Pharmacist independent prescribing- a review of the evidence

Author: Anne Hinchliffe, Consultant in Pharmaceutical Public Health

Date: 12 February 2015

Version: 1.1

Publication/ Distribution:

- Public (Internet)
- NHS Wales (Intranet)
- Public Health Wales (Intranet)
-

Review Date: Not planned

Purpose and Summary of Document:

To inform strategic decisions around the development of pharmacist prescribing in Wales.

The key points are provided as bullets in section 1.

CONTENTS

1 Key points

- No high level research studies (e.g. RCT, meta-analysis, cohort studies) were identified in the literature search. However a number of UK workforce surveys, qualitative research papers and service evaluations have been published providing a wealth of information on the implementation of pharmacist independent prescribing, across a range of settings and clinical specialities.

- In 2013, approximately seven per cent of the pharmacist workforce held a prescribing qualification.

- Two-thirds pharmacist prescribers work in a hospital setting. Across the UK 13% pharmacist prescribers are based in community pharmacy, however in Wales just two pharmacists (3%) use their prescribing qualification in community pharmacy.

- Funding is a key driver both in the decision whether to become a pharmacist prescriber and the clinical area the pharmacist works in.

- Those funded by the NHS are more likely to prescribe antibiotics and for long-term conditions. Non-NHS funded services are more likely to include acute conditions, travel prophylaxis and influenza vaccination.

- Factors facilitating pharmacist prescribing include; support from colleagues, having appropriate knowledge and experience, dedicated time, funding, good communication, a good relationship with the patient's doctor and access to shared records.

- Barriers to implementation are; lack of time, lack of funding, limited opportunities, the need for a second pharmacist to clinically check the prescription before dispensing, inadequate access to medical records, difficulty assessing patients and a lack of support and awareness from other healthcare professionals.

- Service evaluations have identified the following benefits from the introduction of pharmacist independent prescribing: reduction in prescribing errors, medicines optimisation, reduced admissions/ readmissions and referrals, pharmaceutical care issues being resolved more quickly, reduced length of hospital stay and delays to discharge, and freeing up of medical time.

2 Background

Primary legislation in the 2001 Health and Social Care Act set the legal basis to allow non-medical prescribing. In 2004, nurse and pharmacist supplementary prescribing was introduced in Wales and in 2006 further legislative changes came into force permitting pharmacists to prescribe independently.

A pharmacist independent prescriber may prescribe autonomously for any condition within their clinical competence, thus providing opportunities for new models of working, as well as increasing service capacity and clarifying accountability.

To qualify as an independent prescriber a pharmacist must complete a General Pharmaceutical Council (GPhC) accredited programme and have the appropriate annotation on the GPhC register. Accredited courses have been available in Wales since 2006, including those provided by the Welsh School of Pharmacy, Cardiff University and nurse education providers across Wales.

3 Aim

To explore the settings and clinical areas where independent pharmacist prescribers contribute or could contribute to improved patient care.

4 Review questions

What is the uptake of pharmacist independent prescribing in different settings?

In which clinical areas are pharmacist independent prescribers working?

What are the enablers for pharmacist independent prescribing?

What are the barriers to pharmacist independent prescribing?

Can pharmacist independent prescribing improve the quality of services?

Can pharmacist independent prescribing increase service capacity?

5 Search strategy

A systematic search of the databases Embase, AMED, HMIC, Medline PscyINFO and Cochrane was conducted to identify studies published in English peer-reviewed journals from January 2006 to January 2015. The search terms pharmac$ and independent prescrib$ were combined using Boolean operators to increase sensitivity.

Topic specific websites of The Royal Pharmaceutical Society of Great Britain and that of the United Kingdom Clinical Pharmacy Association were accessed.

Further relevant grey literature was identified by free text website searching.

Original research papers, service evaluations and systematic reviews written in the English language were included. Studies conducted outside the UK were accepted provided the study findings were considered relevant to the provision of healthcare in the UK. Papers concerned with the development and evaluation of independent prescriber courses were not included nor were papers relating entirely to supplementary prescribing or independent prescribing by professional groups other than pharmacists. Papers reporting patients' views of pharmacist independent prescribing were only included if the patients had received care from a pharmacist prescriber.

Please note this review is not a systematic review of primary studies.

6 Summary of results

There are approximately three thousand pharmacist prescribers in Great Britain, equating to seven per cent of the pharmacist workforce.[1] Nearly two-thirds (61%) work in a hospital, 30% in primary care and 13% in community pharmacy (percentages exceed 100 as pharmacists may work in more than one setting).[1]

The GPhC Registrant Survey 2013 identified 183 pharmacist prescribers in Wales. Two-thirds responded to the survey (114/183, 62.3% response rate) and of these, the majority (86%) had prescribed in the previous 12 months; four out of five (79%) prescribed in a hospital setting and almost half (46%) prescribed for fewer than five patients a week on average.[1] Another survey of pharmacist independent prescribers in Wales found two-thirds (48/75), 64%) were using their qualification with the majority prescribing on hospital wards (35%) and out-patient clinics (33%), although some held clinics in GP practices (12%), made home visits (7%), visited care homes (4%), visited nursing homes (4%), or were responsible for repeat prescriptions at a GP practice (3%). Just two pharmacists (3%) used their prescribing qualification in a community pharmacy setting.[2]

Several studies have explored the clinical areas pharmacist prescribers work in.[1,2,3,4,5,6,7] Those funded by the NHS are more likely to prescribe antibiotics and/or treat a wide range of long term conditions. By contrast non-NHS funded services focus on acute conditions, travel prophylaxis and influenza vaccination.[3]

The following list summarises the areas prescribed for, as identified in the papers included in this literature review; antibiotics [1,8], pain management [1,4,6,9-10], cardiovascular [1,4,5-7,9,11-15], hypertension [1,6,9,11,16], anticoagulation [1,2,17], respiratory [1,2,3-7,9,18,19], diabetes [1,2,6,9,11,14,21-24], mental health [1,2,9,25], rheumatology [1,2,26], orthopaedics [10,27-29], osteoporosis [6,30], surgery [19,29,31], total parenteral nutrition[1], medicines reconciliation/ medical admissions

[1,2,10,32-34], care of the elderly [1,9] , minor ailments [1-2], oncology [1-2,6], palliative care [1,35], renal disease [1], dermatology [1], substance misuse [1,2,6], travel medicine [1,3], influenza vaccination [3], sexual health [2,6], gastroenterology [2,4,6], neurology [2], clinical trials [8], ophthalmology [4], HIV and immunology. [1,18]

In Wales the three areas most commonly prescribed in were antibiotics (32%), anticoagulation (28%) and pain management (26%).[1]

Factors facilitating pharmacist prescribing include, support from colleagues [2], having appropriate clinical knowledge and experience [2,7] , dedicated time and funding being available for the service [2,3] , good communication and a 'good relationship' between the PIP and the patient's doctor/ GP practice [3,19] and access to shared records. [7,19]

Barriers to the implementation of pharmacist prescribing are; lack of time [2,4,7,8,35,36] , lack of funding [2,3,4,7,8,37] , lack of opportunities [1], the need for a second pharmacist to clinically check the pharmacist prescriber's prescription prior to dispensing [8], inadequate access to medical records [3,19,37], difficulty assessing patients [4,36] and lack of support and awareness of pharmacist prescribing from other health care professionals. [7,37]

Latter et al. evaluated a sample of pharmacist independent prescriber consultations against the ten Medication Appropriateness Index (MAI) criteria and concluded that in the majority of instances pharmacist independent prescribers were prescribing clinically appropriately on all ten criteria. [38]

A number of service evaluations reported quality improvements following the introduction of independent pharmacist prescribers. These included a reduction in prescribing errors [5,12,29,33], optimisation of medicines, including more patients reaching and staying within clinical targets [13,14,17,20-24,30], reduced admissions/ readmissions/ referral to other services (e.g. pain clinic) [10,18], and pharmaceutical care issues being resolved more

quickly in A&E or following admission. [32-34] Pharmacist independent prescribing also resulted in reduced length of stay for surgical patients [10,31], reductions in delays to hospital discharge [12,27,31], and a freeing up of medical time. [6,10,12,16]

7 Results table

Ref	Study	Population/ setting	Intervention/aim	Results
1	Phelps A et al. *GPhC Registrant survey 2013.* Prepared for the General Pharmaceutical Council. London: NatCen; 2014. Available online	Pharmacist registrants in GB	Survey of GPhC registrants Findings relevant to pharmacist prescribing are reported	GB response rate 50.8% Wales response rate overall 56.7% (751 responses) Wales response rate Pharmacist Independent Prescribers (PIPs) 62.3% (114 responses) Across GB, three quarters (74%) of prescribers had prescribed at some point since their annotation and of these, 82% had prescribed in the last 12 months. In Wales 83% prescribers had prescribed at some point since their annotation. The reasons prescribers gave for not prescribing were; lack of opportunities, changes in circumstances, and for personal reasons such as retirement and maternity leave. Lack of opportunities included; commissioning environment, GPs prescribe in current work place, not needed in the area, not supported by large multiple community pharmacies, their pharmacy does not cover the required indemnity insurance. Across GB, prescribers were predominantly working in hospital settings (61%) and primary care settings (30%), less so in community settings (11%). Six per cent worked across multiple settings. In Wales, 79% PIPs worked in a hospital, 20% in primary care and 3% in community pharmacy. No respondents worked in a large multiple community pharmacy (5+ stores). Compared with

Ref	Study	Population/ setting	Intervention/aim	Results
				England and Scotland more PIPs work in hospital and less in primary care and community pharmacy. Across GB, the three most frequently given areas for prescribing were antibiotics (39%), pain management (38%) and cardiovascular (37%). In Wales the three most frequently mentioned areas were antibiotics (32%), anticoagulation (28%) and pain management (26%). Two-thirds (64%) prescribed to 10 patients or fewer in a typical week. 54% of those who had prescribed in the last 12 months prescribed 10 items or fewer in a typical week. In Wales almost half (46%) prescribed for fewer than five patients a week on average with 42% prescribing fewer than five items per week on average. The clinical areas where PIPs prescribe included: Antibiotics; anticoagulation; cardiovascular; diabetes; hypertension; medication optimisation for the elderly; minor ailments; oncology- adult; oncology- paediatric; pain management; palliative care; renal; respiratory; substance misuse; total parenteral nutrition; travel medicine; mental health; HIV; rheumatology; medicines reconciliation; dermatology.
2	Rees O. *How is pharmacist independent prescribing being used in Wales and what are the facilitators and*	All PIPs working in Wales	Questionnaire to evaluate PIP in Wales	75 respondents (response rate 59%, 75/128) 64% (48/75) used the qualification; 3 were working as supplementary prescribers and 11 (15%) had never used the qualification. PIP prescribed in the following setting (n):

Ref	Study	Population/ setting	Intervention/aim	Results
	barriers to its implementation? [MPharm IV project submission] Cardiff: Cardiff University. 2013			Hospital ward (26), hospital out-patient clinic (25), clinic held in GP practice (9), home visits to patients (5), care homes (3), nursing homes (3), prisons (3), responsible for repeat prescriptions in GP practice (2), community pharmacy (2). Specialist areas practiced by PIPs: Cardiology (10/75, 13%), respiratory (10/75, 13%), medication reviews (10/75, 13%), rheumatology (7/75, 9%), oncology (5/75, 7%), mental health (5/75, 7%), diabetes (4/75, 5%). Other areas with 3 or less prescribers included; sexual health, haematology, infections, nephrology, paediatrics, gastroenterology, anticoagulation clinic, medical admissions, pain management, minor ailments, substance misuse, neurology. Factors which help pharmacists use their PIP qualification include: Support from colleagues (n=28), Clinical knowledge and experience (n=8) Time (n=7) Funding (n=3) Barriers to PIP include: Lack of time (n=10) Lack of funding (n=9) Advantages perceived by PIPs were increased job satisfaction, improving services to patients and improving relations with doctors. The disadvantages were, being asked to prescribe outside their scope of practice by other colleagues, additional workload and associated pressures, lack of support for the role and more responsibility.

Ref	Study	Population/ setting	Intervention/aim	Results
3	Cope LC. *Non-medical prescribing –successful models in community pharmacy.* [PHD dissertation] Manchester. Manchester University. 2013.	18 community pharmacist non-medical prescribers England and Wales	Semi-structured telephone interviews (n=18) Face-to-face interviews (n=11)	All participants were strongly motivated and innovative. Reasons for starting non-medical prescribing (NMP) services included increased job satisfaction and clinical role, identification of local need, professional development and business opportunities. For pharmacists in England and Wales where central funding was not available, accessing funding was a key issue. In Scotland, where central funding was available, continuity of funding was more important. The funding model appeared to impact on the area of prescribing. Central funding was largely associated with support for long-term conditions and public health topics. Private funding models prescribed for innovative niche areas such as acute conditions, travel prophylaxis and influenza vaccination. The therapeutic area prescribed for was linked to the pharmacist prescriber's need and ability to access patient records. Interviewees delivering a NMP service for long-term conditions all accessed patient records pre and post consultation, whilst those prescribing for non-long term conditions did not consistently do so. The extent of communication between the pharmacist prescriber and the patient's GP was related to the degree of collaboration between the two. A 'good relationship' with the local GPs was deemed essential for success by the majority of pharmacists.

Ref	Study	Population/ setting	Intervention/aim	Results
4	Adaeddine S, Khachi M, Milller G. Impact of pharmacist independent prescribers at Imperial College Healthcare NHS Trust. Poster presentation at GHP/UKCPA 10th Joint National Conference; 2014 Apr 4-6; Manchester, UK	Acute teaching hospital, London	Electronic questionnaire sent to 19 PIPs at the hospital To identify how PIPs use their prescribing skills in the hospital	Response rate 68% (13/19) • 77% PIPs prescribed for inpatients only, 15% outpatients only and 8% both • 54% prescribe at least daily • Main BNF categories prescribed from were infections (77% of PIPs), cardiovascular (54%), gastro-intestinal (54%), respiratory (46%), eye (46%) • % of PIPs prescribing: o High risk medicines: anticoagulants 23%, vancomycin 77%, aminoglycosides 69% o Medicines reconciliation 85% o Acute pain management 38% o On consultant-led ward rounds 46% o Discharge medication 62% o Specialist practice 54% Although some PIPs use their diagnostic skills, the majority of diagnostics have already been undertaken by doctors. Barriers that result in less frequent prescribing were noted as; 'do not wish to deskill medical staff ', 'time constraints due to other duties', 'high workload/ coverage of multiple rounds', 'asking doctors is faster', 'not seeing patients independently', 'difficulty assessing patients', 'covering a mixture of specialities', 'need to expand scope of practice' and 'not having opportunities to attend ward rounds'.
5	Baqir W et al. An evaluation of pharmacist prescribing in a hospital setting.	3 district general hospitals (England)	To assess the prevalence of prescribing (part 1) To assess the	In part 1, PIPs prescribed for 182 (39.8%) of patients and 12.9% (680/5274) of all items. PIPs prescribed a wide variety of medication from 12 out of the 15 BNF categories. The majority of prescribing was for CNS, cardiovascular and respiratory medicines.

Ref	Study	Population/ setting	Intervention/aim	Results
	Conference abstract. *IJPP* 2013;21:56-7	457 patients on 26 wards	prevalence of prescribing errors by pharmacists during a two week period (part 2)	In part 2, PIPs prescribed for 155 patients on 31 wards. 1,413 pharmacist prescribed items were clinically checked, with 4 errors (0.3%) noted. The authors compared the low error rate associated with PIPs with a 8.9% error rate for all prescribers in the EQUIP study
6	Latter S et al. *Evaluation of nurse and pharmacist independent prescribing*. University of Southampton, Keele University; 2010. Available at: http://eprints.soton.ac.uk/184777/3/ENPIPfullreport.pdf Accessed 14 Jan 2015	England	To provide a national evaluation of nurse and pharmacist prescribing in England.	Settings in which PIPs work: (n=143) General medical practice in primary care 55.2% (79) NHS Acute Trusts 36.4% (52) Home visits to patients 2.8% (4) NHS Mental health Trust 1.4% (2) Care homes 1.4% (2) Hospice 1.4% (2) Private clinics 1.4% (2) Sexual health clinic 1.4% (2) Nursing homes 0.7% (1) NHS Walk in centre 0.7% (1) Other 12.6% (18) 42.7% PIPs said they prescribe instead of a medical prescriber in their most frequent treatment area. The majority of Trusts (93%, 81/87) reported having nurse independent prescribers, with only 7% (6/87) Trusts not having any compared with 40% (35/87) reporting not having any PIPs Therapeutic areas seeing the greatest increase in pharmacist involvement following IP qualification were: Hypertension CHD prevention

Ref	Study	Population/ setting	Intervention/aim	Results
				Diabetes Pain management Osteoporosis prevention Weight management The treatment areas PIP prescribed in most frequently were: Hypertension Cardiology Asthma CHD prevention Care of older people Oncology Diabetes Infections Drug/ substance misuse Gastrointestinal Nearly one-third of PIPS were either uncertain (21.8%) or agreed (10.5%) that 'I do not have the clinical examination skills to be a safe independent prescriber'. Nearly one third of PIPs (28.2%) and two thirds (58%) of nurse IPs had concerns about prescribing for patients with co-morbidities. The full report runs to 374 pages and includes results on a range of other issues, not covered here
7	Hughes C et al. *An evaluation of pharmacy prescribing in Northern Ireland –*	Pharmacist prescribers in Northern Ireland	To evaluate pharmacist prescribing from the perspective of pharmacists, medical colleagues and other	Phase 1: Pharmacists felt least competent in conducting physical examinations of patients

Ref	Study	Population/ setting	Intervention/aim	Results
	a quantitative and qualitative assessment. Executive summary and recommendations Belfast: Department of Health, Social Services and Public Safety; 2012. Available at: http://www.dhsspsni.gov.uk/impact_of_pharmacy_prescribing.pdf Accessed 14 Jan 2015		key stakeholders	Barriers to implementing pharmacist prescribing were: inadequate funding, inadequate resources to cover other core resources and onerous paperwork associated with the clinical management plan (supplementary prescribing), lack of support and awareness of pharmacist prescribing from other health care professionals Shared records were considered essential to effective and safe prescribing. Between March 2009 and November 2010 pharmacist prescribing accounted for just 4,610 items prescribed, representing only 0.007% of all items prescribed in the community and primary care setting. Cardiovascular medicines were most frequently prescribed, followed by the CNS and respiratory system Phase 2: The importance of the multi-disciplinary team to pharmacist prescribing in relation to the management of patients with long term conditions and multi-morbidities was highlighted and seen as essential for the progression of pharmacist prescribing. Some pharmacist interviewees felt that they could reduce the medication burden for patients as they tended to provide a more comprehensive medication review than doctors. A number of challenges faced pharmacist prescribers such as dealing with clinically complex patients and confining prescribing within their areas of clinical competency. Phase 3: (see ref.11)

Ref	Study	Population/ setting	Intervention/aim	Results
8	Mulholland P. Pharmacist prescribing in neonatal intensive care units in the UK Abstract of oral presentation presented at the 18th Neonatal and Paediatric Pharmacists Group (NPPG) Annual Conference; 2012 Nov 11-12; Liverpool, UK *Arch Dis Child* 2013;98:e1 Available at: http://adc.bmj.com/content/98/6/e1.41.abstract Accessed 14 Jan 2015	Members of the neonatal and paediatric pharmacists group, UK, working in neonatal intensive care units	To determine what prescribing was being undertaken, medicines being prescribed, benefits of, and barriers to pharmacist prescribing	45 responses received (response rate not reported). Of these 40% (18) were PIPs. Prescriptions were primarily for: parenteral nutrition, supplements, antibiotics, caffeine and discharge prescriptions. One pharmacist prescribed clinical trial medicines. PIPs thought their prescribing improved safety by reducing communication errors (the pharmacist making a change in medication or dosage, rather than asking a doctor to do it) and resulted in more timely correction of wrong prescriptions. PIPs thought being able to prescribe facilitated their integration into the multidisciplinary team. Barriers: lack of funding and time to undertake the course, need for a second pharmacist to clinically check the PIP.
9	MacLure K et al. Small step, large leap: Exploring pharmacists'	Pharmacist prescribers from the prescribing	To explore how pharmacist prescribers view their transition from supplementary to	The pharmacists worked in a range of practice settings (13 general practice/ primary care, 8 hospital, 3 community pharmacy, 1 out of hours) and therapeutic areas e.g. hypertension, respiratory, pain management, cardiovascular,

Ref	Study	Population/ setting	Intervention/aim	Results
	experiences of transition from supplementary to independent prescribing. Oral presentation at Health Services Research and Pharmacy Practice Conference. Research in Partnership;2011 May 5-6; Norwich, UK *IJJP* 19: pp20-1	conversion course at Robert Gordon's University, UK n=22	independent prescribing with particular focus on potential facilitators and barriers affecting service development. Semi-structured telephone interview	medication reviews for the elderly, mental health, diabetes). The most cited facilitators were supportive professional relationships, training courses and prior prescribing experience. Barriers included time, resources and funding constraints and the perceived need for a national strategy supported by Health Boards.
10	O'Brien N, Hoskins C. Pilot of a pharmacist independent prescriber in orthopaedic admissions suite (OAS) to support the Enhanced Recover After Surgery (ERAS) project for patients undergoing hip and knee replacement surgery and to	Cheltenham General Hospital	Addition of a PIP to the OAS with the aim of: • Reduce missed doses and risk of compromise to patients pre-existing medical conditions through accurate and complete prescribing and medicines reconciliation of patients' regular medicines	Following the introduction of the PIP there was reduced length of stay for both hip and knee replacement patients. During the first 6 weeks the only change in practice was the introduction of the PIP. The further reduction at 12 weeks may have been influenced by the increased use of a local wound infiltration within the hospital. Average length of stay (days): Pre-pilot: Hip 6.7, Knee 7.3; 6 weeks into pilot: Hip 5.7, Knee 5.5; 12 weeks into pilot: Hip 5.3, Knee 4.2

Ref	Study	Population/ setting	Intervention/aim	Results
	reduce length of stay. UKCPA Joint Poster presentation at the National Conference; 2014 Apr 4-6; Manchester, UK		• Improve post-operative pain by consistent prescribing of analgesia by the PIP in OAS Feedback was gathered from medical, nursing and pharmacy staff involved in the care of total hip or knee replacement patients using a form. (n=18)	All those returning feedback forms agreed or strongly agreed that prescription of ERAS analgesic medication and patient's regular medication improved following the introduction of a PIP. Junior doctors reported an estimated time saving of at least 45 minutes per day as a result of not being required to attend OAS. Consequently they were able to spend more time on the T&O wards looking after patients post-operatively and preparing their discharge. The acute pain service at the hospital also reported that since the pilot, with analgesics prescribed consistently by the pharmacist, there had been virtually no referrals for patients in pain who had undergone hip and knee replacement surgery.
11	McCann L et al. Pharmacy prescribing in Northern Ireland- A patient perspective. Paper presented at the Royal Pharmaceutical Society Conference 2011; Sept 11-12; London, UK. *IJPP* 2011; 19: 67-8	34 patients of three PIPs in Northern Ireland	To explore the patients' perspective of pharmacists as prescribers	The three PIPs prescribed in the clinical areas of i) hypertension ii) cardiovascular and diabetes management and iii) anti-coagulation. 32% (34/105) patients invited, took part in the focus groups. One overarching theme emerged; team approach to patient care. Sub themes related to patient benefits and the role of the doctor. Patients discussed the importance of a multi-disciplinary approach to their care especially for those with more complex conditions. Pharmacist prescribing was a positive experience and identified benefits included increased follow-up, improvement in their medical conditions and additional time. However, patients wanted

Ref	Study	Population/ setting	Intervention/aim	Results
				to consult their doctor for the initial diagnosis or if a more 'serious' or acute medical problem arose.
12	Cerrato M, Pearce S. Impact of pharmacist prescriber service to the cardiovascular and thoracic (CV&T) care group. Poster presentation at the GHP/ UKCPA Joint National Conference; 2013. May 17-19; Harrogate, UK Available at http://www.ukcpa.net/wp-content/uploads/2010/11/May-Conference-Handbook-2013-Abstracts-only.pdf Accessed 14 Jan 2015	Acute hospital, Southampton, UK	To evaluate the impact of introducing a PIP to work with the multi-disciplinary team on cardiothoracic wards	The PIP wrote 21% discharge prescriptions (equivalent to 48% discharge prescriptions written during core hours Mon-Fri; a PIP was not available outside these hours). This freed up time for junior doctors to spend time with sicker patients on the wards. The PIP had a zero error rate for discharge prescriptions, compared with 0.67% for nurse prescribers and 1.05% for doctors. This reduced the time taken by pharmacists sorting out problems on prescriptions leading to a quicker turnaround time for the prescription and more efficient discharges. Data showed there was a 30% reduction in time taken to complete the discharge process when the prescriptions were written by a PIP.

Ref	Study	Population/ setting	Intervention/aim	Results
13	Lawson A, James DH, Hodson K. The feasibility of a specialist pharmacist-led medicines optimisation clinic for patients with heart failure. Poster presentation at the UK/CPA Joint National Conference; 2014 Apr 4-6; Manchester, UK	Community based heart failure (HF) clinic for HF patients, UK	To implement and evaluate a community based pharmacist-led clinic for HF patients in order to optimise their treatment	Clinic established at one GP practice Barriers: Incorrect coding of patients Lack of documented ejection fraction Facilitators Ability of the pharmacist to act as an independent prescriber IP links with the cardiology consultants 113 interventions were made in 18 patients including pharmacological (n=22), non-pharmacological (n=79) and referral (n=12) An increase in the mean total daily doses of B-blockers, ACEIs/A2RBs and aldosterone antagonists taken by the study population was seen post-intervention. A higher proportion of patients had a heart rate of between 60-70bpm at the end of the study. Feedback from 12 patient participants was positive and revealed an appreciation of the pharmacist's knowledge of their condition, approachable nature, information given and appointment length.
14	Donnelly R et al. A feasibility study of pharmacist independent prescribing in a primary care setting *Diabet Med* 2010; 27 (2 Suppl.1): 165	Four GP practices, UK 2 control and 2 intervention sites n=87	To investigate the feasibility of extending a type 2 diabetes cardiovascular risk clinic, run by a PIP, to primary care During the study the pharmacist altered	Mean BP measurements for patients in the intervention group improved throughout the study compared with the control patients (p=0.003). More patients in the intervention group compared to patients in the control group achieved target cholesterol profiles by the end of the study (p=0.001). Patient in both groups reported improvements in diabetes self-care activities and self-reported adherence with medicines. Intervention patients completing questionnaires and GPs participating in semi-structured interviews were supportive of the pharmacist-run clinic.

Ref	Study	Population/ setting	Intervention/aim	Results
			prescribed medication, as necessary, for patients	
15	Bateman J, Green CF. The impact of including a heart failure specialist on the inpatient health failure service: a pilot study. Abstract presented at Progress in practice. Leading in excellence, UKCPA Autumn Symposium; 2013 Nov 22-23; Chester, UK *Clinical Pharmacist* 2013; S1:S5-S6. Available at: http://www.pharmaceutical-journal.com/files/rps-pjonline/UKCPA_Jan_Feb_2013.pdf Accessed 14 Jan 2015	Inpatient heart failure service at one NHS Trust in England	Redesign of the inpatient heart failure service to incorporate a heart failure specialist pharmacist in addition to the existing specialist nurse role. The redesign aimed to develop the service from one focused on patient counselling, to a more proactive service which included clinical assessment and prescribing by the specialist nurse and pharmacist.	The number of new drug initiations for the nurse and pharmacist specialists increased over the 9 month study period as confidence and experience grew. Of prescriptions written by the nurse or pharmacist, the pharmacist was responsible for 64% initiations and 63% dose adjustments during this time. The pharmacist recorded 57 clinical interventions during the evaluation period, including stopping of contra-indicated medicines, dealing with adverse drug reactions, incorrect dosing and drug interactions. In addition the pharmacist referred several acutely unwell patients to a cardiologist, many of which resulted in transfers to a cardiology ward for specialist treatment. Mean length of stay remained similar before and after and readmissions reduced, however the results are difficult to interpret due to demographic differences between the before and after populations.

<table>
<tr><th>Ref</th><th>Study</th><th>Population/ setting</th><th>Intervention/aim</th><th>Results</th></tr>
<tr><td>16</td><td>Gerard K et al. Valuing the extended role of prescribing pharmacist in general practice: Results from a discrete choice experiment. Value in Health 2012; 15 (5): 699-707</td><td>Five general practices in England</td><td>To quantify patients' preferences for new PIP services in general practice for managing common existing long-term conditions compared with usual medical prescribing</td><td>451 patients completed questionnaires.

Respondents preferred a 'pharmacist' or 'own doctor' compared with 'available doctor' with a larger value given to own doctor. All attributes on patient-professional interaction were important in choosing how to manage diagnosed hypertension, while the 'length of consultation' did not have any impact.

Patient preferences suggested that about 16% of consultations with a patient's own doctor could be switched to a PIP instead.</td></tr>
<tr><td>17</td><td>Akinwunmi F. et al. Evaluation of warfarin management by pharmacist prescribers in primary care settings. Poster presentation at the GHP/ UKCPA Joint National Conference; 2013 May 17-19; Harrogate, UK

Available at http://www.ukcpa.net/wp-content/uploads/2010/11/May-</td><td>Primary care settings in Southeast England

Patients attending INR clinics</td><td>To retrospectively evaluate INR management of patients taking warfarin, by a pharmacist prescriber in a primary care setting.

To reduce selection bias, all patients who were seen in October 2010 clinics were included if they were over 18 years with a confirmed diagnosis of AF and on established warfarin therapy.</td><td>Data was collected for 61 patients, seen by five PIPs.

<table>
<tr><td>Measurement against published standards</td><td>No.</td><td>%</td></tr>
<tr><td>INRs in range</td><td>494</td><td>71</td></tr>
<tr><td>INR results >5.0</td><td>3</td><td>0.4</td></tr>
<tr><td>INR results >8.0</td><td>1</td><td>0.1</td></tr>
<tr><td>INR results > 1 unit below the target range</td><td>13</td><td>1.9</td></tr>
<tr><td>Patients suffering serious adverse outcomes, categorised by type</td><td>0</td><td>0</td></tr>
<tr><td>Patients with unknown diagnosis, target INR or stop date</td><td>0</td><td>0</td></tr>
<tr><td>Patients lost to follow up</td><td>0</td><td>0</td></tr>
<tr><td>Patients with appropriate target INR for diagnosis</td><td>61</td><td>100</td></tr>
</table></td></tr>
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Ref	Study	Population/ setting	Intervention/aim	Results
	Conference-Handbook-2013-Abstracts-only.pdf Accessed 14 Jan 2015			The authors concluded PIPs in this evaluation demonstrated effective management of warfarin therapy against published national standards.
18	Vaghela T, Ramesh C. Impact of change in practice: Pharmacist-led respiratory syncytial virus (RSV) immunoprophylaxis clinic. Conference abstract. The Neonatal and Paediatric Pharmacists Group 16th Annual Conference; 2010 Nov 12-14; Sheffield, UK *Arch Dis Child* 2011; 96:4	Hospital OPD clinic All infants who attended the clinic from 2006/7 to 2009/10 All infants received palivizumab	To measure the impact of a new pharmacy-led RSV immunoprophylaxis clinic on hospital admission rates in high-risk infants with RSV bronchiolitis	Data were compared with pre-clinic data for 2004/5 and 2005/6. Prior to the introduction of the clinic 5/15 infants were admitted over a 2 year period. In the four years following the implementation of the clinic there were no hospital admissions of high risk infants with RSV bronchiolitis. Factors for this improvement may include: Parental education- the pharmacist provided information to parents on palivizumab. More accurate dosing of palivizumab at the correct intervals by PIP. Previously all infants received palivizumab at regular 28 day intervals. In addition, nursing time was reduced and drug costs were reduced through efficient usage of less expensive 100mg vials.
19	Sillito V. Helping COPD patients in	Patients from local GP	Spirometry testing for COPD patients,	Initially the clinic was held in the GP surgery, whilst the PIP gained experience and confidence. This also allowed a strong

Ref	Study	Population/ setting	Intervention/aim	Results
	the community. *Clinical Pharmacist* 2009; 1: 46	practice, Aberdeen, Scotland	delivered by an PIP working in community pharmacy	relationship with practice staff to be developed. Subsequently the clinic transferred to the community pharmacy. Appointments were booked with staff at the GP surgery and the surgery provided a patient summary which could be used to check current medication, other medical conditions and a brief patient history. Due to a lack of IT links the pharmacist needed to attend the GP surgery within 24 hours of a consultation to update the patient record. The main focus of the clinics was to optimise COPD treatment and facilitate patient concordance and compliance. The work of the PIP supported the GP Quality and Outcomes Framework. The pharmacist required additional training to gain the skills and knowledge necessary to run the clinic. Funding was provided by the Scottish Government; £750 start-up payment and £150 per session fee for a half day clinic.
20	Gibson D, Foden A. Improving oxygen management : a patient safety initiative.*Clinical Pharmacist* 2012; (S3): S1-2	Patients admitted to medical admissions unit at a hospital in England	Using National Patient Safety Agency (NPSA) and British Thorassic Society (BTS) guidelines, to implement an emergency oxygen strategy to ensure patients receive oxygen therapy adjusted to targets As part of the oxygen management strategy	The impact of the PIP cannot be singled out from other aspects of the oxygen strategy implemented. The overall effect was a reduction in the proportion of patients receiving oxygen admitted to the ward (pre- 68/359, 19%, post 24/328, 7.3%). Before introducing the strategy no patients had oxygen prescribed on their drug chart and only 4 patients had targets set for oxygen saturations. After, 22 patients had appropriate oxygen targets defined and 20 of these patients achieved their targets. All patients had their oxygen saturations measured and 19 patients had their oxygen prescribed on an appropriate kardex.

Ref	Study	Population/ setting	Intervention/aim	Results
			for the hospital pharmacist prescribers were trained on the use of oxygen Before and after study	
21	Munro NM, Bellary S, Barnett A. Metabolic outcomes in people with diabetes seen in pharmacist-led diabetes outpatient clinic. Diabetes UK. Annual Professional Conference. The changing face of diabetes. *Diabet Med* 2009; 26: 161	Joint PIP/ diabetes specialist nurse diabetes out-patient clinic. Referrals accepted from primary and secondary care Patients with Type 1 or Type 2 diabetes, who were not achieving their targets from HbA1c, blood pressure, lipids or who had suspected/ confirmed	Pharmacist delivered medicines use review process to identify and solve concordance issues, and to initiate and titrate drug therapy.	At 6 months HbA1c decreased from 10.1% at baseline to 8.31% (mean difference 1.7%, $p<0.01$), BP 151/82 to 136/75, total cholesterol 4.52mmol/l to 4.04mmol/l. Proportion of patients achieving recommended targets was HbA1c 12.9% vs 2.4%, BP 30% vs. 2.4% and cholesterol 54% vs. 19%. Concordance issues were identified in 67%. The authors concluded that an integrated approach utilising the skills of the independent prescribing pharmacist supported by the diabetes specialist nurse appears to improve metabolic outcomes in patients with poor control or concordance issues.

Ref	Study	Population/ setting	Intervention/aim	Results
		concordance issues N=127 Follow-up data available for 70 patients		
22	Al Harmarneh YN et al. Pharmacist intervention for glycaemic control in the community (the RxING study) *BMJ Open* 2013;3:e003154. Available at: http://bmjopen.bmj.com/content/3/9/e003154.full.pdf+html Accessed 14 Jan 2015	12 community pharmacies in Alberta, Canada	To determine the effect of a community pharmacist prescribing intervention on glycaemic control in patients with poorly controlled type 2 diabetes	111/365 screened patients were eligible. Eligible patients were identified by inviting patients with type 2 diabetes to test their HbA1c using validated point-of-care technology. Those with HbA1c between 7.5 and 11% were eligible. 100 patients were enrolled into the study. Pharmacists prescribed 10 units of insulin glargine at bedtime, adjusted by increments of 1 unit daily to achieve a morning fasting glucose of <5.5mmol/l Significant reductions in HbA1c and fasting blood glucose were observed at 26 weeks. 51% patients achieved the target HbA1c of <7% at the end of the study.
23	Payton H et al. Evaluating the clinical impact of a	Outpatient clinic, Birmingham,	To determine the clinical impact of a pharmacist-led clinic on patient's	Statistically significant reductions in blood pressure, HbA1c and total cholesterol were observed at 6,12,18,24 months and at discharge compared with baseline results. The percentage of

Ref	Study	Population/ setting	Intervention/aim	Results
	pharmacist-led diabetes outpatient clinic Conference abstract. *IJPP* 2011; 19:17	UK n=112, 56% male 91% type 2 diabetes, 9% type 1 diabetes	diabetes control.	patients achieving NICE recommended targets for BP, HbA1c and cholesterol increased following attendance at the clinic (10.7%, 9.8% and 42.0% respectively at baseline versus 49.0%, 44.7% and 71.8% respectively on discharge). Survey data demonstrated that patients held positive views of the pharmacist-led clinic.
24	Williams S et al. Evaluation of a pharmacist independent prescriber in a hospital type 2 diabetes clinic *Diabet Med* 2010; 27 (2 suppl.1): 166	Hospital clinic, Manchester, UK n=100	To establish the impact of a PIP on metabolic targets of type 2 diabetes patients	Patients seen by the PIP were matched with patients seen by a doctor of registrar grade. A greater mean reduction in cholesterol was observed in the pharmacist group compared with the doctor group (3.7 vs. 3.9mmol/l, p=0.038); A greater mean reduction in HbA1c (7.08 vs. 7.32, p=0.12) and diastolic blood pressure (72.7 vs. 74.5mmHg, p=0.34) was observed but neither of these results were statistically significant. The authors suggest that a PIP was equivalent to medical prescribers at lowering metabolic parameters.
25	Sutton J, Taylor DA, Dawson HE. Pharmacist prescribing in clozapine clinics. Conference abstract. *IJPP* 2010; 18: 25	7 hospital sites	To explore the extent to which pharmacist prescribing skills are being used in clozapine clinics	PIPs were leading three of the clozapine clinics, while the remaining four were run by specialist community psychiatric nurses. The three pharmacists were working as supplementary prescribers even though they were qualified to work as PIPs. Preliminary findings from interview data suggest this was a personal choice of each prescriber. Reasons for this included feeling unsupported by colleagues and 'the system' and being wary of taking responsibility for the prescribing of clozapine. They were willing to prescribe for clozapine side-effects.

<table>
<tr><th>Ref</th><th>Study</th><th>Population/ setting</th><th>Intervention/aim</th><th>Results</th></tr>
<tr><td>26</td><td>Copeland R, Birrell F. Improving skill-mix in rheumatology: High quality of care from an independently prescribing rheumatology pharmacist practitioner. Oral presentation. Rheumatology conference: British Society for Rheumatology and British Health Professionals in Rheumatology, 2009.

Available at: http://rheumatology.oxfordjournals.org/content/48/suppl_1/ii26.full.pdf

Accessed 14 Jan 2015</td><td>Rheumatology out-patient clinic at one hospital in UK

Assessment tool posted to 437 patients of which 263 responded (60.2%)</td><td>To assess the impact of an independent prescribing rheumatology pharmacist practitioner (RPP) on the quality of care provided to rheumatology outpatients.

At clinics the pharmacist had their own patient list. The outpatient clinic was supervised by a consultant rheumatologist.

Questionnaires were posted to patients who had been seen by any of the following; rheumatology consultant, SpR, GP registrar, nurse specialist or RPP.</td><td>Overall
<table>
<tr><th></th><th>Median score</th><th>Interquartile range</th></tr>
<tr><td>Listening to you</td><td>10</td><td>10-10</td></tr>
<tr><td>Explaining the disease and options for treatment</td><td>10</td><td>9-10</td></tr>
<tr><td>Looking at your joints and/ or your skin</td><td>10</td><td>9-10</td></tr>
<tr><td>Providing the opportunity to discuss the options for treatment before going ahead</td><td>10</td><td>9-10</td></tr>
<tr><td>Arranging access to other team members</td><td>10</td><td>9-10</td></tr>
</table>
Medians of 10 were also obtained when each professional was compared individually.

The authors concluded that patients valued the quality of care delivered by the pharmacist as highly as that provided by other members of the team.</td></tr>
<tr><td>27</td><td>Park C. et al. Nurses opinions of pharmacist</td><td>Orthopaedic ward , Wirral University</td><td>To investigate nursing staff opinion of pharmacist prescribing</td><td>The questionnaire was completed by 10 nurses of which two were advanced nurse practitioners (ANP).</td></tr>
</table>

<table>
<tr><th>Ref</th><th>Study</th><th>Population/ setting</th><th>Intervention/aim</th><th>Results</th></tr>
<tr><td></td><td>prescribing on an orthopaedic ward. Poster presentation at the GHP/ UKCPA Joint National Conference 2013. May 17-19; Harrogate, UK</td><td>Teaching Hospital, UK</td><td>on an elective orthopaedic ward</td><td>
<table>
<tr><th>NHS benefit</th><th>No. nurses who chose this option (n=10)</th></tr>
<tr><td>Patient benefit</td><td>8</td></tr>
<tr><td>Utilising clinical skills of pharmacist</td><td>7</td></tr>
<tr><td>Helps NHS gain value for money on medicines expenditure</td><td>5</td></tr>
<tr><td>Other (helps other disciplines)</td><td>1</td></tr>
</table>
Responses from open questions included:
"Having another prescriber on the ward in addition to a doctor was ideal on a busy ward"
It's an extra safety net for patients which helps nurses"
"Pharmacists have more in depth knowledge of drug interactions and contraindications"
"Quicker discharge process (medicines-related problems are resolved prior to discharge)"

All nurses felt that the ward would benefit from pharmacist cover being extended to longer hours.
Since the introduction of pharmacist prescribing on the ward nurses said they made fewer referrals to doctors regarding inpatient medicines and discharge prescriptions
One ANP thought the pharmacist had less clinical knowledge of the patient compared with the doctor and ANP

</td></tr>
<tr><td>28</td><td>Park C. et al. Patients' opinions</td><td>Orthopaedic ward , Wirral</td><td>To investigate patient opinion of pharmacist</td><td>58 patients completed the questionnaire.</td></tr>
</table>

<table>
<tr><th>Ref</th><th>Study</th><th>Population/ setting</th><th>Intervention/aim</th><th>Results</th></tr>
<tr><td></td><td>of pharmacist prescribing on an orthopaedic ward. Poster presentation at the GHP/ UKCPA Joint National Conference 2013. May 17-19; Harrogate, UK</td><td>University Teaching Hospital, UK</td><td>prescribing during their inpatient stay on an elective orthopaedic ward

Questionnaire distributed to all patients during a 5 week period</td><td>Over 90% patients were happy for their medicines to be prescribed by a pharmacist whilst in hospital. When given the choice of healthcare professional to discuss their discharge medicine with, 35% would choose a doctor, 24% a pharmacist and 12% a nurse, 29% expressed no preference.

<table><tr><th>NHS benefit</th><th>No. patients who chose this option (n=58)</th></tr><tr><td>Easier access to medicines for patients</td><td>40 (69%)</td></tr><tr><td>Better use of pharmacists' knowledge</td><td>35 (60%)</td></tr><tr><td>Better access to prescribers for patients with chronic diseases/ conditions</td><td>27 (47%)</td></tr><tr><td>Enhanced job satisfaction for pharmacists</td><td>26 (45%)</td></tr><tr><td>Reduce doctors' hours</td><td>25 (43%)</td></tr><tr><td>Value for money for medicines expenditure</td><td>21 (36%)</td></tr></table></td></tr>
<tr><td>29</td><td>Graham L, Howarth N, Gordon S. An evaluation of the error rate of an independent prescribing pharmacist service on the surgical day unit UKCPA Joint stay. Poster</td><td>Surgical and orthopaedic day unit (SDU), University hospitals Southampton, UK</td><td>To assess the accuracy of pharmacist prescribing within the SDU and determine the time associated with prescribing to inform workforce planning

Data collection- manual and from interrogation</td><td>467/699 patients seen on the SDU were seen by ward pharmacists after their surgery. These 467 patients screened for errors in prescribing by the PIP. 2057 items were screened and 21 errors were identified (error rate 1.02%). 20 errors were considered minor and 1 moderate.

• The PIP saw 4 patients per day
• Mean number of medicines prescribed per patient, 4 (range 0-25)</td></tr>
</table>

Ref	Study	Population/ setting	Intervention/aim	Results
	presentation at the National Conference 2014 Apr 4-6; Manchester, UK		of electronic records.	• Average time spent with each patient 13 minutes (range 1 to 80 minutes) The authors note an unanticipated advantage of taking a medication history on SDU, compared to the ward was the reduced level of distractions e.g. TV, visitors, post-operative pain. This meant the information given by the patient was more accurate and could be gained more quickly. The error rate in this study was considerably lower than the 9% found in the EQUIP study which was predominantly medical prescribing.
30	Turk A, Johansen A. Pharmacist independent prescribing- An evaluation of care for patients admitted with fragility fractures. Conference abstract. *Osteoporos Int* 2010; 21(Suppl 3): S481	Trauma patients admitted following a fragility fracture. n=133 UK	Patients were assessed by a PIP for treatments appropriate to the secondary prevention of osteoporotic fragility fractures.	Thirty-three patients (25%) had a prior history of fragility facture. Of these, 18 (54%) had previously been prescribed secondary prevention treatments, though only 9 (27%) had persisted, and 15 (46%) had never been offered secondary prevention. New treatments prescribed were alendronate (60%), strontium ranelate (14%), zoledronate (8%), alfacalcidol (5%), ibandronate (1%), calcium and vitamin D alone (3%). Eleven patients (8%) were referred for DXA scanning following NICE guidance. The authors concluded that adding a PIP to the multidisciplinary team caring for all inpatient fractures would increase the proportion of inpatients offered appropriate osteoporosis treatments as per NICE guidance.
31	Callejas-Diaz L, Seymour K, Woodcock S. The specialist bariatric	Pre-operative clinic at one hospital in Northumberla	This paper described the role of a PIP for patients undergoing bariatric surgery	The pharmacist compiled an accurate drug history, prescribed the most suitable formulation and discussed the short and long term drug changes after bariatric surgery.

Ref	Study	Population/ setting	Intervention/aim	Results
	pharmacist- who's prescribing your medicines? Conference abstract. *Obes Surg* 2012; 22 (8): 1151-2	nd, UK		The authors claimed patients were discharged sooner and pharmaceutical issues pre-empted. Patients were well informed and received appropriate and correct medicines in a suitable format.
32	Mews S et al. Pharmacist independent prescribing – the impact on patient care in an acute medical admissions setting. Poster presentation at the GHP/ UKCPA Joint National Conference 2013. May 17-19; Harrogate, UK Available at http://www.ukcpa.net/wp-content/uploads/2010/11/May-Conference-Handbook-2013-Abstracts-only.pdf	Acute medical unit, acute teaching hospital, UK	To evaluate the difference between PIP and non- independent prescriber pharmacists with respect to the timely resolution of pharmaceutical care issues (PCIs) and the severity of the impact on missed drug doses and/or dose adjustments Four clinical pharmacists provided pharmaceutical care to the acute medical unit. Two were PIPs and two were not. Patients were randomly seen by either a PIP or a non IP pharmacist	Time taken to resolve pharmaceutical care issues: Time (mins) / PIP (n=125) / Non-IP (n=125) <1 / 19 (15%)≈ / 5 (4%) 1 to 5 / 71 (57%)≈ / 40 (32%) 5 to 10 / 26 (21%) / 39 (31%) 10-20 / 8 (6%)≈ / 30 (24%) >20 / 1 (0.8%)≈ / 11 (9%) ≈statistically significant difference 37/250 (15%) patients reviewed by a pharmacist required additional drugs to be prescribed and/or amendments made to already prescribed drugs by medical staff. Of these, one patient was in the IP group and 36 in the non-IP group. The most common error picked up by pharmacists was the unintentional omission of medicines, frequently bronchodilators, antianginals, vitamins, proton-pump inhibitors, and analgesics. This study suggests that pharmaceutical care issues in AMU are resolved more quickly by PIPs than non-IP pharmacists.

Ref	Study	Population/ setting	Intervention/aim	Results
	Accessed 14 Jan 2015			
33	Mills PR, Crawford A, McGuffie. Formal medicine reconciliation within the emergency department reduces the medication error rates for emergency admissions *Emerg Med J* 2010; 27: 911-5	Emergency department in a busy district general hospital, England	To improve medication history accuracy and reduce prescribing errors for unscheduled patients admitted via the emergency department (ED) by including a pharmacist independent prescriber in the ED team. The task of the PIP was to complete systematic medicine reconciliation in the ED before patient transfer and to initiate the original inpatient prescription chart when appropriate Before and after study	Medicine reconciliation completed within 24 hours of admission increased from 50% to 100% and prescription chart initiation in the ED increased from 6% to 80%. The prescribing error rate was reduced from 3.3 errors to 0.04 errors per patient (difference 95% CI 2.5 to 5.1)
34	Dunne H, Jones O. The impact of independent prescribing	One hospital in South Wales	To determine whether there are advantages if medicines reconciliation is carried out by a PIP	Medicines reconciliation was carried out by the nIPP for 66 patients and by the PIP for 60 patients. The mean time to medicines being reconciled and issues resolved

Ref	Study	Population/ setting	Intervention/aim	Results
	pharmacists on medicines reconciliation at the Royal Glamorgan Hospital. Conference abstract. *IJPP* 2012; 20: 55-6		versus a non independent prescriber pharmacist (nIPP)	was 29 hours for nIPP and 3 hours for PIP.
35	Zeigler L, Blenkinsopp A, Bennett M. Pharmacist prescribing in palliative care. Conference abstract. *IJPP* 2014; 22: 25-6	Members of the National Palliative Care Pharmacy Network, UK (n=180)	To explore barriers to becoming a qualified prescriber To investigate pharmacist prescribers' experiences To identify CPD needs	70 respondents (response rate 39%) Base: 49% (34) acute Trust 10% (7) community Trust 41% (28) hospice All (70) thought a pharmacist prescribing qualification would be relevant to their current role. 20% (14) were currently prescribing. The PIPs reported prescribing a wide range of medicines in patients with complex comorbid conditions. Discontinuing and rationalising medication was a significant part of their role.
36	Shrestha N, Omisakin E, Clifford S. Evaluating the role of non-medical prescribers at	Hospital in the UK	To assess the views and experiences of nurse and pharmacist prescribers and the attitudes of doctors and non-prescribing	Response rate 100% (6/6), 93% (14/15), 35% (7/20) and 20% (12/60) for pharmacist prescribers, non-prescribing pharmacists, nurse prescribers and doctors, respectively. All the respondents generally viewed the role of non-medical prescribers positively in terms of improved patient care and

Ref	Study	Population/ setting	Intervention/aim	Results
	Whipps Cross University Hospital NHS Trust. Conference abstract. *IJPP* 2011; 19:21		pharmacists regarding the role of a non-medical prescriber in a secondary care setting	services, however 42% (5) doctors showed concerned for boundary encroachments of non-medical prescribing and 67% (9) of them agreed there was a lack of diagnostic skill among non-medical prescribers to prescribe independently. 83% (5) of pharmacist prescribers showed concerns regarding their lack of diagnostic skills although 100% of them stated confidence to prescribe and appropriate treatment to patients. Nurses were similarly confident in their prescribing skills (100%) but none of them expressed concern about their diagnostic skills. 83% (5) of pharmacist prescribers perceived time constraints as a major barrier to using their prescribing role.
37	Dapar M et al. Facilitators and barriers to pharmacist prescribing: Exploring the association of pharmacy practice setting *IJPP* 2010; 18:38-9	All prescribers on the register of the Royal Pharmaceutical Society of Great Britain in April 2009 (n=1653)	To explore the association of practice setting on facilitators and barriers in relation to prescribing practice	Response rate 42% (695/1653) More than 68% (n=472) had written a prescription with those working in GP surgeries or hospitals more likely than those in community pharmacy settings ($p<0.01$). Just 28% community pharmacists felt they were appropriately remunerated for their prescribing practice. Community pharmacists were less likely to agree they have adequate access to medical records than pharmacist prescribers in GP and hospital settings (75.9%, 95.8%, 96.1% respectively). Community pharmacists were less likely to agree that IP facilitated their prescribing practice; that other health professionals colleagues fully supported their prescribing practice; and that they had adequate communication with other pharmacist prescribers. The authors concluded that practice setting is important in relation to the implementation of pharmacist prescribing, with barriers identified more in community pharmacy compared with

<table>
<tr><th>Ref</th><th>Study</th><th>Population/ setting</th><th>Intervention/aim</th><th>Results</th></tr>
<tr><td></td><td></td><td></td><td></td><td>other settings.</td></tr>
<tr><td>38</td><td>Latter S. et al. Are nurse and pharmacist independent prescribers making clinically appropriate prescribing decisions? An analysis of consultations J Health Serv Res Policy 2012;17:1-8</td><td>Nine clinical practice settings in England</td><td>Evaluation, using a modified version of the Medication Appropriateness Index (MAI), of a sample of 100 audio-recorded consultations in which a medicine was prescribed by a nurse (n=52) or pharmacist (n=48).

Each consultation was scored by four independent assessors</td><td>In the majority of instances, nurses and pharmacists were prescribing clinically appropriately on all of the ten MAI criteria. The following results relate to the pharmacists only.

<table>
<tr><td></td><td>Appropriate rating</td><td>Inappropriate rating</td></tr>
<tr><td>Indication</td><td>94%</td><td>6%</td></tr>
<tr><td>Effectiveness</td><td>98%</td><td>2%</td></tr>
<tr><td>Dosage</td><td>91%</td><td>9%</td></tr>
<tr><td>Directions</td><td>89%</td><td>11%</td></tr>
<tr><td>Practicality</td><td>97%</td><td>3%</td></tr>
<tr><td>Drug-drug interaction</td><td>94%</td><td>6%</td></tr>
<tr><td>Drug-disease interaction</td><td>90%</td><td>10%</td></tr>
<tr><td>Duplication</td><td>98%</td><td>2%</td></tr>
<tr><td>Duration</td><td>96%</td><td>4%</td></tr>
<tr><td>Cost</td><td>78%</td><td>22%</td></tr>
</table></td></tr>
</table>

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