PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	Question design in Nurse and GP-Led Telephone Triage for Same-Day Appointment Requests: A Comparative Investigation
AUTHORS	Murdoch, Jamie; Barnes, Rebecca; Pooler, Jill; Lattimer, Valerie; Fletcher, Emily; Campbell, John

VERSION 1 - REVIEW

REVIEWER	Inger K. Holmström Mälardalen university, Sweden
REVIEW RETURNED	23-Dec-2013

GENERAL COMMENTS	This paper aims to compare doctors' and nurses' communication with patients in primary care telephone triage consultations. This is an interesting and highly valuable contribution to research in this field, of great clinical importance. The manuscript fits well into the aims and scope of BMJOpen. The manuscript is well written and easy to follow. However, some issues need to be attended to before the manuscript is ready for publication. Title, article summary, abstract and key-words The title is descriptive and well-chosen. The abstract and article summary are well written and covers the content of the paper. I think the authors should consider adding "CDSS", "conversation analysis" and "UK" to the list of key-words. Introduction and literature-review The introduction is somewhat brief but covers important aspects of the area. I think the authors have missed to include Ernesäter et al:s paper (JTT 2012) about malpractice claimed calls in Sweden. Also Röing et al:s paper (SJCS 2013) on patient safety threats in telephone nursing could be useful. Furthermore, the concept of patient-centered communication needs more elaboration in the introduction. Street et al. (PEC 2009) have shown interesting pathways of how patient-centered communication might heal. The paper would be even more important and interesting if its theoretical underpinnings are clarified and more thoroughly described. Finally, some appropriate information about the UK system with telephone triaging needs to be included. In my country, it is not possible for patients to be telephone triaged by doctors, only by nurses. In other countries yet, it is the other way around, the doctors only are conducting telephone triage. I also think that the design of the particular CDSS should be described here, and not in the findings section. Methods There is no rationale for the study design – why was it the best way to carry out the study? As I think that the study is well designed and methodologically sound, it should not be difficult for the authors to

	justify this. However, the small number of HCPs included is a major drawback, and the study is indeed of a pilot-study character. It is not clear to me why only nurses were video-recorded. Video-recording of GPs might have provided interesting and non-expected findings. Myself being a health care researcher, I am not familiar with terminology such as “lexicomorpho-syntactic or prosodic interrogative marking”. Some further explanation of such terminology is hence needed. In addition, I would like the authors to justify further why questions seeking acknowledgment, repair questions and questions that suggest, propose, or offer something to another were not coded. From my viewpoint, such questions could affect how the conversation went further along. I think that call-outcome would have provided important additional information. Findings The findings are clearly displayed and easy to follow. Tables and figures are illustrative. I think however that the section describing the CDSS should be moved to the introduction of the paper. Discussion and conclusion The discussion section is well written and covers the important findings. However, I think that the authors also should discuss patient safety in telephone triage, especially in relation to CDSS. Furthermore, a comparison with telephone triage practices internationally would make the paper more interesting for such reader. Doctors, nurses, call-handlers – this differs internationally. As stated before, I think the study is of pilot-nature given the small sample of HCPs included. The study is conducted as a quatification of mostly qualitative data. A more in-depth methodological discussion about this is needed. Finally, the authors state that “our findings provide important evidence for the training of staff and for the design of CDSS in supporting staff to conduct telephone triage”. Although I do agree that the findings are very relevant for practice indeed, I would like the authors to elaborate some more on how they actually could be used.

REVIEWER	Celia Roberts King's College London UK
REVIEW RETURNED	23-Dec-2013

GENERAL COMMENTS	This is a clear and useful paper. It demonstrates the significance of computer software in structuring triage questions and shows clearly how different designs of triage interactions are produce by the two different groups. Until research has been done on how patients respond to these two different approaches, it may be difficult to be more assertive about the effectiveness of these approaches. However, some more, if rather speculative conclusions on the costs and benefits of these two approaches would add to its practical relevance. It is good to see more linguistically informed research being done on these aspects of clinical care.

REVIEWER	H.Derkx Retired as GP and advisor at medical call centre . Consultant teacher at University of Maastricht.
REVIEW RETURNED	24-Dec-2013

GENERAL COMMENTS	Well described and very interesting. For me the most interesting remark was in the Introduction: about telephone triage;is it safe and effective. To work with a system like Odyssey obviously requiers a lot of experience. The research showes that GPs perform telephone consultation (thinking and looking for a diagnosis to understand the clinical problem) and nurses doing telephone triage, looking for the urgency level and supported by the CDSS in a safe way! Interesting to read there was not much difference in time to make the assessment. What might be relevant is at what moment the nurse decided to determine the outcome? From own research we learned that 50% of questions asked by nurses (not CDSS guided) did not include high urgency questions but they were more diagnostic oriented. As if they were preparing the face to face consultation. Maybe this has also happened in this research project. The fact that these GPs asked far less questions to decide the outcome, does not mean they made a safe decision. And what we need in medicines is a good discussion about our attitude towards triage, whether face to face or by phone;is it done safely? And that is something we can and should explain to patients; That's why I ask the patient a few more questions etc. etc. I missed any information on the importance of good communication. The research is limited to the clinical part of a medical problem, but nothing is said about the communication which is often as important for the patient. What about the reason for encounter? What about feeling involved as a patient in the outcome and advice? If or if not working with a CDSS system, patients accept to be asked many questions IF it is explained by the triagist! I would like to read a bit more about these aspects of a telephone consultation/triage by phone. We lack in this research the patients opinion. I would like to read something in the discussion about the absence of investigation of communicative aspects in the telephone consultations and what this might mean to patients. Furthermore I would like to read something about the basic and ethical attitude of safety first! And this not only goes for telephone consultations but in all clinical consultations because this would influence a lot the way GPs, specialists and nurses perform any kind of consultation. In this research we see how things go and we learn a bit about differences but nothing is said about how we want the performance to be for any kind of consultaton. In my opinion; again; safety first, covered with a good quality of communcation. Very good article, good research.

VERSION 1 – AUTHOR RESPONSE

1. Reviewer 1 suggested we consider adding “CDSS”, “conversation analysis” and “UK” to the list of key-words. These have now been added.

2. Reviewer 1 made a number of suggestions for the introduction: a) the introduction should include the following references on patient safety: Ernesäter (2012) and Röing et al:s paper (2013); b) the “concept of patient-centered communication needs more elaboration in the introduction. Street et al.

(PEC 2009) have shown interesting pathways of how patient-centered communication might heal."; c) we should include some text that describes the UK triage system. Reviewer 3 also suggested that more information on patient safety and the importance of good communication from the patient's perspective is required.

Reviewer 1 also asked for a comparison with telephone triage practices internationally in the discussion given that systems and personnel vary across countries. To do this fully would require a systematic review but we accept that signalling to readers the relevance of our paper internationally would be helpful. We therefore feel that instead of providing any comparison in the discussion we feel it is more logical to offer a broad comparison of telephone triage in the introduction which sets the international relevance of the paper for readers.

We have now made the following changes to the introduction to address Reviewer 1's and Reviewer 3's suggestions, including the three references Reviewer 1 suggests:
a. Page 4, paragraph 1, old text:
"The use of the telephone to triage patients requesting same-day appointments represents one strategy to manage the increasing workload taking place in primary care1. Whilst there is some evidence that telephone triage may reduce GP workload2,3, there is equivocal evidence that telephone triage is a safe4-7 and satisfactory means of delivering care to patients3,8.
Research comparing how GPs and nurses communicate with patients within face-to-face consultations has identified patterned differences in the process of assessing patients and in the opportunities afforded to patients to explain their presenting problems9."

Page 4, paragraph 1, new text:
"Telephone triage is the process where calls, from people with a health care problem, are received, assessed and managed by giving advice or by referral to a more appropriate service1. It is increasingly being used internationally to help with the provision of out-of-hours care, manage demand for care, or provide an additional source of help and advice2. In the UK, the use of the telephone to triage patients requesting same-day appointments represents one strategy to manage the increasing workload taking place in primary care3. Nurses and general practitioners may provide telephone triage and consultation, with nurses typically trained to use computerised decision support software to provide this service, both in office hours and out-of-hours. Whilst there is some evidence that telephone triage may reduce GP workload4,5, there is equivocal evidence that telephone triage is a safe6-9 and satisfactory means of delivering care to patients5,10. The quality of patient-clinician interaction during triage and telephone consultation is key to aspects of safety, effectiveness, patient experience2,11 and, potentially, to health outcomes12. How clinicians communicate with patients and respond to their presenting concerns within telephone triage consultations is therefore central to decisions about its delivery within primary care."
Research comparing how GPs and nurses communicate with patients within face-to-face consultations has identified patterned differences in the process of assessing patients and in the opportunities afforded to patients to explain their presenting problems13."

Please note, in making the above change we replaced the reference to Crouch et al (1997) with Lattimer et al (1998) as this latter study demonstrating safety of telephone triage was the largest trial prior to the ESTEEM trial (Campbell et al, 2013).

b. Page 5, paragraph 2, old text:
"A recent retrospective case review of closed malpractice claims regarding telephone-related consultations in the United States17 found that 38% of litigation cases were because of problems with communication. Reporting on cases involving clinicians from a range of professional disciplines, Katz et al suggested that as workload increases, clinicians may rush through triage and in some cases patients may be doing the triage rather than the clinician. If nurse/GP triage is to be widely used within

primary care in the UK there is a need for greater insight into patient-clinician telephone communication that is both safe and acceptable to patients. To date there has been no research that has directly compared telephone triage communication of nurses using CDSS with GPs conducting telephone triage without the additional support of CDSS."

Page 5, paragraph 3, new text:
"A recent retrospective case review of closed malpractice claims regarding telephone-related consultations in the United States21 found that 38% of litigation cases were because of problems with communication. Reporting on cases involving clinicians from a range of professional disciplines, Katz et al suggested that as workload increases, clinicians may rush through triage and in some cases patients may be doing the triage rather than the clinician. In a similar analysis of calls to Swedish Healthcare Direct, Ernesater et al22 reported that failures in communication and asking the caller too few questions were commonly observed in malpractice claims, a finding also reported in a Dutch study of simulated calls to out-of-hours centres17.
If nurse/GP triage is to be widely used within primary care in the UK there is therefore a need for greater insight into patient-clinician telephone communication that is both safe and acceptable to patients."

3. Reviewer 1 commented that "The paper would be even more important and interesting if its theoretical underpinnings are clarified and more thoroughly described" We agree with the reviewer that this would provide interesting additional detail of our approach but feel that there would be insufficient space to discuss this at length in this article.

4. Reviewer 1 suggested we move the description of the CDSS to the introduction. Although we acknowledge that a description of the Odyssey software might be helpful earlier in the article we feel it is best placed in the findings section for two reasons. The introduction provides a literature review and key rationale to the study and we feel the description would appear out of place here; and secondly it currently provides a description of Odyssey which sets the context for the presentation of the nurse extracts.

5. Reviewer 1 requested that we provide a justification for the study design. The following text has now been inserted into the methods section:

a. Page 6, paragraph 1, old text:
"The research was a sub-study, and formed part of the recruitment process for the ESTEEM trial18, the first multi-centre randomised controlled trial to compare GP-led vs. nurse-led telephone triage vs. usual care for UK patients requesting same-day appointments. Five intervention practices were approached (2 Nurse, 3 GP), from whom two were successfully recruited (1 Nurse, 1 GP)."

Page 6, paragraph 3, new text:
"The research was a sub-study, and formed part of the recruitment process for the ESTEEM trial18, the first multi-centre randomised controlled trial to compare GP-led vs. nurse-led telephone triage vs. usual care for UK patients requesting same-day appointments. A qualitative comparative study of nurse-led and GP-led triage consultations was used to enable close analysis of interaction between clinicians and patients; and the role the CDSS played in organising nurse-patient interactions.

Five intervention practices were approached (2 Nurse, 3 GP), from whom two were successfully recruited (1 Nurse, 1 GP)."

6. Reviewer 1 commented that: "The study is conducted as a quantification of mostly qualitative data. A more in-depth methodological discussion about this is needed." We agree with the reviewer that this

would provide interesting additional detail of our approach but feel that there would be insufficient space to discuss this at length. However, we have included a brief description in the analysis section to explain why such an approach was taken:
a. Page 7, paragraph 2, old text:
“All calls were transcribed in detail according to standard conversation analytic conventions19 (see Box 2 for transcription key). Call lengths were measured from audio-recordings. We adapted an established conversation-analytic coding scheme for analysis of question-response sequences20.”

Page 8, paragraph 1, new text:
“All calls were transcribed in detail according to standard conversation analytic conventions24 (see Box 2 for transcription key). Call lengths were measured from audio-recordings. This led to identifying potentially important differences between the two groups in call length and numbers of questions clinicians asked. In order to understand the nature of these differences we adapted an established conversation-analytic coding scheme for analysis of question-response sequences25. Conversation analysis is increasingly being used to support medical research aimed at understanding the distribution of interactions by offering operational definitions of phenomena that can subsequently be coded and counted26.”

7. Reviewer 1 requested some clarification of “lexicomorpho-syntactic or prosodic interrogative marking” and a justification for not coding questions seeking acknowledgement, repair questions and questions that suggest, propose, or offer.

We agree that although other types of questions may be consequential for how the consultation proceeds, the focus of our coding was specifically the series of questions driving the process of clinical assessment. We therefore excluded any other categories of question oriented towards different actions i.e. actions not directly relevant to decision-making about triage outcomes. However, we agree that our use of lexicomorpho-syntactic or prosodic interrogative marking” is unnecessarily complicated and have taken the decision to remove it. We have made the following change to the analysis section:
a. Page 7, paragraph 2, old text:
Questions had to be either (or both) a formal question (i.e., it had to rely on lexico-morpho-syntactic or prosodic interrogative marking) or a functional question (i.e., it had to effectively seek to elicit information, confirmation or agreement whether or not they made use of an interrogative sentence type);

Page 8, paragraph 2, new text:
Questions had to effectively seek to elicit information, confirmation or agreement whether or not they made use of an interrogative sentence type);

8. Reviewer 1 commented that call-outcome would have provided important additional information. Table 2 provides details of call outcome for the patient sample. We are able to provide call outcome for the individual extracts but they are presented as prototypical cases of question-response sequences and the consequences of such interactions for ongoing talk. We are not however arguing that such talk leads to a particular triage outcome. We therefore feel that adding call outcome for these individual extracts is not particularly informative.

9. Reviewer 3 commented that: “What might be relevant is at what moment the nurse decided to determine the outcome? From own research we learned that 50% of questions asked by nurses (not CDSS guided) did not include high urgency questions but they were more diagnostic oriented.”
In our data we only observed instances of nurses asking more diagnostic oriented questions when not using CDSS, and we have reported an example of this in our findings (Box 6). We also agree with the reviewer that the moment nurses determine the outcome is an interesting consideration that

influences the style of nurse questioning and trajectory of the call. To do so would require interview data which asked nurses to make retrospective decisions about points at which these decisions were made. In this study we used a conversation analysis methodology to analyse how clinicians and patients could be seen to orientate to particular styles of questions and responses as evidenced within the interactions themselves and the consequences this had for ongoing talk. The issue is therefore how decisions about determining triage outcome are manifested in the question-style itself. Answering this question was not the focus of this study (and so we have not discussed this issue in the manuscript) but recognise that it would make an interesting component of a follow-on study.

10. Reviewer 1 commented that: “It is not clear to me why only nurses were video-recorded. Video-recording of GPs might have provided interesting and non-expected findings.”
Although GPs did not use CDSS to triage patients, we accept the Reviewer’s comment and recognise that GPs may have consulted the electronic patient record when triaging patients which may have provided an interesting comparison to the nurse data. We have now inserted the following text in the discussion:

a. Page 21, paragraph 3, old text:
“This study was limited by the inclusion of only two GP practices. It is possible that nurses and GPs conducting triage in other GP surgeries would have employed different patterns of distribution of question designs, actions and activities to those reported here. It might also be the case that given further training and experience of the CDSS, nurses would have delivered different interactions from those we observed here.”

Page 22, paragraph 3, new text:
“This study was limited by the inclusion of only two GP practices. It is possible that nurses and GPs conducting triage in other GP surgeries would have employed different patterns of distribution of question designs, actions and activities to those reported here. Although GPs did not use CDSS to triage patients, we also recognise that GPs may have actively consulted electronic patient records whilst triaging which might have provided an interesting comparison to the nurse data.

Given further training and experience of the CDSS, nurses might have delivered different interactions from those we observed here.”

11. Reviewer 1 requested that we elaborate further on how the findings can be used to develop training for clinicians. Reviewer 2 also commented that: “Until research has been done on how patients respond to these two different approaches, it may be difficult to be more assertive about the effectiveness of these approaches. However, some more, if rather speculative conclusions on the costs and benefits of these two approaches would add to its practical relevance.”
In addressing these points a key issue is whether adapting question design when using CDSS impacts on patient experience and triage outcome, but also whether more extensive training of CDSS makes a difference to how nurses conduct triage calls. Our findings therefore highlight a number of potential follow-on interventional studies that could compare nurses with different levels of training in the use of CDSS and also nurses who receive training in question design. We have now included the following text in the discussion:

a. Page 21, paragraph 2, old text:
“However, using CDSS involves extensive questioning which may also unnecessarily contribute to longer triage times. A key issue is therefore how these different triage methods affect triage outcome and overall consultation time. The benefit of GPs delivering a more patient-centred consultation during triage, or nurses focusing solely on patient management, for patients and in terms of resources therefore remains unclear.”

Page 22, paragraph 2, new text:
“However, using CDSS involves extensive questioning which may also unnecessarily contribute to longer triage times. How these different triage methods affect triage outcome and overall consultation time; whether training nurses to adapt their question design when using CDSS affects triage outcome; and how patients experience and respond to these different approaches are key issues requiring investigation.”

b. Page 22, paragraph 1, old text:
“This is backed up by our observation of nurses’ different questioning pattern when not using CDSS. The resonance between nurses’ questioning in our data and interactions observed in NHS Direct consultations14; and the GP’s questioning style in our data and previous research on telephone consultations11 also indicates how our findings may be transferred to other primary care settings. Studies such as the one reported here therefore offer important insights into the actual implementation of telephone triage using different professionals, and how CDSS can organise telephone triage interactions and patient experiences. Such insights can assist both with the training of those professionals in conducting triage, help improve the design of CDSS systems, and manage patient expectations.”

Page 23, paragraph 2, new text:
This is backed up by our observation of nurses’ different questioning pattern when not using CDSS. Investigating how nurses with extensive training in the use of CDSS communicate with patients, and how this compares with nurses not using CDSS would therefore provide important insights into the contribution of CDSS in supporting nurses to deliver safe and effective patient management. The resonance between nurses’ questioning in our data and interactions observed in NHS Direct consultations18; and the GP’s questioning style in our data and previous research on telephone consultations15 also indicates how our findings may be transferred to other primary care settings. Training for telephone triage could be designed to incorporate working with sample recordings and transcripts of real calls to illustrate the full range of questions that can be asked in the interrogative series; and how question design itself can be consequential for the nature of a patient’s response. Studies such as the one reported here therefore offer important insights into the actual implementation of telephone triage using different professionals, and how CDSS can organise telephone triage interactions and patient experiences. Such insights can assist with the training of those professionals in conducting triage; with revealing how the design of CDSS systems might be more effectively configured; and with the management of patient expectations around new technologies for medical service delivery.

12. Reviewer 1 suggested that we discuss patient safety in more detail in the discussion, particularly in relation to CDSS. Reviewer 3 also asked for more detail on patient safety. To fully address the question of CDSS and safety would require a whole review in its own right but accept that some discussion of safety and CDSS would be helpful. We have therefore made the following change to the discussion section:
a. Page 22, paragraph 1, old text:
Studies such as the one reported here therefore offer important insights into the actual implementation of telephone triage using different professionals, and how CDSS can organise telephone triage interactions and patient experiences. Such insights can assist both with the training of those professionals in conducting triage, help improve the design of CDSS systems, and manage patient expectations.

Page 24, paragraph 1, new text:
Studies such as the one reported here therefore offer important insights into the actual implementation of telephone triage using different professionals, and how CDSS can organise

telephone triage interactions and patient experiences. Such insights can assist both with the training of those professionals in conducting triage, help improve the design of CDSS systems, and manage patient expectations.
Although the parent trial to this study examined the issue of patient safety alongside telephone triage23, we did not specifically examine safety in this qualitative study. Previous relevant reviews2,35, and individual studies4,6,17,36 are conflicting in respect of patient safety outcomes and the related matters of hospital admissions or A&E attendance associated with triage. Specific concerns have been raised in relation to the quality of information gathering in telephone triage consultations8,17, and the differences in information-gathering between nurses using CDSS, and GPs not using CDSS, in our findings place communication, information-gathering and the role of CDSS at the heart of ongoing debates about patient safety.

VERSION 2 – REVIEW

REVIEWER	Inger k. Holmström Mälardalen university Scool of heatlh, care and social welfare Sweden
REVIEW RETURNED	04-Feb-2014

GENERAL COMMENTS	I congratulate the authors to their beatifully revised manuscript. I think they have handled my questions and suggestions in a very constructive way, and further improved this very important and instersting manuscript. I have no further remarks.

REVIEWER	H.Derkx Maastricht university. The Netherlands, Faculty of Medicines
REVIEW RETURNED	02-Feb-2014

GENERAL COMMENTS	The need for further reasearch on telephone communication is clearly described but this can not be emphasised enough as this study shows. Personal note for investigators. In the Netherlands I work for a medical call centre and there we use since many years this CDSS system but our agents are intensively trained on telephone commuication according the RICe instrument. If they are interested to hear morte about this, please contact me directly. hay.derkx@medicinfo.nl I would liked to read in the discussion something about the questions; who are doing a better (=safer) telephone triage? An ethical problem demonstrated and provoced by this research