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Discharge Communication in Patients Presenting to the Emergency Department With Chest Pain: Defining the Ideal Content

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ABSTRACT

In an emergency department (ED), discharge communication represents a crucial step in medical care. In theory, it fosters patient satisfaction and adherence to medication, reduces anxiety, and ultimately promotes better outcomes. In practice, little is known about the extent to which patients receiving discharge information understand their medical condition and are able to memorize and retrieve instructions. Even less is known about the ideal content of these instructions. Focusing on patients with chest pain, we systematically assessed physicians' and patients' informational preferences and created a memory aid to support both the provision of information (physicians) and its retrieval (patients). In an iterative process, physicians of different specialties ($N = 47$) first chose which of 81 items to include in an ED discharge communication for patients with acute chest pain. A condensed list of 34 items was then presented to 51 such patients to gauge patients' preferences. Patients' and physicians' ratings of importance converged in 32 of the 34 items. Finally, three experts grouped the 34 items into five categories: (1) information on diagnosis; (2) follow-up suggestions; (3) advice on self-care; (4) red flags; and (5) complete treatment, from which we generated the mnemonic acronym "InFARcT." Defining and structuring the content of discharge information seems especially important for ED physicians and patients, as stress and time constraints jeopardize effective communication in this context.

Chest pain accounts for up to 10% of all patient presentations in emergency departments (EDs) (Konkelberg & Esterman, 2003). The majority of these patients will usually be discharged within hours, after exclusion of serious conditions such as myocardial infarction (Goodacre et al., 2011). A comprehensive workup of low- to intermediate-risk patients is not feasible in the ED (Reichlin et al., 2009). Yet many of these patients go on to suffer from repeated episodes of chest pain, associated with anxiety and uncertainty about diagnosis and outcome (Jones & Mountain, 2009). Effective discharge communication, empowering patients to understand and memorize medical information, should therefore be an integral part of patient care. It is a likely contributor to better outcomes (Bishop, Barlow, Hartley, & William, 1997; Kessels, 2003), higher patient satisfaction (Kessels, 2003), better adherence to medication (Cameron, 1996; Kessels, 2003), more adequate disease management, and reduced anxiety (Galloway et al., 1997; Mossman, Boudioni, & Slevin, 1999).

Communication challenges in the emergency department

Communication between physician and patient represents a fundamental element of health care quality, and is attracting an increasing amount of attention in health care studies (Ong, de Haes, Hoos, & Lammes, 1995). Physician–patient communication about prognosis and preferences for care is critical in helping patients adequately prepare for and plan future care, and physicians' communication style may affect patients' satisfaction, trust, willingness to cooperate, and health status (Ambady, Koo, Rosenthal, & Winograd, 2002; Beck, Daughtridge, & Sloane, 2002; Fiscella et al., 2004; Hall, Roter, & Katz, 1988). Investigating the communication between physicians and patients can therefore help to

optimize health care provision by identifying specific training needs for physicians in this context.

Physicians working in the ED face numerous challenges, such as working in a chaotic environment and treating mentally or chronically ill patients, challenges that impact ED communication, which is also constrained by stress and the time-sensitive nature of many cases (Dean & Oetzel, 2014). Patients arrive in the ED with various amounts of information, experience with the health care system, language fluency, and health literacy (Samuels-Kalow, Stack, & Porter, 2012), and the practice of emergency medicine is characterized by episodic contact with patients and difficulties in establishing continuous care.

For many patients, being discharged from the ED represents a moment of high vulnerability (Samuels-Kalow et al., 2012). Ineffective communication at discharge may result in

adverse consequences, ranging from inappropriate use of drugs to neglect of follow-ups for pending tests. Effective discharge communication is an important tool for establishing continuity of care and a link to the primary care provider (Kripalani et al., 2007; Samuels-Kalow et al., 2012; Villanueva, 2010). Furthermore, it is likely to be cost-effective by reducing readmission of patients with ischemic heart disease (Menzin, Wygant, Hauch, Jackel, & Friedman, 2008).

Rationale for this research

Notwithstanding these potential benefits, little is known about ED patients' understanding of their condition, or their ability to memorize and recall information and instructions following discharge (Sanderson, Thompson, Brown, Tucker, & Bittner, 2009). For patients with chest pain, ED discharge represents an important transition to primary care or cardiology; for physicians, it is an important opportunity to proactively address patient-specific issues (Villanueva, 2010). A recent study, however, showed that chest pain patients were often unable to recall diagnoses or advice after discharge; furthermore, they reported limited opportunity to discuss their diagnosis, their worries, and their questions on further management (Price et al., 2005). Ineffective discharge communication does not appear to be the exception to the rule. Immune-compromised patients' knowledge of medication at discharge was also found to be only moderate (Chau et al., 2011).

There are various ways to render discharge communication more effective, such as using tools (Jones & Mountain, 2009), improving communication skills (Langewitz, Eich, Kiss, & Wossmer, 1998), and defining the ideal content, which has rarely been attempted. In EDs in Switzerland and most European countries, verbal discharge communication without written instructions is the standard of care. Yet a recent study showed that verbal ED discharge instructions are often incomplete (Vashi & Rhodes, 2011). Note, however, that the nine categories examined in the Vashi and Rhodes study were derived from a textbook rather than based on physicians' or patients' opinions or objective criteria. Patients' needs, as assessed in a chest pain clinic, suggest that patients want to be reassured; they want to know what caused their pain, to understand the cause, and to feel able to help themselves (Price et al., 2005). Price and colleagues proposed that patients should be provided with written information regarding the diagnosis, future medical care, self-care, and health promotion. Although researchers have also begun to assess patients' information needs in psychiatry (van Os & Triffaux, 2008) and oncology (Buzaglo et al., 2007), no such research has been conducted in the context of emergency medicine. And, to our knowledge, no previous study has assessed both physicians' and patients' informational preferences in ED discharge communication, and the extent to which both parties' preferences converge.

Goals of this investigation

In this study, we addressed the following research question: What are the similarities and differences of the

communication preferences between physicians of different specialties and patients suffering from chest pain? Specifically, we aimed at investigating and improving physician-patient communication in an ED discharge setting by identifying the information that needs to be covered in this interaction. As successful communication involves both parties, the sender (physician) and the receiver (patient), we examined both patients' and physicians' views of the ideal content of a discharge communication. Although we are aware that the form of physician-patient communication is just as important as the content and that the two are, in practice, inseparable, our focus in the present study was to identify the ideal content of effective discharge communication with ED patients presenting with acute chest pain. This content was determined from physicians' and patients' evaluations of what information should be conveyed. Another goal was to assess the extent of agreement between physicians and patients. Finally, we aimed to generate a mnemonic tool helping physicians and patients to remember key information. To this end, we synthesized the derived information into the smallest number of discrete categories capturing all elements that the physicians and patients considered important. These categories of items were then grouped such that physicians and patients could take advantage of "chunking," a powerful mechanism to boost learning and human memory (Chen & Cowan, 2005; Gobet et al., 2001; Li et al., 2013). Specifically, we generated an acronym from the first letter(s) of each category. The letters of the acronym serve as retrieval cues to items that need to be remembered. For instance, the acronym HOMES helps to remember the Great Lakes: Huron, Ontario, Michigan, Erie, and Superior.

Methods

Study design

The single-center cross-sectional study comprised two phases: First, we quantitatively assessed physicians' views of the ideal content of an ED discharge communication for patients presenting with acute chest pain. Second, we assessed patients' evaluations of this content, both quantitatively and qualitatively. Our study thus implemented a mixed-methods approach incorporating elements derived from both quantitative and qualitative traditions: (a) A comprehensive list of items that could potentially be discussed at discharge was evaluated by both patients and physicians in paper-and-pencil format. (b) Face-to-face interviews (free generation task) were conducted with ED patients presenting with chest pain, and the transcripts were subjected to qualitative analysis. The mixed-methods approach has proved valuable in various health care communication studies (Arora et al., 2010; Bennett, Switzer, Aguirre, Evans, & Barg, 2006; Cherlin et al., 2005; van Staa, 2011; Wittink, Barg, & Gallo, 2006). Mixed-methods research has the potential to collect, analyze, and combine both quantitative and qualitative data in a single study. We used a mixed-methods design as it accommodates key aims of this study: (a) to determine, through quantitative methods, the ideal content of ED discharge communication with chest pain patients from both the senders' and the

receivers' perspective, and to formalize a comparison between these, and (b) to elicit, through qualitative methods, patients' perspectives on the information required at discharge. Physicians (cardiologists, internists, and ED physicians; $N = 47$) and chest pain patients awaiting ED discharge ($N = 51$) were the main sources of information.

Setting

The study was conducted at the ED of the University Hospital of Basel, an urban 700-bed tertiary care teaching center. The University Hospital of Basel is one of Switzerland's five university medical centers, consisting of 52 departments and institutes with interdisciplinarity as a strategic aim. It serves a population of 500,000, and more than 45,000 trauma and nontrauma patients are seen in the ED every year. Specialists of all disciplines and subspecialties are available around the clock. The local ethics committee approved the study protocol (<http://www.clinicaltrials.gov> ID NCT01540266). Patients and physicians gave written informed consent.

Phase one: physicians

Participants

Recruitment took place during three staff meetings in the departments of cardiology, internal medicine, and emergency medicine. All 47 physicians present during meetings volunteered to participate.

Procedures and data collection

Physicians were fully informed about the study's goal: to determine the ideal content of effective discharge communication with chest pain patients. Responses were collected during staff meetings and subsequently anonymized. Specifically, physicians were presented with a list of 81 items (Ackermann et al., 2012) that could potentially be addressed at discharge. This initial list was constructed by three of the authors (physicians with more than 10 years of experience), taking advantage of their first-hand knowledge of discharge communication. Participating physicians first read an original patient history.¹ They then selected the items they felt needed to be addressed in a (typical) discharge interaction of less than 15 minutes (items were not ranked). The standardized instruction read as follows: "You are the responsible physician and plan a discharge interaction lasting less than 15 minutes with the patient described above. From your point of view, which of the points listed below should be discussed?"

For each physician, the following information was recorded: age, sex, position, specialty, experience in the specialty (in years), and overall clinical experience (in years). A randomly selected subset of 12 physicians was asked to repeat the assessment, on average 6 months after the first assessment, without being prospectively informed about this retest. The retest data were used to determine intrarater reliability.

Phase two: patients

Participants

Recruitment took place from May 2012 to October 2012 in the ED of the University Hospital of Basel on weekdays during the day shift and was conducted by a psychologist. The electronic patient tracking system was screened to identify those patients with chest pain who had completed clinical workup and were awaiting discharge from the ED. Exclusion criteria were chosen to limit participation to patients with an intermediate risk of coronary heart disease (CHD). Specifically, patients meeting one or more of the following conditions were excluded:

- High-risk features in an electrocardiogram (ECG; e.g., ST elevation) and/or increased high-sensitive troponin levels (to exclude high-risk patients).
- None of the following cardiovascular risk factors: smoking history, diabetes, hypertension, dyslipidemia, age above 50 years, family history of CHD (to exclude low-risk patients).
- Dementia, as defined by a score of <7 on a clock-drawing test.
- Age under 18 years.
- Limited German language skills (German being the default language at the hospital).

Procedures and data collection

Study enrollment was conducted shortly before the discharge communication. Chest pain patients were presented with a text informing them about the study's goal and procedure: to determine the ideal content of effective discharge communication with chest pain patients. After giving their written informed consent, patients responded to demographic questions (age, sex, profession, race, and nationality). Their emergency severity index (ESI) was recorded (Gilboy, Tanabe, & Travers, 2005). One of the authors (psychologist) conducted all face-to-face interviews (free generation task), in which patients were asked for their thoughts on the information to be provided at discharge. Specifically, patients were asked the following open-ended question: "With respect to the upcoming discharge interaction with your attending physician: What kind of information is important to you?" If patients' statements were irrelevant, we tried to guide them by briefly repeating the question. Subsequently, the patients were presented with a list of the 34 items endorsed by the majority of study physicians (see Results section). Some items were rephrased in lay terms to make them comprehensible (based on the results of a prestudy with 30 ED patients who evaluated the comprehensibility of each item; items not understood by more than 20% of patients were rephrased until comprehensible). For each item, patients stated whether they would prefer it to be included in or excluded from a discharge interaction, whether they had no preference, or whether they found the item incomprehensible. We collapsed the categories

¹Complete original patient history is available from the corresponding author.

“excluded” and “no preference,” treating both as “undesired.” Only 39 of the 1734 responses evaluated an item to be “incomprehensible,” and they were reasonably evenly spread across all 34 items. We therefore treated these responses as “missing,” and did not have to exclude any items (only the items concerning beta blockers and nitroglycerine were incomprehensible to a greater amount of patients [i.e., 10 and 9 patients, respectively], but as most patients who understood them considered them crucial, they were also not excluded). All responses were rendered anonymously. Finally, 6 days after baseline assessment, retest materials were mailed to all patients’ homes in order to assess the reproducibility of our approach.

Consensus classification system

Having used physicians’ and patients’ answers to define the ideal content of an effective discharge communication (34 items), we sought to group these items into the smallest possible number of discrete informational categories. To this end, we identified three expert physicians with more than 12 years of experience in the field and a position that involved student teaching and training of junior physicians. These experts discussed the items and potential categories, and reviewed the results in several rounds until five categories emerged (see Results section).

Data analysis

Descriptive statistics (means, standard deviations) and analyses were calculated with SPSS for Windows (v. 18). Patients’ answers to the free generation task were audiotaped, transcribed verbatim, and coded. After the three experts had achieved consensus on the five categories of information, two independent raters (an ED physician and a psychologist) coded each transcript by mapping patients’ answers to the categories of the consensus classification system (see Results section). In case of disagreement, consensus was reached through joint analysis and discussion of the audiotapes and the transcripts. An interrater reliability analysis using kappa statistics was performed to determine consistency among raters (Landis & Koch, 1977). The 10 most frequently named patients’ informational needs that could not be assigned to the classification system were then noted. Because this method is not empirically derived, it is only a best approximation for evaluating the audiotaped responses. Correlations between the percentages of physicians and patients who endorsed the respective items, as well as between physicians’ and patients’ initial and retest scores, were calculated using Pearson’s correlation coefficient. Concordance between the two distributions of the items was calculated using the Mann–Whitney *U*-test.

Results

Participant characteristics

Physicians

Among the 47 participating physicians (19 women), there were 6 interns, 11 residents, 25 consultants, 4 senior

consultants, and 1 department head. The average clinical experience was 10.1 years ($SD = 8.3$). In terms of specialty, 23 were hospital internists, 13 emergency physicians, 8 cardiologists, 2 preclinical emergency physicians, and 1 internist specialized in psychosomatic medicine.

Patients

In total, 187 patients were consecutively screened for inclusion. Of those, 4 were excluded because of dementia; 2 because they were aged under 18 years; 67 because of increased troponin levels or high risk features in the ECG; 7 because of lack of cardiovascular risk factors; and 33 because of limited language skills. Finally, 23 patients were excluded for miscellaneous other reasons (mostly no informed consent). A final sample of 51 patients resulted.

The mean (SD) age of the 51 patients (22 women) was 53.8 (16.7) years, with a range of 21 to 83 years. All patients presented to the ED because of chest pain, and data were obtained in the ED (41 patients) or the ED-associated monitoring and decision unit (10 patients). In total, 35 (69%) patients had an ESI level of 2; 16 (31%) had an ESI level of 3. The majority (63%) were Swiss; the rest had various other nationalities (Portuguese, Spanish, German, Sri Lankan, Turkish, Italian, and Serbian), a mix typical for Swiss urban EDs.

Consensus between patients and physicians

Physicians were first presented with the full list of 81 items. The 34 items with > 50% physician endorsement were then presented to the patients. Table 1 lists these 34 items and the proportions of physicians and patients endorsing them. All but two of the 34 items endorsed by the majority of physicians were also judged to be important by more than 50% of patients (i.e., 32 of the 34 items); 26 were endorsed by more than 75% of patients. One item was endorsed by less than 50% of all patients (“address the need to stop smoking”; however, this item was selected by 59% of patients with present or past smoking history). Finally, one item was endorsed by exactly 50% of patients (“Encourage the patient to make an appointment with his family physician to obtain more information”), but by about two-thirds of physicians.

Application of the consensus classification system

Given the high concordance between physician and patient perspectives, we used the condensed list of 34 items to generate categories. Working individually, three expert physicians identified a small number of nonoverlapping basic categories to which the individual items could be assigned and classified each item to those categories. Each individual classification system was then shared and discussed with the others, with the goal of arriving at a system agreed upon by all participants. The resulting classification system comprises five categories (Table 1): Seven items were assigned to the category “information on diagnosis,” nine to the category “follow-up suggestions,” four to the

Table 1. Endorsement of the 34 items, classified to the five categories, by physicians and patients, respectively.

Category	Item	Physicians (N = 47)	Patients (N = 51)
Information on diagnosis (7 items)	Inform the patient that he is ready to go home	89%	96% (48/50)
	Reassure the patient ("you were right to come to the ED")	72%	73% (37/51)
	Explaining that blood, heart, and lungs were thoroughly examined	57%	100% (51/51)
	State the presumptive diagnosis	83%	98% (49/50)
	Broad statement: "All the investigations exclude a diagnosis of myocardial infarction at this time"	79%	94% (48/51)
	Explain the significance of the presumptive diagnosis	66%	96% (48/50)
	Explain the association of symptoms with the suspected diagnosis	62%	96% (49/51)
Follow-up suggestions (9 items)	State why further investigation is necessary	94%	92% (47/51)
	State what the planned investigations are	89%	75% (38/51)
	State when the investigations will be carried out	77%	88% (45/51)
	State where the investigations will be done	74%	82% (42/51)
	Describe necessary precautions for the test (no coffee, no tea, ...)	64%	88% (45/51)
	Explain that an information sheet with details of the pretest preparation will be sent by mail	57%	65% (33/51)
	Explain that detailed information on the time and location of the test will be sent by mail	68%	78% (39/50)
	Advise the patient to contact his or her family physician should he or she have further questions	79%	65% (33/51)
	Encourage the patient to make an appointment with his or her family physician to obtain more information	68%	50% (25/50)
Advice on self-care (4 items)	Address risk factors	53%	94% (48/51)
	Address the need to stop smoking	83%	48% (24/50)
	Address current avoidance of physical stress	81%	78% (39/50)
	Recommend that the patient resumes normal daily activities	53%	90% (46/51)
Red flags (6 items)	Stress that the patient should present immediately to the ED in case of chest pain radiating into arms/jaws	83%	94% (48/51)
	Stress that the patient should present immediately to the ED if the symptoms last longer than 10 minutes	81%	86% (44/51)
	Stress that the patient should present immediately to the ED if he or she is dyspnoeic	68%	92% (46/50)
	Stress that the patient should present immediately to the ED if he or she experiences chest pain not responding to nitroglycerin	96%	88% (43/49)
	Explain that the ED is open 24/7 ("you may come back any time")	68%	63% (32/51)
	Reassert the importance of presenting immediately to the ED in case of any complaints or symptoms, even at night	57%	53% (27/51)

(Continued)

Table 1. (Continued).

Category	Item	Physicians (N = 47)	Patients (N = 51)
Complete treatment (all medication) (8 items)	Explain that treatment has to start immediately	55%	90% (46/51)
	Explain why treatment has to start immediately	70%	86% (44/51)
	State the names of the new medications (ASS, beta blocker, nitroglycerine spray)	96%	76% (39/51)
	Give the ASS dose and explain when it should be taken	66%	84% (42/50)
	Give the beta blocker dose and explain when it should be taken	64%	88% (36/41)
	Describe the side effects of beta blockers	53%	85% (39/46)
	Give the nitroglycerin dose and explain when it should be taken	81%	86% (36/42)
	Describe the side effects of nitroglycerin	62%	89% (42/47)

Note. Percentages indicate the proportion of physicians and patients, respectively, who selected each item.

In parentheses: number of patients selecting the item/number of patients comprehending the item.

category "advice on self-care," six to the category "red flags," and eight to the category "complete treatment."

Two independent raters also used the consensus classification to categorize patients' freely generated answers; interrater reliability was fairly high ($\kappa = 0.70$ [$p < 0.01$], 95% CI [0.61–0.79]). All disagreements between the two independent raters could be resolved by discussion, consulting the other authors as experts.

The correlation between the percentage of items endorsed by patients and that endorsed by physicians proved to be essentially nil ($r = .013$; $p = .94$). Yet concordance between patients and physicians was high, with 32 of the 34 items selected by the majority of physicians also being selected by the majority of patients. A Mann-Whitney U -test demonstrated that the two distributions did not differ significantly from each other ($U = 544$, $p = .15$).

Patients' needs as elicited by the free generation task

Patients' responses in the free generation task showed greater variation across the categories of the consensus classification system. In total, 84% of patients voiced a need to receive information on their diagnosis, 22% on their follow-up, 55% on self-care, 20% on red flags, and 14% on their complete treatment. Numerous statements could not be assigned to the categories of the classification system. Table 2 lists patients' 10 most frequently named needs as derived from the free generation task. All of these items concerned the style or form, but not the content, of the discharge communication. As the focus of this study was on defining the ideal content of discharge communication, they were not appended to the condensed list of items.

Table 2. The 10 most frequently named patient needs as elicited by the free generation task.

Patients wish...
to feel cared for
to be reassured
to be taken seriously
to have the opportunity to ask questions
to have their questions answered
to be able to spend sufficient time with the physician
for the physician to do their best
for the physician to use appropriate language
for the physician to admit if they do not know something
for the physician to be completely honest without concealing details

Generation of a mnemonic acronym

Using the initial letter(s) from the classification categories, we generated the acronym “InFARcT” (In: information on diagnosis; F: follow-up suggestions; A: advice on self-care; R: red flags; cT: complete treatment). This acronym is not a neologism but represents a word with an established meaning both in the medical nomenclature and (in German-speaking countries) in everyday discourse. It is obviously also highly pertinent to patients with acute chest pain.

Retest results

A randomly selected subset of 12 physicians participated in the retest. Of the 51 patients contacted, 31 completed the retest materials (on average, 17 days after the initial assessment). In order to determine how reliable both physicians’ and patients’ responses were, we correlated their first and second selections. Correlations proved to be moderate (physicians: $r = .52$, $p < .001$, in the full set of 81 items; patients: $r = .53$, $p < .001$, in the condensed set of 34 items). However, we were still able to assign all items endorsed by physicians in the retest to the classification system we had developed based on their initial answers. Thus, all categories “survived” this retest.

Discussion

How can the content of discharge communication in the ED be designed to optimize patient outcomes? To our knowledge, there has been scarce systematic study of this issue. Although chest pain, relative to other symptoms, is a well-defined and well-recognized symptom in the general population (Mata, Frank, & Gigerenzer, 2012), a multitude of information could, in theory, be conveyed to a chest pain patient who is being discharged. At the same time, there are severe limitations on physicians’ time and, equally importantly, the human capacity to recall information. Physicians tend to overestimate patients’ capacity to recall information while simultaneously underestimating the time needed to convey information (Ackermann et al., 2012). Taken together, efforts to define the both the scope and the content of discharge communication are anything but trivial.

Our goal was to implement a new method for content definition, using the example of chest pain, one of the most frequent complaints in the ED. Using an iterative procedure involving both “expert” groups (i.e., physicians and patients) and a group of expert physicians, we generated and refined a

list of important items to be discussed at discharge. By involving professionals with daily experience of chest pain patients (i.e., cardiologists, internists, and emergency physicians), we sought to bring medical expertise and a focus on feasibility to the process; by involving patients, we sought to represent the perspectives and needs of people experiencing alarming symptoms.

Our key finding is that the two “expert” groups strongly overlap in their assessment of what ought to be conveyed in discharge communication: Nearly all items identified by the majority of physicians as important were also endorsed by the majority of patients. Specifically, about four in five of the items endorsed by the majority of physicians were rated as important by more than 75% of patients. This strong consensus provides one basis on which the content of discharge communication can be defined.

However, some disparities remained (see Table 1). Take, for instance, the issue of addressing risk factors (see Advice on self-care). This is an aspect that a large majority of patients (94%) considered important, relative to just over half of the physicians (53%). Relatedly, 100% of patients felt it important to be told that their blood, heart, and lungs had been thoroughly examined, relative to just 56% of physicians. There are several possible explanations for these disparities: First, one could speculate that these and other disagreements may be due to physicians—cognizant of time constraints, but not fully aware of patients’ need for reassurance—omitting to state things they consider obvious (“thorough examinations”). Second, another hypothesis is that these disparities could reflect different ideas as to how much people can encode and process in a given period of time. Indeed, patients and physicians greatly overestimate the number of items that can be communicated within the prescribed 15 minutes—and that human memory is likely to be able to store. Third, patients may come to the ED with only fragmentary knowledge of the topic of the discharge communication, as has been shown for stroke patients (Williams, Bruno, Rouch, & Marriott, 1997). Physicians should therefore ascertain the degree of patient understanding in this area. Finally, patients were asked to rate their own informational needs, whereas physicians were rating the needs of patients in general. Thus, caution is warranted in overinterpreting the total difference in informational needs between patients and physicians.

Three expert physicians classified the items chosen by the two groups into five exclusive categories. These categories are similar to the seven categories used in a recent study on written discharge communication (Vashi & Rhodes, 2011); however, the latter study gave no principled account for the choice of the categories. The same holds for another recent study using written discharge information (Arnold, Goodacre, Bath, & Price, 2009). Again, four of five of their categories were identical with our classification system. This study concluded that written discharge information can reduce anxiety and depression, and improve mental health and perception of general health, but does not influence satisfaction with care or other outcomes (Arnold et al., 2009). More generally, a recent systematic review on the role and effectiveness of written discharge information found no robust evidence that it affected patient satisfaction or adherence (Raynor et al., 2007). Even if written information

were the key to higher patient satisfaction and better health outcomes in patients with chest pain, physicians need help to decide which content has the potential to improve patient outcomes. In the absence of any longitudinal studies, one way to determine the ideal content of written communication is by consulting the two parties involved, as we did for verbal communication. And even if written discharge information is the standard of care, a normal ED discharge will conclude with verbal communication. Physicians should not waste this opportunity to communicate and to educate.

A review study (Stewart, 1995) found a correlation between effective physician–patient communication and improved patient outcomes, with a multitude of interventions and instructions emerging to be beneficial. However, all of the analyses reviewed assessed the form of the physician–patient interaction; none assessed the content (though, as Table 2 shows, the mode of communication is also of utmost importance). Structuring the content of ED discharge communication and offering a mnemonic aid could improve patients' outcomes. For instance, parents of children with otitis media who received standardized discharge instructions were better able to recall information than were parents who received nonstandardized instructions (Isaacman, Purvis, Gyuro, Anderson, & Smith, 1992). By the same token, a standardized approach to physician–physician interaction using the DINAMO acronym led to a significant decline in missing or wrong information detected after handover (Rudiger-Sturchler, Keller, & Bingisser, 2010). Notwithstanding these findings, further research is needed to define the ideal quantity, quality, and form (e.g., written vs. oral) of discharge information. Such outcome studies can include a wide range of measures, ranging from short-term patient satisfaction and reduction of anxiety to morbidity and use of health-care resources.

Limitations and future directions

Our results suggest that the content of discharge information for patients presenting to the ED with chest pain can be standardized based on physicians' perspectives and patients' expressed informational needs. For several reasons, physicians and patients are unlikely to be in complete agreement as regards the ideal content. First, there is substantial interindividual variation. As we have previously shown, physicians selected between as few as 20 and as many as 57 items (Ackermann et al., 2012). Second, there is substantial intra-individual variability, as can be inferred from the moderate level of reliability in both physicians' and patients' retests. Nevertheless, it seems that even if there is not necessarily agreement on individual items, there is broad agreement on categories.

Another limitation of our study is that standardization cannot replace individualized communication. A protocol should never compete with or even replace patients' questions. Fears must be perceived, addressed, and discussed. We are well aware that good discharge communication requires tools and communication skills such as mirroring and permitting patients to speak for longer than a few seconds without interruption (Suchman, Markakis, Beckman, & Frankel, 1997). However, this study focused on the content of discharge communication, rather than on such skills.

Finally, a gold standard for defining effective content is currently lacking; few outcome studies (Engel et al., 2012; Isaacman et al., 1992) have investigated the effect of discharge information on outcomes such as patients' ability to recall information, morbidity, or quality of life after discharge, and none have focused on one of the most frequent serious complaints in patients presenting to EDs, namely, chest pain. A first necessary step toward such studies is to define the substance of an effective discharge interview. Our study represents an attempt to offer such a definition.

Our results indicate that two avenues of future research can help achieve deeper insights into the mechanisms involved in physician–patient communication. First, extensive work is needed in the field of patient recall. Given the high number of items selected as important by both patients and physicians, how and to what extent could patients' memory for the information discussed during discharge be maximized? Investigations of whether well-established mnemonic techniques, such as the method of loci (Bower, 1970) or the testing effect (Roediger & Karpicke, 2006), could enhance patients' ability to recall instructions are warranted.

Second, research efforts should be directed at devising and evaluating strategies to help physicians implement the content elaborated in this study in real discharge communication and assessing its impact on outcomes such as patient satisfaction, stress, and acquisition of disease-related information. Efforts are needed to determine whether structuring communication along these lines affects patient recall. Furthermore, studies assessing the effects of various forms of physician communication on patient outcomes and combining elements of both content and form are highly warranted.

Practical implications and conclusion

One way of addressing the thorny issue of recall is to offer both parties involved in a communication a mnemonic device. The content of this communication should consist of categories and items that are limited in number, easy to retrieve (for both physicians and patients), and conducive to grouping into high-level, meaningful categories. Chunking increases the likelihood that people can reproduce the information they have received (Gobet et al., 2001; Li et al., 2013). Presenting discharge information in combination with the categories and thus in clustered form has the potential to foster patients' ability to reproduce it later. To what extent this is indeed the case should be addressed in future work.

Defining and structuring the content of discharge information for the most frequent diagnoses seems especially important for ED physicians. In the ED, stress and time constraints jeopardize optimal communication. Furthermore, the vast majority of residents in this field cannot call upon extensive experience, especially in countries in which emergency medicine has not yet become a specialty. Effective communication, in content and form, at the moment of discharge represents a valuable and rare opportunity to communicate, and thereby to foster better outcomes. It should not go to waste.

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