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What happens when pharmacist independent prescribers lead on medicine management in older people's care homes: a qualitative study

Linda Birt ,[1,2] Lindsay Dalgarno,[3,4] Fiona Poland,[5] David Wright,[1,2] Christine Bond[4]

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[1]Faculty of Medicine and Health Sciences, University of East Anglia, Norwich, UK
[2]School Healthcare, University of Leicester, Leicester, UK
[3]School of Health and Wellbeing, University of Glasgow, Glasgow, UK
[4]School of Medicine, Medical Sciences and Nutrition, University of Aberdeen, Aberdeen, UK
[5]School of Health Sciences, University of East Anglia, Norwich, UK

Correspondence to
Linda Birt; linda.birt@uea.ac.uk

ABSTRACT

Objective Older people in care homes frequently experience polypharmacy, increasing the likelihood of medicine-related burden. Pharmacists working within multidisciplinary primary care teams are ideally placed to lead on medication reviews. A randomised controlled trial placed pharmacists, with independent prescribing rights (PIPs), into older people care homes. In the intervention service, PIPs worked with general practitioners (GPs) and care home staff for 6 months, to optimise medicine management at individual resident and care home level. PIP activity included stopping medicines that were no longer needed or where potential harms outweighed benefits. This analysis of qualitative data examines health and social care stakeholders' perceptions of how the service impacted on care home medicine procedures and resident well-being.

Design Pragmatic research design with secondary analysis of interviews.

Setting Primary care pharmacist intervention in older people care homes in England, Scotland and Northern Ireland.

Participants Recruited from intervention arm of the trial: PIPs (n=14), GPs (n=8), care home managers (n=9) and care home staff (n=6).

Results There were resonances between different participant groups about potential benefits to care home residents of a medicine service provided by PIPs. There were small differences in perceptions about changes related to communication between professionals. Results are reported through three themes (1) 'It's a natural fit'—pharmacists undertaking medication review in care homes fitted within multidisciplinary care; (2) 'The resident is cared for'—there were subjective improvements in residents' well-being; (3) 'Moving from "firefighting" to effective systems'—there was evidence of changes to care home medicine procedures.

Conclusion This study suggests that pharmacist independent prescribers in primary care working within the multidisciplinary team can manage care home residents' medicines leading to subjective improvements in residents' well-being and medicine management procedures. Care home staff appreciated contact with a dedicated person in the GP practice.

Trial registration ISRCTN 17847169

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ The study draws on data from a relevant sample of 38 health and social care professionals involved in medicine management in care homes.
⇒ The analytical approach foregrounded the effect of pharmacist-led medication review on the older resident in care homes, therefore having relevance to practices supporting safer medicines in this group of people.
⇒ A limitation is the absence of residents' voices, due to recruitment challenges with this group.
⇒ The study provides insights into activity provided by specialist pharmacists with independent prescribing qualifications so it cannot be assumed that more generalist pharmacists would have the experience to make specialised medicine management decisions.

INTRODUCTION

Older people in care homes (CHs) are often subject to complex medicine regimes which may include the concurrent administration of more than five different medicines daily.[1 2] This is known as polypharmacy; it is associated with a higher risk of adverse side effects including falls, hospitalisation and mortality.[3 4] The complexity of managing and administering multiple medicines increases CH staff workload.[5] This can lead to increased rates of medicine administration errors, and while few errors result in serious consequences for residents, all need to be reported and followed up.[6] The Care Quality Commission highlights management of medicines as an area of concern and holds it under constant review.[7] In UK CHs, prescribing and medication reviews for individual residents are the responsibility of clinical professionals in the primary care team.[8] A Structured Medication Review (SMR) is recommended for all CH residents.[9] An SMR takes a personalised approach, drawing on

shared decision-making principles to increase safety and efficacy.[9] Pharmacists are being routinely employed to lead on SMRs in primary care practices, and an English government initiative to enable pharmacists to have a role within CHs is gathering momentum.[10] Pharmacists have a specialised knowledge of medicine-related burden[11] including 'drug burden' where the cumulative effect of the active ingredients of medicines can impact on physical and cognitive function.[12] If pharmacists have the postgraduate Independent Prescriber qualification, they can start (prescribe) or stop (deprescribe) medicines within their area of clinical competence.[13 14] This enhanced role allows them to use their expert clinical knowledge of medicines to deliver services in CHs.

This paper reports on a secondary analysis of interview data collected from pharmacists with independent prescribing rights (PIPs), general practitioners (GPs) and CH staff as part of the process evaluation[15] undertaken as part of the Care Home Independent Prescribing Pharmacist Study (CHIPPS).[16] Within the trial, a service intervention was designed which enabled pharmacist-led medicine management for CHs. PIPs worked within CHs on a weekly basis over 6 months to review their medicine systems and residents' personal medicines.[17] PIPs were based within the general practice aligned to the CH. The secondary analysis aimed to understand how the PIP role was enacted and PIPs, GPs and CH staffs' perceptions of how PIP activity impacted on CH medicine procedures and resident well-being, concepts which were outside the remit of the trial process evaluation.[17]

METHODS

The CHIPPS study

The pharmacist-led service offered in CHs is briefly described below to set the findings of the secondary analysis in the practice context; full details of the trial design are available at references[16 17] and trial outcomes are available.[18]

The pharmacist-led service was delivered through a triad of a GP, a PIP based at the GP practice, and up to 24 CH residents, from up to three CHs, registered with the GP. Service specifications were developed following focus groups with stakeholders to guide the PIPs' work (see online supplemental file 1). The primary trial outcome was reduction in falls for residents.[18] However, in a prestudy focus group, health and social care professionals (HSCPs) wondered whether there might be wider benefits for residents.[19] The communication between the triad, their understanding of responsibilities of PIPs and outcomes for residents are the focus of this secondary analysis of process evaluation interview data. Within the trial, 25 triads were recruited to the intervention arm. Sixteen PIPs were already working with the GP; the remaining nine were allocated a GP practice for the purposes of the study. PIPs undertook a 2 day bespoke face-to-face training programme, produced a portfolio of evidence of competencies and finally were signed off to prescribe in older people medicine by an independent GP.[20] To spread researcher workload (triad recruitment, data collection), the intervention was delivered over four 6 month phases between January 2018 and March 2020. Data collection for the process evaluation occurred between May 2019 and March 2020 as each phase completed. The secondary analysis of interview data was carried out by LB and LD.

Design

Pragmatism is a research methodology suited to characterising knowledge about how behaviours and actions impact on healthcare systems and outcomes. This approach can help appreciate the value of knowledge within its context of activity, uses and how these relate to the experience of addressing practical problems.[21] As this work aimed to understand and learn from the diverse ways different stakeholders engaged with and perceived the intervention, a pragmatic design provided a way to recognise multiple realities of people involved.

Recruitment and sample

During the process evaluation, health and social care stakeholders in each triad where the intervention was delivered, were invited to take part in a semistructured interview at the end of each 6 month phase: PIPs n=23 (2 withdrew and contact details not available), GPs n=25 and CH managers n=38. A reminder invitation email was sent after 2 weeks. CH managers provided recruitment information to staff, residents and relatives. Those interested in participating returned expressions of interest to study researchers. A purposive sampling framework was designed to ensure representation across stakeholder roles, location and phases of the intervention. However, response rates were low and therefore all those replying were invited to interview.

Data collection

The process evaluation semistructured interview guide drew on outcomes from the earlier feasibility study[22] and reflected the Medical Research Council process evaluation domains.[23] Questions explored participants' experiences of the service intervention, anticipated and unanticipated outcomes, including multidisciplinary communication and outcomes for residents (see online supplemental file 2). Interviews were undertaken by LB and LD academic researchers, between May 2019 and March 2020, either in person or by telephone and audio recorded and professionally transcribed. Informed consent was obtained before interview.

Data management and analysis

An inductive thematic analysis was used to characterise participants' experiences of delivering or receiving the pharmacist-led service. Thematic analysis provides a structured, methodical way for the researcher to familiarise with the data and to organise, analyse and report findings; importantly it is not strongly aligned to any epistemological stance,[24] so was appropriate within the pragmatic design. Both researchers familiarised themselves

with the data through checking transcripts for accuracy, then reading and making analytical memos.[25] Next, they independently developed open codes (see online supplemental file 3). The developing framework was discussed with the wider research team to refine the boundaries of the codes. Each interview was coded and any uncertainty arising during coding was discussed between researchers (see online supplemental file 4). While the researchers predominantly coded interviews they had carried out, each coded two of the other's interviews to check for consistency of approach. This along with fortnightly review meetings increased dependability during analysis. The coding framework was revised iteratively as analyses progressed, for example grouping similar codes into a category of meaning. Categories were refined and, following discussions with the research team and patient and public partners, the final themes (overarching, abstracted semantic interpretations of the data[26]) were developed. While a theme does not rely on specific quantities of data, here each theme provided extensive examples of data. To further support trustworthiness in results, illustrative examples of data within the theme were shared at research meetings to seek consensus from healthcare professionals, including pharmacists and GPs. Participant validation was not undertaken due to the time between interviews conducted in each phase and the end of study analysis.

Patient and public involvement

Public involvement was supported by the Patient and Public Involvement in Research group (further details at https://nspccro.nihr.ac.uk/working-with-us/public-patient-and-carer-voice-in-research). Public members were involved at all stages of the trial and in relation to this paper, they reviewed data and provided comments on emerging interpretations. Public members had experience of having relatives receiving polypharmacy and of working in CHs; this enabled the research team to have confidence in their interpretations and to consider in greater detail potential resident-focused benefits.

RESULTS

Interviews, lasting between 30 and 90 min, were undertaken with 38 HCPs: 14 PIPs, nine GPs, nine CH managers and six CH staff. Participants were recruited from 18 of the 25 triads: six in Scotland, four in Northern Ireland and eight in England. There was no expression of interest from any stakeholder in seven triads. In three of these triads, the PIPs did not deliver the intervention; in the remaining four triads, the demographics and trial outcomes were similar to the sample interviewed. Data were collected from a heterogeneous sample of professionals and locations as shown in online supplemental file 5 (demographic characteristics of interview participants). Data were collected from triads with older people CHs who provide personal care and some social activities (residential) and dual registration care homes which provide personal and nursing care. We identify illustrative quotes within quotation marks. For substantial quotes, we provide professional role and unique triad number; non-italicised text in quotes is for explanation.

Three themes were developed. Theme (1) '*It's a natural fit'—multidisciplinary working in CHs* explores GP, PIP and CH staff differing experiences of this new role; (2) *'The resident is cared for'—shared goals in medicine management* provides exemplars of improvement in residents' experience of medication and the impact of targeted deprescribing (3) '*Moving from "firefighting" to effective systems'* reports on the improvement to organisation systems across CHs and GP practices and whether this lasted beyond the intervention. Participants mostly recounted positive experiences but some identified challenges inherent in pharmacist-led medicine management in CHs.

Theme 1: 'It's a natural fit'—multidisciplinary working in care homes

This theme reports GP, CH staff and PIPs' experiences of pharmacist-led medicine management. The GP and CH staff valued the PIPs' activity for differing reasons, suggesting that a PIP role can meet both sets of needs.

GP perceptions

GPs highlighted the safety advantage of having PIPs within the multidisciplinary team, explaining that it was helpful to have 'another pair of eyes' to increase patient safety:

> Having a pharmacist who had good knowledge of all kinds of medications, going through polypharmacy, with a fine-tooth comb and picking up any errors or things we could do better. GP_21.

GPs also drew on PIPs' expertise of medicine administration for the wider benefit of CH residents, *'things that can be crushed or can be opened or whether they need to be changed to suspensions'*, explaining the PIP *'seems to know the answer for everything with regards to medication interactions and probably the thing I ask her most is appliances, different catheters and things'* GP_8.

GPs explained that as PIPs could spend several hours within the home with a small number of residents, they could understand residents' medicine needs in greater detail, '*it has brought up things that I might not have thought about'* GP_16. GPs and care home staff were generally open to suggestions from PIPs. However, two PIPs not based in the GP practice prior to the intervention struggled to have their prescribing role accepted, *'I couldn't just go off and prescribe things because the doctor would need to know … it was quite obvious she didn't want me to do anything without putting it through her'* PIP_19. This may suggest a need for actively reviewing and clarifying accountability of roles so that PIPs may be fully integrated into the multidisciplinary team.

While GPs found it hard to quantify the impact of the intervention on their workload, on reflection they mostly described how they were now dealing with fewer daily

enquiries from CHs. Where PIPs and GPs had established communication channels, the PIPs regularly identified residents and issues that the GP should look at in their weekly ward round:

> It has reduced the time taken to see patients as I can be confident their meds are all up to date, tests required for routine monitoring have been flagged up and I have been able to action these GP_3.

Not all GPs agreed that the PIP intervention was a 'natural fit', rather one GP described a situation where they believed the intervention had increased their workload as the PIP had requested biochemical monitoring which was '*creating work…actual fact I didn't change resident's dose, there was no indication to do so and I did wonder what I was trying to achieve.*' GP_19. In part, this situation arose as the PIP did not have full access to the resident's clinical records and was unaware a blood test had been taken during a recent hospital visit, highlighting the importance of PIPs being able to have full access to the primary care team's systems and patient records.

Care home team perceptions

CH managers and staff identified benefits in having a dedicated pharmacist attached to the home. Most CH teams explained they had gained improved accessibility and advice by having PIPs as a point of contact in the primary care team, '*if you're phoning a surgery about a pharmacy issue, probably better speaking to a pharmacist than a GP*' CH manager_21a.

Where multidisciplinary working was embedded, CH teams explained the clinical skills of each professional were respected, and teamwork supported effective resident care:

> The [CH] nurses' assessments are being taken as a valuable tool, because the nurses are observing, the nurses are giving the assessment, and the nurses are liaising with the PIP, to prescribe what they think is needed, so I think it's a win, win situation, the nurses are feeling valued, and the PIP as well CH manager_21b.

However, in two homes, PIPs were not able to become integrated into the CH. In one, the PIP reported that CH staff were unclear of their role. In another, there was confusion about the legal position of PIPs to prescribe and the manager insisted the GP signed off all the PIP's prescribing activity. This highlights the importance of understanding and trust across the triad.

PIP perceptions

PIPs commonly reported that their prescribing authority meant decisions and resident care could be followed up in a timely way:

> I think the benefits of having pharmacists in Primary Care is we can go in and make the changes and own it and follow it up rather than pass it on, …leaving it for other people to follow up PIP_17.

A few PIPs mentioned the role of the pharmacy technician as potentially supporting their work, as pharmacy technicians would undertake stock control and check medicine administration records for accuracy with stock. Only one PIP appeared to have worked with a technician during the intervention '*…a [pharmacy] technician that's employed to go around the homes, I had a relationship with them already, … a lot of the work that they had already done, …so it meant me going in wasn't as huge job to turn around the whole care home*' PIP_14. A GP pointed out that it may not be good use of a pharmacist '*to be going in and counting tablets and working out what the home needed*' GP_21.

In summary, GPs and PIPs made clear what expertise an independent prescribing pharmacist could bring to the multidisciplinary team and saw a continuing place for pharmacists in CHs. While most CH teams valued the PIP role, a few were still uncertain on the range of their specific responsibilities.

Theme 2: 'The resident is cared for'—shared goals in medicine management

GPs and PIPs highlighted a strength of having a PIP as 'the linchpin in medicine management' in that they had detailed pharmaceutical knowledge allowing them to take actions which would directly and specifically benefit residents. PIPs reviewed prescriptions and could actively seek to rectify any prescribing errors and reduce the drug burden related to adverse effects from medicines. By doing this, they importantly improved safety for the resident and helped to make MAR (Medication Administration Record) sheets fit for purpose thereby potentially reducing the risk of administration error. Changes PIPs could make ranged from small actions such as changing the time of eye drop administration, so residents were not woken every night by staff, changing tablet preparations to soluble form, to complex titrating of medicines, for example, reducing doses of morphine-based painkillers and stopping antipsychotic medicines. PIPs reviewed all medicines in the context of a resident's current biomedical markers and stage of life.

Residents, alongside some members of the multidisciplinary team, were sometimes uncertain of the PIP's credentials, and PIPs reported that a few residents were reluctant to have their medicines reviewed, preferring to remain with prescriptions given by the GP or secondary care team. There were a few triads where CH teams struggled to recall changes which had impacted on residents' well-being. These proved to be either homes where PIPs struggled to build working relationships and therefore their medication activity was negligible, or homes that already had highly developed relationships with either the PIP allocated to the intervention or with another pharmacist. In this latter case it was reported that most residents already received regular medication reviews.

Managing resident prescriptions

Independent prescribing activity was a key role of PIPs in the multidisciplinary team. Their involvement could

directly benefit residents, often because this could progress a new prescription much more speedily:

> If my residents are feeling their symptoms, then refer to the PIP, and the PIP will prescribe immediately, there will immediate response, and then the residents will be happy CH manager_21b.

Other CH teams identified how having direct contact with a PIP stopped conditions worsening, '*somebody having dry skin, and being able to contact a pharmacist, definitely improved care and stopped things becoming more acute, skin breaking down*' CH Manager_16. They explained that for such conditions, they would not have contacted the GP but would have waited for the weekly GP visit, with the ensuing delay potentially leading to the worsening of conditions.

Key to successful deprescribing, reducing or stopping a medicine, was the PIP having trustful relationships with the CH team, the GP and the resident or their family. The importance of this trustful relationship was made evident when CH teams explained how they were now confident in trying to titrate prescriptions down as they knew the PIP was easy to contact and had agreed that if there were adverse effects the process could be stopped, and the medicine reinstated:

> Seeing PIP on a weekly basis meant we were able to make some huge reductions but also we were both very honest with each other so when we had got rid of almost everything and then resident's behaviour got worse again, we were able to add in a tiny little bit of something and I mean tiny bit which was appropriate CH Manager_9.

Titrating antipsychotic medicine is a complex process and each stakeholder needs to be fully committed and in good communication with each other. Here, a PIP explains how the process continued after the intervention ended, illustrating the continued benefit of having PIPs working in the GP practice:

> We had started to titrate it down and for a few days they were okay and then they started to need a lot of diazepam so we increased it back up but now it has come back down by half; they are checking and watching even though the study has ended because I have been involved and generally keeping an eye on things too they still have my contacts. PIP_1.

Discussions on deprescribing were also enabled between PIPs and the resident or their relative, thereby providing more patient-centred care. A CH manager explains:

> …talking through that with the PIP and the resident she has come full circle and is off her Butec patches with no pain; that was agreed with her and her family … she didn't mind coming off and giving it a trial period CH Manager_6.

Shared decisions

While it was intended that PIPs would be actively engaged with residents as part of the intervention, frequently residents did not have the mental capacity for this. However, even though a PIP stated that residents would possibly have little recall of their conversation, they still found it relationally valuable to meet with residents, '*I enjoyed meeting them all and then they become more than just a name on a page, you remember the person behind the medication*' PIP_1. A few PIPs also reported the benefit of engaging with family:

> I could really get on well with the family, she wanted to know everything what I was going to do so that was more interesting because I could discuss things, a really good example of joint working with the family PIP_16.

In summary, most participants readily identified ways in which the intervention had directly benefited individual residents. The key factor enabling PIPs to work in ways which benefited residents stemmed from the trust the CH team, resident and their family could place on the PIP as a readily accessible, clinically competent person who could react appropriately if adverse consequences arose to any medicine change.

Theme 3: 'Moving from "firefighting" to effective systems'

Within the CH, most of the PIPs actively reviewed and where appropriate improved medicine ordering and administration systems, for example streamlining dispensing systems, consolidating MAR charts and stock control.

Streamlining medicine supply and stock control

PIPs could articulate their detailed knowledge of the role of the community pharmacist and the processes which may be in place when a medicine is started or stopped, particularly the time it can take for automated systems to register the change. This 'insider knowledge' placed PIPs in an ideal position to educate other professionals and try to streamline medicine ordering processes:

> Geriatrician didn't realise that although it was stopped in the MAR chart the next month's is out there in the van waiting to be delivered, just anticipating those fires PIP_9.

PIPs explained that such lack of understanding about the medicine supply process led to stopped medicines still being dispensed and administered and this could be a patient safety issue. The majority reported developing enhanced relationships with community pharmacists and CH staff. If the PIP worked in the GP practice, these relationships were often sustained postintervention, *'any query we just email the PIP we get information get straight from the horse's mouth'* CH Manager_14a.

A few PIPs explained that taking part in the intervention had prompted them to review systems in the GP surgery:

> We have 5 people—pharmacy technician, pharmacy assistants, generating prescriptions, dealing with questions, and discharge letters, so one of them is now appointed for the nursing home patients. If we need to discuss anything, she's the one that helps if we make a change, she'll change it on their file, and then she'll liaise as well with the nursing home PIP_22.

Rationalising record and stock

Working alongside CH staff PIPs allocated time to review MAR charts and consider if medicines could move to PRN (as required) or homely medicines. The staff reported they appreciated dedicated time to discuss things and simplified MAR charts:

> It sorted out things that we didn't need any longer and put things a bit more into place, like the PRNs particularly where some people didn't need it on their MAR charts any longer, … I suppose that had been overlooked which does happen I'm afraid, yes it was useful CH staff_19.

Removing no-longer-needed prescriptions and identifying changes in the ordering systems helped reduce workload, '*it really reduced our workload, in terms of kind of managing medication in the nursing home*' CH manager_11.

Many of the PIPs explained that by regularly attending the care homes, they were able to identify waste and unused stock and could take measures to reduce waste:

> I spoke a few times with the dispensing pharmacists about errors that came up on the MAR chart etc. we tried to address those issues. I spoke to the appliance contractors not just the Pharmacy, … I had to address it in a really decisive manner PIP_16.

One GP highlighted the importance of cost-saving inherent in stock control, *'I wouldn't have had a clue about it* {over stock} *because I don't go into the store cupboards so that was a massive cost saving'* GP_16.

In summary, many PIPs were found to take an active lead in reviewing and advising on more efficient medicine systems. However, their efforts to improve systems could be thwarted if either the CH staff or GP team were unwilling, or unable, to adopt new ways of working.

DISCUSSION

This secondary analysis of interview data from the process evaluation of the CHIPPS study[15] specifically focused on how the PIP role was enacted and PIPs, GPs and CH staffs' perceptions of the impact of PIP activity on CH medicine procedures and resident well-being. The results provide contextualised understandings of the independent prescribing pharmacist role within the wider primary care team, with most PIPs and GPs suggesting PIPs should have a continued role in management of CH medicine systems and residents' medicines. Importantly, most participants reported perceptible benefits from the PIP intervention whether through improved resident well-being or increased safety and streamlining of CH procedures. Benefits from the intervention appeared greater when there was professional trust between GP, CH staff and the PIP. Examining exceptions can help better understand what resources, training or other preparation might need to be put in place for stakeholders to benefit from extended pharmacist roles.

GPs and PIPs made clear a pharmacist independent prescriber could bring specialised clinical knowledge to the multidisciplinary team and they saw a continuing place for pharmacists in CHs. While most CH teams valued the role of the PIP, a few were still uncertain on the range of their specific responsibilities. Pharmacists have an increasingly valued place within multidisciplinary primary care teams, and this is evident within policy statements.[8 27] However, importantly, the pharmacist role needs to cover more than reviewing medicines to maximise impact. As part of a multidisciplinary team, pharmacists can provide dedicated specialist input into SMR[9] by drawing on their clinical pharmaceutical knowledge.[28] A pharmacist independent prescriber may be able to relieve the GP of some prescribing activity and so help to backfill GP shortages as fewer European GPs are now recruited.[29] Yet as the CHIPPS study found, there are differences in the character of pharmacist medication review[15] and there are suggestions that there may need to be quality check tools on practice.[30]

The review of individual resident's medicines undertaken as part of this intervention was reported by CH staff and PIPs as having readily demonstrated benefits for residents' subjective quality of life. This understanding is important as the evidence on objective improvements in resident outcomes, that is, admission to hospital, falls or mortality from this trial and others is inconclusive.[18 31 32] Holland *et al*,[33] suggested that measures relating to older people's quality of life may be a better measure. This is borne out in trails that fail to find significant change in primary outcomes such as falls but do find positive outcomes in reduction of drug-related burden.[18 34] Our study suggests that measures of impact may need to be related to residents' everyday experiences, such as better engagement with others, more alert at mealtimes, rather than clinical risk of side effects from multiple no-longer-needed medicines. We found that there needed to be trust between the CH staff and PIPs in order for some of the pharmacists' recommendations to be enacted; CH staff needed to have confidence the pharmacist would respond quickly if a resident's behaviour became distressed and a challenge to manage.

As part of the intervention service specification, PIPs spent time actively reviewing, and where appropriate, improving CH medicine systems. For example, reviewing and improving dispensing systems, consolidating MAR charts and monitoring stock control. These were reported as having benefits for CH staff in that administration and reordering were easier, and potentially safer. Improved

management of stock reduced wastage and therefore had financial benefits. These findings resonate with evidence supporting the place of pharmacists within CHs.[35] Nonetheless, future work might explore if this is optimum use of a pharmacist's skills or if this might be a technician-level activity.

The exceptions to the positive results reported so far occurred when relational factors inhibited the scope of pharmacist contributions. For example, when the relationship between pharmacist and GP or CH could not be successfully established, or understanding of the pharmacist's legal clinical scope was not understood. This suggests the need for strategies which will develop shared understanding of the potential of each other's roles. Our results resonate with a survey by Kahn *et al*[36] that aimed to understand factors impacting on interprofessional working in primary care; they found that the time the team had worked together, and opportunities for formal and informal communication were important in enabling the team to develop trust and collaborative working practices. In our study, the few PIPs who had not previously worked in the trial GP surgery reported greater resistance to their role and made fewer substantive changes to residents' medicines and CH medicine ordering and administration systems. It is important that all stakeholders understand the pharmacist role so as to support collaborative working practices.[37]

Strengths and limitations

Missing from our study are the resident and relatives' opinions of medication review and the place of the pharmacist in this. We attempted to recruit the residents consented to the intervention arm of the trial through CH staff. It is unclear why this was unsuccessful with only three residents expressing an interest, but in part it is likely to be due to the severe cognitive impairment many residents were living with, meaning staff may not have actively encouraged residents or their families to take part in a process evaluation interview. A further point to note is that the sample, while appearing representative of the main trial sample, consists of those who volunteered for the additional process evaluation interview so may not represent the views of those who declined. This point along with the limited number of participants represented in a small number of codes means that the transferability of the data needs to be considered with caution as the results provide insights and understandings from a very specific group of HSCPs involved in supporting older resident CHs. All pharmacists were independent prescribers, and all had received additional training in medicine for older people. It cannot be assumed that more generalist pharmacists in a GP surgery would have the experience to make the specialised medicine management decisions demonstrated by these pharmacist independent prescribers who had received additional training. There are recommendations to make CH pharmacists a designated specialty.[38] However, further training may be needed as inexperienced pharmacists may rely on template-driven reviews.[39]

The bespoke training developed for this intervention appeared appropriate for enhancing pharmacists' clinical skills and confidence.[40] Pharmacists in our study had medication review responsibilities only for between 9 and 24 residents, so allowing them dedicated time to come to understand those residents' individual needs.

The CHIPPS RCT found the fall rate risk ratio for the intervention group compared with the control group was not significant. However, the Drug Burden Index outcome significantly favoured the intervention.[18] Reduction in drug related problems is reported in another pharmacist led review intervention,[41] indicating there is potential for pharmacist led review to have some positive impacts for CH residents relating to side effects of some medicines. Further economic evaluation would be required to examine if this level of pharmacist input would be cost effective in practice. It may be that some tasks could be allocated to the developing role of pharmacy technicians.[42]

There are practice implications for other roles within the wider healthcare team. For example, during interviews, PIPs referred to their work with community pharmacists, describing the community pharmacist position as key in dispensing medicines. Future work exploring medicines management in CHs might include the community pharmacist or dispensing pharmacy so that the efficiency of medicine ordering and dispensing can be further optimised. This might reduce the potential safety risk, reported in this study, which occurs when medicines which have been deprescribed remain on the MAR chart.

The CHIPPS process evaluation was completed in 2020 just as primary care networks (PCN) were being introduced in England and at the start of the COVID-19 pandemic. A key aspect of the role was the presence of the pharmacy within the CH, the move to more 'on-line' working since the COVID-19 pandemic may make this aspect of the intervention more difficulty to implement. Within PCNs, pharmacists work across several GP practices rather than being within a single practice.[43] Our finding that PIPs not integrated within the GP team faced the most challenges in developing trustful working relationships, mirrors an evaluation of PCNs published in 2022.[44 45] This evaluation reported the need for change in cultures and practices to support additional clinical roles in a GP practice.[39 40] Those working within a PCN rather than a single GP surgery reported feeling a lack of autonomy, belonging and contribution, reflecting the trial experience of PIPs 'dropped' into GP practices.

CONCLUSION

Independent prescribing pharmacists can successfully take responsibility for medicine management and SMR for older people in CHs. When pharmacists develop professional trustful relationships with GP colleagues and CH staff, they can independently make changes to medicines which benefit resident well-being. Their expertise in medicine systems including stock control and ordering

enabled them to streamline CH systems with the potential benefit of reducing waste and likelihood of administration errors. The changing landscape of global primary care provision indicates that pharmacists will continue to have a key role in leading management of medicines but that how this happens may require monitoring to enable refinement of the delivery model.

Twitter Christine Bond @christinebond20

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ORCID iD

Linda Birt http://orcid.org/0000-0002-4527-4414

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Additional file 1 CHIPPS Intervention Service Specification

	Specification
Recruitment and employment of the Pharmacist Independent Prescriber (PIP)	
	Excellent interpersonal, communication and IT skills
	Familiarity with relevant GP software systems
	Experience of providing prescribing and medicines management advice and support
	Previous experience of working in GP practice environment
	Be able to travel to site locations
	A mobile phone to be contactable for the purposes of delivering this service
	Appropriate indemnity insurance for prescribing
PIP roles and responsibilities	
Review each resident's medication and develop and implement a pharmaceutical care plan (essential)	Optimise prescribing ensuring clear indication and evidence base for each medication (taking into consideration national and local pathways, guidelines and formularies), informed by tools such as STOPP/START
	Minimise the potential for adverse effects
	Optimise the dose of all medication
	Co-ordinate appropriate monitoring and associated tests for all medicines and conditions

Service specification 05.08.2020

	Agree initial care plan with GP, care staff and resident (where appropriate)
	Document and maintain records relating to review and care plan in GP and care home records as appropriate
Prescribing (essential)	
	Authorise repeat prescriptions
	Co-ordinate appropriate monitoring and associated tests for all medicines and conditions
	Deprescribe medicines according to agreed pharmaceutical care plan
	Document medication changes in GP and care home records and notify supplying pharmacy of all changes to medication within 24 hours
	Only initiate new medicines for existing diagnoses or for common ailments which can be managed with medicines classified by the Medicines and Healthcare products Regulatory Agency (MHRA) as Pharmacy (P) or General Sales List (GSL)
	Any additional areas of prescribing must be agreed and documented with the GP practice prior to prescribing (e.g. antibiotics for simple UTIs
Communication (essential)	
	Agree local protocols for communication with GP practice and care home prior to commencing service. This should include: o Process of communication and messaging

Service specification 05.08.2020

	○ The location and expected level of detail of all PIP interventions in the medical records Process and communication of referrals for activities outside the competence of the PIP
	Inform supplying community pharmacy about service and role (prior start of service) ○ Communicate all changes in medication to supplying pharmacy
	Complete all documentation and recording of activities as required by the study team.
Support systematic ordering, prescribing, and administration processes with each care home, GP practice and supplying pharmacy where needed: (undertaken at PIP's discretion)	
	Provide instructions on how to administer each drug
	Synchronise residents prescription quantities for monthly cycles
	Add or clarify directions for all medication where it is currently not clear
	Provide advice on repeat prescription ordering processes to: ○ Minimising missed items ○ Optimising quantities
	Optimise the use of homely remedies within the care home
	Reconcile resident medication following a transfer of care
Training provision (undertaken at PIP's discretion)	
	Review training needs of care home and GP practice and draft proposed training plan

Service specification 05.08.2020

	Provide training to care home staff on training needs basis from agreed list of potential topics/areas
	Provide guidance to relevant GP practice on training needs basis from agreed list of potential topics/areas
Safe and effective service provision	
	PIP will be contactable and respond to messages within 24 hours (Monday - Friday)
	The PIP will establish a locally agreed protocol with the GP practice for referral/notification of all medicine related queries from CHIPPS participants to the PIP as appropriate (see 4.3.5)
	PIP will have full (read/write) access to GP record system to issues prescriptions and update records
	Where possible PIP will use remote access to update records when changes are made to GP held record o Where remote access is not feasible the PIP must update records within 24 hours of making a change
	PIP will have full (read/write) access to care home records to update records during all visits using appropriate local reporting systems
	The PIP will visit/contact the care home at least once a week
	The PIP will visit/contact the GP practice at least once a week
	Wherever possible, all annual leave should be agreed before the beginning of the study. A clear system for transfer of responsibility communicated to GP, care home and supplying pharmacy

Service specification 05.08.2020

	The PIP will work within the local prescribing formularies of GP practice and primary care organisation.
	The PIP will report and document all significant clinical events or near misses using local reporting procedures and study documentation.
	Ensure all records are aligned

Service specification 05.08.2020

CHIPPS WP6 QUAL Evaluation: Topic Guide for PIP

As the purpose of this interview is to encourage a conversation in which the participant can feel confident in expressing their own views, the following topic guide is indicative. This means that the interviewer may adapt it to suit the conversation style and preferences of the participant.

	Introduction. **1. Introduce yourself** **2. Explain the purpose of the research**	We have developed a new service in which a specially trained 'pharmacist independent prescriber' (PIP) becomes part of the care home team, working alongside general practitioners. The aim is to improve how resident's medicines are managed in a safe, effective and cost effective way. We hope this may improve resident's care, wellbeing and health outcomes. We are evaluating this new service in a large multi-centre randomised controlled trial in different places in the United Kingdom. The study is run by the universities of East Anglia, Aberdeen, Leeds and Queen's Belfast. It is funded by the UK National Institute for Health Research. *Since participating in the training for 'pharmacist independent prescribers (PIPs) ' you have set up and have delivered the Care Home Independent Pharmacists Prescriber service in the trial,* *We would like you to consider your overall role as a PIP providing this service and your experience in delivering this. We would also like your views on the Service Specification and Pharmaceutical Care Plan, your thoughts about the mentoring you received and how useful the personal development plan and training was in preparing you for this role and how this has impacted on your ability to set up and deliver this service.*
	The digital recorder **1. Stress confidentiality**	I would like to highlight the confidentiality of everything you tell me, and specifically that: • *the recording will be deleted after being transcribed* • *you won't be identified individually in any report.* • *all information will be anonymised.* • *we will not tell anyone else including your employer organisation, what you tell us as an individual.* • *likewise no other individual e.g. GP, care home staff, resident will be identifiable in any report.*

	2. Set ground rules	*We do need to remind you, however, that* if you do disclose anything which might identify a risk to yourself or to others, or a personal or professional offence, this would be shared with the relevant responsible authority. However we would tell you if we thought this were the case. • All of your views are of value to us. There are no right or wrong answers, • Please ask me to clarify if the question isn't clear. • We remind you not to share any personal or patient identifying information during this interview
	Ask if there are any questions	
	Confirm consent	

	Stem question PIP service delivery	**Probes / follow ups**
1.	What was your experience of delivering the service?	• Any particular issues • Anything particularly good (Interaction with GP/ care home staff/residents/ relatives access to records/ information/routines /types of interventions) • Acceptability to residents without capacity
2	In what ways did your service affect resident care	• Examples positive and negative
3.	What are your views on the Service Specification?	• Clarity? • Level of detail? • Inclusion/exclusion criteria • Service requirements? • Outcomes • Transitional arrangements
	Stem Question –research activity	•
34	What are your views on the research study documentation including: Pharmaceutical Care Plan, PIP log and resource use data?	• Ease of use • Anything missing/ not needed • Fit for purpose?

		• How much time did it take
		•
5.	What were your thoughts on the role of the mentor?	• Positive • Negative • Areas for improvements
6.	What was your experience of developing your own personal development plan with your mentor?	• Went well/ not so well • Mentor support/ time scale for completion • Accessing training on the identified development areas • General acceptability
7.	What do you think about the competency framework assessment?	• Comprehensive? • Easy/hard to demonstrate achievement?
78	What do you think about the assessor signing you off?	• Useful / difficult discussion? • Appropriate? • Alternative suggestions? • Process fit for purpose?
	Stem question Training	**Probes / follow ups**
89	What are your thoughts on the impact of training you received?	Any gaps- • *preparation for role,* • *underpinning knowledge,* • *competency framework,* • *relationship building* • *personal development skills*
10.	Now that you have been delivering the service for 3 months which particular elements of the training do you think have been most useful?	• Why? • Relevance • Time spent on this • Delivery
11.	Which particular elements of the training do you think have been least useful in your role, delivering the service?	• Should we continue to provide this element of the training?

		• How should this element of training be delivered? • What should we do to improve these elements of training?
11.	Is there anything that should have been included in the training that wasn't?	• How would you suggest that we train pharmacists in that? • Is there existing training available, that you are aware of, to meet this • Need? • When should this training be provided?
12.	It is important to us that across the four areas, all PIPs provide a similar service. What would be the best way for this to be achieved?	• Training? • Checklist?
13.	In what ways could you contribute to the training of the next cohort of Pharmacist Independent Prescribers?	• Mentor? • Helping to deliver educational package locally?
14	How important for you was peer support	• use The Telegram group • Use other ways if staying in contact
	Stem question on team work	•
8.	Where did communication issues arise between your and the other team members involved in the PIP service?	• Care homes • Other Pharmacist • Primary care team • GP Practice • Relatives/residents
9.	How do you think communication impacted on resident care? (positively/ negatively)	• Examples
14.	Any final comments?	
15.	Thank you for taking part in this interview	

N.B. all interview topic guides started with the setting the introduction and digital record prompts; in the remainder of the document we only include stem questions.

CHIPPS WP6 QUAL Evaluation: Topic Guide for GP

	Stem question	**Probes / follow ups**
Part 1	Intervention	
1.	Overall what are your views of the PIP service?	• New contributions • New problems
	Views on changing skill mix in the primary care team Views on changing skills mix in the care home team	• Diversity in team(s) • Challenges • Issues in managing
2.	How has the PIP service impacted on your work load?	• (Negatively/ positively) • Time • Visit frequency • Referrals • Tests • Medication changes • Medication reviews • Medication ordering • Repeat prescriptions
3.	In what ways has the PIP service impacted on patient care?	• Examples • Acceptability for patients without capacity?
Part 2	Implementation	
4.	What barriers if any to implementing this service?	
	How could we overcome any barriers?	
5.	What did you see as facilitating the service to be implemented?	

	Stem question	**Probes / follow ups**
	Stem question	**Probes / follow ups**
Part 3	Working relationship	
6.	What is your view of your working relationship with the PIP?	• Good relationship areas • Difficult relationship areas
7.	Could the working relationship with the PIP have been improved?	
8.	How has the new service affected your relationship with your patients?	• New contributions • New problems
9.	How has the new service affected your relationship with the care home staff?	• New contributions • New problems
10.	Where did communication issues arise between you and the other team members of the team involved in the PIP service, and what were they?	• PIP • Care Home • Community Pharmacist • Primary care Pharmacist • District Nurse • GP Practice
11.	How do you think any communication issues may have affected patient care?	• (Positively/ negatively) • examples
Part 4	Acceptability	
12.	What aspects of the PIP service went well from your perspective?	• Time commitment • Paper work • Issues raised/resolved
13.	What aspects of the PIP service went less well from your perspective?	• Time commitment • Paper work

	Stem question	**Probes / follow ups**
		• Issues raised/resolved
	How could we improve these?	
14.	What elements of the service did you like best?	• Patient care
15.	Overall, how satisfied are you with the service provided by the PIP?	
16.	Would you like the service to continue?	• In its current from • In a revised form • Not at all
17.	Any final comments?	
18.	Thank you for taking part in this interview	

CHIPPS WP6 QUAL Evaluation: Topic Guide for Care Home Manager

	Stem question	**Probes / follow ups**
Part 1	Views of the intervention	
1.	Overall what are your views of the PIP service?	• New contributions • New problems
	Views on changing skill mix in the primary care team Views on changing skills mix in the care home team	• Diversity in team(s) • Challenges • Issues in managing
2.	How has the PIP service impacted on your work load? (positively/negatively)	• Time • Referrals • Tests • Medication changes • Medication reviews • Repeat prescriptions • Medication administration processes • Record keeping • Medication storage • Interactions with GPs • Interaction with community pharmacist • Number of pharmaceutical advisory visits (i.e. not including PIP)
3.	In what ways has the PIP service affected patient care? positively/negatively)	• Examples • Acceptability for patients without capacity?

	Stem question	**Probes / follow ups**
4.	Have you or your staff received any additional training since the introduction of the PIP service?	• Impact?
Part 2	Implementation	
5.	What barriers if any to implementing this service?	
	How could we overcome any barriers?	
6.	What did you see as facilitating the service to be implemented?	
Part 3	Working relationship	
7.	What is your view of your working relationship with the PIP?	• Good relationship areas • Difficult relationship areas
	How can your working relationship with the PIP be improved?	
8.	What is your view of your staffs' relationship with the PIP?	• Good relationship areas • Difficult relationship areas
	How can their working relationship with the PIP be improved?	
9.	How has your working relationship with the PIP affected your relationship with your patients?	• New contributions New problems
10.	Where did communication issues arise between you and the other team members involved in the PIP service, and what were they?	• PIP • Community Pharmacist • Primary care Pharmacist • District Nurse • GP Practice
11.	How do you think communication issues may have affected patient care?	• Examples
Part 4	Acceptability	
12.	What aspects of the PIP service went well from your perspective?	• Time commitment • Paper work • Issues raised/resolved
13.	What aspects of the PIP service went less well from your perspective?	• Time commitment

	Stem question	**Probes / follow ups**
		• Paper work • Issues raised/resolved
	How could we improve these?	
14.	What elements of the service did you like best?	
15.	Overall, how satisfied are you with the service provided by the PIP?	
16.	Would you like the service to continue?	• In its current from • In a revised form • Not at all
Part 5	Study procedures	
17.	Recruitment and participation	• Acceptability for residents with/without capacity • Time commitment • Paper work
18.	Any final comments	
19.	Thank you for taking part in this interview	

CHIPPS WP6 QUAL Evaluation: Topic Guide for Care Home Staff

	Stem question	**Probes / follow ups**
Part 1	Views of the intervention	
1.	What involvement have you had with the PIP service?	
2.	Overall what are your views of the PIP service?	• New contributions • New problems
	Views on changing skill mix in the primary care team Views on changing skills mix in the care home team	• Diversity in team(s) • Challenges • Issues in managing
3.	How has the PIP service impacted on your work load? (positively/negatively)	• Time • Referrals • Tests • Medication changes • Medication reviews • Repeat prescriptions • Medication administration processes • Record keeping • Medication storage • Interactions with GPs • Interaction with community pharmacist
4.	In what ways has the PIP service affected patient care? positively/negatively)	• Examples • Acceptability for patients without capacity?
5.	Have you received any additional training since the introduction of the PIP service?	• Impact?
Part 2	Implementation	

	Stem question	**Probes / follow ups**
6.	What barriers if any to implementing this service?	
	How could we overcome any barriers?	
7.	What did you see as facilitating the service to be implemented?	
Part 3	Working relationship	
8.	What is your view of your working relationship with the PIP?	• Good relationship areas • Difficult relationship areas
9.	*How can your working relationship with the PIP be improved?*	
10.	How has your working relationship with the PIP affected your relationship with your patients?	• New contributions New problems
11.	Where did communication issues arise between you and the other team members involved in the PIP service, and what were they?	• PIP • Community Pharmacist • Primary care Pharmacist • District Nurse • GP Practice
12.	How do you think communication may have affected patient care? (positively/ negatively)	• Examples
Part 4.	Acceptability	
13.	What aspects of the PIP service went well from your perspective?	• Time commitment • Paper work • Issues raised/resolved
14.	What aspects of the PIP service went less well from your perspective?	• Time commitment • Paper work • Issues raised/resolved
	How could we improve these?	
15.	What elements of the service did you like best?	• Patient care

	Stem question	**Probes / follow ups**
16.	Overall, how satisfied are you with the service provided by the PIP?	
17.	Would you like the service to continue?	• In its current from • In a revised form • Not at all
18.	Any final comments?	
19.	Thank you for taking part in this interview	

CHIPPS WP6 QUAL Evaluation: Topic guide for residents or relatives

	Stem question Resident/relatives	**Probes / follow ups**
Part 1 Awareness of the intervention		
1.	Overall have you noticed any changes in your care/ the care of your relative/friend since the introduction of the PIP service?	
	What changes have you noticed?	• Good/Bad • Examples
Part 2 Implementation		
2.	Before the PIP service started, what did you think about the information you received describing the new service?	• Relevant to you • Amount of detail • Understandable
3.	Given information you had before the PIP service started, how far was the service what you thought it would be?	• Examples
Part 3 Relationship with PIP		
4.	How did you get on with your PIP?	• Good relationship areas • Difficult relationship areas
	How could your relationship with the PIP be improved?	
5.	How easy did you find it to talk to the PIP?	• Examples
6.	How do you think your relationship with the PIP affect your care/ your relative/friends care?	• Examples
Part 4 Acceptability		
7.	What aspects of the PIP service went well from your perspective?	• Examples
8.	What aspects of the PIP service went less well from your perspective?	• Examples
9.	Is there anything we could improve the overall service?	• Examples
10.	Overall how satisfied are you with the service provided by the PIP?	

Part 5	Study procedures	
16.	Recruitment and participation	• Acceptability for residents without capacity
11.	Any final comments?	
12.	Thank you for taking part in this interview	

End document

Supplementary file 3 Coding Framework

code	Number participants	Number times coded
1 Implementation	10	30
list of services offered by PIP	5	7
care home study procedure	8	23
GP study procedures	6	7
2 Mechanisms of impact	7	46
medication changes made	13	33
bio chemical monitoring	8	9
non-patient facing activities	8	25
completing PCP	5	15
tasking items to GP	4	4
liaising with community pharmacist about scripts	7	14
liaising with primary care practice pharmacy staff	4	6
evidence of GP tasking items to PIP	4	10
recruiting residents	3	4
authorising repeat prescription	7	13
staff education	8	13
staff training	12	15
review of medication systems	11	18
review of stock	7	8
care home workload due to intervention	7	24
3 Communication	10	62
PIP to GP	9	19
PIP to care home	12	55
PIP to residents and relatives	8	16
PIP to others	10	21
GP to PIP	7	16
Care home to PIP	13	56
resident or relative to PIP	0	0
GP to CH	5	6
4 Outcomes	10	46
case studies of improvement to residents	18	43
case studies where planned change not successful	2	2
reduced drug or stock wastage	3	3
improved ordering system	8	19
adding to multi disciplinary practice	17	44
opinion on intervention	6	32

PIP satisfaction or not	5	11
GP satisfaction or not	7	28
Care home satisfaction or not	10	47
5 intervention safety	4	6
PIP perspective	5	12
GP perspective	7	17
Care home perspective	6	9
resident or relative perspective	0	0
6 contextual factors	13	61
barriers to delivery	18	44
facilitators to delivery	14	42
impact of site factors on delivery	14	34
impact of patient factors on delivery	8	12
GP workload impact	12	27
care home staff awareness	11	30
7 Intervention normalised into routine	13	25
actions taken to ensure intervention works	3	5
narrative of engagement or disengagement	10	18
legacy of intervention	11	20
Future developments	2	4
8 Discussion on professional roles	12	46
9. Geographic differences	6	9
10 Should this type of service be implemented	14	21

Supplementary file 4 Example of text to code 'PIP satisfaction or not'

PIP 1

Reference 1-the one to one contact, the face to face umm for those patients that were able to participate umm you know I think a lot of the time they are happy to see somebody and know there is another person involved in their care, umm a lot of them were great characters and you know it was lovely for building that relationship and then of course there would be the patients where you would be in a relationship with them and then you would be leaving the room and they had forgotten who you were, that was just their you know their conditions, so umm but no it was a positive experience definitely from the patients' perspective and getting to know them.

Reference 2 - I thought the project is really worthwhile umm and I hope that you are able to get all the data and make sense of it all especially with me, umm I, you know I think it's a great project, I have encouraged other people to get involved in it locally umm and you know I know there's a few. -

PIP 2

Reference 1 - part of me, admittedly four hours isn't enough time, sometimes I wish it was more patients because I felt I could have probably made more of an impact and I do wish it was only the one Care Home but other than that.

Reference 2 – I think so with the Primary Care network role, pharmacist's role that is something that each Care Home resident will be getting and should be getting the Pharmacist's review so. Yeah it is, it's utterly definitely of benefit. - §

PIP 6

Reference 1 – Q I'm just wondering if there is a specific example of where you felt that that lack of knowing affected your sort of practice? Response I think it just was the, I think it was just the fact that I never got to the stage where the Home were calling me about things, we never got to that stage

Reference 2 – Q Was there anything that was particularly good about your experience of delivering the service? Response 2 / 3 Definitely, yes, I have been very negative, no I think just the fact that there is a need for it, you know I did pick up on things in review, GPs now are so busy you know particularly when they get given, the way that it happens, that they get given a whole Care Home to look after, they do tend to when, you know once that patient moves into that Care Home the GP will you know do a quick review and all of that to get to know them and their records a bit better but often after that the GP can only ever respond to acute needs and those patients, you know often those, the way it works at the Care Home I was at, that the GP would visit every Thursday, they would have a list of all of the patients that the Care Home wanted them to see so it was often dictated by what the Care Home needs were rather than what the GP, and by that time it was all filled up so the GP you know would follow up on some things but in terms of on-going chronic conditions that's where I feel Pharmacists in Care Homes have an impact and that I saw, so my main things were about trying to reduce pain medication, so we got a few people reduced on some of the Opioid patches and monitoring, not over-monitoring because you know that is totally unnecessary at this stage but the monitoring that is necessary so there was some blood tests that had slipped that were important and de-prescribing other things for different medications like statins that patients don't need so much anymore and the GP I felt was grateful for that because they would love to have

the time to do that I'm sure, but yeah they are working on a, you know firefighting basis whereas this was more of a you know a pro-active approach to it. –

PIP 19

Reference 1 - it was generally positive, there were obviously some things we will perhaps come back to that were sort of challenging in terms of time management and prioritising what I needed to do umm but umm but yes on the whole I think I learnt from it and it was beneficial to the patients I hope. –

PIP 9

Reference 1 - quite good really it kind of built upon the kind of relationships that I had with the Care Home anyway, so I do speak to them quite often on the phone, I deal with queries but it just, it made things better because I had to go and see the Home, I didn't know where the Home was, it was just out there somewhere. I didn't know what the Home was like, I had a picture of it in my head about who the people were who I was dealing with but I didn't know them so I had to go and see them so that was great and then because we knew one another we then kind of shared email addresses and stuff and we made maybe some of the things a bit more twenty-first century, we were emailing one another whereas in the past they were faxing us queries and stuff so, so that's yeah so it was, yeah it was good it kind of pushed us a bit more together to kind of work together.

Reference 2 - can't think of anywhere where it was negative, I can just see it was all positive. Basically we did do a kind of an in-depth six month review of people which I don't think we would have done it had I not been involved in the CHIPPS study you know and there was lots of, because basically what I used it for we kind of took a step back and said 'why is this patient on this drug?' as opposed to 'what's the drug for?' so if they are on drugs and antidepressants you know well anti-depressants they're depressed, but actually what I started doing was going you know 'why were they put on this drug?' and sometimes we didn't know and they were on the drug and I didn't think it was doing any good and I said 'maybe we could maybe halve this or stop this?' so yeah so I can't think of anything, I can't think of anything negative.

Reference 3 - So communication only improved, you know we did move away from them sending faxes to us saying 'and you owe these medicines for various people' to them emailing and you know yeah and it just improved you know and sometimes when I had those emails I was able to reply back to them and say 'I've sorted it out for you now' but I was able to reply to the Pharmacy as well saying 'these things have been sorted, the script is on the way' or whatever and it only improved really, do you know what I mean 'improved'?

Reference 4 - I thought whatever you are going to try and show a difference in, that half my time or double my time was taken filling out paperwork when actually I did do it in half the time but you do not know and I kind of squandered some of that yeah

Table Demographic characteristics of interview participants

Intervention ID Interviewee N=38		**General practice**			**Pharmacist**			**Care Home**		
Triad	**Interviewee**	**Location***	**Patient list**	**Previously employed PIP**	**Time Independent Prescriber**	**Previous experience in care homes**	**Number of residents in intervention**	**Type of registration**	**Indices of multiple deprivation***	**Ownership**
1	PIP, CH Manager	Northern Ireland Urban	< 10,000	Yes	1 month	No	6	Dual	10	Private
2	PIP	England Semirural	≥10,000	Yes	2 months	Yes	20	Dual	8	Private
3	GP	England Urban	< 10,000	No	12 months	Yes	16	Residential	6	Local Authority
4	PIP	Scotland Urban	≥10,000	No	12 months	No	24	Dual	10	Private
6	PIP, GP, CH Manager, CH Staff	England Urban	≥10,000	No	16 months	No	22	Residential	5	Voluntary
8	PIP, GP, CH Manager	England Semirural	≥10,000	Yes	18 months	Yes	24	Dual	4	Private
9	PIP, CH Manager	England Rural	≥10,000	Yes	18 months	No	21	Residential	6	Private
11	PIP, GP, CH Staff	Scotland Semirural	< 10,000	Yes	3 years	No	14	Residential	8	Private
12	CH Manager	Northern Ireland Urban	≥10,000	Yes	4 years	Yes	19	Residential	7	Voluntary
14	PIP, GP, CH Manager (x2), CH Staff	Scotland Rural	< 10,000	Yes	4 years	No	20	Dual	9	Private
15	PIP	Scotland Urban	< 10,000	Yes	6 years	Missing	18	Dual	7	Private
16	PIP, GP	England Urban	< 10,000	No	6 years	Yes	20	Dual	1	Private
17	PIP	Northern Ireland	Missing	Yes	7 years	Yes	6	Dual	10	Private

		Urban								
18	CH Manager	Scotland Urban	< 10,000	Yes	8 years	No	9	Dual	6	Private
19	PIP, GP, CH Staff	England Rural	< 10,000	No	9 years	Yes	24	Residential	6	Private
20	PIP	Northern Ireland Semirural	Missing	Yes	10 years	Yes	23	Dual	8	Private
21	GP, CH Manager (x2), CH Staff	Scotland Urban	< 10,000	Yes	14 years	Yes	21	Dual	10	
22	PIP	Scotland Urban	< 10,000	Yes	16 years	Yes	11	Dual	Private	

Key

Location country: urban refers to city GP practice, semirural refers to market town GP practice, rural refers to village GP practice

Indices of Multiple Deprivation: The deciles ranks are nationally calculated by ranking the 32,844 LSOAs in England from most deprived to least deprived and dividing them into 10 equal groups. LSOAs in decile 1 fall within the most deprived 10% of LSOAs nationally and LSOAs in decile 10 fall within the least deprived 10% of LSOAs nationally. NI decile calculated manually from rank