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GPs' and community pharmacists' opinions on medication management at transitions of care in Ireland.

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General practitioners' and community pharmacists' opinions on medication management at transitions of care in Ireland

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Abstract

Objective

The aim of this study was to survey general practitioners (GPs) and community pharmacists (CPs) in Ireland regarding current practices of medication management, specifically medication reconciliation, communication between healthcare providers and medication errors as patients transition in care.

Design, Setting & Participants

A national cross-sectional survey was distributed electronically to 2364 GPs, 311 GP Registrars and 2382 CPs. Multivariable associations comparing GPs to CPs were generated and content analysis of free text responses was undertaken.

Results

There was an overall response rate of 17.7% (897 respondents - 554 GPs/Registrars and 343 CPs). More than 90% of GPs and CPs were positive about the effects of medication reconciliation on medication safety and adherence. Sixty per cent of GPs reported having no formal system of medication reconciliation. Communication between GPs and CPs was identified as good/very good by >90% of GPs and CPs. The majority (>80%) of both groups could clearly recall prescribing errors, following a transition of care, they had witnessed in the previous six months. Free text content analysis corroborated the positive relationship between GPs and CPs, a frustration with secondary care communication, with many examples given of prescribing errors.

Conclusions

While there is enthusiasm for the benefits of medication reconciliation there are limited formal structures in primary care to support it. Challenges in relation to systems that support inter-professional communication and reduce medication errors are features of the primary/secondary care transition. There is a need for an improved medication management system. Future research should focus on the identified barriers in implementing medication reconciliation and systems that can improve it.

Introduction:

Medication discrepancies during transitions of care can occur as a result of incomplete or inaccurate communication as responsibility shifts between healthcare providers or back to the patient. These discrepancies are common, reported in up to 67% of hospital admissions, and have been linked to potential as well as actual adverse drug events (ADEs)¹⁻³. The coordination of care, in particular improved systems of transfer of medication information at transitions, especially for those with complex chronic illnesses is essential⁴. Policy recommendations in the area have been numerous, with reports recommending coordinated care delivered by community based multi-professional teams, mandating all healthcare providers deliver medication reconciliation (A 3 step process - verification of a current medication list, clarification of directions and appropriateness; and documentation of changes⁵.); as well as minimum datasets and safe modes of transfer of patient information on referral and discharge.^{4,6,7}

Medication reconciliation has been promoted by many statutory and safety focused organizations and a number of studies have explored the most effective method of medication reconciliation^{3,8-12}. Most existing studies have been prevalence studies of discrepancies attempting to identify high risk groups and transitions, or trials of pharmacist and Information Technology (IT) mediated interventions with only a few studies investigating primary care based healthcare professionals (HCPs) opinion on their role in reducing and preventing errors at transitions¹³⁻¹⁵. Barriers to effective reconciliation have been grouped as patient, provider and system factors; in considering designing solutions to reconciliation issues it is necessary to examine these factors more closely¹⁶.

The aim of this study was to gather information from general practitioners (GPs) and community pharmacists (CPs) on current practices of medication management at the primary/secondary care interface in Ireland. Specific objectives of the study included an assessment of the experience of prescribing errors following transition, identification of medication reconciliation practices, and evaluating the quality of communication/relationship between HCPs.

Methods:

A cross sectional, self-administered electronic questionnaire which facilitates anonymous completion was devised based on the literature and the input of a group of relevant GPs and CPs. The questionnaire had a mix of quantitative response options as well as free text responses. Core content consisted of basic demographics, details on employment and professional experience. In addition, questions on current medication management practices (specifically medication reconciliation), the quality of communication and relationship with other healthcare providers, as well as the experience and handling of prescribing errors were included.

Setting & Population:

Healthcare in the Republic of Ireland is provided through a mixed model of funding. The Health Service Executive (HSE) provides all state funded health services; it has four administrative regions representing broad geographic regions (Dublin Mid-Leinster, Dublin North East, South and West). Almost half (44%) (July 2013) of the population have their healthcare subsidised by the state (General Medical Services scheme - GMS). GPs operate as private contractors, consulting with both private (self-funding) and public (GMS) patients. CPs are contracted by the HSE to dispense medication, and are typically private contractors also. The study aimed to recruit a representative sample in Ireland (total population 3439 CPs and 2799 GPs). A sampling frame of potential participants was identified with the permission of the Irish College of General Practitioners (ICGP) and the Pharmaceutical Society of Ireland (PSI). The survey was distributed in June 2014 via these email lists (2364 GPs, 311 GP Registrars [complete ICGP mailing list] and 2382 CPs [PSI random sample]) with a hyperlink to the online survey tool. A reminder email was sent four weeks later.

In order to attain a statistically representative sample of the target population, allowing for a 15% response rate, a sample size of 346 for each profession was calculated (margin of error: 5%, confidence level: 95%). Participants were incentivized, with their consent, to complete the survey (voluntary participation in a prize draw for a gift voucher).

Analysis:

One researcher (HC) was primarily responsible for data entry with a second (PR) verifying a random

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sample of 10% for accuracy and consistency of coding. Summary statistics were used to characterize the sample and compare it to the original proposed population. Responses were assessed for missing data, in particular patterns of non-response.

The distributions of responses to questions concerning key outcomes (medication reconciliation, quality of communication and prescription error) were compared between GP and CP. The sign-test, Chi-squared test and Fisher's exact test were used as appropriate. Logistic regression was used to model recall of prescribing errors following a care transition in the previous six months and ordered logistic regression for quality of communication with public hospital, private hospital and between GP and CP. For each model the primary exposure variable was healthcare provider (GP or CP), with adjustments for relevant confounders (HSE region, practice location, age, gender, hours worked per week and distance from the local public hospital). Due to the low number of responses to 'very poor' and 'poor', these were amalgamated when considering opinions on communication of GP and CP of each other.

All free text responses were reviewed by the inductive method of data-driven content analysis, developing themes linked to individual participants' contributions.

Results

Quantitative survey results

In total, 949 out of 5057 questionnaires were returned resulting in an overall response rate of 17.7%; the response rate was 20.7% (n=554) and 14.4% (n=343) for GPs and CPs respectively.

Demographic data of respondents are summarised in Table 1. There was broad representation from all geographic regions, with more male GP respondents (n=317, 57.2%) but more female CP respondents (n=223, 65%).

Respondent characteristics

The majority of GP respondents were GP principals (n=349, 63%) working with other GPs as part of a larger practice (n=407, 73%), with computerised prescribing records (n=517, 96%), seeing 10-19 individual patients per session/half day (n=430, 78%). A third of CPs (n=119, 35%) held a role as a Supervising Pharmacist, dispensing >3000 prescriptions/month (n=103, 30%); more than half described themselves as employees (n=189, 55%), working in an independently run pharmacy (n=193, 57%).

Views on medication reconciliation

Most GP respondents did not feel they had a formal system for medication reconciliation (n=327, 60%). Nevertheless, three quarters of GPs (n=298, 75.4%) rated the standard of medication reconciliation in their practice as being good to excellent. Most CPs had systems in place to identify omissions (n=213, 74.5%) and newly initiated medications (n=220, 76.9%) in their patients' prescriptions.

Almost all GPs (n=396; 97.8%) agreed or strongly agreed reconciling medication was an important way to both improve medication safety, with both GPs (93%) and CPs (93%) in agreement that it was also an important way to improve medication adherence. Only 22% (n=90) of GPs agreed that reconciliation was best handled by pharmacists. However, the majority (74%) of CPs agreed/strongly agreed that they were best placed to handle reconciliation, with 88% agreeing their time was well-spent updating the patient medication list.

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When asked to rank what information they considered most important to include when receiving details of medications from other HCPs, respondents ranked a full list of current medications (GP n=314, 69.6%; CP n=171, 64.5%) followed by details of any change to long-term medication (GP n=76, 16.6%; CP n=33, 12.2%) as most important. Details of previous adverse effects (GP n= 10, 2.2%; CP n=3, 4.1%) and special administration requirements (GP n=10, 3.8%; CP n=11, 3.7%) were considered the least important information. There was no overall difference in the mean rankings given to items selected by GP and CP ($p=0.72$)

Communication and relationship between GP, CP, hospital pharmacist, public and private hospitals

There were mixed views amongst GPs and CPs regarding communication with their local publicly funded hospital, with approximately a third describing it as poor/very poor and a similar proportion describing it as good to very good. Most GPs did not receive communication electronically about prescriptions from their local hospitals (n=348, 64%). There were differences in satisfaction levels between HSE regions. Respondents in Dublin North East were, on average, 40% less likely, and those in the West 34% less likely, to report higher levels of satisfaction in communication with public hospitals than their counterparts in Dublin Mid-Leinster, [adjusted odds ratio (AOR):0.60, 95%CI: 0.41-0.87, $p=0.01$; AOR: 0.68, 95%CI: 0.45-0.95, $p=0.03$ respectively]. These effects did not vary between GPs and CPs ($p=0.53$). Differences in levels of satisfaction between HSE regions in satisfaction of communication with private hospitals were not apparent. CPs were less likely to rate communication with private hospitals favourably compared to GPs (AOR: 0.66, 95%CI: 0.48-0.90, $p=0.01$).

The opinion of GPs and CPs on their relationship with each other was generally positive, with 62% (n=311) of GPs and 52.5% (n=150) of CPs describing the relationship as very good (Table 2).

Regarding hospital pharmacists (HP), nearly 40% of GPs described the quality of communication as poor/very poor. Adjustment for age, gender, location, hours worked and distance from a public hospital had no significance. Both CPs (86%) and GPs (87%) were in favour of expanding the role for HPs in identifying and preventing prescribing errors as patients experienced care transitions. Similarly, GPs (74%) and CPs (82%) felt the role of the community pharmacist should be expanded in the identification and prevention of prescribing errors following a transition.

Experience of prescribing errors

Almost 84% (n=320) and 87.2% (n=205) of GPs and CPs respectively reported that they could remember mistakes in patients' prescriptions, which may have been due to poor transfer of information following a care transition (e.g. delayed or no discharge prescription available, omission of long-term medications) in the past six months (p=0.27; Table 3). Although in-patient discharge prescriptions were selected by both respondent groups as being the single largest source of prescription error (GP 21.6%, CP 16.8%), all sources of prescriptions including out-patients, emergency departments, in-patient discharges and private hospitals were implicated. There was evidence (p<0.001) of an overall significant difference in the sources of mistakes in prescribing errors identified between GPs and CPs. GP transcription of hospital prescriptions was identified as also being a source of error with 67.7% of CPs stating it was likely/very likely for an error to arise. In general, managing identified errors was recognised as being complicated with most respondents (CP n=170, 79.4%; GPs n=253, 88.1%) finding it difficult or impossible to contact hospital prescribers.

Free text content analysis survey results (Quotes summarised in Table 4):

The examination of free text responses generated four broad categories representing a number of subthemes.

1. Organisational/Infrastructural issues
2. Relationship and quality of communication between HCPs
3. Role of the patient/vulnerable patients
4. Prescribing errors

Organisational/Infrastructural issues

Many CPs were frustrated by the lack of clinical information available to them about their patients (I). An expanded role for CPs was also highlighted by some respondents (II): The clinical guidance given to junior hospital doctors in preparing discharge summaries and prescriptions was also raised as an issue (III):

CPs underlined the role that HPs could play in improving safe and appropriate prescribing by providing an additional layer of review in the transition process for patients (IV). Finally, the fragmented nature of the healthcare system itself was also noted. There were issues regarding the lack of printed or computerised discharge letters/prescriptions, interoperability of hospital/pharmacy and GP software systems, a 'safety net' for some categories of patients, and resources (V-VII):

Relationship and quality of communication between HCPs

A good relationship was reported between the two groups of HCPs by respondents. The strength of this relationship in terms of improving patient safety was highlighted (VIII). The specific skills of the CP were recognised and valued by GPs, even when correcting GP prescribing or seeming to be particularly fastidious (IX).

A significant theme in terms of contributions from respondents was disappointment with the quality of communication within the health system,, particularly when attempting to contact hospital prescribers to resolve identified problems or ambiguities with prescriptions outside of normal working hours (X-XI).

Role of the patient/vulnerable patients

Respondents highlighted the need for involvement of patients in ensuring correct prescribing information was transmitted. Some respondents felt patients contributed to the lack of clarity (XII). Comments also indicated that patients should be respected and engaged when making changes to their prescriptions (XIII).

Respondents highlighted patients with multi-morbidity and those with mental health issues as having the greatest risk of medication error due to frequent transitions of care and specialist review without a global view of their medications (XIV).

Prescribing errors

The majority of participants recalled that they had seen any errors in their patients' prescriptions over the past six months. There was almost universal agreement, with many examples given of errors (XV-XVI).

Discussion

Internationally, patient safety incidents are relatively common in primary care and prescribing incidents are those most likely to cause avoidable harm to the patient¹⁷. The main findings of this study highlighted a high level of experience of prescribing errors following transitions, an absence of formalised medication reconciliation practices in GP practices, dissatisfaction with the current standard of communication between primary and secondary care, and support for a greater role for both HPs and CPs in medication management.

Implementing formal systems of medication reconciliation was a key recommendation in terms of medication safety in a *Department of Health & Children, Ireland* report in 2008⁶. Despite this and the fact that both responding GPs and CPs were positive about the benefits of medication reconciliation in terms of prescribing safety and adherence, formal systems of medication reconciliation were not in place in most GP practices. A greater understanding is needed as to why improvements in medication reconciliation have not been adopted by the majority of GPs.

Our results are in-keeping with barriers and potential solutions identified internationally to medication management at transitions of care¹⁵. In terms of provider and organisational issues, concerns with poor communication across the primary/secondary interface were highlighted, with many examples of errors arising. While the reason for the reported geographic difference in opinion on the quality of communication is not clear from this study, a discrepancy between regions in terms of the in-patient clinical pharmacy services provided has been recorded previously¹⁸. Furthermore, there is a deficit in the limited use of IT to improve communication, as well as its possible role in reconciliation. GPs reported having limited contact with CPs and both groups felt HPs could play a greater role in interacting with primary care HCPs. This lack of contact between HPs and community HCPs has been confirmed previously with a majority of hospitals having no arrangement for HPs involvement or communication to primary care based HCPs upon patient discharge¹⁸.

Conversely the relationship between GPs and CPs was rated positively by the majority of both groups. However, there was a frustration from some CPs that they could not contribute more in the management of medications. Indeed high quality trials of CPs effectiveness in medication

management, while limited in number, are generally favourable¹¹. Furthermore, 22% of GPs agreed that reconciliation was best handled by pharmacists while 74% of CPs agreed/strongly agreed that they were best placed to handle reconciliation. This highlights a possible ambiguity around 'ownership' of outpatient medications and the difficulty in developing a community of HCPs to coordinate care for patients as recommended in the King's Fund and subsequent commissioner reports in the UK^{4,19}. This is further compounded by the majority of GP respondents' view that CPs role in medication management could be enhanced. This apparent conflict in findings is perhaps representative of the legal underpinning of prescribing authority in Ireland – CPs can contribute to the process, but do not have prescribing authority.

The majority of both groups noted that they were exposed to errors in prescriptions in the past 6 months, following a transition of care. These findings are consistent with international experience, particularly omission of chronic medications and possible subsequent re-hospitalisation and mortality^{2,20}. The fact that respondents also expected more ADEs to occur than is the case is also supported by previous reviews that found that most unintentional discrepancies had no apparent clinical significance³.

Respondents also highlighted a lack of funding to dedicate time and staff to reconciliation – an issue likely impacting development of additional services in secondary care too (e.g. HP availability for discharge reconciliation). Finally, a theme which resonates with much of the literature around multi-morbidity was the lack of patient involvement in the process of coordinating transitions for complex patients.

Limitations

There are some limitations to the study. Firstly, the response rate (17.7 %), similar to many electronic surveys, was low and the possibility of responder bias needs to be taken into consideration. Nevertheless, the demographics of GP and CP responders were comparable to data published in two national reports, giving confidence that the respondents comprise a representative sample. Additionally, many of the findings were consistent with international literature. Secondly, although the questionnaire enabled the collection of data from a large number of respondents, it may have been

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limited in its ability to gain rich in-depth information on behaviours and feelings. Finally, with self-report questionnaires, the issue of socially desirable responding (i.e. the tendency for participants to present a favourable image of themselves) should be considered.

Conclusion

The findings from this study are consistent with previous research highlighting HCPs' recognition of prescribing errors as being a common event at transitions of care. Poor communication between primary care HCPs and secondary care, as well as the call for a more "structured seamless care programme" linking primary and secondary care, were also highlighted. A suggestion of geographical variation in satisfaction with communication also emerged. The results of this study confirm that while there is enthusiasm for the benefits of medication reconciliation, there are limited formal structures in primary care to support it, despite it being a stated aim of regulatory agencies. Additionally, CPs have limited opportunity to contribute in medication reviews and the role of HPs in coordinating transitions could, in the respondents' view, be expanded. Future research should focus on the barriers identified in this study in implementing medication reconciliation and improving medication management at transitions.

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Conflict of interest:

PR, TG, RMcD, FB, CH, TF are conducting a systematic review and observational study on the topic of medicines reconciliation.

Ethics statement:

Ethical approval to undertake this study was granted by the Royal College of Surgeons in Ireland Research Ethics Board (ID REC000923). Completion and return of the questionnaire was taken as indicating consent.

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Table 4 Content analysis of GPs and CPs free text comments.

Table 1 Characteristics of GP and CP respondents. GP (n=554) CP (n=343)

Key Characteristics	GP (n, %)	CP (n, %)
Gender	554	343
Male	317 (57.2)	120 (34.9)
Female	237 (42.8)	223 (65.0)
Age	554	343
<=30	27 (4.87)	58 (16.9)
31-40	187 (33.8)	137 (29.9)
41-50	124 (22.4)	80 (23.3)
51-60	149 (26.9)	50 (14.6)
>61	67 (12.1)	18 (5.3)
Health Service Executive (HSE)Region	554	342*
HSE Dublin Mid Leinster	174 (31.4)	102 (29.8)
HSE Dublin North East	112 (20.2)	69 (20.2)
HSE West	125 (22.6)	79 (23.1)
HSE South	143 (25.8)	92 (26.9)
Hours worked per week	553*	342*
10 or less	7 (1.3)	12 (3.5)
11 to 20	41 (7.4)	24 (7)
21 to 30	46 (8.3)	28 (8.2)
31 to 40	148 (26.8)	123 (35.9)
>40	311 (56.2)	155 (45.3)
Location	554	342
City Suburbs	187 (33.8)	105 (30.7)
Large Town	108 (19.5)	88 (25.7)
Inner City	72 (13.0)	26 (7.6)
Small Town/Rural	187 (33.6)	123 (35.9)
Distance from nearest acute public hospital	554	340*

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<5km	255 (46.0)	138 (40.6)
5-15km	109 (19.7)	86 (25.6)
6-20km	53 (9.6)	37 (10.9)
21-40km	93 (16.8)	79 (23.2)
>40km	44 (7.9)	0 (0.0)

GP: General Practitioner; CP: Community Pharmacist

*Some non-responders to items from total GP (n=554) CP (n=343)

Table 2 Quality of communication between GP/CP and Primary/Secondary Care (GP n=498; CP n=286*)

How would you rate the quality of communication you have with...?		
	GP (n, %)	CP (n, %)
Between GP & CP	498	286
• Very good	311 (62.4)	150 (52.4)
• Good	138 (27.7)	109 (38.1)
• Neutral	24 (4.8)	18 (6.3)
• Poor	4 (0.8)	7 (2.4)
• Very Poor	10 (2.0)	2 (0.7)
• N/A	11 (2.2)	0 (0.0)
Public Hospital	498	286
• Very good	16 (3.2)	18 (0.6)
• Good	173 (34.7)	68 (23.8)
• Neutral	148 (29.7)	95 (33.2)
• Poor	104 (20.9)	71 (24.8)
• Very Poor	55 (11.0)	31 (10.8)
• N/A	2 (0.4)	3 (1.0)
Private Hospital	498	285
• Very good	41 (8.2)	14 (4.9)
• Good	195 (39.8)	73 (25.6)
• Neutral	140 (28.1)	83 (29.1)
• Poor	71 (14.3)	44 (15.4)
• Very Poor	20 (4.0)	21 (7.4)
• N/A	31 (6.2)	50 (17.5)

*285 answered the private hospital question

Table 3 Comparison of GPs and CPs experience and handling of prescribing errors. GP n=381; CP n=235)

	GP (n, %)	CP (n, %)	p- value
<i>In the past 6 months can you remember a time where mistakes have happened in patients' prescriptions? (GP: n=381, CP: n=235)</i>			
Yes	320 (83.9)	205 (87.2)	p=0.27*
No	61 (16.0)	30 (12.8)	
<i>Which sources account for the mistakes you see? (GP: n=320, CP: n= 203)</i>			
Out patients Department	16 (5.0)	8 (3.9)	p<0.001**
Emergency Department	5 (1.6)	4 (1.9)	
Inpatient	69 (21.6)	34 (16.8)	
Private	2 (0.6)	1 (0.5)	
Other	7 (2.2)	17 (8.4)	
Mixture of sources	204 (63.7)	111 (54.7)	
No preference	17 (5.3)	28 (13.8)	
<i>If you do attempt to contact the hospital prescriber, how easy is it to do? (GP: n=287, CP: n= 214)</i>			
Very Easy	0 (0.0)	1 (0.5)	p=0.07**
Easy	9 (3.1)	14 (6.5)	
Neutral	25 (8.7)	29 (13.6)	
Difficult	215 (74.9)	146 (68.2)	
Impossible	38 (13.2)	24 (11.2)	
<i>In those patients whom you have received a prescription transcribed by their GP how likely is it that an error from an original hospital prescription – how likely is it, in your opinion that a potential error will arise? (CP: n=226)</i>			
	N/A	40 (17.7)	N/A
Very likely		113 (50.0)	
Likely		49 (21.7)	
Neutral		24 (10.6)	
Unlikely			

GP: General Practitioner; CP: Community Pharmacist

*Pearson's chi-squared test **Fisher's exact test

N/A: Not applicable

Table 4 Content analysis of GPs and CPs free text comments.

Organisational/Infrastructural issues	
i.	<p><i>“The current role is an impossible guessing game where community pharmacists don't have the information to do any more than prevent the most gross of errors. More subtle but equally dangerous errors can and do go unmissed”</i></p> <p>Female Superintendent/Supervising Pharmacist, 51-60, Small town/rural, HSE West</p>
ii.	<p><i>“Currently the only official recognition of the pharmacist's intervention in patient care is via the 'not-dispensed' category in dispensing of GMS [General Medical Services] only prescriptions. This should be expanded to all State Schemes and an electronic communication mechanism should be put in place to allow pharmacists to directly contact the prescriber and record details of their discussion on medication changes”</i></p> <p>Male Superintendent/Supervising Pharmacist, 51-60, City Suburb, HSE Dublin North East</p>
iii.	<p><i>“There needs to be accountability by consultant/senior team member so that scripts and letters written by inexperienced interns and SHOs [Senior House Officers] are reviewed at time of discharge or at the very least post discharge a chart review in a timely fashion. It is impossible to expect a junior doctor to understand the importance of this crucial step unless he/she is taught this by their seniors”</i></p> <p>Male GP Principal, 31-40, Large Town, HSE South.</p>
iv.	<p><i>“Hospital pharmacists have the knowledge and access to current clinical in-patient notes and determine which medications have been adjusted and to communicate this to the team/GP on discharge. The main reason that this is not happening across the country is due to poor resourcing of pharmacists in hospital and inadequate staffing levels so that they do not have time to perform this function in all wards etc. I have worked in hospitals/units before where the pharmacist played a key role in reviewing medication lists on discharge and there is no doubt that this prevented many prescribing/transcribing errors”</i></p>

Male GP Principal, 31-40, Large Town, HSE South

- v. *“Every 2 year old is computerised...my first PC was a 386 in 1994....so WHY are we still receiving illegible hand written prescriptions from hospitals?????!!!!”*

Female GP Principal, 41-50, Large Town, Dublin Mid Leinster

- vi. *“Medicine reconciliation is often complex...while updating medication lists is professionally fulfilling it is time-consuming and must be suitably remunerated”*

Female Superintendent/Supervising Pharmacist, 51-60, Small Town/Rural, HSE West

- vii. *“...patients can go straight to any pharmacy in any town with a prescription - lots of scope for errors and misunderstandings to occur and in relation to private patients, they may not attend at GP at all and in some cases prescriptions are dispensed by pharmacies without any medical check being done”*

Male GP Principal, 51-60, Small Town/Rural, HSE West

Relationship and quality of communication between HCPs

- viii. *“In all instances, no harm came to [the] patient as between the GP and pharmacy any problems were identified and rectified- benefit of having a working relationship”*

Female CP <=30, Small group pharmacy, HSE South

- ix. *“An essential professional in helping to minimise drug errors. I will always take phone call queries from pharmacists, even being very careful and 'OCD' nearly about my prescribing, we are all human and mistakes can happen. Also pharmacists' pharmacology knowledge I feel is superior to*

doctors in general...!”

Male GP Assistant, <=30, Large Town, HSE South

- x. *“Difficult to impossible. Signatures are always illegible. Bleep numbers are often incorrect or missing. Entire teams can be unavailable”*

Male Superintendent/Supervising Pharmacist, 31-40, Small/Town, HSE Dublin Mid-Leinster

- xi. *“Incomplete list of meds no mention of specific meds to be stopped. Medication prescribed that patients have already been on and found ineffective or intolerable Delay in the discharge letter and script. Patients often present with a script but no discharge letter so no information as to what was or wasn't done or why”*

Female GP Principal, 31-40, Inner City, HSE South

Role of the patient/vulnerable patients

- xii. *“Have found in the past that patients sometimes are reluctant to tell their GP that they have stopped taking a medication, yet do not get it dispensed every month and leave it on the prescription indefinitely. Is problematic for GP's as they do not have the full picture from patients...”*

Female Pharmacist <=30, employee, City Suburb HSE South

- xiii. *“Patient's own personal responsibility and education. Paramount [to] educate them to hold their own drug (and indication) records and encourage them to chase all to update them”*

Male GP Principal, 51-60, City Suburbs, HSE Dublin North East

- xiv. *“... Quite often the hospital specialist is only concerned about his area of expertise (e.g. cardiac) and is not aware of the other medicines taken by the patient. This can lead to errors in prescribing. The pharmacist is concerned with the total drug therapy”*

Female supervising pharmacist, 51-60, employee, Small town/rural, HSE Dublin North East

Prescribing errors

- xv. *“... This is a genuine problem, and it'll blow up for some individual. I'm amazed it doesn't frequently blow up actually given the amount of prescribing errors I see”*

Male Superintendent pharmacist, 31-40, Inner City, Employer, Dublin Mid Leinster

- xvi. *“Multiple errors. Nearly a daily occurrence. Can be very stressful trying to ensure safe prescribing”*

Male GP Assistant, <=30, Large Town, HSE South

GP: General Practitioner; CP: Community Pharmacist; HSE: Health Service Executive

Selected responses from total GPs (n=554) CPs (n=343)