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Discharge report for the community pharmacist: Development and validation of a prototype

Joke Wuyts^{a,*}, Marie Vande Ginste^a, Jan De Lepeleire^b, Veerle Foulon^a^a KU Leuven, Department of Pharmaceutical and Pharmacological Sciences, 3000, Leuven, Belgium^b KU Leuven, Department Public Health and Primary Care, 3000, Leuven, Belgium

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ABSTRACT

Background: The potential benefit of community pharmacist's involvement in continuity of care is well-known. However, it is not standard practice to exchange information with the community pharmacist (CP) after hospitalization.

Objective: To construct and validate an evidence-based prototype of a discharge report for the community pharmacist.

Methods: First, a review of literature, guidelines and established initiatives was performed to construct a preliminary discharge report. Secondly, the content of the discharge report was reviewed and optimized using semi-structured individual interviews with CPs and general practitioners (GPs).

Results: The review identified six guidelines for information exchange with the CP originating from three countries, 17 research papers and three local initiatives. Overall, 49 different elements for a discharge document were identified. Based on recurring elements, a preliminary discharge report was created. Interviews with ten CPs and nine GPs provided insights into which information is considered crucial for patient safety and why. This allowed an optimization of the document. The final discharge report consists of three categories: administrative, medication and medical data. The medication data includes medication registered at hospital admission as well as at hospital discharge, drug indications, reasons for initiating, adjusting or discontinuing therapies and start/stop dates. The medical data contains reasons for hospitalization, comorbidities and allergies.

Conclusions: The literature review and semi-structured interviews resulted in an evidence-based prototype of a discharge report for the community pharmacist. This document contains both administrative, medical and medication data.

1. Introduction

Continuity of care or seamless care describes 'efficient, effective, ethical care delivered through interaction, integration, coordination and sharing of information between different healthcare actors over time'.¹ Multiple researchers have demonstrated that patients experience discontinuity at hospital discharge.² Moreover, patient safety may be endangered as hospital discharge entails a risk for drug-related problems,² adverse events³ and even readmissions.^{4,5} In 2010, a research report was published by the Belgian Healthcare Knowledge Centre concerning the continuity of medication therapy between the hospital and ambulatory care.⁶ Focus groups with multiple healthcare professionals (HCPs) identified problems related to admission and discharge, problems related to the profession, to patients and family and problems

related to the process.⁶ Most problems originated from a lack of information for the healthcare professionals and a lack of communication between HCPs. Similarly, Karapinar et al. postulates three causes for medication errors at transitions of care: insufficient patient information, insufficient communication between healthcare providers and incomplete medication lists with subsequently inappropriate medication reconciliation.⁷

This paper will focus on information exchange between hospital physicians and community pharmacists as a method to improve patient safety during the transfer from the hospital to primary care. Accurate, up-to-date information allows HCPs to perform medication reconciliation and subsequently counsel the patient after hospital discharge. Information transfer to general practitioners (GPs) at discharge has been studied extensively and is standard practice in Belgium.^{8–10} In

* Corresponding author. Clinical Pharmacology and Pharmacotherapy, Department of Pharmaceutical and Pharmacological Sciences, Herestraat 49 O&N2 box 521, 3000, Leuven, Belgium.

E-mail addresses: joke.wuyts@kuleuven.be (J. Wuyts), marie_vande_ginste@hotmail.com (M. Vande Ginste), jan.delepeleire@kuleuven.be (J. De Lepeleire), veerle.foulon@kuleuven.be (V. Foulon).

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addition to the role of the GP, research has shown that the community pharmacist (CP) also contributes to continuity of care after a hospitalization.¹¹

In recent years, the role of the community pharmacist in Belgium has evolved towards clinical, non-dispensing services. Currently, three pharmaceutical care service are remunerated in Belgium and can be provided by every community pharmacist. Two of those services focus on adequate use of medication for specific pathologies (asthma and diabetes respectively).^{12,13} In 2017, the service 'reference pharmacist' was introduced.¹⁴ This service is remunerated for ambulatory patients with chronic diseases. In brief, a reference pharmacist (1) registers all the patient's dispensed medication in the patient's pharmaceutical dossier, (2) constructs and updates a medication list for his/her patients and (3) ensures the patients (and their care team) have access to an up-to-date medication list. Future perspectives include an intermediate medication review service. To date, Belgian pharmacists do not have access to clinical data such as medication indications, lab values or renal function. No specific pharmacist-led service exists for discharged patients (e.g. a medication reconciliation service with discharge counselling).

As an example of healthcare digitalization in Belgium, electronic prescribing is currently being implemented. Moreover, the Flemish government (Flanders is a region in Belgium with approximately 6.500.000 inhabitants) has developed a secured, electronic platform 'Vitalink' to organize health information exchange between HCPs.¹⁵ Upon patients' consent, physicians and pharmacists can add, adapt and delete a medication list of the patient on this platform. To date, the implementation of Vitalink is limited and information exchange between HCPs is not yet standard practice. This is because not all GPs and CPs can access the platform with their software and the platform is not yet operational in hospitals.¹⁵ From a content perspective, only the current medication list can be exchanged with Vitalink. The application does not offer the possibility to annotate changes or look back at previous medication lists. It is questionable whether this information, as exchanged in Vitalink, will be sufficient to perform medication reconciliation and patient counselling after hospital discharge.

Information exchange upon hospital discharge in Belgium consists of (1) a letter for the GP (2) medication prescriptions and (3) in some cases a medication list is provided for the patient. Because communication to the CP is limited to indirect communication through prescriptions, there is a risk that the pharmacist does not have a complete overview of the patients' situation.

Little research focused on the content of the information that should be exchanged at discharge with the community pharmacist. Therefore, this research aims to develop an evidence-based prototype of a discharge report for the CP, as a basic medication list may not be sufficient. Unlike a medication report which is limited to medication information, a discharge report is defined as a 'clinical report concerning a completed mandated period of care'.¹ It should contain all relevant information for the community pharmacist.

2. Aim of the study

To construct and validate a prototype for a discharge report for the community pharmacist. This discharge report should be tailored to the pharmacists' informational needs post-discharge, and to the pharmacists' role in ensuring patient safety by dispensing medication in a responsible way and providing patient counselling after hospital discharge.

3. Method

3.1. Literature review and construction of a preliminary discharge report

First, a literature review was performed to identify initiatives in which information is shared with the community pharmacist at hospital

discharge and to summarize the content of the discharge information. For this purpose, both peer-reviewed publications in the database "Medline" as well as grey literature published before November 30th, 2016 were included. The search strategy for Medline combined the concepts community pharmacy, hospital discharge, discharge document, their synonyms and related Medical Subject Headings (MeSH) terms (displayed in Supplementary material 1). Strategies for the collection of grey literature were (1) references to national or regional guidelines in published studies (2) personal knowledge, by members of the research team, of on-going local clinical pharmacy initiatives.

The following two inclusion criteria were applied:

- Information exchange that comprised more than a basic list of the medication at discharge. A basic list contains the name, quantity and time of intake of the medication and a remark section.
- Exchange with, but not necessarily limited to, the CP

No restrictions on type of research, language or publication date were imposed. Aside from research articles, also websites and documents were eligible sources of information.

One researcher (JW) performed data selection. The findings were organized and summarized per initiative, as multiple sources of info could refer to one single initiative. The content of each discharge document was categorized into administrative, medical and medication data. These categories were developed inductively based on the identified content. Next, recurring elements were identified. The research team (JW, MVDG, VF and JDL, researchers with a CP and GP background) discussed the findings of the literature search and constructed a preliminary discharge report.

3.2. Validation of the discharge report

3.2.1. Design

In a second step, the content of the preliminary discharge report was reviewed by CPs and GPs. Face-to-face, semi-structured individual interviews were performed using an interview guide and covered a range of topics related to medication counselling after hospital discharge. Topics included hurdles and facilitators in current practice, as well as actions to optimize continuity of pharmacotherapy upon hospital discharge that were considered supportive and feasible, including a proposal for a discharge report. A thematic framework approach was used for the analysis of all topics in the semi-structured interviews.¹⁶ This paper reports on the results pertaining to the proposed discharge report; other findings are embedded in a separate manuscript.¹⁷

3.2.2. Content

The preliminary discharge report for a clinical case was shown in the interviews using a PowerPoint presentation. The report contained administrative data, medical data and medication data. Medication data included a medication list upon admission and discharge, reasons for drug adjustments, initiation or cessation, drug indication and active compound per drug. In each interview, it was emphasized that the document was specifically intended for the CP. Upon presenting the preliminary discharge report to the participants, they were asked what information they considered (not) relevant to exchange and why. Participants were asked to give examples on how this information could improve patient care and safety. To ensure all relevant components were included in the discharge report, the interviewer asked if any additional information should be added to the discharge report.

3.2.3. Participants

At the start of the study, a purposive sampling strategy to invite opinion leaders was chosen. The researchers perceived opinion leaders to be the most informative to explore optimization methods for medication counselling after hospital discharge and to critically review the content of a discharge report. Opinion leaders were defined as GPs and

CPs with experience in daily practice and who also have an interest in research or optimization of healthcare. Participants were recruited via healthcare professional associations. The sampling strategy was modified throughout the study upon discussions within the research team. Due to the low response rate, the sample was expanded to non-opinion leaders, HCPs who have experience with daily practice but do not necessarily have experience with research. After conducting the study, the researchers believe that the inclusion of non-opinion leaders has further enriched the findings, as this led to maximal variation of the participants in the study. Individual interviews were carried out in two regions in Flanders to obtain a diverse population with experience with multiple hospitals. CPs and GPs were interviewed alternately. Through an iterative process, findings from previous interviews were incorporated in future interviews.

3.2.4. Data collection and analysis

Interviews took place between October 2015 and April 2016 and were conducted by two researchers who had no relationship with the interviewed HCPs (JW, MVDG, both with a pharmacy background). The two researchers (JW and MVDG) developed the research protocol and topic guide together. The first interview with a GP and CP served as a pilot interview. Each interviewer performed one of the pilot interviews; both attended. This allowed the researchers to ensure the quality of the interviews and ensure the same attitude and goals were set. Both pilot interviews were included in the study results.

Interviews were performed until there was saturation of information and no new arguments on the relevance of the elements in the discharge report emerged.¹⁸ The saturation was determined by the researchers for GPs and CPs separately. Additional descriptive information of the interviewees was collected (gender, years of experience, experience as opinion leader, type of practice, type of patients and number of colleagues in their own practice). All interviews were audiotaped, the identity of the participants was encoded during transcription and the recordings were destroyed.

A thematic framework approach was used for the data analysis. First, each interview was transcribed verbatim by the researcher who performed the interview. After familiarization with the interviews, one researcher (MVDG) designed a coding scheme to categorize the collected data into theme codes using deductive coding. The theme codes were based on the literature review (i.e. administrative data, clinical data, medication data and related subthemes). Next, the coding scheme was optimized through discussion between both interviewers and applied to all interviews. Data coding and analysis was executed using Nvivo 11 qualitative data analysis software. In the interpretation phase, in line with the thematic analysis, commonalities and differences were identified, relationships between different themes were explored and descriptive and/or explanatory conclusions were made for each theme.¹⁶ Finally, the findings were discussed and interpreted within the multidisciplinary research team (JW, MVDG, VF, JDL) and led to the finalization of the prototype of a discharge report. In this decision making process, we considered the arguments and examples of healthcare professionals on what information should (not) be exchanged and why. Secondary to that, we took into account how often arguments recurred to estimate the possible support for these particular concerns.

3.2.5. Ethics approval

The protocol of the semi-structured interviews was approved by the Ethics Committee of UZ/KU Leuven (s58480). Written informed consent was obtained from all individual participants included in the study.

4. Results

Literature review and construction of a preliminary discharge report

In total, 26 initiatives from nine different countries were selected

(Table 1).^{6,7,19–47} A flowchart of the literature selection is displayed in Supplementary material 2. The majority of the initiatives were retrieved from journal articles (17/26 initiatives)^{6,7,19–21,23,25–28,30,32,33,35–37,39,41,43,45–47}; six from guidelines^{29,34,38,40,42,44} and three local initiatives^{22,24,31} were included in the review.

The content of the exchanged information upon hospital discharge from the different initiatives were compared and presented in Supplementary material 3. Of the 26 initiatives, 12 contained an example of the discharge document.^{7,22–27,29,31,33,34,40} In total, 49 different items were documented and categorized into three categories (administrative, medical and medication data). Aside from this variability in exchanged information, there was a lack of detailed description of the content and lack of argumentation why information was or was not exchanged. Likewise, the author of the information and the communication channel were not consistently reported in literature. None of the initiatives researched the accuracy of the content that was being exchanged. Therefore, the quality of the exchanged information could not be guaranteed and the implementation of the study procedures was questionable.

Overall, recurring *administrative data* included the patient's name, date of birth, sex, period of hospitalization, hospital contact information (i.e. name of the treating hospital physician, hospital department, phone number and e-mail address) date and author of the discharge report. Recurring *medical data* includes reason(s) for hospitalization, comorbidities, weight and height, (drug) allergies, blood pressure and lab values including renal function. Finally, recurring *medication data* consisted of drug indications, a start and stop date, a list of the medication at hospital admission as well as a list at discharge. Moreover, the reasons for drug therapy changes were also frequently shared. Based on these findings, a preliminary discharge report was constructed.

4.1. Validation of the discharge report

4.1.1. Participant characteristics

Nineteen interviews were carried out in 2 regions in Belgium, Leuven (CP = 5; GP = 7) and Bruges (CP = 5; GP = 2), between November 2015 and April 2016. Table 2 provides an overview of the participant's characteristics. The duration of the entire interviews ranged from 37 to 90 min. One general practitioner refused to have the interview audiotaped. For this interview, field notes were taken.

4.1.2. Content of the discharge report

Table 3 shows the items that were present in the preliminary discharge report and the main results of the interviews. Illustrative quotes are shown in Table 4. No objections were made for including the patient's name, sex, general practitioner and period of hospitalization in the discharge report. Pharmacists argued that the period of hospitalization would be beneficial to indicate the severity of the hospitalization. The dates could also be taken into account for medication compliance and illustrate how long ago the patient was discharged. Additionally, it was suggested to add the contact information of the GP, to register the patient's regular pharmacy and the identification number of the patient for insurance purposes.

Secondly, pharmacists expressed great interest to receive contact information of the hospital (i.e. name of the treating hospital physician, hospital department, phone number). Currently, contacting the hospital physician is a time-consuming and discouraging process. In spite of some HCPs being very enthusiastic about this information, two GPs emphasized that the GP should coordinate patient's care and therefore be the primary contact person for community pharmacists.

Third, medical data were discussed in the interviews. Overall, the majority of HCPs could see the value of sharing the reason for hospitalization and comorbidities with the community pharmacist. However, one GP stated that reasons for hospitalizations should only be shared if relevant for the CP, for instance if the hospitalization was related to drug use. Both GPs and CPs argued that information on medical history

Table 1
Detailed overview of the reviewed initiatives.

Reference	Country	Year	Source	Name of the document	Example		Recipient	
					CP	Patient	GP	
Stowasser et al. ^{19,20}	Australia	2002	A	Discharge communication	No	Yes	No	Yes
Gilbert et al. ²¹	Australia	2012	A	Medicines Information Transfer Fax (MITF)	No	Yes	No	Yes
Spinewine et al. ⁶	Belgium	2010	A	Up to date medication scheme	No	*	*	*
AZ Groeninge Kortrijk, De Westvlaamse, huisartsenkring Zuid West-Vlaanderen vzw ²²	Belgium	2013	L	Actueel medicatieschema	Yes	Yes	Yes	Yes
Claeys et al. ²³	Belgium	2015	A	Feuille de transfert	Yes	Yes	Yes	No
Hospital UZ Brussel Geriatrics department ²⁴	Belgium	2015	L	Ontslagmedicatiefiche	Yes	Yes	Yes	Yes
Mallet et al. ²⁵	Canada	1996	A	Pharmacy discharge plan	Yes	Yes	*	Yes
Paquette-Lamontagne et al. ²⁶	Canada	2001	A	Discharge prescription form	Yes	*	Yes	*
Kergoat et al. ²⁷	Canada	2010	A	Discharge summary adapted to the frail elderly patient (D-SAFE); Discharge Prescription Section	Yes	Yes	No	Yes
Cameron et al. ²⁸	Canada	2010	A	Pharmacy summaries; Rationale for inpatient changes (RIC)	No	*	No	Yes
Institute for Safe Medication Practices Canada (ISMP) ²⁹	Canada	2012	G	Recommendations for future changes (RFC)	Yes	*	Yes	*
Lalonde et al. ³⁰	France	2008	A	Best Possible Medication Discharge Plan (BPMDDP)	No	Yes	Yes	Yes
Hospital CHU Grenoble ³¹	France	2015	L	Medication discharge plan	Yes	No	No	No
Bolas et al. ³²	Northern Ireland	2004	A	Feuille de sortie	No	Yes	No	Yes
Bergkvist et al. ³³	Sweden	2009	A	Pharmaceutical discharge letter	Yes	*	Yes	*
Richlijn Overdracht van Medicatiegegevens in de keten (2008) ³⁴	The Netherlands	2008	G	Discharge summary	Yes	Yes	No	Yes
User requirements specification medicatieoverzicht 2.0 (2013) ³⁴				Actueel medicatieoverzicht	Yes	Yes	No	Yes
Karapinar-qarkit et al. ⁷	The Netherlands	2010	A	Discharge medication overview	Yes	Yes	No	Yes
Eggink et al. ³⁵	The Netherlands	2010	A	Discharge medication list	No	Yes	No	Yes
Shaw et al. ³⁶	United Kingdom	2000	A	Pharmacy discharge plan	No	Yes	No	No
Nazareth et al. ³⁷	United Kingdom	2001	A	Discharge plan	No	Yes	Yes	Yes
Royal Pharmaceutical Society: Keeping patients safe when they transfer between care providers - getting the medicines right - Final report (2012) ³⁸	United Kingdom	2011	G	Core content of records for medicines when patients transfer	No	Yes	No	Yes
Scullin et al. ³⁹	United Kingdom	2011	A	Discharge summary	No	Yes	No	Yes
National Health Service (NHS): Community pharmacy services: Guidance for hospitals (2012) ⁴⁰	United Kingdom	2012	G	Community pharmacy referral	Yes	Yes	No	No
Elson et al. 2016 ⁴¹	United Kingdom	2014	A	NPC minimum dataset item in a discharge summary	No	*	No	Yes
National Prescribing Centre. Medicines reconciliation: a guide to implementation. 2008. ⁴²	United Kingdom	2014	G	Medicines discharge information	No	*	No	*
Hammad et al. 2014 ⁴³	United Kingdom	2015	G	Discharge medication care plan	No	Yes	No	Yes
National Institute for Health and Care Excellence ⁴⁴	United States	2008-2014	A					
Iowa continuity of care study								
Carter et al. 2008 ⁴⁵								
Israel et al. 2013 ⁴⁶								
Farris et al. 2014 ⁴⁷								

For each initiative, it is indicated if this information originates from a guideline (G), a journal article (A) or a local initiative (L). The recipients of the discharge information are categorised into community pharmacist (CP), patient and general practitioner (GP).

*Information is not designed specifically for this recipient, but is mentioned as a potential recipient.

Table 2
Characteristics of the participants.

Characteristic	General practitioners	Community pharmacists	Total
N	9	10	19
Region			
- Leuven	7	5	12/19
- Bruges	2	5	7/19
Gender (female)	5	6	11/19
Clinical experience			
- < 10 years	3	0	3/19
- 10–20 years	2	5	7/19
- > 20 years	4	5	9/19
Opinion leaders (yes)	5	6	9/19

Table 3
Items in a discharge report based on 19 interviews.

Item	Relevance ^a	Final discharge report
Administrative data		
- Name, sex	++	Yes
- Period of hospitalization	++	Yes
- GP name	++	Yes
- Hospital contact information	+	Yes
Medical data		
- Reason for hospitalization	+	Yes
- Comorbidities	+	Yes
- Weight and height	+	No
- Allergies	++	Yes
- Blood pressure	±	No*
- Lab values (K ⁺ , Na ⁺ , INR, Digoxin)	–	No
- Renal function	++	No*
Medication data		
- Admission list	++	Yes
- Reason for starting, adjusting or stopping a drug	+	Yes
- Drug indication	+	Yes
- Active compound	–	No
- Start and stop date per drug	++	Yes

The listed items were present in the preliminary discharge report, based on their relevance as discussed in the interviews, part of the items were retained in the final discharge report.

++ All respondents agreed this information should be shared with the CP after discharge.

+ The majority of respondents indicated the information should be shared.

± No consensus among respondents.

– The majority of respondents indicated the information should not be shared.

– All respondents agreed this information should not be shared with the CP after discharge or that the exchange would have no added value.

* The clinical or lab values as such are not included in the final version of the discharge report but a diagnosis of hypertension or chronic kidney disease is registered in the discharge report under comorbidities.

^a The relevance of each item was categorised into five levels (ranging from – to ++).

and comorbidities could potentially be useful to help interpret the medication list and could be a valuable source of validated and trustworthy information. One GP demonstrated the added value for patient safety if a pharmacist is aware of a history of stomach ulcers and takes this information into account when dispensing over the counter drugs. However, another GP expressed concerns for sharing information such as psychiatric comorbidities and questioned the relevance of this information for a CP. The utility of the height and weight of the patient on the discharge report was disputed. In contrast, all respondents agreed (drug) allergy information should be transferred across settings to ensure patient safety.

In a next step, the exchange of blood pressure, renal function and other lab values such as potassium, sodium, INR and digoxin concentrations were discussed. Blood pressure values were not considered as relevant. Arguments included the variability of the measure over time, the patient and situation specific nature of the value, and the importance of correct interpretation. Respondents (both GPs and CPs) rather suggested including the diagnosis of hypertension in the comorbidity list. Comparable arguments were made for the exchange of lab values. In these discussions with CPs and GPs, the importance of up-to-date information was also emphasized. One pharmacist questioned how it would be decided which values are displayed and which not. He suggested only showing values that are not within the normal range. In the proposal, aside from the actual result of the lab test, the date of test and the normal range of the lab value were shown as well. Nonetheless, concerns were expressed on what would happen if a pharmacist would not have the most recent lab values. Moreover, both GPs and CPs agreed that education on interpreting the lab values is required for high-quality patient care. Pharmacists acknowledged they have not received sufficient education on this matter. Upon education, the majority of CPs found lab values valuable information. It was argued on the one hand that this information could allow the pharmacist to perform an additional check before drugs are dispensed and therefore enhance patient safety. On the other hand, reservation existed also among GPs and CPs as to what responsibilities this information would bring and how it would affect the role of the CP. Both HCPs agreed the general practitioner is the primary HCP to manage a patient's health and request, interpret and follow up lab values.

The significance of renal function for the use of medication was acknowledged by both groups of HCPs. Both for over-the-counter and prescribed medication, the pharmacist could perform an additional verification to make sure the drug and dosage is adapted to the renal function. Nevertheless, the reservations for sharing blood pressure and other lab values are also valid arguments in the discussion on the exchange of renal function. One GP gave the example that one lab value does not allow a differentiation between a diagnosis of acute and chronic kidney disease. Therefore, multiple respondents postulated sharing chronic kidney disease and the stage of the disease as a diagnosis rather than the renal function itself.

In contrast to a basic medication list containing the medication regimen at hospital discharge, the discharge report contained additional medication data. For one, the discharge report displayed the medication list of a patient as registered at hospital admission. The value of this information was acknowledged unanimously. The respondents indicated this information would be beneficial to verify that all drugs were registered upon hospital admission, to follow up changes in drug regimen, to confirm and reconcile with prescriptions and to counsel patients.

Secondly, reasons for starting, adjusting or stopping the drug regimen were incorporated in the proposal. All but one GP found this information valuable. Pharmacists stated they are confronted with patients questioning the reasons for adjustments in drug regimen and have to guess why adjustments were made. Moreover, pharmacists noticed this lack of information hinders patient counselling, undermines patient involvement and results in patients who are not motivated and are not convinced about the drug therapy. Therefore, this verified information is of great value for patient counselling and can reinforce the treatment as intended by the treating physicians. Barriers included the time-consuming nature of registering this information in the hospital. One GP feared that if multiple HCPs informed patients on drug alterations, it could result in mixed messages and confused patients.

Third, the indication of each drug was added to the medication list. Although some CPs stated that this information was already known for regular patients and straightforward for some drugs, the majority of CPs and GPs perceived it as useful. Knowing drug indications would allow pharmacists to tailor advice to the specific indication or situation of the patient. Moreover, the indication of a drug could determine whether a

Table 4

Illustrative quotes about the relevance of the items in the discharge report.

Items	Quotes
Administrative data	
- Contact details of the hospital	- "I will call the hospital for urgent matters, but to be honest, contacting the hospital is discouraging because it takes a long time to get to the right person, but if it is needed for the patient, then it is needed." (GP7L)
	- "Contact details from the hospital: That seems logical [this can be exchanged with the CP]. I would also like this info [in my discharge letter]" (GP6L)
Medical data	
- Comorbidities	- "This [comorbidities] is validated information of a reliable source. Otherwise, I would guess the patient's condition based on the medication. I don't think that is a reliable method so I would find this [comorbidities] interesting." (CP1L)
	- "When you are talking about psychiatric things (hesitation)... In my opinion, it would be useful to provide information on the conditions that patients use medication for. If a patient was depressed but never took antidepressants, I don't necessarily want to keep this secret for the CP, but why would this be useful information for him? What can he do with this information?" (GP2B)
- Allergies	- "This [Allergy information] is not only nice to have, I feel it is good that this is exchanged. We need to know this." (CP5B)
- Lab values and kidney function	- "Lab values, to be honest, I do not feel I have the knowledge to interpret this data. Luckily there are reference values ... Maybe to keep the balance between GP and CP, this is too much information [and should not be part of the discharge report]" (CP1B)
	- "I fear that exchanging data on blood pressure, there will be very diligent pharmacists who may say to patients 'your blood pressure is too high, you should discuss this with the GP' even though this value only represents one moment in time. This may result into unnecessary care." (GP6L)
	- "This [labvalues] is often a snapshot [a measurement at one timepoint]. I would prefer that the comorbidity, in case of a limited kidney function, is included [in the discharge report]. With the INR, exactly the same. Okay, this is the latest measurement, but it changes so frequently. [...] I think this is too broad, and if you provide too much information, it will not be looked at. It think the information should be concise, to the point so that who receives the information, has the information he needs and that is then read." (GP4L)
Medication data	
- Medication list upon admission	- "I would definitely add this [Medication registered at hospital admission]. This makes it clear that if medication is not on the list at discharge that they (HCP of the hospital) were aware of the medication use and the medication therapy has been stopped." (GP1B)
- Reasons for drug alterations	- "This [reason for drug cessation] allows us to provide precise information [to patients]: 'It is clear that medication X should no longer be used.' Otherwise we are always uncertain." (CP3L)
- Indications	- "If I want to do my job well, then one of the elements that I should be alert for are contra-indications. I can only be alert for this if I know the indication of drugs." (CP5B)
	- "Medication indications could potentially be useful for medication with several indications, but otherwise [it has little added value]." (CP3L)

A code was given to each participant containing a character based on their profession (general practitioner or community pharmacist), a chronological number based on the date of the interview and a character based on the care region (Bruges or Leuven).

patient is eligible for additional drug reimbursement.¹ For this purpose, it was also suggested to add information on the reimbursement status of drugs (requested, granted or denied). Finally, some respondents remarked that comorbidities and indications contain overlapping information, and they perceived that the added value of indication was limited. One GP argued that a history of a stomach ulcer is a relevant comorbidity in a discharge document, even if there is no current treatment required.

Finally, adding the active compound to the medication list was considered unnecessary in a discharge report for the community pharmacist. The stop date of medication was considered useful, especially for acute drugs. Other suggestions included adding the last date and time that the drug was administered in the hospital. This would be valuable for drugs that should not be administered on a daily basis or have a narrow therapeutic range.

Based on these findings from the interviews, the discharge report was optimized (Table 3). Both the indication and comorbidities were incorporated in the document. In line with the feedback of interviewees, the renal function was not included in the final discharge report but chronic or acute kidney disease (including the stage of the disease) would be registered in the comorbidity list. The final, validated prototype of a discharge report can be found in Fig. 1.

¹ In Belgium, some drugs require an additional document for drug reimbursement. To qualify for this reimbursement, the treating physician should fill out a request with patient information and indicate the patient meets the requirements for additional reimbursement. If the attestation is granted, the community pharmacist can dispense the drug at a reduced rate.

5. Discussion

5.1. Main findings

This research generated an evidence-based prototype of a discharge report for the community pharmacist. The report was constructed and validated using two methods: a literature review to identify information that is exchanged with the CP at discharge and semi-structured interviews with HCPs in primary care to assess the relevance of the content. The final discharge report contains concise medical data (including reasons for hospitalization, comorbidities and allergies), medication data and administrative data (e.g. hospital contact information). The medication data encompasses a medication list at hospital admission and discharge, reasons for drug adjustments, drug indications and start/stop dates.

The content of this prototype is tailored to the informational needs of community pharmacists. Although their needs have been documented in several countries, the literature review found only six guidelines for information exchange with the CP originating from three countries.^{29,34,38,40,42,44} The developed discharge report strongly contrasts to a basic medication list which can be shared with the CP through the Vitalink platform in Belgium. This research has shown that a basic medication list does not fully meet the pharmacist's information needs after hospital discharge. This research established that additional medical, medication and administrative data is preferred.

In contrast to expectations, HCPs in Belgium were hesitant to exchange data on renal function and other lab values in spite of acknowledging the importance of renal function for drug therapy. The interviews uncovered that there is a risk of misinterpretation of the data, and exchange of data is accompanied with a responsibility to act

Discharge report (part A)

Administrative data		Medical data	
Patient			
Name	Brouwers Pierre		
Date of birth	01/01/1930		
Sex	Male		
Hospitalization period	3/06/2018 – 19/06/2018		
General practitioner			
Name GP	De Vadder Hugo		
Address	Streetname, City		
Phone number	02/20 00 00		
Hospital			
Hospital address	Test Hospital, Streetname, City		
Hospital department	Geriatrics Department		
Treating physicians	Prof. Jos Keppens		
Clinical pharmacist	Marie Vande Ginste		
Phone number	016/32 05 61		
E-mail address	Marie.vandeginste@hospital.be		
Discharge report			
Created on	19/06/2018		
Created by	Marie Vande Ginste		
Validated by	Leen De Nijs		
Clinical data			
Reason of hospitalization	Heart failure		
Comorbidities	<ul style="list-style-type: none"> Bilateral cataract (operation in 2010) Arterial hypertension Heart failure (NYHA III) Chronic kidney disease stage 2 (GFR: 65 mL/min/1.73 m²) 		
Allergies			
- Allergen	Clindamycine		
- Reaction	Skin reaction		
- Date	19/05/15		

Discharge report (part B)

Discharge report (part 2)

Medication data														
Admission		Indication	Route	Freq	Time				Start date	Stop date	Remarks	ADMISSION	DISCHARGE	Reason for starting or adjustments
					08	12	18	20						
AMLOR	Tabl 10 mg	Hypertension	Oral	Daily	1 tabl							x		! Dose adjustment due to edema
BISOPROLOL EG	Tabl 5 mg	Heart failure	Oral	Daily	1 tabl							x	x	
CRESTOR	Tabl 40 mg	Unknown	Oral	Daily				1 tabl				x		X Stopped, no indication
LANOXIN	Tabl 0,125 mg	Heart failure	Oral	Daily	1 tabl							x	x	
LASIX	Tabl 30 mg	Heart failure	Oral	Daily	1 tabl							x	x	
MOVICOL	Bags	Constipation	Oral	Daily	1 bag					Only if necessary		x	x	
RAMIPRIL EG	Tabl 2,5 mg	Heart failure	Oral	Daily	1 tabl							x	x	
ZYLORIC	Tabl 100 mg	Hyperuricemia	Oral	Daily	1 tabl							x		X Stopped, no indication

Discharge		Indication	Route	Freq	Time				Start date	Stop date	Remarks	ADMISSION	DISCHARGE	Reason for starting or adjustments
					08	12	18	20						
ALDACTONE	Tabl 25 mg	Heart failure	Oral	Daily	1/2 tabl								x	V Started due to edema
BISOPROLOL EG	Tabl 5 mg	Heart failure	Oral	Daily	1 tabl							x	x	
LANOXIN	Tabl 0,125 mg	Heart failure	Oral	Daily	1 tabl							x	x	
LASIX	Tabl 30 mg	Heart failure	Oral	Daily	1 tabl							x	x	
MOVICOL	Bags	Constipation	Oral	Daily	1 bag					Only if necessary		x	x	
RAMIPRIL EG	Tabl 2,5 mg	Heart failure	Oral	Daily	1 tabl							x	x	

Fig. 1. The validated prototype of a discharge report for community pharmacists, completed with a fictitious patient case. Part A shows the administrative and medical data. Part B displays the medication data.

on the information. Pharmacists indicated they require additional education on this matter before this information should be exchanged. In the Belgian context, it is not standard practice to exchange clinical information with the community pharmacist. Contrastingly, the literature review found five initiatives where renal function was exchanged with the CP.^{7,25,27,31,34} Given that the education level of pharmacists with regard to lab values may differ across countries, the decision not to

exchange lab values may not be transferrable to other countries and settings. For the Belgian setting, it is recommended to revisit this decision at a later timepoint given the evolutions in education and increase in pharmaceutical care services.

Six articles explored experiences and expectations of pharmacists related to discharge information via interviews and/or questionnaires.^{19,23,32,48–50} These articles confirmed the necessity of sharing

the medication-related data. A questionnaire in the United Kingdom in 1997 already revealed that the majority of CPs (94%; $n = 33$) and GPs (96%; $n = 71$) desire to receive reasons for drug therapy changes after hospitalization.⁴⁹ In 2011, a Belgian questionnaire explored which information CPs find indispensable using a 26-item questionnaire ($n = 309$).²³ A majority of participants considered reasons for hospitalization, reasons for drug alterations and drug indication indispensable or useful information. However, for confidentiality reasons these elements were not retained in a subsequent intervention study.²³ This demonstrates the sensitivity of exchanging patient information between healthcare providers.

5.2. Evidence

Information exchange is a promising strategy to ensure continuity of care and patient safety.³² A discharge report for the community pharmacy can facilitate medication reconciliation after hospital discharge and allow customization of counselling to the patient's specific situation. Participants of this study gave examples how certain information could contribute to patient safety. However, current evidence is limited. Grey et al. found a discharge letter for the community pharmacist to have a positive effect on the implementation of treatment plans.⁵¹ Hockly et al. demonstrated that sharing the GP's discharge letter with the CP reduced the number of post-discharge prescribing discrepancies and reduced discrepancies between the patients' self-described medication regimen and the discharge letter.⁵² However, sharing a discharge medication plan with the physician and pharmacist did not reduce the number of adverse events and readmission rate in the study of Farris et al.⁴⁷ These studies were not incorporated in this review because no detailed information was provided about the content of the discharge report. To the best of our knowledge, there are no impact studies with discharge reports for the CP that provide: (1) a description of and (2) argumentation for the content, (3) the author of the document, (4) the communication channel and (5) assess the quality of the document. Further research, with adequate reporting of these elements, is needed to confirm the added value of this discharge report on continuity of care and patient safety.

5.3. Limitations and strengths

It is a strength that this research combined a literature review and semi-structured interviews for the development of the discharge report (method triangulation). To our knowledge, this is the first article to provide an overview of national and international initiatives of information exchange with the CP. Only one database was consulted by one researcher, but this probably did not significantly impact the findings. The purpose of the review was to summarize the exchanged information in the identified initiatives. Many items for a discharge report occurred in several initiatives. In the decision-making process, a multidisciplinary team discussed the findings and constructed the preliminary discharge report.

It is a strength that the subsequent semi-structured interviews actively involved both community pharmacists and general practitioners (data triangulation). The sampling strategy included both opinion and non-opinion leaders from two regions in Belgium which lead to maximal variation in the participants (data triangulation). This strengthens the generalizability of the findings. In addition, participants were given the opportunity to add elements to the discharge report. This further supports the statement that the main elements for a discharge report were covered in this research. However, it is a limitation that the patients' perspective related to information exchange and the perspective of HCPs in the hospital, who could reflect on the feasibility and implementation of a discharge report in practice, were not incorporated in this research. This should be addressed in future research.

The researchers purposefully did not choose a traditional consensus-based approach such as a Delphi method. In the opinion of the research

team, a consensus-based method cannot provide as much insights into the different arguments of HCPs, and to disclose advantages and potential pitfalls of information exchange. In contrast to a previous questionnaire on the subject,²³ these semi-structured interviews provided insights into the aspects that the respondents perceived as important or had a strong opinion about. As a result, not all elements of the discharge report were discussed in as much detail in every interview. The participants were asked to illustrate their statements with examples from practice which strengthens the credibility of the findings. A focus group design would have allowed direct interaction between different participants but may have discouraged HCPs to voice their opinion. Overall, during the review and validation of the discharge report by healthcare professionals, patient safety, as well as patient privacy, roles and responsibilities of HCPs were taken into consideration.

5.4. Implementation of the discharge report in practice

This research identified relevant information to exchange with the community pharmacist at hospital discharge. In the study by Claeys et al. certain information was not exchanged with the CP due to privacy reasons.²³ Likewise, concerns regarding a patient's privacy were expressed during the interviews. The recent European General Data Protection Regulation (GDPR) provides a regulatory framework. GDPR states that in general, it is prohibited to process (and this includes the exchange of) health data. However, an exception is made if the exchange is necessary for the provision of healthcare and it involves professionals who have a professional secrecy or if the patient has provided explicit informed consent for the exchange of data (Art 9 GDPR).⁵³

Moreover, the added value of this discharge report will depend on multiple factors. A first factor to consider is the quality of the data. Research has demonstrated discrepancies between the documentation for the patient, CP and the GP.^{21,54} A transcription burden is known to increase the risk of errors.⁵⁵ The time-consuming nature of writing a discharge report was also noted in the interviews as a barrier for implementation. Therefore, the researchers advocate for an automatic software generation of a discharge report, based on the electronic patient records in the hospitals. Secondly, the availability, accessibility and safe exchange of the discharge information is crucial. Upon receiving information, a third factor is the responsible use of the information.

6. Conclusion

The literature review and semi-structured interviews with Belgian healthcare professionals in primary care, resulted in an evidence-based prototype of a discharge report for the community pharmacist. This discharge report contains concise medical data (including reasons for hospitalization, comorbidities and allergies), medication data and administrative data (e.g. hospital contact information). The exchange of this type of information with the community pharmacist might contribute to patient safety after hospital discharge and continuity of care.

7. Clinical trial registration information

Retrospectively registered in clinicaltrials.gov (number NCT03223584).

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Declarations of interest

None.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.sapharm.2019.04.049>.

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