Courtenay M, Stenner K, Carey N. An exploration of the practice of nurse prescribers who care for people with diabetes: A case study. *Journal of Nursing and Healthcare of Chronic Illness*. 2009;1:311-20
57. Holdsworth LK, Webster VS, McFadyen AK. Physiotherapists' and general practitioners' views on self-referral and physiotherapy scope of practice; results from a national trial. *Physiotherapy*. 2008;94:236-43.
58. Stake RE. *The art of case study research: perspectives on practice*. London: Sage; 1995.
59. Luck L, Jackson D, Usher K. Case study: a bridge across the paradigms. *Nursing Inquiry*. 2006;13(2):103-9.
60. Popadiuk S RS. Benefits of non-medical prescribing within an NHS podiatry service. *Journal of Foot and Ankle Research* 2010;3((Suppl 1)):020.
61. Toracco RJ. Writing Integrative Literature Reviews: Guidelines and Examples. *Human Resource Development Review*. 2005;4(356):DOI: 10.1177/1534484305278283.
62. Whittemore R, Knafl K. The integrative review: updated methodology. *Journal of Advanced Nursing*. 2005;52(5):546-53.
63. Pluye P, Gagnon MP, Griffiths E, Johnson-Lafleur J. A scoring system for appraising mixed methods research, and concomitantly appraising qualitative, quantitative and mixed methods primary studies in Mixed Studies Reviews. *International Journal of Nursing Studies*. 2009;46(4):529-46.
64. Pace R, Pluye P, Macaulay AC, Salsberg J, Jagosh J, Seller R. Testing the reliability and efficiency of the pilot Mixed Methods Appraisal Tool (MMAT) for systematic mixed studies review. *International Journal of Nursing Studies*. 2012;49(1):47-53.
65. Nicholls J. Summary of survey of organisational arrangements for non-medical prescribing: NHS London 2009.
66. British National Formulary. 2014 [01/12/2013]; Available from: <https://www.bnf.org/>.
67. Carey N, Courtenay M, Stenner K. The prescribing practices of nurses who care for patients with skin conditions: a questionnaire survey. *Journal of Clinical Nursing*. 2013(22):doi: 10.1111/jocn.12271.

68. Stenner K, Courtenay M, Cannons K. Nurse prescribing for inpatient pain in the United Kingdom: a national questionnaire survey. *International Journal of Nursing Studies*. 2011;10.1016/j.ijnurstu.2011.01.009 online 12th February
69. Association for Nurse Prescribing. Annual Conference: Non medical prescribing. London, UK.2014.
70. Cohen J. Prescribing – your feedback. *Extended Scope Practitioners Newsletter*. 2002;11:12-3.
71. Goodrick D. Comparative Case Studies:. *Methodological Briefs: Impact Evaluation 9*. 2014;UNICEF Office of Research, Florence.
72. Courtenay M, Carey N, Stenner K, Gage H, Williams P. A comparison of prescribing and non-prescribing nurses in the management of people with diabetes. *Journal of Advanced Nursing*. 2015 71(12):2950-64
73. Polit DF, Beck CT. *Nursing research: principles and methods*. 7th Edition ed. Philadelphia, USA.: Lippincott Williams & Wilkins; 2004.
74. Bergen A, While A. A case for case studies: exploring the use of case study design in community nursing research. *Journal of Advanced Nursing*. 2000;31(4):926-34.
75. Courtenay M, Carey N, Stenner K. *Evaluation of Nurse Independent Supplementary Prescribing in the UK: Interim Report: University of Surrey*2010.
76. Latter S, Sibley A, Skinner TC, Craddock S, Zinken KM, Lussier MT, et al. The impact of an intervention for nurse prescribers on consultations to promote patient medicine-taking in diabetes: A mixed methods study. *International Journal of Nursing Studies*. 2010;doi: 10.1016/ijnurstu.2010.02.004.
77. Sherrington S, Bell D. Quality, innovation, productivity and prevention through non-medical prescribing. *Pharmacoepidemiology and Drug Safety*. 2011;20(660-667);doi:10.1002/pds.
78. Gardner GE, Gardner A, Middleton S, Gibb M, Della P, Duffield C. Development and validation of a novel approach to work sampling: a study of nurse practitioner work patterns. *Australian Journal of Advanced Nursing*. 2010;27(4):4-12.
79. Drennan J, Naughton C, Allen D, Hyde A, Felle P, O'Boyle K, et al. *Independent Evaluation of the Nurse and Midwife Prescribing Initiative*. Dublin: University College Dublin2009.
80. Poulton B. Use of the consultation satisfaction questionnaire to examine patients' satisfaction with general practitioners and community nurses: reliability, replicability, and discriminant validity. *British Journal of General Practice*. 1996;46 26 - 31.
81. Baker R. Development of a questionnaire to assess patients' satisfaction with consultations in general practice. *British Journal of General Practice*. 1990;40:487-90.
82. Baker R, Whitfield M. Measuring patient satisfaction: a test of construct validity. *Quality in Healthcare*. 1992; 1 104-9.
83. Meakin R, Weinman J. The Medical Interview Satisfaction Scale (MISS-21) adapted for British General Practice. *Family Practice*. 2002;19 (3):257-63.
84. Wolf M, Putnam S, James A, Stiles W. The Medical Interview Satisfaction Scale: development of a scale to measure patient perceptions of physician behavior. *Journal of Behavioural Medicine*. 1978;1 301-401.

85. Horne R, Hankins M, Jenkins R. The Satisfaction with Information about Medicines Scale (SIMS): a new measurement tool for audit and research. *Quality in Health Care*. 2001;10:135-40.
86. Gasquet I, Villemillot S, Estaquio C, Durieux P, Ravaud P, Falissard B. Construction of a questionnaire measuring outpatients' opinion of quality of hospital consultation departments. *Health Qual Life Outcomes*. 2004;4(2):43.
87. Latter S, Maben J, Myall M, Courtenay M, Young A, Dunn N. An evaluation of extended formulary independent nurse prescribing. Final Report: Policy Research Programme Department of Health & University of Southampton 2005.
88. Herdman M, Gudex C, Lloyd A, Janssen MF, Parkin D, Bonser G, et al. Development and preliminary testing of the new five-level version of EQ-5D (EQ-5D-5L). *Quality of Life Research*. 2011 20(10):1727-36.
89. Ritchie J, Spencer L. Qualitative data analysis for applied policy research. Bryman, A & Burgess, R: *Analysing Qualitative Data*. 1994:173-94.
90. Courtenay M, Carey N, Stenner K. Nurse Prescriber-Patient Consultations: A Case Study in Dermatology. *Journal of Advanced Nursing*. 2009;65(6):1207-17
91. NPC. Maintaining Competency in Prescribing. An outline framework to help nurse prescribers. : National Prescribing Centre:2001.
92. NPC. Prescribing Competencies Framework. 2012.
93. HCPC. Standards for Prescribing. 2013.
94. Jani Y. Proforma for the retrospective case-note review of medication error: Version 13. UCL School of Pharmacy. 2006.
95. Green P, Rees L. Hospital discharge of elderly patients: is seamless care achieved? . *British Pharmaceutical Conference, Cardiff Pharmaceutical Journal*. 1999;263.
96. Britten N, Jenkins L, Barber N, Bradley C, Stevenson F. Developing a measure for the appropriateness of prescribing in general practice. *Quality and Safety in Health Care*. 2003;12:246-50.
97. Courtenay M, Carey N. The Completeness of Prescriptions issued to Dermatology Patients by Nurse Prescribers. *Nurse Prescribing*. 2008;6(9):391-6.
98. Carey N, Stenner K, Courtenay M. Prescription writing for patients with diabetes: compliance with good practice *Nurse Prescribing*. 2009;7(10):464-8.
99. BMA. British National Formulary, . BMA, & Royal Pharmaceutical Society: London. 2015.
100. Drummond M, Sculpher MJ, Torrance GW, O'Brien B, Stoddart GL. *Methods for the economic evaluation of health care programmes*. Second ed. Oxford: Oxford Medical Publications; 2005.
101. Curtis L. Unit costs of health and social care: <http://www.pssru.ac.uk/project-pages/unit-costs/2013/> :2013.
102. Chartered Society of Physiotherapy. EQ5D 5L. 2016 [08/10/16]; Available from: <http://www.csp.org.uk/professional-union/practice/evidence-base/outcome-experience-measurement/eq5d5l>
103. Devlin N, Krabbe PFM. The development of new research methods for the valuation of EQ-5D-5L. *European Journal of Health Economics*. 2013;14(Suppl 1):S1-S3.
104. Gardiner J, Wagstaff S. Extended Scope Physiotherapy: The way towards consultant physiotherapists? *Physiotherapy* 2001;87(1):2-3.
105. Chartered Society of Physiotherapy. The use of injections by physiotherapists. *Physiotherapy* 1990;76(4):218-9.

106. Chartered Society of Physiotherapy. Information paper: The use of medicines with injection-therapy in physiotherapy services.2010; PD003: Available from: <http://www.csp.org.uk/publications/use-of-medicines-injection-therapy>.
107. Birchall D, Ismail AM, Peat G. Clinical outcomes from a physiotherapy-led intra-articular hyaluronic acid injection clinic. *Musculoskeletal Care*. 2008;6(3):135-49.
108. Hockin J, Bannister G. The Extended Role of a Physiotherapist in an Out-patient Orthopaedic Clinic. *Physiotherapy* 1994;80:281-4.
109. Hattam P, Smeatham A. Evaluation of an orthopaedic screening service in primary care. *Clinical Performance and Quality Health Care*. 1999;7(3):121-4.
110. Robinson P. Why do physiotherapists wish to inject? . *International Journal of Therapy and Rehabilitation* 1998;5(8):409 - 13
111. Saunders S. Injection therapy in management of musculoskeletal pain. *International Journal of Therapy and Rehabilitation* 1998;5(8):417 - 20.
112. Smith G. Review of steroid-only injection therapy clinics performed by a physiotherapists working in primary care. *International Musculoskeletal Medicine*. 2011;33(2):61-3
113. Shacklady C, Saunders S, Mallion C. Clinical effectiveness of physiotherapist administered injection therapy. *Physiotherapy* 1997;83(77):353.
114. Laslett M. Spinal Injection Therapy Delivered By Physiotherapists: Pushing the Boundaries. *The Development and Evaluation of a New Service New Zealand J Phys*. 2012; 40(2):88.
115. Clews G. Injecting improvements. *Frontline, News and Events*. 2009;15(11).
116. Kearney RS, Parsons N, Metcalfe D, Costa ML. Injection therapies for Achilles tendinopathy. *Cochrane Database of Systematic Reviews*. 2015(5).
117. Maffulli N, Papalia R, D'Adamio S, Diaz Balzani L, Denaro V. Pharmacological interventions for the treatment of Achilles tendinopathy: a systematic review of randomized controlled trials. *British Medical Bulletin* 2015;113:101-15.
118. Morris J, Grimmer K, Gilmore L, Perera C, Waddington G, Kyle G, et al. Non-medical prescribing by physiotherapist: issues reported in the current evidence. *Manual Therapy* 2014;19:82-6.
119. Benson CJ, Schreck RC, Underwood FB, Greathouse DG. The Role of Army Physical Therapists as Nonphysician Health Care Providers Who Prescribe Certain Medications: Observations and Experiences. *Phys Ther* 1995;75:380-6.
120. Donato EB, DuVall RE, Godges JJ, Zimmerman GJ, Greathouse DG. Practice analysis: defining the clinical practice of primary contact physical therapy. *Journal of Orthopaedic & Sports Physical Therapy*. 2004; 34:284-304.
121. Chartered Society of Physiotherapy. Information Paper: Practice Guidance for Physiotherapist Supplementary and/or Independent Prescribers in the safe use of medicines 2013; PD026: Available from: <http://www.csp.org.uk/publications/practice-guidance-physiotherapist-supplementary-prescribers>.
122. McClellan C. Extended Scope Physiotherapist in Emergency Departments - a UK Perspective. *Australian Physiotherapy Network E-Update* 2014.

123. Kuipers K, Cox R, Doherty D, Grudzinskas K. The process of developing a non-medical (advanced allied health) botulinum toxin A prescribing and injecting model of care in a public rehabilitation setting. *Australian Health Review*. 2013;37(5):624-31.
124. McMillan I. On target. *Frontline*. 2013.
125. Millett R. Physio aims to use independent prescribing to reduce delays in the remote Western Isles. *Frontline, News and Events*. 2014;20(13).
126. Millett R. First wave of physios set to qualify as independent prescribers. *Frontline, News and Events*. 2014;20(4).
127. Millett R. Physios start prescribing. *Frontline, News and Events*. 2014;20(4).
128. Hey M. Supplementray prescribing - can it have a place in pain management in physiotherapy? A personal view. *Physiotherapy Pain Association Newsletter* 2008(December).
129. Limb M. Halfway house to home *Frontline , News and Events*. 2006;12(1):<http://www.csp.org.uk/frontline/article/halfway-house-home>
130. Limb M. Another string to physiotherapy's bow. *Frontline, News and Events*. 2009;12(19).
131. Carlisle D. Life-affirming Development *Frontline, News and Events*. 2007;13(13).
132. Eaton L. Landmark decision gives UK physios a world first in prescribing rights. *Frontline, News and Events*. 2012;8(14).
133. Trueland J. A Breath of Fresh Air. *Frontline, News and Events*. 2012;18(9).
134. Millett R. Profile - Rapid response *Frontline, News and Events*. 2013;19(18).
135. Stanhope J, Grimmer-Somers K, Milanese S, Kumar S, Morris J. Extended scope physiotherapy roles for orthopedic outpatients: an update systematic review of the literature. *Journal of Multidisciplinary Healthcare* 2012;5:37-45.
136. Atkins E. Physiotherapists' experience of implementing injection therapy skills. *Physiotherapy* 2003;80(3):145-57.
137. Dawson LJ, Ghazi F. The experience of physiotherapy extended scop practitioners in orthopaedic outpatients. *Physiotherapy*. 2004; 90:210-6.
138. Ball STE, Walton K, Hawes S. Do emergency department physiotherapy Practitioner's emergency nurse practitioners and doctors investigate, treat nd refer patients with closed musculoskeletal injuries differently? *Emerg Med J*. 2007;24:185-8.
139. McClellan CM, Greenwood R, Benger JR. Effect of an extended scope physiotherapy service on patient satifaction and the outcome of soft tissues injury in an adult emergency department. *Emerg Med J* 2006;23:384-7.
140. McClellan CM, Cramp F, Powell J, Benger JR. A randomised trial comparing the clinical effectiveness of different emergency department healthcare professionals in soft tissue injury management. *BMJ Open* 2012;2:e001092 doi:10.1136/bmjopen-2012-.
141. McClellan CM, Cramp F, Powell J, Benger JR. A Randomised trial comparing the cost effectiveness of different emergency department healthcare professionals in soft tissue injury management. *BMJ Open* 3 e001116. 2013.
142. Limb M. Supplementary question *Frontline, News and Events*. 2006;12(16):<http://www.csp.org.uk/frontline/article/supplementary-question>

143. Morris J, Vine K, K. G. Evaluation of performance quality of an advanced scope physiotherapy role in a hospital emergency department. *Patient Related Outcome Measures*. 2015;6:191-203.
144. Daker-White G, Carr AJ, Harvey I, Woolhead G, Bannister G, Nelson I, et al. A randomised controlled trial. Shifting boundaries of doctors and physiotherapists in orthopaedic outpatient departments. *J Epidemiol Community Health*. 1999 Oct;53(10):643-50.
145. Lansbury G, Sullivan G. Physiotherapists and drug administration: a survey of practices in New South Wales. *Aust J Physiotherapy*. 1998;44:231-7.
146. Lansbury G, Sullivan K. Advising clients about prescription medications: a survey of physiotherapy practice in Australia. *Aust J Physiotherapy*. 2002;88:18-24.
147. Lansbury G, Sullivan K. Physical therapists' knowledge, advice and administration of nonprescription medication to their clients. *Journal of Allied Health Professions*. 2002;31(1):43-50.
148. Sullivan G, Lansbury G. Physiotherapists' knowledge of their clients' medications: a survey of practising physiotherapists in New South Wales. *Phys Theor & Pract* 1999;15:191-98.
149. Grimmer K, Kumar S, Gilbert A, Milanese S. Non-steroidal anti-inflammatory drugs (NSAIDs): physiotherapists' use, knowledge and attitudes. *Australian Journal of Physiotherapy*. 2002;48(2):82-92.
150. Kumar S, Grimmer K. Non steroidal anti-inflammatory drugs (NSAIDs) and physiotherapy management of musculoskeletal conditions: A professional minefield? *Therap and Clin Risk Manage*. 2005;1(1):69-76.
151. Unger M, Lochner R. Pharmacology practice and South African physiotherapists - part one. *The South African journal of physiotherapy* 2005;61(3):21-7.
152. Unger M, Lochner R. Pharmacology practice and South African physiotherapists - part two: a needs analysis. *The South African journal of physiotherapy* 2006;62(2):18-22.
153. Braund R, Abbott JH. Recommending NSAIDs and paracetamol: a survey of NZ physiotherapists' knowledge and behaviours. *Physiotherapy Research International* 2011;16(43-49).
154. Braund R, Abbott JH. NSAIDs and paracetamol for acute musculoskeletal injuries: physiotherapists' understanding of which is safer, more effective, and when to initiate treatment. *Physiotherapy Theory & Practice* 2011;27(7):482-91.
155. Onigbinde AT, Olaogun MOB, Iroghue K. An evaluation of the knowledge level of nigerian physiotherapists on topical pharmacology. *Hong Kong Physio Journal*. 2012;30:36-42.
156. Onigbinde AT, Kayode BDS, Olaogun MOB, Olukemi MO, Elubode AG, Emmanuel O. Opinion and knowledge of Nigerian physiotherapists on relevance and usefulness of pharmacology education on dosage of topical medications. *International Journal of Pharmacy and Pharmacology*. 2013;2(4):055-63.
157. Onigbinde AT, Adebisi S, Bamitale K, Kambalmetore S, M'kumbuzi V, Margaret W. Changing the prescription status of physiotherapists to supplementary prescribing: Perception of Nigerian physiotherapists. *Global Journal of Chiropody and Dermatology*. 2014; 2 (1):004-11.

158. Lee R, Scherer SA, Smith MB. Physical therapists knowledge, attitudes, and professional use of nonprescription analgesics. *Am J Health-Syst Pharm.* 2005; 62:1440-1.
159. Anonymous. Should you give advice on OTCs? *Physiotherapy Practice* 2011;1(3):9-11.
160. American Physical Therapy Association. Medications and the PT's role. *Physical Therapy.* 1995;75(6):54-70.
161. Anderson L. Traveling light - sports physiotherapists administering medications in the absence of a doctor. *New Zealand J Sports Med* 2010;37(2):38-42.
162. Anderson L. Physiotherapists administering medications under instruction. *Br J Sports Med.* 2012;46(4):222-3.
163. Jennings J. Practice question. *Nursing Older People* 2015; 27(9):14.
164. American Physical Therapy Association. The Role of Physical Therapists in Medication Management 2010:Available at: http://www.apta.org/uploadedFiles/APTAorg/Payment/Medicare/Coding_and_Billing/Home_Health/Comments/Statement_MedicationManagement_102610.pdf (Accessed: 5 May 2014).
165. American Physical Therapy Association. Pharmacology in physical therapy practice. 2012:Available at: http://www.apta.org/uploadedFiles/APTAorg/About_Us/Policies/HOD/Practice/Pharmacology.pdf (Accessed: 5 May 2014).
166. Paterson RE, Redman SG, Unwin R, McElhinney E, Macphee M, Downer F. Non-medical prescribing assessment An evaluation of a nationally agreed multi method approach. *Nurse Education in Practice* 2016;16:280-6.
167. Weglicki RS, Reynolds J, Rivers PH. Continuing professional development needs of nursing and allied health professionals with responsibility for prescribing. *Nurse Education Today.* 2015 35 227-31.
168. Young G, Hulcombe H, Hurwood A, Nancarrow S. The Queensland Health Ministerial Taskforce on health practitioners' expanded scope of practice: consultation findings. *Australian Health Review.* 2015 39:249-54.
169. Borthwick AM. In the beginning: local anaesthesia and the Croydon Postgraduate Group. *British Journal of Podiatry* 2005;8:87-94.
170. Borthwick AM. Drug prescribing in podiatry: radicalism or tokensim? *British Journal of Podiatry.* 2001;4(2):56-64.
171. Borthwick AM, Short AJ, Nancarrow SA, Boyce R. Non-medical prescribing in Austrlasia and the UK; the case of poditry. *J Foot Ankle Res* 2010;3(1).
172. Borthwick AM. Attaining prescribing rights: Miracle or mirage? *Podiatr Now* 2002;5:158.
173. Borthwick AM. Prescribing rights for allied health professionals: temporary lull or quiet abandonment. *Podium* 2003;1(4):4-6.
174. Borthwick AM. The politics of allied health prescribing: reflections on a new discourse. *Br J Podiatry.* 2004;7:31.
175. Borthwick AM. A long and wining road: attaining prescribing rights for podiatrists. *The Diabetic Foot Journal* 2012;13(3).
176. Stuart L, Fox M, Borthwick A, Sancella U, Wiles P. Supplementary prescribing: Patient, podiatrist and professor perspectives. *The Diabetic Foot Journal* 2010;13(3).

177. Stuart L, Fox M. Non-medical prescribing: a road less travelled? *The Diabetic Foot Journal*. 2007;10(3):122-4.
178. Gilheany MF, Borthwick AM. Recent developments in podiatric prescribing in the UK and Australia. *Journal Of Foot And Ankle Research*. 2009;2:doi:10.1186/757-46-2-37.
179. Borthwick AM. Predicting the impact of new prescribing rights. *The Diabetic Foot* 2001;4(1):4-8.
180. Gray C. Podiatrists and optometrists mounting provincial lobby campaigns to get greater treatment authority. *Canadian Medical Association Journal* 1978;119:370-2.
181. Institute of Chiropractors and Podiatrists. *Good practice in prescribing and medicines management for podiatrists*. London, UK. 2013.
182. Royal College of Physicians. *Spasticity in adults: management using botulinum toxin: national guidelines:2009*: Available from: <https://cdn.shopify.com/s/files/1/0924/4392/files/spasticity-in-adults-management-botulinum-toxin.pdf?7537870595093585378>.
183. Laslett M. Injections by physiotherapists: It is time to broaden our scope. *Expanding Horizons: Physiotherapy New Zealand Biennial conference; Wellington Conference Centre, Wellington, New Zealand: New Zealand Journal of Physiotherapy*; 2012.
184. HCPC. Information request: Number of Physiotherapist and Podiatrist Independent Prescribers: Personal Communication. HCPC. 2016.
185. New Zealand Ministry of Health. *Standing Order Guidelines*. Wellington, New Zealand:2012; Available from: <http://www.health.govt.nz/publication/standing-order-guidelines> (accessed 11 January 2015).
186. Grimmer K, Kumar S, Gilbert A, Milanese S. Non steriodal anti-inflammatory drugs: physiotherapists' use, knowledge and attitudes. *Aust J Physiother* 2002;48:82-92.
187. Hey M. *Supplementary Prescribing – Can it have a place in Pain Management Physiotherapy ? A Personal View*. 2007 [08/10/14]; Available from: http://www.prescribingforsuccess.co.uk/document_uploads/ahp-publishedwork/NMPArticle.pdf.
188. Richardson B, Shepstone L, Poland F, Mugford M, Finlayson B, Clemence N. Randomised controlled trial and cost consequences study comparing initial physiotherapy assessment and management with routine practice for selected patients in an accident and emergency department of an acute hospital. *Emergency Medicine Journal: EMJ*. 2005;22:87-92.
189. Morris J, Vine K, Grimmer K. Evaluation of performance quality of an advanced scope physiotherapy role in a hospital emergency department. *Patient Related Outcome Measures*. 2015;6:191-203.
190. Popadiuk S, Rajbhandari S. Benefits of non-medical prescribing within an NHS podiatry service. *Journal of Foot and Ankle Research* 2010;3((Suppl 1)):O20.
191. Anderson L. Physiotherapists administering medicine under instruction: Editorial. *British Journal of Sports Medicine*. 2012.
192. Borthwick A, Short A, Nancarrow AA, Boyce R. Non-medical prescribing in Australasia and the UK: the case of podiatry. *Journal of Foot and Ankle Research*. 2010;3(1).

193. Devlin N, Shah K, Feng Y, Mulhern B, van Hout B. Valuing Health-Related Quality of Life: An EQ-5D-5L Value Set for England: Research Paper 16/01: Office of Health Economics Research, London :2016.
194. Curtis L, Burns, A. Unit costs of health and social care <http://www.pssru.ac.uk/project-pages/unit-costs/> (accessed 8th Oct 2016). 2015.
195. DH. Supplementary Prescribing for Nurses and Pharmacists within the NHS in England. London: DH:2003.
196. Rogers E. Diffusion of Innovations. 5th Edition ed. New York,: Simon & Shuster Inc; 2003.
197. Courtenay M, Carey N, Burke J. Independent Extended and Supplementary Nurse Prescribing Practice in the UK: A National Questionnaire Survey. *International Journal of Nursing Studies*. 2007;44(7):1093-101.
198. Stenner K, Carey N, Courtenay M. A questionnaire survey of nurses who prescribe for patients with pain in the United Kingdom. *Journal of Clinical Nursing*. 2012:DOI: 10.1111/j.365-2702.012.04136.x.
199. Carey N, Courtenay M. Nurse Supplementary Prescribing for patients with diabetes: a national questionnaire survey. *Journal of Clinical Nursing*. 2008;18:2185-93.
200. Carey N, Stenner K, Courtenay M. How nurse prescribing is being used in diabetes services:views of nurses and team members. *Journal of Nursing and Healthcare of Chronic Illness*. 2010;2:13-21.
201. McPherson K, Kersten P, George S, Ellis B, Lattimer V, A B. Enhanced or extended roles for Allied Health Professionals in the NHS. Report to the NHS Service Delivery and Organisation (SDO) Programme (Accessed 01/12/2016) http://www.nets.nihr.ac.uk/data/assets/pdf_file/0005/81248/BP-08-1203-031.pdf :2004.
202. Chartered Society of Physiotherapy. Stretched to the limit. An audit of physiotherapy services in England. <http://www.csp.org.uk/documents/stretched-limit>: CSP; London :2010.
203. Courtenay M, Carey N, Stenner K, Lawton S, Peters J. Patients views of nurse prescribing: effects on care, concordance and medicine taking. *British Journal of Dermatology*. 2011(164):396-401.
204. Stenner K, Courtenay M, Carey N. Consultations between nurse prescribers and patients with diabetes in primary care: a qualitative study of patient views. *International Journal of Nursing Studies*. 2011;48(1):37-46.
205. Courtenay M, Stenner K, Carey N. The views of patients with diabetes about nurse prescribing. *Diabetic Medicine*. 2010;27:1049-54.
206. Carey N, Stenner K, Courtenay M. An exploration of how nurse prescribing is being used for patients with respiratory conditions across the east of England. *BMC Health Service Research*. 2014;14(27):DOI: 10.1186/472-6963-14-27.
207. Stenner K, Courtenay M. Benefits of nurse prescribing for patients in pain:nurses's views. *Journal of Advanced Nursing*. 2008;63(1):27-55.
208. Bradley E, Campbell P, Nolan P. Nurse prescribers: who are they and how do they perceive their role? *Journal of Advanced Nursing*. 2005;51(5):439-48.
209. Bradley E, Nolan P. Impact of nurse prescribing: a qualitative study. *Journal of Advanced Nursing*. 2007;59(2):120-8.

210. Stenner K, Courtenay M. A qualitative study on the impact of legislation on prescribing of controlled drugs by nurses. *Nurse Prescribing*. 2007;5(6):257-61.
211. Carey N, Stenner K, Courtenay M. Views on implementing nurse prescribing in a specialist children's hospital. *Nurse Prescribing*. 2009;7(5):205-10.
212. Stenner K, Carey N, Courtenay M. Implementing nurse prescribing: a case study in diabetes. *Journal of Advanced Nursing*. 2010;66(3):522-31.
213. Carey N, Stenner K, Courtenay M. Adopting the prescribing role in practice: exploring nurse's views in a specialist children's hospital. *Paediatric Nursing*. 2009;21(9):25-9.
214. HCPC. Operations Directorate Management Information Pack. HCPC. 2016.
215. Lim RHM, Courtenay M, Fleming G. Roles of the non-medical prescribing leads within organisations across a Strategic Health Authority: perceived function and factors supporting the role. *International Journal of Pharmacy Practice*. 2013;doi.10.1111/j.2042-7174.2012.00224.x.
216. DH. Proposals to introduce prescribing responsibilities for paramedics: stakeholder engagement. Consultation paper. London: DH2010.
217. Black A, Dawood M. A comparison in independent nurse prescribing and patient group directions by nurse practitioners in the emergency department: A cross-sectional review. *International Emergency Nursing*. 2014;22:10-7.
218. Cooper RJ, Anderson C, Avery T, Bissell P, Guillaume L, Hutchinson A, et al. Nurse and Pharmacist supplementary prescribing in the UK-A thematic review of the literature. *Health Policy*. 2008;85:277-92.
219. General Pharmaceutical Council. Prescribers Survey Report. GPC, London: (accessed 14th Decemebr 2016)
http://static.correofarmaceutico.com/docs/2016/06/17/gphc_prescribers_survey_report.pdf:2016.
220. General Pharmaceutical Council. Discussion paper on supervising pharmacist independent prescribers in training, (November 2016).
www.pharmacyregulation.org:2016.
221. BMA. GP 10 point-plan. available from <https://www.bma.org.uk/collective-voice/committees/general-practitioners-committee/gpc-current-issues/workforce-10-point-plan> (accessed 22nd November 2016). 2015.
222. NHS England, Royal College of General Practitioners, Health Education England. General Practice Forward View London: (accessed 25th May 2017) available from <https://www.england.nhs.uk/wp-content/uploads/2016/04/gpfv.pdf>2016.
223. Laurant M, Hermens R, Braspenning J, Akkermans R, Sibbald B, Grol R. An overview of patients' preference for, and satisfaction with, care provided by general practitioners and nurse practitioners. *Journal of Clinical Medicine*. 2008;17:2690-8.
224. Horrocks S, Anderson E, Salisbury C. Systematic review of whether nurse practitioners working in primary care can provide equivalent care to doctors. *BMJ*. 2002;324:819-24.
225. Doyle C, Lennox L, Bell D. A systematic review of evidence on the links between patient experience and clinical safety and effectiveness. *BMJ Open*. 2012;2013;3:e001570 doi:10.1136/bmjopen-2012-001570.

226. Barbosa CD, Balp MM, Kulich K, Germain N, D. R. A literature review to explore the link between treatment satisfaction and adherence, compliance, and persistence. *Patient Prefer Adherence*. 2012;6:39-48, doi: 10.2147/PPA.S24752.
227. Latter S, Maben J, Myall M, Young A. Perceptions and practice of concordance in nurses' prescribing consultations: Findings from a national questionnaire survey and case studies of practice in England. *International Journal of Nursing Studies*. 2007;44:9-18.
228. York Health Economics Centre. Evaluation of the Scale, Causes and Costs of Waste Medicines Final Report <https://core.ac.uk/download/pdf/111804.pdf?repositoryId=90>: YHEC & School of Pharmacy, University of London: 2010.
229. Hugtenburg JG, Blom ATG, Kisoensingh SU. Initial phase of chronic medication use; patients reasons for discontinuation. *British Journal of Pharmacology*. 2005;61(3):352-4.
230. Hogg D. An Economic Evaluation of Non-Medical Prescribing: Association of Prescribers Annual Conference, Holiday Inn Regents Park, London, 23rd November 2016.
231. Courtenay M, Carey N, James J, Hills M, Roland J. An Evaluation of a Specialist Nurse Prescriber on Diabetes In -Patient Service Delivery Practical *Diabetes International*. 2007;24(2):69-74.
232. Carey N, Courtenay M, James J, Hills M, Roland J. An Evaluation of a Diabetes Specialist Nurse Prescriber on the System of Delivering Medicines to Patients with Diabetes. *Journal of Clinical Nursing*. 2008;17(12):1635-44.
233. NHS England, Care Quality Commission, Health Education England M, NHS Trust Development Authority, England PH. Five year forward view: (accessed 24th November 2016) available from www.england.nhs.uk/ourwork/futurenhs/nhs-five-year-forwardview: 2014.
234. DH and Department for Communities and Local Government. Better Care Fund: Policy Framework: DH, 2014.
235. DH. The Musculoskeletal framework: Report: 270211. London: DH: 2006.
236. Gilbert H. Supporting integration through new roles and working across boundaries. The Kings Fund. 2016.
237. Chartered Society of Physiotherapy. Physios key in MD teams developing new ways of working: (accessed November 24th 2016) available from <http://www.csp.org.uk/frontline/article/physios-key-md-teams-developing-new-ways-working> :2009.
238. NICE. Patient Group Directions: Medicines practice guideline (accessed November 24th 2016) available from <https://www.nice.org.uk/guidance/mpg2/resources> :2013.
239. BMA. Patient Group Directions. available from <https://www.bma.org.uk/advice/employment/gp-practices/service-provision/prescribing/patient-group-directions> (accessed 24th November 2016). 2016.
240. HCPC. Standards for Prescribing. London: HCPC2016.
241. Courtenay M, Carey N, Burke J. Independent Extended and Supplementary Prescribers: their prescribing practice and confidence to educate and assess prescribing students. *Nurse Education Today*. 2007;27(7):739-47.

242. Scottish Government. Non-medical prescribing. (accessed 28th November 2016) <http://www.gov.scot/Topics/Health/NHS-Workforce/Pharmacists/Non-Medical-Prescribing> :2016.
243. Carey N, Ayers N, Gage H, Grainger L, Seiss E, Williams P, et al. The Parkinson's Inpatient Medicines Management Study (PIMMS): a mixed methods evaluation in two general hospitals in England Parkinsonism & Related Disorders. 2016;under review.
244. DH. Making a Difference. Strengthening the Nursing, Midwifery and Health Visiting Contribution to Healthcare. London: DH: 1999.
245. Chief Allied Health Professions Officers's Team. AHPs into Action. Using Allied Health Professions to transform health, care and wellbeing. London: Chief Allied Health Professions Officer's Team, NHS England,2017.

Appendix 1: Project Advisory groups' members

Dr June Crown (Chair)

Dr Alan Borthwick: Associate Professor, University of Southampton

Nicole Casey: Policy Manager, Health and Care Professions Council

Matt Fitzpatrick: Consultant Podiatrist, Provost, College of Podiatry

Rosie Furner: Community Services Pharmacist, East Sussex Healthcare NHS Trust

Sally Gosling: Chartered Society of Physiotherapy Practice & Development - Assistant Director

Michael Guthrie: Director of Policy and Standards Health and Care Professions Council

Diane Hogg: NMP Lead East Lancashire Hospitals NHS Trust, AHP Medicines Project Lead NHS England

Helen Marriott: Allied Health Professions Medicines Project Lead NHS England

Shelagh Morris: Deputy Chief Allied Health Professions Officer, NHS England

Dr Carol McCrum: Consultant Physiotherapist, East Sussex Healthcare NHS Trust

Dr Michael Okorie: Senior Lecturer in Medicine and Medical Education, Brighton and Sussex Medical School, Consultant Physician

Dr Lucy Redhead: Senior Lecturer Physiotherapy, School of Health Sciences, University of Brighton

Sarah-Jane Ryan: Senior Lecturer Physiotherapy, School of Health Sciences University of Brighton

Debbie Sharman: Consultant Podiatrist Diabetes and Visiting Lecturer (University of Southampton), Dorset HealthCare University NHS Foundation Trust

Martin Turns: Lead Podiatrist in Diabetes (Brighton and Hove), Sussex Community NHS Trust

Helen Ward: Associate Professor, Non-Medical Prescribing, London South Bank University

Dr John Wilkinson: Research Programmes Senior Manager, Department of Health

Patient Public Involvement Group (PPI)

Norman Prowie,
Kenneth Giles
Ann and Derek Heasman,
Christine Barnes

Appendix 2: Literature review – additional information

- Sample search string
- PRISMA flow chart
- In/exclusions

Figure A2.1 Literature review - sample search string

Database: Medline	
Platform: EBSCO	
Limits:	
Physiotherapy Limiters - Date of Publication: 19850501-20140731, Human only	
Podiatry Limiters - Date of Publication: 19680101-20160531, Human only	
Search modes - Boolean/Phrase	
1	"physical therap*".ti.ab
2	"physiotherap*".ti.ab
3	(MH "Physical Therapy Modalities")
4	"extended scope of practice".ti.ab
5	"ESP".ti.ab
6	"extended scope physiotherap*".ti.ab
7	"enhanced scope of practice".ti.ab
8	"advanced practice*".ti.ab
9	"advanced practitioner*".ti.ab
10	"allied health professional*".ti.ab
11	prescrib*.ti.ab
12	"prescribing right*".ti.ab
13	"non-medical prescrib*".ti.ab
14	"independent prescrib*".ti.ab
15	"supplementary prescrib*".ti.ab
16	"patient group direct*".ti.ab
17	"patient specific direct*".ti.ab
18	exemption*.ti.ab
19	"injection therap*" ti.ab
20	Podiatry.ti.ab
21	(MH "Podiatry")
22	"specialist podiatrist".kw
23	"Consultant Podiatric Surgeon".kw
24	"podiatric surgeon".ti.ab
25	OR/1-10 (Physiotherapy terms)
26	OR/8-10 OR/20-24 (Podiatry terms)
27	OR/11-19 (Prescribing terms)
28	25 AND 27
29	26 AND 27
30	28 OR 29 (Physio and Pod together)
Key	
Ti- title word	
Ab - abstract word	
MH - Main index/ MeSH term	
Kw - Key Word	

Figure A2.2 PP-IP Literature review PRISMA flow chart

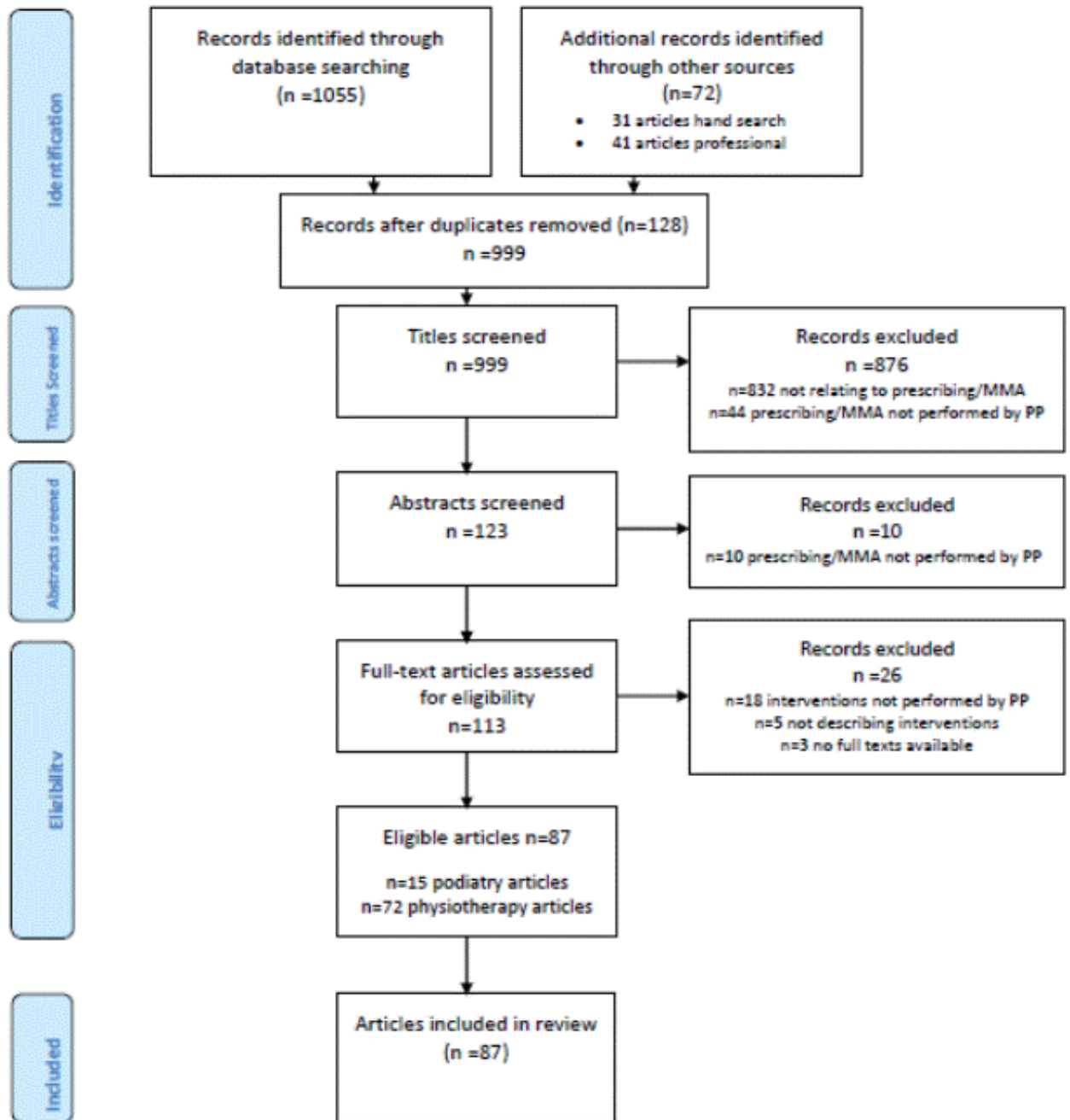


Table A2.1 Inclusion and exclusion criteria

Articles were included if they:
<ol style="list-style-type: none">1. Described any intervention by podiatrists or physiotherapists relating to the use of prescribing and/or medicines management activity2. Described interventions impacting any patient/carer or workforce/service outcomes3. Described interventions delivered by podiatrists or physiotherapists in any professional role and/or clinical specialty4. Were based in any health or social care setting or geographical area5. Were published from January 1985 to July 2014 (physiotherapy), and January 1968 to July 2014 (podiatry)6. Were any type of published literature including: empirical and theoretical papers, editorials/ commentaries/professional opinions, service audits, conference abstracts, guidelines, professional governing body development/information papers, or policy documents7. Were web based newsletters/features/ briefings, professional governing body development/information papers, or policy documents
Articles were excluded if:
<ol style="list-style-type: none">1. No abstract or full publication was available2. They were in the non-English language and no translated copy could be identified3. No full text copies were available.

Appendix 3: Trainee PP-IP Questionnaires

Appendix 3a Q1
Appendix 3b Q2



Adobe Acrobat
Document

PP-IP Questionnaire 1



Adobe Acrobat
Document

PP-IP Questionnaire 2

Appendix 4: Observation diaries

Appendix 4a Observation diary NP-PP sites

Appendix 4b Observation diary PP-IP sites

Site ref

Date..... Interview No.....

Project title: *Evaluation of physiotherapist and podiatrist independent prescribing*

**NP-PP Observation Diary
Non-prescribing Physiotherapist/podiatrists**

Q1) Time in/ Time out of consultation

Q2) Type of service

- a) NHS hospital inpatient
- b) NHS hospital outpatient
- c) NHS community clinic
- d) Community service (e.g. home visits)
- e) General practice
- f) Social enterprise
- g) Independent private sector
- h) Local authority
- i) Other – please describe

Q3) Consultation type: Face to face/ telephone/email/ other

Q4) Referral source:

- a) NHS hospital inpatient
- b) NHS hospital outpatient
- c) NHS community clinic
- d) Community service
- e) General practice
- f) Social enterprise
- g) Independent private sector
- h) Local authority
- i) Self-referral
- j) Other – please describe

Q5) Type of consultations: initial routine/ follow-up/ emergency/ other

Medicines management activities

Q6) Outcome

- a. New medication required
- b. Alter or stop existing medications
- c. No change to existing medications or no medication required
- d. Repeat prescribe previous item(s)

Q7) Prescribing actions taken

- i) Recommend OTC product
- ii) Recommend to doctor or other prescriber that a prescription is required (in person, via tel/ email/ letter)
- iii) Recommend via Hospital notes
- iv) Adjust dose/ drug according to pre-agreed protocols
- v) PGD
- vi) PSD
- vii) Exemptions

Other actions

Q8) Advise patient about medicines:

- how it works,
- when/ how to take
- side effects

Q9) Discuss with colleague(s)

- Same profession
- Medical profession
- Other (specify)

Q10) Time spent in discussion with colleague(s)

- Start time
- End time

Q11) Refer to colleague

- Same profession
- Medical profession
- Other (specify)

Q12) Referral method:

- Face to face
- Telephone
- Email
- Other (specify)

Q13) Time spent in referring to colleague(s)?

Q14) Medication (s) detail: name of medication, dose/ duration/ formulation recommended

Q15) Review arrangements: describe

Site ref

Date..... Interview No.....

Project title: *Evaluation of physiotherapist and podiatrist independent prescribing*

**PP-IP Observation Diary
Prescribing Physiotherapist/podiatrists**

Q1) Time in/ Time out of consultation

Q2) Type of service

- a) NHS hospital inpatient
- b) NHS hospital outpatient
- c) NHS community clinic
- d) Community service (e.g. home visits)
- e) General practice
- f) Social enterprise
- g) Independent private sector
- h) Local authority
- i) Other – please describe

Q3) Consultation type: Face to face/ telephone/email/ other

Q4) Referral source:

- a) NHS hospital inpatient
- b) NHS hospital outpatient
- c) NHS community clinic
- d) Community service
- e) General practice
- f) Social enterprise
- g) Independent private sector
- h) Local authority
- i) Self-referral
- j) Other – please describe

Q5) Type of consultations: initial routine/ follow-up/ emergency/ other

Medicines management activities

Q 6) Outcome

- a. New medication required
- b. Alter or stop existing medications
- c. No change to existing medications or no medication required
- d. Repeat prescribe previous item(s)

Q 7) Prescribing actions taken

- i) Recommend OTC product
- ii) Recommend to doctor or other prescriber that a prescription is required (in person, via tel/ email/ letter)
- iii) Recommend via Hospital notes
- iv) Adjust dose/ drug according to pre-agreed protocols
- v) PGD
- vi) PSD
- vii) Exemptions

Other actions

Q8) Advise patient about medicines:

- how it works,
- when/ how to take
- side effects

Q9) Discuss with colleague(s)

- Same profession
- Medical profession
- Other (specify)

Q10) Time spent in discussion with colleague(s)

- Start time
- End time

Q11) Refer to colleague

- Same profession
- Medical profession
- Other (specify)

Q12) Referral method:

- Face to face
- Telephone
- Email
- Other (specify)

Q13) Time spent in referring to colleague(s)

Q14) Medication (s) detail: name of medication, dose/ duration/ formulation recommended

Q15) Review arrangements: describe

Appendix 5: Work sampling tool



**Adobe Acrobat
Document**

Work sampling tool

Appendix 6: Patient Questionnaires



Adobe Acrobat
PDFXML Document

Patient Questionnaire 1 1

Appendix 6a



Adobe Acrobat
PDFXML Document

Patient Questionnaire 2 1

Appendix 6b

Appendix 7: Interview schedules

Project title: *Evaluation of physiotherapist and podiatrist independent prescribing*

**Podiatrist/Physiotherapist Independent Prescriber
Interview Schedule**

Confirm consent to be interviewed and for audio-recording

1. Could you tell me a bit about yourself and your role?

2. Can you explain more about the services you provide?

Prompts:

- Range of services provided and their settings
- Typical patient caseload
- How patients are referred in and out of the service
- How easy is it for patients to access the service (e.g. waiting times)?

3. To what extent have you been able to use the IP qualification so far?

Prompts:

- Are there instances where you would use another route to prescribe or administer medicines? [e.g. supplementary prescribing, PGD] –If, so why?
- Do you use guidance/protocol to support your prescribing decisions?

4. What, if any, do you consider to be the main benefits of you being able to prescribe independently?

Prompts: in relation to a) patients b) services c) other health care professionals c) yourself

5. Have there been any difficulties or anything that has prevented you from using IP?

Prompts:

- Difficulties in setting up/starting to use IP in practice
- Prescribing budget
- Relationships with patients and/or professionals
- Access to patient records

6. Have there been any changes to the way that care is organised as a result of you being able to prescribe?

Prompts:

- appointment times/slots,
- type of clinics,
- number of doctor or other healthcare professional appointments

7. Thinking back, which aspects of the prescribing programme have been most useful?

8. What do you regard as the key strengths and weaknesses of current governance arrangements for your prescribing practice?

Prompts:

- access to own prescribing data
- availability of suitable CPD/training
- guidance for audit of prescribing practice
- access to supervision/support for prescribing decisions
- communication between providers

9. Can you describe how you communicate prescribing decisions to other relevant healthcare professionals, such as the patient's GP?

10. How would you describe the impact that IP has had on you as an individual?

Prompts:

- How does prescribing fit within your broader scope of practice?
- Has it changed your role in anyway?
- Has it influenced your job satisfaction?
- Changes to relationships with colleagues or patients

11. How do you think prescribing rights will impact on the development of podiatry/physiotherapy as a profession?

12. Is there anything that you would like to add?

Finish

Thank you for your time

Project title: *Evaluation of physiotherapist and podiatrist independent prescribing*

Non-Prescriber Podiatrist/Physiotherapist Interview Schedule

Confirm consent to be interviewed and for audio-recording

13. Could you tell me a bit about yourself and your role?

14. Can you explain more about the services you provide?

Prompts:

- Range of services provided
- Typical patient caseload
- How patients are referred into the service
- How easy is it for patients to access the service (e.g. waiting times)?

15. What are your views about podiatrist/physiotherapist prescribing?

Prompts:

- Potential advantages of independent prescribing
- Potential disadvantages to PP prescribing
- Would you personally consider undertaking the prescribing course?

16. What involvement, if any, do you have in providing advice or information to patients about medicines?

Prompts:

- How often do you provide advice to patients about medicine (discuss both existing medicines and the need for new medication)?
- Are you involved in assessing patients and making decisions about their medicines?
- What happens if you think a patient requires medicine, e.g. do you refer them to a GP or other health professional?
- Who else is involved in prescribing or managing medicines for your patient group?
- How easy is it, in your opinion, for patients to access the medication required for the conditions that you treat?

17. Can you explain how decisions about patients' treatment are communicated between different service providers? (e.g. from physiotherapy/podiatry to general practice, or between primary and secondary care)

18. Is there anything that you would like to add?

Project title: *Evaluation of physiotherapist and podiatrist independent prescribing*

**Team Member Interview
Non-prescribing sites**

Take consent (reading each item on consent form)

Role and relationship to physiotherapist/podiatrist (PP) participant

- What is your role in relation to the physiotherapist/podiatry service?
- How long have you been in this role or worked with physiotherapist/podiatry service?
- Do you have direct contact with the patients seen by the physiotherapist/podiatry services?

Medicines Management

- Are you involved in medicines management in any capacity for this patient group?
- Can you describe the current process by which patients are prescribed medication?
- Who is involved in assessing patients?
- Who is involved in making prescribing decisions?
- How are decisions about patients' treatment communicated between different service providers? (e.g. from physiotherapy/podiatry to general practice, or between primary and secondary care)
- How easy is it, in your opinion, for patients to get appointments and receive the care they need?

Views on PP prescribing and its potential impact

- What is your opinion about physiotherapists/podiatrists taking on a prescribing role?
- Do you think there would be any advantages to the physiotherapy/podiatrist being able to prescribe? [benefits to patients, the service, the physiotherapy/podiatrists, other staff]
- Do you think there would be any disadvantages or concerns to PP-IP?
- Do you think employing a PP-IP would change the way that care is organised?

Is there anything else that you would like to add?

Project title: *Evaluation of physiotherapist and podiatrist independent prescribing*

**Team Member Interview
Prescribing Sites**

Take consent (reading each item on consent form)

Role and relationship to physiotherapist/podiatrist (PP) participant

- What is your role in relation to the physiotherapist/podiatry service?
- How long have you been in this role or worked with PP service?
- Do you have direct contact with the patients seen by the PP services?

Medicines Management

- Are you involved in medicines management for this patient group?
- Can you describe the process by which patients are prescribed medication?
- Who is involved in assessing patients?
- Who is involved in making prescribing decisions?
- How many appointments do patients need before they receive their medication?
- How are decisions about patients' treatment communicated between different service providers? (e.g. from physiotherapy/podiatry to general practice, or between primary and secondary care)
- How easy is it, in your opinion, for patients to get appointments and receive the care they need?
- How easy is it, in your opinion, for patients to get to their medications?

Views on PP prescribing and its potential impact

- What is your opinion about physiotherapists/podiatrists taking on a prescribing role?
- Do you think there are any advantages to the physiotherapists/podiatrists being able to prescribe? [benefits for the patient, for the service/organisation, for the PP-IP, for other staff]
- Do you think there are any disadvantages to PP-IP?
- Are there any barriers to making the best use of IP in this service?
- If so, how could these be overcome?
- Do you think having a PP-IP has or will change the way that care is organised?

[Prompts: educational preparation, safety and governance]

Is there anything else that you would like to add?

Appendix 8: Audio recording: Consultation assessment tool

Assessor Initials.....

Date of assessment

Evaluation of Physiotherapist and Podiatrist Independent Prescribing

Rating Scale		
1. Safe practice	2. Concern	3. Unsafe practice
Good history Appropriate assessment/examination Clear communication Clear instructions Holistic approach	Insufficient evidence to make judgement History incomplete, but covers basics Limited assessment Satisfactory instructions but not comprehensive Some holistic elements missing	History missed key elements Inappropriate and/or omissions to exam Poor/no instructions Lacks holistic approach

Consultation Assessment Schedule

Behavioural indicators of competence

		Occurred?			Rating			Comment
		Yes	No	N/A	1	2	3	
	Assessment & Diagnosis <i>Takes a comprehensive history of the patients presenting problem including:</i>							
1	Identifies a chief complaint							
2	Explores presenting symptoms							
3	Explores management of presenting problem to date							
4	Determines previous episodes of presenting problem							
5	Explores past medical history							
6	Explores family/social history							

	Assessment and diagnosis <i>continued</i>	Occurred?			Rating			comment
		Yes	No	N/A	1	2	3	
7	Determines any known allergies and nature of allergic response							
8	Explores current prescribed medication							
9	Explores OTC /herbal products							
10	Makes a working or final diagnosis/ decision by deciding between the various possibilities							
11	Identifies a relevant physical examination							
12	Considers psychological, social and environmental factors when establishing treatment options							
13	Considers non-pharmacological treatment options							
14	Requests or interprets relevant diagnostic tests							
15	Selects the most appropriate treatment option and/or drug, dose and formulation for the individual patient, assessing the risks and benefits to the patient							
16	Established a plan for reviewing the therapeutic objective/end point of treatment							

	Communication with the patient	Occurred?			Rating			Comment
		Yes	No	N/A	1	2	3	
1	Explains the nature of the patient's condition and/or the potential risks and benefits of treatment options							
2	Identifies and respects the patient's values beliefs and expectations							
3	Works with patient to make informed choice about their management/treatment							
4	Where possible, supports patient to take responsibility for their medications and/or self-managing their conditions							
5	Provides lifestyle advice or support							
6	Adapts consultation to meet needs of different patients, e.g. culture, language, age, capacity, physical or sensory impairment							

		Occurred?			Rating			Comment
		Yes	No	N/A	1	2	3	
7	Gives clear instructions to the patient about their medication and how to apply if required (dose, use and duration)							
8	Gives clear instructions to the patient about possible side-effects, and action to take in event of side effects							
9	Identifies the present and future needs of the patient/client and shows evidence of planning a strategy with them to meet these needs							
10	Checks patients understanding of and commitment to the management, monitoring or follow-up							

Type of appointment: a) Initial appointment b) Follow-up or repeat appointment

Thank you, the assessment is complete

Appendix 9: Patient record audit tool



Adobe Acrobat
Document

Patient record audit tool

Appendix 10: Prescription audit tool

Prescription Assessment

Reviewer initials _____

Date

Participant ID _____

	YES	NO
Number of days stated		
Clear & accurate instructions re (frequency, and timing of treatment)		
Quantity in brackets		
Dosage number		
Dose frequency in words		
Appropriate generic prescribing		
Accurate /appropriate product, dose & preparation		
Correct terminology		
Written legibly in ink		
Uses appropriate prescription / form		

Appendix 11: Case site matched pairs

PODIATRISTS: Pair 1

Site 1: Podiatrist Independent Prescriber

Service Information	Case Site 1
<i>Job title and role:</i>	General podiatrist 30% private; 70% private residential home. Also has educational role in CPD.
<i>Description of service and types of patients treated:</i>	Home based private practice (range of patients including some children) and 3 days at private residential hospital for pensioners (n=300). Patients; average 80 years, mainly men, high levels of LTCs, dementia and deafness.
<i>Single or multi-professional:</i>	Home clinic; single. Residential home part of GP team; GP, clinic nurses, physiotherapy, occupational therapy.
<i>NMPs in team (other than participant if NMP):</i>	One; GP.
<i>Access to patient records:</i>	In residential hospital only/ not in home clinic. No access to budget
<i>Form of clinic notes:</i>	Home practice; paper. Residential hospital; electronic and paper.

<i>Patient access to service:</i>	Home practice; self-referral. Residential hospital; self-referral/re-referral at any time. Flexibility over rapid access.
<i>How patients are referred in:</i>	Patients self-refer to private clinic. Hospital; initial assessment by GP on entering home and routine referral to podiatrist for foot check; all high risk patients seen. Some patients seen daily/weekly, others given follow-up appointments in 1-6 monthly intervals.
<i>Patient access to medicines:</i>	Private home practice; paying patients issued private prescriptions using local pharmacist. Non-paying; written recommendation to GP. Can administer or supply 10 medications via exemptions in home clinic. Residential home; written recommendations for medicines (including drug class/type, dose schedule) using standardised form to GP.
<i>Patient throughput and length of appointments:</i>	Average 15 patients/day in residential hospital; 15 minute appointments NP and FU. Home private practice?
<i>Access to diagnostic and treatment facilities:</i>	Residential home: referral rights to all residential home health services including GP (access to electronic booking system), physiotherapy, occupational therapy, clinic nurse for blood tests.

Site 2: Podiatrist non-prescriber

Service Information	Case Site 2
<i>Job title and role:</i>	Self-employed general podiatrist in own private practice. Also has professional body council/Trustee role.

<i>Description of service and types of patients treated:</i>	Private podiatry practice with; 5 part-time associate self-employed podiatrists, 1 podiatric assistant, 2 administrators, and home based PA. In clinic 2-3 half days per week, plus Friday and Sat. Patients; range of age including children, range of conditions including high risk LTCs (diabetes, stroke, CVD), general and sports.
<i>Single or multi-professional:</i>	Single.
<i>NMPs in team (other than participant if NMP):</i>	None.
<i>Access to patient medical records:</i>	None.
<i>Form of clinic notes:</i>	Paper.
<i>Patient access to service:</i>	Self-referral /re-referral at any time. Rapid access via weekly emergency access slots. Normal waiting time 1 week. Home visits possible. Telephone access.
<i>How patients are referred in:</i>	Self-refer. Recommendation by GPs.
<i>Patient access to medicines:</i>	Can administer or supply 10 medications via exemptions in home clinic.
<i>Patient throughput and length of appointments:</i>	14-20 patients per day, 15-30 min appointments
<i>Access to diagnostic and treatment facilities:</i>	No referral rights; diagnostics/treatments requested through GP.

PODIATRISTS: PAIR 2

Site 3: Podiatrist Independent Prescriber

Service Information	Case Site 3
<i>Job title and role:</i>	Podiatry Team Leader – Diabetic foot clinic. Clinical/managerial role for 7 staff.
<i>Description of service and types of patients treated:</i>	Employed by primary care with secondary care service level agreement. Provides secondary care based specialist diabetic foot service to inpatients and outpatient clinic at 2 sites. Adults age 40 -100, high risk patients (mostly diabetic) with associated LTCs, lower limb amputation prevention, ulcers.
<i>Single or multi-professional:</i>	Multi-professional; consultant podiatrist, diabetes consultant physician, 2 podiatrists, podiatric assistant, diabetes nurse specialists, clinic nurses.
<i>NMPs in team (other than participant if NMP):</i>	Two (consultant podiatrist/consultant physician). All diabetic foot clinics attended/led by 1 of 3 rotating IPs.
<i>Access to patient medical records:</i>	Electronic access to 3 secondary/community care record data systems.
<i>Form of clinic notes:</i>	Paper and electronic; paper scanned into electronic hospital note system. Uses integrated diabetes clinical information system (Diabeta-3); primary care linked electronic database to record diabetes medicines/results/care pathway guidelines.
<i>Patient access to service:</i>	Referral. Once seen, self-re-referral at any time. Rapid access possible but no scheduled emergency slots.
<i>How patients are referred in:</i>	Referral from any health care professional in secondary/primary care (GPs/ doctors, nurses, podiatrists, physios, prosthetic limb centre, tissue viability).

<i>Patient access to medicines:</i>	Issue/dispense prescriptions, administer or supply medicines via exemptions. Makes recommendations to GPs for non-urgent medicines (budgetary reasons).
<i>Patient throughput and length of appointments:</i>	10 appointments per clinic; 3 NP 45 mins, 7 FU 30 mins.
<i>Access to diagnostic and treatment facilities:</i>	Referral rights to; diagnostic blood tests, microbiology, radiology (duplex US scans/ x-ray), neuropathy clinic, primary care and community services (district nurses, podiatric community diabetic foot protection service).

Site 8: Podiatrist non-prescriber

Service Information	Case Site 8
<i>Job title and role:</i>	Senior Podiatrist. 22.5 hours NHS; 7.5 hours private practice (home visits). Also university teaching role as student mentor.
<i>Description of service and types of patients treated:</i>	Employed by NHS secondary care; provides wound care/general care/specialist diabetic foot care and nail surgery for clinics in primary care, one secondary care ward, one secondary care clinic and community home visits. Adults with range of general foot conditions and high risk vascular/diabetic patients.
<i>Single or multi-professional:</i>	Single.
<i>NMPs in team (other than participant if NMP):</i>	None.
<i>Access to patient medical records:</i>	Electronic access to medical records dependent on location.

<i>Form of clinic notes:</i>	Paper notes scanned into electronic systems.
<i>Patient access to service:</i>	Waiting time for routine appointment 12 weeks, rapid access 2-3 days but no scheduled emergency slots.
<i>How patients are referred in:</i>	GP referral only.
<i>Patient access to medicines:</i>	Local anaesthetics under Exemptions. Makes recommendations to GPs for medicines (drug type/schedule not stipulated).
<i>Patient throughput and length of appointments:</i>	15 appointments per general /wound care clinic; minor surgery 6 per clinic. 4-5 home visits in community visit clinic. NP 40 minutes; FU 20 mins.
<i>Access to diagnostic and treatment facilities:</i>	No direct referral rights apart from Trust wide podiatric services; refers to GP for diagnostics including radiology, blood and microbiology.

PODIATRISTS: PAIR 3

Site 10: Podiatrist Independent Prescriber

Service Information	Case Site 10
<i>Job title and role:</i>	Consultant Podiatric Surgeon. Clinical/teaching role for 2 specialist podiatric surgical registrars. Private hospital based private practice.
<i>Description of service and types of patients treated:</i>	Employed by NHS secondary care (50% in each). Provides day case surgery and outpatient podiatry clinics at 2 sites; average 2 theatre slots per week in NHS. Patients: adults and some children with range of general foot and ankle conditions, mainly non-acute/chronic conditions. Provides conservative treatment and surgery. Special interest in rheumatology and case load includes patients with complex foot problems and comorbidities.

<i>Single or multi-professional:</i>	Multi-professional; clinic/theatre nurses, consultant anaesthetists.
<i>NMPs in team (other than participant if NMP):</i>	
<i>Access to patient medical records:</i>	Paper notes scanned into electronic systems.
<i>Form of clinic notes:</i>	Paper notes with electronic referral system.
<i>Patient access to service:</i>	Maximum 18 week wait for routine appointment; no scheduled emergency slots.
<i>How patients are referred in:</i>	GP referral via choose and book system
<i>Patient access to medicines:</i>	Prescribes medicines for surgery. Injections administered under PGDs, and local anaesthetics under Exemptions. Makes recommendations to GPs for non-urgent medicines (drug type/schedule stipulated).
<i>Patient throughput and length of appointments:</i>	Team see approximately 30 patients per week (NHS).
<i>Access to diagnostic and treatment facilities:</i>	Referral rights; radiology (x-ray/US/MRI), Trust wide podiatric, orthotic, biomechanics services and diagnostics (blood tests, microbiology, orthopaedic surgeons).

Site 6: Podiatrist non-prescriber

Service Information	Case Site 6
Job title and role:	Consultant Podiatric Surgeon and Head of Surgical Service (Hand & wrist/ENT/plastic/foot & ankle). Clinical lead for podiatry and orthotic service. Managerial role 30%. n=50-60 podiatry staff, n=20-30 surgical staff.
Description of service and types of patients treated:	Employed by NHS secondary care. Podiatry and orthotic service part of MSK team; mostly all surgical patients, mainly with foot and ankle conditions. Provides day case surgery and outpatient podiatry clinics at 2 sites; 3 theatre lists/week and 9 outpatient clinics/week. Skill mix model used for clinics whereby less senior staff run 3 of the clinics and the podiatric consultant rotates to see all patients for the essential part of their consultation (2-5 minutes) enabling higher throughput of patients and inputting to high risk/surgical cases. The 4 th clinic is kept empty except for emergency/overbooked slots. Anaesthetics administered by senior podiatrists before surgery.
Single or multi-professional:	Multi-professional; consultant podiatrist (participant), principle podiatrist, 2-3 senior podiatrists and nurses in theatre, healthcare assistants, nurses, podiatry technicians, orthoptists in outpatients.
NMPs in team (other than participant if NMP):	None, but all plan to undertake IP qualification
Access to patient medical records:	Shared electronic records via system One between hospital departments. Paper referral letters or telephone calls with GPs. Dictated letters scanned into records.
Form of clinic notes:	Paper notes with electronic referral system.

Patient access to service:	Waiting time for routine outpatient appointment 4 weeks; surgery 4-6 weeks. No scheduled emergency slots. Routine follow up reviews by telephone. Patients can self-refer within 6 months following last appointment. Maximum 3-4 appointments/patient (standard is 1 week for redress, 2 weeks for suture removal and 6 weeks telephone follow-up and 6-month final check).
How patients are referred in:	GP referral; podiatry services, MSK service.
Patient access to medicines:	Administers/supplies medicines under PGDs/exemptions - post-operative medicines protocol driven. Makes recommendations to GPs for post-operative and non-urgent medicines (drug type/schedule stipulated).
Patient throughput and length of appointments:	15 outpatient appointments/day; NP 40 minutes; FU 20 minutes. 4 surgical appointments/theatre session.
Access to diagnostic and treatment facilities:	Full Trust referral rights; radiology (x-ray/US/MRI), orthotics and biomechanics services, physiotherapy, occupational therapy, diagnostics (blood tests, microbiology), orthopaedic and vascular surgeons.

PHYSIOTHERAPISTS: PAIR 4

Site 7: Physiotherapist Independent Prescriber

Service Information	Case Site 7
Job title and role:	Clinical lead physiotherapist for Integrated care service Community Response Service; 2 days NHS, 3 days research/teaching.
Description of service and types of patients treated:	Integrated community response service commissioned by/based in primary care. Provides early supported discharge/admission prevention through domiciliary visits;

	365-day service runs 07.00-19.00. Patients; adults with acute physical conditions, LTC, complex physical/social needs. MDT held every day; one team member designated co-ordinator of case load and responsible for triaging new referrals. Meeting attended by at least one IP.
Single or multi-professional:	Multi-professional (n=33); 3 physiotherapists, occupational therapists, social workers, occupational therapy assistants, nurses, community matron, support workers, administration staff, GPs.
NMPs in team (other than participant if NMP):	Three; 2 nurses, 1 GP.
Access to patient records:	Electronic access to primary care records.
Form of clinic notes:	Electronic access.
Patient access to service:	Waiting time for initial home visit days. Rapid response referrals responded to within 2 hours. Patients/carers/relatives can contact via telephone and re-refer once in service.
How patients are referred in:	Single point of access referral mechanism; from secondary care consultants/health professionals, ambulance service, health professionals from any community service. Patients must have GP within specific geographical region.
Patient access to medicines:	Issues urgent prescriptions. Makes verbal recommendations for non-urgent medicines (drug type stipulated but not dose schedule) to GP.
Patient throughput and length of appointments:	Up to 6 home visits performed /day. Patients seen for up to 7 days, 1-3 visits/day.
Access to diagnostic and treatment facilities:	Referral; any community service including dietician, speech and language, district nurses.

Site 4: Physiotherapist Non-prescriber

Service Information	Case Site 4
Job title and role:	MSK Clinical Lead /ESP Lead for MSK physiotherapy service; clinical role and ESP teaching/supervisory role.
Description of service and types of patients treated:	Commissioned MSK service based in 4 hubs (community clinics) around region. Patients; adults with complex spinal /MSK conditions.
Single or multi-professional:	Multi-disciplinary; physiotherapists, podiatrists, doctors, specialist nurses, osteopaths and occupational therapists
NMPs in team (other than participant if NMP):	One consultant physiotherapist.
Access to patient records:	Electronic access.
Form of clinic notes:	Electronic; dictated letters scanned into electronic records.
Patient access to service:	Waiting times for NP 3 weeks. Approximately 2 contacts/patient.
How patients are referred in:	GP referral, physiotherapists.
Patient access to medicines:	Injections administered under PGDs. Makes recommendations for medicines (drug type stipulated but not dose schedule) to GP.
Patient throughput and length of appointments:	Non-spinal patients; NP 30 minutes, FU 15 minutes. Spinal patients; NP 45 minutes, FU 15 minutes. 12 patients/day.
Access to diagnostic and treatment facilities:	Refer to: radiology (MRI, CT, x-ray, US) nerve conduction studies, physiotherapy, blood tests, pain clinic, orthopaedic surgeons, rheumatologists, and podiatrists.

PHYSIOTHERAPISTS: PAIR 5

Site 9: Physiotherapist Independent Prescriber

Service Information	Case Site 9
Job title and role:	ESP orthopaedic practitioner. Clinical 90%; managerial role 10%.
Description of service and types of patients treated:	Primary care MSK clinical assessment service based in multiple community health centres around region. Employed by social enterprise. Lead for spinal patients; attends spinal MDT meetings. Patients; adults with range of MSK/orthopaedic conditions.
Single or multi-professional:	Multi-professional; physiotherapists, occupational therapist, podiatrist, GP with special interest.
NMPs in team (other than participant if NMP):	Three ESP physiotherapists.
Access to patient medical records:	Electronic record system.
Form of clinic notes:	Electronic; dictated letters scanned into records.
Patient access to service:	Waiting time for routine outpatient appointment weeks. No scheduled emergency slots. Follow up reviews by telephone possible. Patients can self-refer within 6 months following last appointment.
How patients are referred in:	Predominantly GP referral; small number referrals from physiotherapy.
Patient access to medicines:	Issues prescriptions. Administers injections weekly under PGDs.

Patient throughput and length of appointments:	12 patients/day. NP 40 minutes; FU 20 minutes.
Access to diagnostic and treatment facilities:	Referral to: radiology (MRI, X-ray, US, bone scan), Trust/community physiotherapy services, occupational therapy, pain clinic, orthopaedic surgeons, consultant rheumatologists, blood tests.

Site 5: Physiotherapist Non-prescriber

Service Information	Case Site 5
Job title and role:	Consultant lead physiotherapist for MSK assessment services. Clinical role; spinal ESP/lower limb ESP clinics.
Description of service and types of patients treated:	Tier 2 MSK assessment service; covering multiple sites around region. Employed by NHS secondary care. Patients; adults with range MSK spinal and limb conditions
Single or multi-professional:	Multi-professional
NMPs in team (other than participant if NMP):	None.
Access to patient medical records:	Electronic record system.
Form of clinic notes:	Paper notes, dictated letters scanned/scanned into records into electronic referral system.
Patient access to service:	Waiting time for routine outpatient appointment 4-7 weeks. Urgent appointments; 2 weeks. Average 1.2 consultations/patient.
How patients are referred in:	GP referral predominantly; other health care professionals may refer.

Patient access to medicines:	Administers/supplies injections under PGDs.
Patient throughput and length of appointments:	9 patients/day.
Access to diagnostic and treatment facilities:	Trust wide referral rights including radiology (x-ray/US/MRI), physiotherapy, occupational therapy, blood tests, orthopaedic surgeons, consultant rheumatologists, pain clinic.

PHYSIOTHERAPISTS: PAIR 6

Site 11: Physiotherapist Independent Prescriber

Service Information	Case Site 11
Job title and role:	ESP Spinal / Clinical Therapy Manager for surgical spinal team
Description of service and types of patients treated:	Tertiary surgical spinal service based in secondary care outpatients. Includes orthopaedic spinal rapid access service (via bleep). Patients with spinal conditions requiring specialist surgical opinion/ surgery. Patients on central clinic list seen in rotational order by next available clinician; no individual clinic lists.
Single or multi-professional:	Multi-professional; 4 Orthopaedic Spinal Surgeons, 2 ESP Physiotherapists, Clinical Nurse Specialist Occupational Therapist, Staff Nurse.
NMPs in team (other than participant if NMP):	4 doctors.
Access to patient records:	Electronic access.

Form of clinic notes:	Paper notes, electronic referral system.
Patient access to service:	Waiting time for routine clinic appointment weeks. Patients referred through rapid access service seen same day.
How patients are referred in:	Range of health care professionals; GPs, hospital consultants, physiotherapists.
Patient access to medicines:	Not currently prescribing. Patients referred to GP for medicines (drug type/dose schedule not stipulated).
Patient throughput and length of appointments:	16 patients/day; 4 NP and 4 FU morning/afternoon clinics. NP 30 minutes, FU 20 minutes.
Access to diagnostic and treatment facilities:	Referral rights to: radiology (x-ray/US/MRI/PET scan), blood tests, physiotherapy, occupational therapy, orthopaedic surgeons, consultant rheumatologists, pain clinic.

Site 12. Physiotherapist non-prescriber

Service Information	Case Site 12
<i>Job title and role:</i>	Consultant physiotherapist; spinal lead (50%), MSK lead (50%).
<i>Description of service and types of patients treated:</i>	Spinal triage clinic in secondary care outpatients/physiotherapy department (n=7), lead of MSK physiotherapy team (n=60). Patients; mixed age, spinal and MSK conditions. 12.5 spinal clinics/week (CM does 4-5).
<i>Single or multi-professional:</i>	Single; no direct medical input - can consult with on-site consultant rheumatologist.
<i>NMPs in team (other than participant if NMP):</i>	Nil. Three physios administering injections monthly under PSDs.

<i>Access to patient records:</i>	Electronic access and via medical note ordering system.
<i>Form of clinic notes:</i>	Written medical notes; contemporaneous dictations transcribed to letters.
<i>Patient access to service:</i>	No initial direct access; self-re-referral within 6 months of discharge. Follow-up telephone access.
<i>How patients are referred in:</i>	70% GP referrals, 20% from MSK physiotherapy, 10% internal consultant referrals.
<i>Patient access to medicines:</i>	Administration injections under PSD. Makes written recommendations for medicines (drug type/dose schedule not stipulated) to GP.
<i>Patient throughput and length of appointments:</i>	Two clinic templates; 5 NP and 2 FU, and 4 NP and 4 FU patient appointment. Consultation length: 30 mins NP, 15 mins FU.
<i>Access to diagnostic and treatment facilities:</i>	Referral rights to: radiology (MRI/x-ray/US/bone scans), listing for epidural, diagnostic blood tests, Trust wide physiotherapy services, occupational therapy, oncology nurse specialists, pain clinic, consultant orthopaedic/spinal/ surgeons, consultant rheumatologists, GP for exercise prescription/review.

PHYSIOTHERAPISTS: PAIR 7

Site 13: Physiotherapist Independent Prescriber

Service Information	Case Site 13
Job title and role:	Clinical lead MSK physiotherapy service (n=20) /orthopaedic triage clinical assessment service 1 day/week.

Description of service and types of patients treated:	Social enterprise MSK service provided to NHS across multiple sites; including advice, self-management, manual therapy, acupuncture, injections/prescribing. Patients with range of spinal (60%), MSK conditions.
Single or multi-professional:	Single (physiotherapy MSK service) and multi-professional (clinical assessment service - physiotherapists, occupational therapist, podiatrist, GP with special interest).
NMPs in team (other than participant if NMP):	None.
Access to patient records:	Electronic access.
Form of clinic notes:	Electronic.
Patient access to service:	Urgent referrals seen within 1 week; non-urgent 1.5 weeks. Telephone triage and follow up.
How patients are referred in:	Outside service all GP referred; referred within service by CAS, secondary care consultants, occupational therapists.
Patient access to medicines:	Issues prescriptions, administers injections under PGDs.
Patient throughput and length of appointments:	14-16 patients/day; NP 40 minutes; FU 20 minutes.
Access to diagnostic and treatment facilities:	No referral rights in MSK service. In clinical assessment service access to radiology (MRI, X-ray, US, bone scan), Trust/community physiotherapy services, occupational therapy, pain clinic, orthopaedic surgeons, consultant rheumatologists, blood tests.

Site 14. Physiotherapist non-prescriber

Service Information	Case Site 14
Job title and role:	ESP orthopaedic practitioner; 95% clinical role; 5% teaching/managerial role.
Description of service and types of patients treated:	Intermediate primary care MSK clinical assessment service (CAS) based in multiple community health centres around region. Employed by social enterprise. Patients; adults with range of orthopaedic/MSK conditions.
Single or multi-professional:	Multi-professional; physiotherapists, occupational therapist, podiatrist, GP with special interest.
NMPs in team (other than participant if NMP):	1 doctor, 4 ESP physiotherapists IPs. MSK CAS service covers 8 sites with 7-8 physiotherapists across different locations
Access to patient records:	Electronic.
Form of clinic notes:	Electronic and paper; paper referral forms, dictated letters scanned into records.
Patient access to service:	Waiting time for routine outpatient appointment 4 weeks. No scheduled emergency slots. Follow up reviews by telephone possible. Patients can self-refer within 6 months following last appointment. Some arranged management of chronic conditions with agreement from GP.
How patients are referred in:	GP referral.
Patient access to medicines:	Administration injections under PGD. Written recommendations for medicines (drug type stipulated but not dose schedule) to GP.
Patient throughput and length of appointments:	12/13 appointments/day; NP 40 minutes; FU 20 minutes.

Access to diagnostic and treatment facilities:	Has access to radiology/imaging (MRI, X-ray, US, DEXA bone scans), except for CT scans. Referral to: radiology neurophysiological studies, Trust/community physiotherapy services, occupational therapy, pain clinic, orthopaedic surgeons, consultant rheumatologists, blood tests.

Appendix 12: Case site: Site availability for observations of clinical practice

Site 1

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
AM	Private residential hospital	Private residential hospital	Private practice: not observed	Private residential hospital	Private practice not observed	Private practice not observed
PM						

Site 2

	Monday	Tuesday/Wed	Thursday	Friday	Saturday
AM	Private clinic	Admin	Private clinic varies AM/ PM	Closed	Private clinic
PM	Private clinic	Closed	Private clinic	Closed	Private clinic
	Closed		Private clinic	Private clinic	Private clinic
			Private clinic	Private clinic	Private clinic

Site 3

	Monday	Tuesday	Wednesday	Thursday	Friday
AM	NHS Inpatient setting	Admin	Admin	NHS outpatient setting	Day Off
PM	NHS outpatient setting	NHS outpatient setting	NHS outpatient setting	Admin	

Site 4

	Monday	Tuesday	Wednesday	Thursday	Friday
AM	NHS Primary Community Clinic	NHS Primary Community Clinic	NHS Primary Community Clinic	NHS Primary Community Clinic	NHS Primary Community Clinic
PM					

Site 5

	Monday	Tuesday	Wednesday	Thursday	Friday
AM	NHS Primary Community Clinic	NHS Primary Community Clinic	NHS Primary Community Clinic	Day Off	Day Off
PM		PM Off			

Site 6

	Monday	Tuesday	Wednesday	Thursday	Friday
AM	Day off	NHS Outpatient	NHS Outpatient	NHS outpatient	Day Off
PM		Admin		Admin	

Site 7

	Monday	Tuesday	Wednesday	Thursday	Friday
AM	Community service	Community service	University based	University based	University based
PM					

Site 8

	Monday	Tuesday	Wednesday	Thursday	Friday
AM	Private Practice Not observed	NHS Hospital Inpatient setting	NHS community clinic	University based	NHS community clinic
PM					

Site 9

	Monday	Tuesday	Wednesday	Thursday	Friday
AM	NHS Community Clinic	Social enterprise	NHS Community Clinic	NHS Community Clinic	Primary care
PM		Admin time			

Site 10

	Monday	Tuesday	Wednesday	Thursday	Friday
AM	NHS outpatient setting	Private Practice Not observed	NHS outpatient setting	Private Practice Not observed l.	Private Practice Not observed
PM	Admin				
Evening					

Site 11

	Monday	Tuesday	Wednesday	Thursday	Friday
AM	NHS	Admin	Day Off	Admin	NHS outpatient clinic
PM	Outpatient clinic	NHS Outpatients			

Site 12

	Monday	Tuesday	Wednesday	Thursday	Friday
AM	Admin	Admin	NHS Outpatient clinic	Admin/ non- clinical work	NHS Outpatient clinic
PM		NHS Outpatient clinic			

Site 13

	Monday	Tuesday	Wednesday	Thursday	Friday
AM	NHS Primary Community Clinic	NHS Primary Community Clinic	Social Enterprise	NHS Primary Community Clinic	Day off
PM	Admin	PM off			
	NHS Primary Community Clinic				

Site 14

	Monday	Tuesday	Wednesday	Thursday	Friday
AM	NHS Primary Community Clinic	NHS Primary Community Clinic	Social Enterprise	NHS Primary Community Clinic	NHS Primary Community Clinic
PM			NHS Primary Community Clinic (alternate weeks Admin)	Admin	

Appendix 13: Dissemination

On-going information about the study was published on a dedicated study website, established in 2014 and, updated every 6 months during the study period. The website provides details of the study and progress reports with downloadable information.

https://www.surrey.ac.uk/fhms/research/healthcarepractice/evaluation_of_physiotherapy.htm

Six monthly updates detailing key elements of the study and progress were distributed to PPI group members, professional and regulatory bodies, government departments, and HEIs, via the project advisory group and to the case-study sites and NIHR Clinical Research Network during data collection.

To maximise the impact of the study findings and using additional funding secured through the University of Surrey's Impact and Engagement fund 2016-17 dissemination will be achieved through multiple routes including social media, voluntary organisations, distribution of the executive summary and LAY summary and a National Dissemination event.

Our national dissemination event, scheduled for 17th July 2017, provides an opportunity to maximise publicity to individuals, healthcare organisations, voluntary organisations, service user and carer organisations, regulatory bodies, service commissioners, professional bodies, Health Education England, Higher Education Institutes, Department of Health, NHS England communicate key messages from the completed study, help identify priorities for the future and further inform the dissemination of the research. An on-line implementation tool kit for non-medical prescribing will also be launched at this event. Data will be collected on attendance and number of hits to the project website to download the executive summary. Additional data will be collected regarding usage and adoption of the on-line implementation tool kit prototype via the web site, and social media. Analysis of user comments will provide insight in to its usefulness and inform future tool development.

Publications

Stenner, K, Carey, N, Edwards, J, Mold, F, Otter, S, Courtenay, M, Moore A (2016): Medicines management activities and prescribing within physiotherapy and podiatry: a systematic mixed studies review: *under review Health Services Research & Policy*

Presentations

Invited

Carey, N, Stenner K, Edwards, Mold, F *Increased prescribing rights for healthcare professionals: physiotherapist and podiatrist independent prescribing*; Festival of Research, FHMS, University of Surrey, July 2014

Carey, N, Stenner, K, Edwards, J, Margrove K, Mold, F, Otter S, Moore, A, Gage H, Courtenay M, Brown J *Increased prescribing rights for healthcare professionals: physiotherapist and podiatrist independent prescribing Interim findings: Non-Medical Prescribing CPD Conference Programme, Oxford Brookes University, Oxford, 10 September 2015*

Stenner, K, Carey, N, Edwards, J, Margrove K, Mold, F, Otter S, Moore, A, Gage H, Courtenay M, Brown J *Increased prescribing rights for healthcare professionals: physiotherapist and podiatrist independent prescribing Interim findings, Non-Medical Prescribing CPD Conference Programme, Oxford Brookes University, Milton Keynes- November 9th 2015*

Carey, N, Stenner, K, Edwards, J, Margrove K, Mold, F, Otter S, Moore, A, Gage H, Courtenay M, Brown J *Increased prescribing rights for healthcare professionals: physiotherapist and podiatrist independent prescribing Interim findings: Association for Prescribers Annual Conference, London, 12 November 2015*

Edwards, J, Carey, N, Stenner, K, Mold, F, Otter S, Moore, A, Gage H, Courtenay M, Brown J *Increased prescribing rights for healthcare professionals: physiotherapist and podiatrist independent prescribing Interim findings: Non-Medical Prescribing CPD Conference Programme, London South Bank University, 16 March 2016*

Carey, N, Edwards, J, Stenner, K, Otter S, Moore, A, Gage H, Courtenay M, Brown J *Increased prescribing rights for healthcare professionals: physiotherapist and podiatrist independent prescribing Interim findings: IFOMPT (International Federation of Manipulative Physiotherapists) Conference 2016, SEC, Glasgow, 4-8th July 2016 (Plenary Session)*

Carey, N, Edwards, J, Stenner, K, Otter S, Moore, A, Gage H, Courtenay M, Brown J *Increased prescribing rights for healthcare professionals: physiotherapist and podiatrist independent prescribing Interim findings: College of Podiatry Conference 2016, SEC, Glasgow, 17-19th November 2016 (Plenary Session)*

Carey, N, Stenner, K, Edwards, J, Otter S, Moore, A, Gage H, Courtenay M, Brown J *Education and preparation of physiotherapists and podiatrists for independent prescribing: Allied Health Professions Medicines Mechanisms Seminar, AHP Medicines Project, NHS England, The Place Aparthotel, Manchester, February 26th 2017*

Submitted

Edwards J, Stenner K, Carey N, Mold F, Otter S, Moore, A, Gage H, Courtenay M, Brown J *Medicines management activities and non-medical prescribing within physiotherapy and podiatry: an integrative review of the literature; Festival of Research, FHMS, University of Surrey, June 2015*

Edwards J, Stenner K, Carey N, Mold F, Otter S, Moore, A, Gage H, Courtenay M, Brown J *Medicines management activities and non-medical prescribing within physiotherapy and podiatry: an integrative review of the literature*; Physiotherapy UK, BT Convention Centre Liverpool 16-17 October 2015 (poster)

Edwards J, Stenner K, Carey N, Mold F, Otter S, Moore, A, Gage H, Courtenay M, Brown J *Medicines management activities and non-medical prescribing within physiotherapy and podiatry: an integrative review of the literature*; 2015 College of Podiatry Annual Conference, Harrogate 19-21st November (poster)

Stenner, K, Carey, N, Edwards, J, Otter S, Moore, A, Gage H, Courtenay M, Brown J *Increased prescribing rights for healthcare professionals: physiotherapist and podiatrist independent prescribing Interim findings*: HSRUK, Nottingham, 13-14 July 2016 (poster)