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Title	“Pharmacists are more useful than just sticking labels on boxes”	
	Barriers and enablers to collaborative working between GPs and pharmacists: a qualitative interview study	
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Background	Many UK GP practices now employ a practice pharmacist but little is known about how GPs and pharmacists work together to optimise medications for complex patients with multimorbidity.
Aim	To explore GP and pharmacist perspectives on collaborative working within the context of optimising medications for patients with multimorbidity.
Design and setting	Semi-structured interviews with GPs and pharmacists working in the West of England, Northern England and Scotland.
Method	Thirteen GPs and ten pharmacists were purposefully sampled from practices enrolled in the 3D trial. Participants' views on collaborative working were explored with interviews that were audio-recorded, transcribed and analysed thematically. Saturation of data was achieved with no new insights arising from later interviews.
Results	GPs from surgeries that employed a pharmacist tended to value their expertise more than GPs who had not worked with one. Three key themes were identified: resources and competing priorities; responsibility; and professional boundaries. GPs valued recommendations made by pharmacists that were perceived to improve patient safety, as opposed to those that were technical and unlikely to benefit the patient. Pharmacists who were not known to GPs felt under-valued and wanted feedback from the GPs about their recommendations, particularly those that were not actioned.
Conclusion	A good working relationship between the GP and pharmacist, where each profession understood the other's skills and expertise, was key. The importance of face-to-face meetings and feedback should be considered in future studies of interdisciplinary interventions; and by GP practices that employ practice pharmacists and other allied health professionals.
Key words	Polypharmacy, medication review, primary care, qualitative research

Abbreviations:

GP General practitioner

How this fits in (Summarise, in no more than four short sentences, what was previously known or believed on the topic and what your research adds, particularly focusing on the relevance to clinicians.)

Pharmacists working within GP practices have the potential to reduce GP workload and to improve the quality and safety of prescribing. Optimising medications for complex patients with multimorbidity is one area where pharmacist expertise could be usefully deployed but research into how to do this effectively is lacking. This study found that traditional ideas about the different professional roles of GP and pharmacist (e.g. concerns from some GPs that pharmacists stuck too rigidly to guidelines) may stop pharmacists fulfilling their potential within primary care. Where GPs worked collaboratively with pharmacists (e.g. in practices that employed a pharmacist) they reported confidence in their professional skills and more effective collaboration was possible.

INTRODUCTION

Polypharmacy is increasing¹ and the greater the number of long-term conditions a patient has, the greater the number of medicines they are prescribed.² One driver of polypharmacy is the current disease-centred approach to health care, where patients with multimorbidity are prescribed different medications for each of their conditions.³ Some criteria-based tools (e.g. STOPP/Start)⁴ highlight medicines that are potentially harmful and could be tapered down or stopped but these compete with disease-specific guidelines that almost always only recommend starting and intensifying treatment.⁵ Deprescribing (tapering down and stopping medications) for patients with multimorbidity is complex, requiring careful clinical consideration to balance issues such as potential loss of clinical benefit, against potential reductions in medication errors, adverse reactions and prescribing burden.

In response to increased primary care workload pressures in the UK,⁶ there has been an increase in the number of practice pharmacists working as part of the primary care team.^{6,7} Practice pharmacists commonly have non-dispensing roles, including dealing with prescription requests from patients and community pharmacists, reviewing patients' medications and reconciling medications following discharge from hospital, as well as consulting with and treating patients. Pharmacists could play a key role in tackling the workload associated with managing polypharmacy. However, research into how best to integrate their skills is lacking.

We have previously explored GP and pharmacist perspectives on the usual practice of medication reviews and found that being efficient (getting it done) tended to take priority over being thorough (doing it well).⁸ The aim of the current study was to explore GP and pharmacist views towards inter-professional working within the context of optimising medicines for patients with multimorbidity.

METHODS:

Setting, design and participants

The present study was nested within the 3D Study, a multi-centre cluster-randomised controlled trial of a complex intervention for people with multimorbidity.⁹ The 3D intervention comprised six-monthly comprehensive reviews with a focus on patient-centred care, and included a pharmacist reviewing the patients' electronic medical records and making up to four medication recommendations for consideration during a face-to-face review between the GP and patient.

Semi-structured interviews were conducted with GPs and pharmacists participating in the 3D study. Purposeful sampling from usual care and intervention practices, and practices with and without a practice pharmacist, allowed for a range of views and experiences to be captured. Before the study, six of the pharmacists were working as practice pharmacists, three were Clinical Commissioning Group pharmacists (who tended to work across several GP practices), and one was a community pharmacist; and three GPs worked in practices that employed a practice pharmacist. We stopped recruiting interviewees once data saturation had been reached.

Research team and data collection

PD interviewed participants face to face in GP surgeries or over the phone between January and October 2017. The interviews lasted between 40-60 minutes and were recorded using an encrypted audio-recorder.

Topic guides tailored for GPs and pharmacists were developed by GPs PD and BG (See Boxes 1 and 2). The first half of the interview focused on the usual practice of medication reviews and the second half on the 3D Study intervention. To ground the interviews, GPs and pharmacists were asked to review the records of several 3D study patients (case studies) selected by the interviewer during the interview. The GPs were asked to reflect on the pharmacist recommendations (e.g. did they look at them, were they useful, did they act on them, did they have any concerns) and the pharmacists on whether the GP had acted on their recommendations. As topics emerged, more explicit questions about the pros and cons of a practice pharmacist were added to the topic guide.

Analysis

To aid interpretation of the meaning behind participant responses, field notes taken immediately after the interviews. The audio-recordings were transcribed and anonymised. Field notes and interviews were imported into Nvivo version 11 and the interviews analysed thematically.¹⁰ PD read and coded all the transcripts. MJR (GP), CC (qualitative researcher) and DM (primary care researcher) read and coded a subset of transcripts independently. Emerging themes were discussed and a coding structure was developed over several team meetings. The remaining interviews were coded using the agreed framework. As data analysis continued, PD and CC modified the coding framework. Codes were grouped under overarching themes.

Ethical approval

The 3D study was approved by South-West (Frenchay) NHS Research Ethics Committee (14/SW/0011). Trial registration number: ISRCTN06180958.

RESULTS

Thirteen GPs and 10 pharmacists were interviewed. The participant characteristics are shown in Table 1. The barriers and enablers to collaborative working between GPs and pharmacists are described within the main themes of: resources and competing priorities; responsibility; and professional boundaries. A summary of the findings is shown in Figure 1.

Resources and competing priorities

GPs weighed up the time and cost of employing a practice pharmacist against the benefit of the pharmacist taking on some of their workload. Of the six practice pharmacists, only one was routinely involved in medication reviews due to competing priorities, such as managing prescription requests, which were perceived to impact more on GP workload and were prioritised by the GP practices.

Workload and value-for-money

Many GPs and pharmacists talked about the current GP recruitment crisis in the UK and the need for practices to employ allied health professionals, such as pharmacists, to reduce GP workload.

“We’ve had trouble recruiting GPs...a pharmacist was a good person that could actually do quite a lot of things that we [GPs] do at the moment.” (GP6, female GP)

For practices that employed a pharmacist, both professions argued that they significantly reduced GP workload. Several of the pharmacists and GPs argued that some pharmacist-led projects, particularly those focused on cost-saving, increased GP workload, however.

“They’ll send it to me...it’s just the GPs’ workload, they can’t get through everything.” (P2, female practice pharmacist)

“Tamsulosin capsules instead of Tamsulosin tablets to save like £3.50 a month ...it’s kind of frustrating that we have to waste your [the GP’s] time and I can’t come to you with a real issue” (P4, female non-practice pharmacist)

There were mixed views about whether a practice-employed pharmacist was good value-for-money. Several pharmacists commented that they were cheaper to employ than a GP. Some GPs argued, however, that pharmacists tended to take longer to complete tasks than GPs and so, although pharmacists cost less per hour to employ than GPs, they were not necessarily more cost effective. GPs commented that, owing to pharmacists spending longer on tasks, the quality of their work was high. Other GPs commented that pharmacists were more expensive than other professionals, such as nurses.

“So pharmacists are good at that kind of thing and they’re cheaper than GPs, it makes a lot of sense” (P3, male practice pharmacist)

“I think that she [the pharmacist] would probably take twice or three times as long doing it as a GP would but I’ve got no doubt that she would do it a hundred percent correct... in some ways GPs are the most quick person at dealing with almost anything (laughs)...” (GP4, male GP)

“The downside of it is that they’re a more expensive member of staff than a nurse. I think we’ve gained a lot of benefit from getting the nurses a bit more specialised...you get more for your money.” (GP10, male GP)

Competing priorities

Medication reviews were not prioritised by practices for many of the practice pharmacists. Some GPs reasoned that pharmacist-led medication reviews would not impact much on GP workload as medication reviews were being done as part of routine consultations. Their skills were viewed by practices as being better utilized carrying out other duties, such as dealing with prescription enquires.

“They might take away some [workload] but it would probably be quite small because we’re all doing this as part of our general consultation so we’re not always doing it sort of as a separate issue.” (GP2, female GP)

“We have a big workload in terms of repeat prescriptions so some help with getting through that...patients who ring up with medication queries he can quite often deal with the queries...He can fend off a lot of those.” (GP9, male GP)

One pharmacist appeared frustrated that GP practices focused too much on reducing GP workload and this led to pharmacists carrying out more mundane tasks:

“Some of the pharmacists are just doing all the medicines management which we’re not supposed to be doing and I think if you asked those practices they’d say that’s the pro of having a pharmacist there that someone’s just sat signing prescriptions all day” (P9, male practice pharmacist)

Responsibility

For most interviewees, the responsibility for prescribing decisions lay with the GP. However, some pharmacists were independent prescribers and would make changes to patient’s medications without involving the GP. Many GPs were reluctant to relinquish control of prescribing decisions and preferred having decisions approved by them. Other GPs felt overwhelmed by the responsibility of prescribing increasingly complex medications and valued advice and expertise from the pharmacists and practice nurses.

Several GPs, particularly those who had a good knowledge of and relationship with their patients, preferred to remain in control of prescribing decisions and some pharmacists liked to seek the reassurance of GPs. There was a tension between GPs staying in control of decisions and reducing their workload by delegating responsibility/tasks to pharmacists.

“we [GPs] are quite possessive of our patients...some of us who have been here a long time and know our patients very well need to let go so...personally I would probably be happy for the pharmacist to work it out and I don't know that I would need to ok it.” (GP1, Female GP)

“practice notes to the GPs to just say this is what I'm doing, are you happy with that?... for me it's quite a nice little buffer...I can just run past things in front of the GPs” (P6, female practice pharmacist)

Many GPs felt overwhelmed by the responsibility of prescribing and some GPs described an increasing expectation for GPs to prescribe complex medications that would have previously been prescribed only by hospital doctors. Many of the GPs welcomed the pharmacist's advice and expertise but preferred to remain in control of decisions.

“There's been just the most amazing difference between prescribing when I first started being a GP and prescribing now...and now almost nobody is seen again at the hospital...it is a massive responsibility which I really don't think that we are, um, able to do safely without help from other professionals” (GP1, Female GP)

“She [the pharmacist] will perhaps point out anti-cholinergic burden in elderly patients or dementia patients...we can then discuss- GP makes a decision and then she will take the required action. Yeah. So that's incredibly valuable.” (GP5, female GP)

Pharmacists who were independent prescribers deferred prescribing decisions to the GPs when they encountered conditions that were outside of their area of expertise.

“I'm a prescriber by the way...I'm basically working independently all the time ..I don't ask for any kind of guidance on any of that...diabetic neuropathy and erectile dysfunction, those are a couple of areas where I don't initiate treatment myself just 'cos I kind of haven't, um, really worked that through...I just tell them [the patients] they need to make a GP appointment.” (P3, male practice pharmacist)

Professional boundaries

GPs had mixed views about whether pharmacists should have the authority to suggest and make changes to patients' medications, with some GPs valuing pharmacist's expertise and knowledge of medicines. Other GPs raised concerns that pharmacists lacked the key attributes required to make clinical decisions, including a trusting relationship with the patient and knowledge of their medical and social background. Within the context of the 3D trial, GPs most valued pharmacist recommendations that improved the safety of prescribing and least valued recommendations which they perceived as being technical and unlikely to lead to patient benefit.

Clinical decision-making skills of pharmacists

Several GPs expressed dismay about pharmacist recommendations that they deemed as "treating the numbers" (GP1) rather than the patient, such as recommendations to change a patient's statin in line with the most recent NICE guidance. GPs tended to ignore this advice because they felt that in the context of often complex social and medical problems, altering a statin was unlikely to make a significant difference to the patient's health. In general, the GPs perceived that the pharmacists tended to be driven by following guidelines to the letter.

"I kind of didn't really feel greatly engaged with changing that [the statin] particularly 'cos, you know, if your cholesterol's 3.4 I don't think there's a lot to be gained really." (GP6, female GP)

Some GPs thought that very few pharmacist recommendations were made. One such GP was surprised to find that pharmacist recommendations had been made for all the case study patients.

"there was never any pharmacy information available so the pharmacist hadn't done it...it's my recollection that I was doing these reviews and the pharmacist hadn't provided any information... whether that was just luck because all of them [the case study patients] had, hadn't they, and in fact we'd acted on a few of them" (GP8, male GP)

Several GPs questioned the clinical decision-making skills of pharmacists, commenting that they were good at applying clinical guidelines but struggled to think outside the box. A small number of GPs described the pharmacist as being technical and clerical rather than clinical.

"They [pharmacists] want strict protocols- their job is very technical, they have to get the end dosage right, quantities etc. Sometimes, I mean clinical medicine isn't- you've got to think outside the box..." (GP3, male GP)

"They [pharmacists] are perhaps less willing to tolerate the uncertainty that a GP would tolerate" (GP4, male GP)

In contrast, many of the GPs valued pharmacist's knowledge of medicines and, feeling de-skilled in chronic disease management (a point also noted by pharmacists), welcomed the pharmacist's input. GPs particularly valued pharmacist recommendations which improved the safety of prescribing e.g. picking up medication errors and adjusting medication doses due to renal impairment.

"they [pharmacists] have such a good clinical knowledge and they also have that kind of pharmacological knowledge ...I just think as a GP you can't possibly know all of those things. (GP12, female GP)

"A patient...on a vitamin D replacement, on a high dose sort of quick replacement that had never been dropped down...a good reflection of not doing a proper medication review (laughs)...So that was all very useful" (GP1, female GP)

Hierarchy of authority

Some GPs described a hierarchy of authority, whereby the opinion of hospital doctors and GPs took precedence over that of the pharmacist. In contrast, other GPs and pharmacists argued that pharmacists had a better eye for detail and would pick up and challenge medication errors made by doctors.

"They're [hospital doctors] the gods (laughs) in hospitals as far as a lot of the elder patients are concerned so they're [the patients] not going to want to go against them unless we have got a really good reason for stopping and we have sent them [the patients] for that opinion" (GP2, female GP)

"I will spot things that the GPs probably won't and looking - I don't take what the hospitals say for granted... I will question it" (P2, female practice pharmacist)

Relationship between the GP and pharmacist

Pharmacists that were not attached to a specific practice described some difficult relationships with GPs, where they felt poorly understood and under-utilized. One non-practice pharmacist wanted feedback from GPs to understand the reasons that her recommendations had not been implemented.

"there were other surgeries that didn't have that open-mindedness and didn't- I suppose were sort of old-fashioned really in the sense that they didn't want anybody else to sort of interfere with the medication" (P8, male non-practice pharmacist)

"I sometimes feel that we don't get utilized...people [need to] realize that pharmacists are more useful than just sticking labels on boxes ...The patients

don't realise, the GPs don't realise...I would check back to see how they got on. Yeah, rarely the GP, erm, took upon my suggestion...I wasn't being nose-y, I was just interested to see, did they take heed or did they not" (P4, female non-practice pharmacist)

In contrast, the practice pharmacists felt valued as part of the practice team, and many GPs and pharmacists described a good collaborative relationship with the two professions seeking advice from one another. One pharmacist (P6) had joined a practice since taking part in the 3D Study and commented on the value of getting to know GPs in the practice through informal face to face chats.

"I feel we couldn't manage without her [the pharmacist] at all. She a vital member of the clinical team." (GP5, female GP)

"it's lovely working as part of the team because they're [the GPs] throwing questions at me...they know what I can do and I know what they can...it [the 3D Study] was good but it felt slightly different because you didn't know everybody, you didn't know quite how to word things...you can actually have a face to face chat about it...it's the fact that you're there all the time for them to come and bounce ideas off you" (P6, female practice pharmacist)

DISCUSSION

Summary

This study identified barriers and enablers to collaborative working between GPs and pharmacists within the context of optimising medications for patients with multimorbidity. A good working relationship was key to effective integrated working and GPs who worked in practices that employed a pharmacist were more likely to value their professional expertise. In some practices, independent prescribing pharmacists prescribed within clearly defined competencies deferring decisions outside of this to GPs. This suited both the pharmacist, who liked the safety net of “running things past” the GP, and the GP, who preferred to remain in control of complex prescribing decisions but benefited from the pharmacist’s knowledge. Most interviewees felt that pharmacists could reduce GP workload by taking on routine prescribing tasks, although not all pharmacists thought this the best of use of their time. In contrast, it wasn’t clear that pharmacists doing medication reviews would reduce GP workload even if valuable in other ways. Within the context of the 3D Study, GPs valued pharmacist recommendations that improved the safety of prescribing but tended to ignore recommendations which they deemed as being technical and of little benefit to the patient. GPs who worked in practices that did not employ a practice-pharmacist were more likely to question pharmacists’ clinical decision-making skills and ability to ‘think outside the box’.

Strengths and limitations

A key strength is that the interviews were grounded using real patient case studies, which encouraged GPs and pharmacists to reflect on real decisions and yielded richer information than talking in generalities. One GP, for example, commented that few recommendations were made by the pharmacist. By reviewing the case study patients, this view could be challenged, as it was evident that the pharmacist had made recommendations and that GPs within the practice had acted on some of them. A further strength is the iterative approach with analysis of earlier interviews informing the focus of later interviews. A range of views was captured, including those of community, clinical and practice pharmacists, and GPs working in practices with and without a practice pharmacist. One limitation is that all interviewees were recruited from practices enrolled in the 3D study, introducing potential bias towards better performing GP practices. A further limitation is that the interviews were conducted by a GP. This may have influenced how forthcoming the interviewees were, particularly in terms of being negative about one another’s profession.

Comparisons with existing literature

Most interviewees in the present study argued that pharmacists had a role to play in reducing GP workload, particularly in performing tasks such as responding to prescription requests and reconciling medications after hospital discharge. Several GPs commented that pharmacist-led medication reviews were unlikely to impact significantly on GP workload, however, since these were being done in a time-efficient manner and pharmacists tended to require more time to complete a review. These views were shared by GPs in New Zealand, some of whom argued that pharmacist-led medication reviews increased GP workload since the GPs were

required to action pharmacist advice.¹¹ Other barriers to collaborative working reported in the literature include funding,¹² concerns from GPs that community pharmacists may be commercially driven,¹³ pharmacist fears about stepping on GPs toes,¹⁰ and GPs being too busy to speak to pharmacists.¹⁴

There is evidence from this study and others from similar contexts internationally that GPs value pharmacists' expertise and the safety net they provided by checking for medication errors.^{8,12} GPs in the present study least valued pharmacist recommendations which they perceived as being 'technical' rather than having clear value for patients, particularly those with complex medical and social backgrounds. GPs in other studies were similarly frustrated by recommendations that were perceived as applying science and theory without considering the individual patient.¹⁵ Some pharmacists in the present study, particularly those who were not known to the GPs, would have valued feedback from the GPs about the acceptability of their recommendations, a view shared by pharmacists in New Zealand.¹⁶

In this study and others, GPs views towards pharmacists were on a spectrum – at one end pharmacists were viewed as professional equals and experts in medicines, and at the other end as lacking clinical decision-making skills and being subordinate to GPs within the medical hierarchy.^{11 17 18} A study of patients' found they believed that reviewing medications was the doctor's rather than the pharmacist's role, and that they trusted their doctor most.¹⁷ This view reflects the traditional idea of medical dominance, under which doctors are in charge not only of their patients but also of allied health professionals contributing to care.¹⁸

Responsibility for prescribing decisions in this and other similar studies lay mostly with GPs, many of whom did not want to relinquish control.^{13,14,18} However, several GPs in the present study felt overwhelmed by the responsibility of prescribing complex medications, and were grateful for pharmacist input. The ability to independently prescribe medication is seen as an important part of clinical autonomy, which was previously the preserve of doctors, and allowing allied health professionals to prescribe independently can be perceived as a threat to medical dominance.^{19 20} In the present study, interviewees described a middle ground where some pharmacists were able to prescribe independently within their area of expertise but would defer decisions outside their expertise to the GP. This appeared to suit both the GP, who liked to remain in control of decisions, and the pharmacist, who valued the safety net of running things past the GP.

Implications for research and practice

In this study, 'knowing' each other was an important underpinning for effective collaborative working between GPs and pharmacists, where each profession values, learns from and utilises the other's expertise. In practices where GPs and pharmacists had little personal contact or knowledge of each other, pharmacists

described feeling under-valued and under-utilized and GPs expressed concerns that pharmacists tended to stick rigidly to guidelines and were unable to 'think outside the box'.

A key finding of this study was the importance of contact between the pharmacist, patient and GP. Within the 3D Study model, many of the GPs argued that pharmacists were unable to make meaningful recommendations because they lacked familiarity with the patient, their medical background and social context. Pharmacists who were not known to the GPs reported that feedback from the GPs about their recommendations, particularly those that the GP chose not to action, would have been helpful. Developing a trusting relationship between the pharmacist, patient and GP through face-to-face meetings should be at the centre of future service developments and trial interventions.

In this study, only one of the practice pharmacists was routinely involved in medicines optimisation and medication reviews. Other roles, such as managing repeat (refill) and acute (one-off) prescription requests that did not involve a consultation, and reconciling medications after hospital discharge, were perceived by interviewees as having more impact on GP workload and so were prioritised by practices. Further research is needed to establish the roles and responsibilities of practice pharmacists currently working in GP practices including to what extent they are involved in medication reviews.

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References

1. Guthrie B, Makubate B, Hernandez-Santiago V, et al. The rising tide of polypharmacy and drug-drug interactions: population database analysis 1995-2010. *BMC Med* 2015;13:74. doi: 10.1186/s12916-015-0322-7
2. Payne RA, Avery AJ, Duerden M, et al. Prevalence of polypharmacy in a Scottish primary care population. *Eur J Clin Pharmacol* 2014;70(5):575-81. doi: 10.1007/s00228-013-1639-9
3. Duerden M, Avery T, Payne R. Polypharmacy and medicines optimisation: making it safe and sound: London: The King's Fund 2013.
4. O'Mahony D, O'Sullivan D, Byrne S, et al. STOPP/START criteria for potentially inappropriate prescribing in older people: version 2. *Age Ageing* 2015;44(2):213-8.
5. Duncan P, Duerden M, Payne RA. Deprescribing: a primary care perspective. *European Journal of Hospital Pharmacy* 2017;24(1):37-42. doi: 10.1136/ejhpharm-2016-000967
6. England N. General practice forward view, 2016. <https://www.england.nhs.uk/wp-content/uploads/2016/04/gpfv.pdf> (accessed 14.08.2019)
7. Royal College of General Practitioners, NHS England, England HE. Clinical Pharmacists in General Practice Pilot, 2015.
8. Duncan P, Cabral C, McCahon D, et al. Efficiency versus thoroughness in medication review: a qualitative interview study in UK primary care. *Br J Gen Pract* 2019;69(680):e190-e98. doi: 10.3399/bjgp19X701321 [published Online First: 2019/02/11]
9. Salisbury C, Man MS, Bower P, et al. Management of multimorbidity using a patient-centred care model: a pragmatic cluster-randomised trial of the 3D approach. *Lancet* 2018;392(10141):41-50. doi: 10.1016/S0140-6736(18)31308-4 [published Online First: 2018/06/29]
10. Braun V, Clarke V. Using thematic analysis in psychology. *Qualitative research in Psychology* 2008;3(2):77-101. doi: 10.1191/1478088706qp063oa
11. Hatah E, Braund R, Duffull SB, et al. General practitioners' views of pharmacists' current and potential contributions to medication review and prescribing in New Zealand. *Journal of Primary Health Care* 2013;5(3):223-33.
12. Tan ECK, Stewart K, Elliott RA, et al. Integration of pharmacists into general practice clinics in Australia: The views of general practitioners and

pharmacists. *International Journal of Pharmacy Practice* 2014;22(1):28-37. doi: <http://dx.doi.org/10.1111/ijpp.12047>

13. Freeman C, Cottrell WN, Kyle G, et al. Integrating a pharmacist into the general practice environment: opinions of pharmacist's, general practitioner's, health care consumer's, and practice manager's. *BMC health services research* 2012;12:229.
14. Loffler C, Koudmani C, Bohmer F, et al. Perceptions of interprofessional collaboration of general practitioners and community pharmacists - a qualitative study. *BMC Health Services Research* 2017;17(1):224. doi: <https://dx.doi.org/10.1186/s12913-017-2157-8>
15. Bryant L, Coster G, McCormick R. General practitioner perceptions of clinical medication reviews undertaken by community pharmacists. *Journal of primary health care* 2010;2(3):225-33.
16. Bryant L, Coster G, McCormick R. Community pharmacist perceptions of clinical medication reviews. *Journal of primary health care* 2010;2(3):234-42.
17. Petty DR, Knapp P, Raynor DK, et al. Patients' views of a pharmacist-run medication review clinic in general practice. *British Journal of General Practice* 2003;53(493):607-13.
18. Freidson E. *Profession of Medicine*. New York: Dodd, 1970.
19. Cooper RJ, Bissell P, Ward P, et al. Further challenges to medical dominance? The case of nurse and pharmacist supplementary prescribing. *Health (London)* 2012;16(2):115-33. doi: 10.1177/1363459310364159. Epub 2011 Jan 13.
20. Britten N. Prescribing and the defence of clinical autonomy. *Sociology of Health & Illness* 2001;23(4):478-96. doi: 10.1111/1467-9566.00261

Box 1: GP interview topic guide

Usual practice

- Before we get into the specifics, I'm interested in understanding how repeat medications are reviewed in your practice?' [how often, within/outside of consultations, patient involvement, purpose, barriers/facilitators]
- Can you tell me about your experience of reviewing medications for patients with polypharmacy ? [different to other medication reviews?]
- Do pharmacists play a role in medication reviews in your practice? [CCG pharmacist or practice pharmacist]
- Are any other non-GP staff involved in medication reviews in your practice?

Usual practice case patients

- Can you think of any non-3D patients who are prescribed lots of medications who you could look up on Emis?
- Could you talk through how you might review their medications? [Is that typical?]

3D Study

- I'd like to ask you to focus more on the 3D Study now. How have you found reviewing patient's medications during the 3D consultations? [purpose of the reviews; pharmacist recommendations, patient involvement, types of changes made, examples]

3D Study case patients (2-3 for each interview)

- Can you have a read over the record for this patient and talk me through how you might have come to the decisions about their medications? [changes made; pharmacist recommendations – looked at, useful, acted on, concerns; patient involvement; typical of other reviews; same/different to usual practice]

Any other issues

- Any other issues you would like to raise?

Box 2: Pharmacist interview topic guide

Usual practice

- Before we get into the specifics, I want to find out a bit more about your role as a pharmacist outside of the 3D study. In particular, whether you are involved in medication reviews for patients? [driven by cost or CCG targets or led by the practice?, face to face or computer led? Useful or not? Barriers, facilitators]
- Can you tell me about the last time you were involved in medication reviews for a practice? [typical?]
- How have you found working with practices?
- Have you been involved in medication reviews for patients with polypharmacy? [driven by cost or CCG targets or led by the practice?, face to face or computer led? Useful or not? Barriers, facilitators]

3D Study case patients (2-3 for each interview)

- Before we go on to talk about the case study patients, can you tell me any thoughts you have about the medication reviews for the 3D study? (working with practices, doing the reviews, purpose, useful)
- Can you have a read over the record for this patient and talk me through the process you might have gone through when you reviewed this patient's medications?
- Recommendations (types of meds stopped/started, purpose of stopping/starting them e.g. safety, pill burden, guidelines)
- Typical of other 3D reviews?
- Same/different to usual practice
- Reflect on whether the GP acted on the recommendations (typical?)

Any other issues

- Any other issues you would like to raise?

Table 1: Participant Characteristics**Pharmacists (n = 10)**

Variable	Number
Sex	
Male	3
Female	7
Estimated age in years	
31-40	6
41-50	4
Job role	
Community pharmacist	1
CCG pharmacist	3
Practice pharmacist	6
Years qualified as a pharmacist	
5-9	4
10-14	3
> 15	3
Years working in primary care (for the six practice pharmacists only)	
< 2	3
2-9	0
>10	3
Intervention or usual care practice	
Delivered the 3D intervention	8
Working in usual care practice	2

General practitioners (n = 13)

Variable	Number
Sex	
Male	5
Female	8
Estimated age	
30-39	6
40-49	2
50-59	5
Years qualified as a GP	
< 5	3
5-9	4
10-14	3
> 15	3
Job role	
GP partner	10
Salaried GP	3
Intervention or usual care practice	
Intervention practice	9
Usual care	4

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Figure1. GP and pharmacist reported barriers and enablers of collaborative working

