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Journal:	*BMJ Open*
Manuscript ID	bmjopen-2016-015038
Article Type:	Research
Date Submitted by the Author:	04-Nov-2016
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Primary Subject Heading:	Communication
Secondary Subject Heading:	Anaesthesia, Qualitative research
Keywords:	Anaesthetic clinic, Handover, Postoperative, Qualitative study

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The postoperative handover: a focus group interview study with nurse anaesthetists, anaesthesiologists, and PACU nurses

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Word count: excluding title page, abstract, references, figures and tables: 3966 words

Keywords: Anaesthetic clinic, Handover, Postoperative, Qualitative study

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ABSTRACT

OBJECTIVES To investigate different professionals' (nurse anaesthetists', anaesthesiologists', and postanaesthesia care unit nurses') descriptions of and reflections on the postoperative handover.

DESIGN A focus group interview study with a descriptive design.

SETTING One anaesthetic clinic at two hospitals in Sweden.

PARTICIPANTS Six focus groups with 23 healthcare professionals involved in postoperative handovers. Each group was composed on the basis of profession: nurse anaesthetists (n=8), anaesthesiologists (n=7) and postanaesthesia care unit nurses (n=8).

RESULTS Through qualitative content analysis of interview transcripts, patterns and five categories emerged: 1) Having different temporal focus during handover, 2) Insecurity when information is transferred from one team to another, 3) Striving to ensure quality of the handover, 4) Weighing the advantages and disadvantages of the bedside handover, and 5) Having different perspectives on the transfer of responsibility. The professionals' descriptions of and reflections on the postoperative handover differed with regard to the temporal focus during handover and perspectives on the transfer of responsibility. All professional groups were insecure about having all information needed to ensure the quality of care. They strived to ensure quality of the handover by: focusing on matters that deviated from the normal course of events, aiding memory through structure and written information, and cooperating within and between teams. They reflected on the bedside handover as enhancing their control of the patient. On the other hand, they also reflected on the bedside handover as a threat to the patient's integrity as well as frequent interruptions could be disturbing.

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CONCLUSIONS There are similarities and differences between the three professional groups' perspectives on postoperative handover; these may affect patient care. Further studies are needed to reach shared understanding and consensus across professional groups – within the operating theatre team and between the operating theatre team and the postanaesthesia care unit team – to ensure safe postoperative care.

Strengths and limitations of the study

- To the best of our knowledge, this is the first study investigating nurse anaesthetists', anaesthesiologists', and PACU nurses' views on postoperative handover using focus group interviews.
- Focus group interviews have the advantage of reaching a wider range of views through group interaction than individual interviews.
- A strength of the study was that personnel involved in postoperative handover was interviewed using profession-based groups to find out each group's perspective on the handover.
- A further strength was that the interviews were observed by an assistant moderator and all participants agreed upon the summary.
- One limitation could be that each group was quite small.

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INTRODUCTION

The handover consists of three key aspects: transfer of 1) information, 2) responsibility and/or accountability, in 3) the context of teams and their work environments.[1] With regards to information transfer, studies have shown that anaesthesiologists and postanaesthesia care unit (PACU) nurses had different expectations concerning the content of information transferred [2] and opinions on what information needs to be reported.[3] Although the handover consists of transfer of responsibility and/or accountability, one study[4] revealed a lack of consensus among personnel concerning when the transfer of responsibility and/or accountability takes place.[4] Yet, another study[2] showed that, during postoperative handover, the time of transfer of responsibility varied.[2] Concerning working conditions during postoperative handover, personnel often work in teams that consist of several different professionals working together in an environment with frequent interruptions,[2, 5, 6] which interfere with the handover recipient's memory.[7] Teamwork is an essential component of achieving high reliability in health care,[8] and working atmosphere and shared understanding are factors of importance to the quality of handover.[9] Poor surgical teamwork behaviour concerning information sharing during intraoperative and handover phases has been shown to be significantly associated with more frequent postoperative complications or death.[10]

To summarize, postoperative handovers are crucial to patient safety. However, there is a lack of consensus about what constitutes a good handover.[11-13] A systematic review of postoperative handover by Møller *et al.*[14] concluded that it is important to acknowledge the role of communication, teamwork and collaboration within the setting.[14] It is important that different professionals have a shared understanding.[9, 15] To achieve such an understanding, it is essential to generate knowledge about each professional group's views on postoperative handover. Qualitative studies of postoperative handovers between anaesthesiologists and

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PACU nurses, using individual interviews, have been conducted.[16-19] To date, however, no study has investigated nurse anaesthetists', anaesthesiologists', and PACU nurses' views on postoperative handover using focus group interviews.

Aim

The aim of the present study was to investigate different professionals' (nurse anaesthetists', anaesthesiologists', and PACU nurses') descriptions of and reflections on the postoperative handover.

METHODS

Design

A focus group interview study with a descriptive design was used.[20, 21]

Setting

The participants worked in an anaesthetic clinic located at two medium sized hospitals, which shared the same top management and were located in the same county council district in central Sweden. In Sweden, postoperative handovers at the PACU between a nurse anaesthetist (the sender) and a specialist nurse in intensive care (the receiver) are common. Nurse anaesthetists may, with support from the anaesthesiologist, independently induce, maintain and conclude general anaesthesia. A specialist nurse in intensive care may judge, address and evaluate, e.g., analgesia and sedation.[22] During the period June 2014 to June 2015, 16,004 operations from different specialties (13,235 inpatients and 2,769 outpatients) were performed at the two hospitals. At the anaesthetic clinic, the communication tool Situation-Background-Assessment-Recommendation (SBAR)[23] and the WHO Surgical

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Safety Checklist[24]were used. The WHO Surgical Checklist was developed to increase teamwork and communication in surgery. The checklist is designed to ensure patient safety on three occasions during the surgical procedure: "Sign in (before the induction of anaesthesia), "Time out" (before the incision of the skin), and "Sign out" (before the patient leaves the OT).[24]

Data collection

A total of six focus groups interviews were conducted from January to May 2015. Purposive sampling was used, and the heads of department established contact with potential participants who had at least one year's experience in the profession. The participants received oral and written information about the study. The composition of the groups was based on the participants' similar professions, role and experience of the same issue,[21] the goal being to identify patterns in the professional groups' descriptions of and reflections on postoperative handover. The six focus groups consisted of two groups of nurse anaesthetists, two groups of anaesthesiologists, and two groups of PACU nurses. In total, 23 respondents participated (Table 1). The study was approved by the Regional Ethical Review Board in Uppsala (reg. no. 2011/061).

Table 1. Demographic characteristics of participants

Profession	Gender Male/Female	Median age (Q1-Q3)[3]	Median years of practice[1] (Q1-Q3)[3]
Nurse Anaesthetists	2/6	40 (34-44)	3 (2-16)
Anaesthesiologists	5/2	54 (47-61)	24 (15-30)
PACU nurses[2]	0/8	59 (55-63)	34 (23-40)

[1]Years of practice in current profession. [2] PACU (Postanaesthesia care unit) nurses were all Specialist Nurses in Intensive Care, which means registered nurses with one year of training and a degree in intensive care. [3]Quartiles.

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A semi-structured interview guide was used covering key topics.[21] The guide was pilot-tested on a focus group of PACU nurses in another hospital, and minor changes were made. All interviews were conducted by one moderator (MR), who is a nurse anaesthetist and specialist nurse in intensive care with 22 years' experience in the professions. During the interviews, the assistant moderator (GM) observed the interaction between participants in the group and made notes.[20] The interviews lasted 1-1,5 hours and were held in an undisturbed room at the participants' workplace and digitally recorded. The interview began with opening questions to get everyone to talk; thereafter, introductory questions were posed to introduce the topic of the questions and to encourage conversation among the participants. To move the conversation closer to the key questions, transition questions were posed.[20] The key questions concerned the participants' descriptions of and reflections on the transfer of 1) information, 2) responsibilities/accountability, in 3) the context of teams and their work environment during postoperative handover. During the interview, the participants were also presented with an example from a transcribed verbal handover in order to stimulate the discussion.[20] Finally, questions about the ideal handover were asked. In the second part of the focus group interview, the main results of an observational study of postoperative handover[6]were presented and discussed, but this is not included in the present analysis. At the end of the interview, the assistant moderator provided a summary, and concluding questions about the adequacy of the summary were posed to enable participants to reflect back on previous comments.[20]

Data analysis

The interviews were analysed using qualitative content analysis.[21] The interviews were listened to and transcripts were read and re-read to obtain an overall impression and become familiar with the text. The three professional groups were first analysed separately, according

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to the study aim, in order to identify preliminary subcategories.[21] Meaning units (sentences and paragraphs) were identified and condensed, abstracted, and labelled with a code. Thereafter, they were sorted into three topics; information, responsibility and/or accountability, in the context of teams and their work environments from the interview guide. The codes within each topic were thereafter grouped into preliminary subcategories based on their similarities and differences. Thereafter, the preliminary subcategories for the three professional groups were compared and subcategories with similar names were scrutinized for differences and similarities and grouped together when found to have the same content. Next, the subcategories were grouped into five categories based on similarities and differences. The analyses were primarily carried out by the first and last author. During the analysis process, the subcategories and categories were discussed with all co-authors until consensus was reached.

RESULTS

From the analysis of the nurse anaesthetists', anaesthesiologists', and PACU nurses' descriptions of and reflections on the postoperative handover, five categories emerged: "Having different temporal focus during handover", "Insecurity when information is transferred from one team to another", "Striving to ensure quality of the handover", "Weighing the advantages and disadvantages of the bedside handover", and "Having different perspectives on the transfer of responsibility." Patterns in the three professional groups' descriptions and reflections appeared, and these patterns are described in each of the categories and subcategories (Table 2). The quotations are presented in italics and the separate character "-" marks that different participant within the group are talking.

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Table 2

Table 2. Categories and subcategories that emerged for each profession, marked by an X

Category	**Having different temporal focus during handover**			**Insecurity when information is transferred from one team to another**		**Striving to ensure quality of the handover**			**Weighing the advantages and disadvantages of the bedside handover**			**Having different perspectives on the transfer of responsibility**		
Subcategory	*Focusing mainly on the past*	*Focusing mainly on the present*	*Focusing on the continuum of care*	*Insecure about having all information needed*	*Insecure about receiver's knowledge*	*Focus the information on deviating events*	*Aid memory by structure and written information*	*Cooperate within and between teams*	*Provide control and save time*	*Threats to integrity*	*The disturbing bedside environment*	*Hand over the responsibility*	*Not handover the responsibility or accountability*	*Require control before taking over responsibility*
Nurse Anaesthetists	X			X	X	X	X	X	X	X		X		
Anaesthesiologists			X	X	X	X	X	X			X		X	
PACU nurses[1]		X		X		X	X	X	X	X	X			X

[1]PACU (postanaesthesia care unit) nurses were all Specialist Nurses in Intensive Care, which means registered nurses with one year of training and a degree in intensive care.

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Having different temporal focus during handover

The three professional groups described different temporal focus during the post-operative handover, e.g., focusing mainly on the past, on the present, and on the continuum of care in its entirety. As senders of information, the nurse anaesthetists described that they focused mainly on what they themselves had done, i.e. the anaesthesia process, and partly on the patients' continuing care. They reflected on the uncertainty concerning which information the PACU nurses considered to be essential and described a disinterest in some of the information reported. The anaesthesiologists described that they focused on the continuum of care from the OT to discharge, e.g., the surgical procedure, observations and recommendations. They described that all personnel should focus on the continuity of care, but they were unsure whether that was the case during the reported handover. Like the nurse anaesthetists, the anaesthesiologists reflected on the insecurity concerning the receivers' focus during handover. As receivers of information, the PACU nurses described a main focus on essential information of importance for the "here and now", e.g., which patient was to be taken care of, vital parameters and recommendations for conducting postoperative care at the PACU. They reflected on nurse anaesthetists' focus as mostly reporting information about the anaesthesia process.

-*"/…/we often report on how the anaesthesia went, if the patient was stable and such things /…/because that's the main thing for us.* "-"*/…/we report on things we're interested in and they* [PACU nurses] *have other interests."* (Nurse anaesthetists)

Insecurity when information is transferred from one team to another

All professional groups described and reflected on the insecurity about whether all of the information needed was actually transferred from one team to another. The nurse anaesthetists described that they were obliged to transfer all important information about the patient from

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3 the OT team to the PACU team, but like the anaesthesiologists and PACU nurses, they
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5 described doubts about whether all of the essential information from the surgeon or theatre
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7 nurse was transferred before the patient left the OT. The anaesthesiologists described
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9
10 insufficient "sign out" between the main surgeon and the nurse anaesthetist before the patient
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12 left the OT and reflected on this as a risk of postoperative misjudgements. They saw
13
14 improvements if important information was always communicated by the main surgeon
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16 before the patient left the OT. Furthermore, several information transfers and lack of
17
18 knowledge are potential risks for the patient's continued care.
19
20
21
22 -*"We don't know a thing about that* [catheters, dressings, drainage]. *The surgeon often escapes*
23 *before saying anything /…/. And then we don't have answers to the PACU's questions."*
24 (Nurse anaesthetist)
25
26
27
28 -*"/…/it's up to the team to be clear with each other before they leave the operation theatre*
29 *and I think there are shortcomings there. The surgeon may have things in mind that aren't*
30 *conveyed and that I don't comprehend. There are four perspectives that need to become one."*
31 (Anaesthesiologist)
32
33
34
35 -*"/…/And how they coped with the surgery because the others* [Nurse anaesthetists] *don't*
36 *have a clue, you know, what it's all about.*"-"*No, and what they* [Surgeons] *have*
37 *done."*(PACU nurses)
38
39
40
41 The nurse anaesthetists also described insecurity as to whether the information was
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43 understood, and the anaesthesiologists described insecurity about the receivers' knowledge
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45 when they did not know the particular PACU nurse. Furthermore, the nurse anaesthetists and
46
47 anaesthesiologists reflected on the need of confirmation from the receiver, so that they could
48
49
50 be sure that the information was understood.
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52
53 -*"/…/But I would probably have liked for the person who receives somewhere, for them to*
54 *summarise and confirm what they have been told. Then I leave and I have made my report but*
55 *I don't know whether they understood what I wanted."*(Anaesthesiologist)
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Striving to ensure quality of the handover

The three professional groups described and reflected on how they strived to ensure quality during the handover by: focusing the information on deviating events, aiding memory through structure and written information, and cooperating within and between teams. All of the groups described the importance of emphasizing information on matters that deviate from the normal course of events. They expressed that information concerning the anaesthetic and surgery process that has proceeded as expected, is less important to mention. The nurse anaesthetists and anaesthesiologists also reflected on the importance of limiting the amount of information during postoperative handover.

-*"/…/put the focus on that, if it's something unusual/…/that sticks out or if the patient has a medical background that means you have to think a bit differently.*"-"*Yes, I think so too" – "Yes*"-"*Yes, things that occur during surgery that are out of the ordinary*"-"*/…/where do we draw the line?* "-"*Exactly*"-"*And of course we do, we make some kind of selection and if there is nothing special, the report will be shorter."* (Anaesthesiologists)

-*"And if something special has occurred.*"-"*Yes, with the patient, loss of blood pressure, the pulse increases or something like that, or extraordinary bleeding. Something that they had to do something about, basically."* (PACU nurses)

The nurse anaesthetists described using a structure such as SBAR to aid memory when they reported essential information. The anaesthesiologists described using a structure for their own memory during handover, and they wanted information to be communicated with a structure to serve as a reminder during handover. The PACU nurses described that they expected to receive the information with a structure. They also reflected on the importance of asking questions, in a structured manner, during the entire handover, rather than only at the end of handover. The nurse anaesthetists and the PACU nurses reflected on the importance of having written information during handover to aid memory, and they felt that the electronic patient records complicated information retrieval.

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3 -*"/…/if you follow the SBAR concept, you have a main thread through the whole thing /…/*"-
4 "*That's what xxx says about the main thread, that you find it and thinks that SBAR helps you*
5 *here."* (Nurse anaesthetists)
6
7
8
9 -*"Yes, if there's anything special there I want to – but what was your thinking there? But we*
10 *have been taught to ask our questions later and that's.*"-"*Not easy.*"-"*There is a risk that you*
11 *forget since there's a lot going on around you. You should have the opportunity to interrupt,*
12 *at least once."* (PACU nurses)
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14
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16 All professional groups saw benefits of cooperation. The nurse anaesthetists reflected on the
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18 need for improved cooperation within the OT team as well as for developing further
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20 collaboration between the OT team and the PACU team to increase interaction around
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23 achieving consensus before executing the handover. The PACU nurses described advantages
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25 when the theatre nurses and the nurse anaesthetist collaborated during handover as more
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28 information about the surgery process was transferred, but also disadvantages as the handover
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30 then became more unstructured. The anaesthesiologists and the PACU nurses described the
31
32 benefits of cooperation within the PACU team, as it facilitated and safeguarded the handover
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34 situation.
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36
37 -*"/…/need to discuss how we will report and who will do the reporting and what should be*
38 *reported, and we have to have this discussion among ourselves in the OT and we need have it*
39 *with the PACU nurses /…/and arrive at some consensus/…/"* (Nurse anaesthetist)
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43 **Weighing the advantages and disadvantages of the bedside handover**
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46 The professional groups described and reflected on both advantages and disadvantages with
47
48 the bedside handover. Nurse anaesthetists and PACU nurses reflected on the benefits of
49
50 carrying out handovers close to the patient, as this provided control over the patient's medical
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52 condition, on the other hand it might threaten the patient's integrity. The nurse anaesthetists
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54 described decisions about whether the handover should be performed bedside depending on
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57 whether the information transferred was meant to be heard by the patient. The PACU nurses
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also reflected on the time-saving benefits of the bedside handover, compared with a handover in a separate room. The anaesthesiologists and the PACU nurses reflected on the disturbing bedside environment as it sometimes entailed frequent interruptions, which they felt caused stress and distraction.

-*"When you're standing at the bedside you can check the vital parameters and see that everything is fine when you hand the patient over*"-"*Yes"* (Nurse anaesthetists)

--*"/…/I prefer having the patient in front of me/…/The times the nurse anaesthetist come and report on a patient I can't see, that upsets me, because I would really like to see who they're talking about.*"-"*I want to have control."* (PACU nurses)

-*"While giving my report/…/if I'm disturbed/…/I mean if my thoughts are interrupted. I think that's dangerous, because every time it happens is harder to return to the main thread"* (Anaesthesiologist)

-*"Well, that the machines are beeping and ringing, it gets your adrenalin going, because you're used to reacting to it.*"-"*Well, then your attention easily shifts to the beeps.*"-"*That´s the way it is.*"-"*You're disturbed and distracted. And that's the idea, it is a warning signal to us."* (PACU nurses)

Having different perspectives on the transfer of responsibility

The professional groups described different perspectives on the transfer of responsibility. The nurse anaesthetists, that they handed over responsibility when all the information was given to the PACU nurse and when they left the PACU. The anaesthesiologists handed over responsibility to other physicians, but their overall responsibility (accountability) remained even after handover to a PACU nurse. The PACU nurses described that they required control over the patient's condition before taking over the responsibility. Uncertainty about responsibility arose when the nurse anaesthetist provided incomplete information about the patient or when the nurse anaesthetist failed to complete tasks that he/she was supposed to have done prior to handover.

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-*"When you hand information over you include what you know and then the responsibility is someone else's"* (Nurse anaesthetists)

-*"We don't transfer the responsibility just because we've transferred the patient.*"-"*As a medical doctor, you still hold overall responsibility."* (Anaesthesiologists)

"/…/you have to wait before taking all of the responsibility, because they should already had found out certain things in the operating theatre/…/" "but I have to know/…/you have to know what we're going to do with this patient." (PACU nurse)

Observation of interaction during focus group interviews

During the interviews the interaction between the participants was observed by the assistant moderator. A friendly atmosphere was observed, the participants seemed to be familiar with each other and no participant seemed shy or otherwise reluctant to speak. The topic engaged them with a lively discussion and "postoperative handover" did not seem to be a sensitive topic. Within the groups, no single participant dominated the discussion and each participant had roughly the same amount of time to talk. During the focus group interviews the participants often confirmed each other non-verbally, e.g. by nodding or smiling back, and verbally, by completing each other's statements and sentences.

DISCUSSION

In the present study, the postoperative handover content time frame differed between the three professional groups. The nurse anaesthetists mainly focused on the past, the anaesthesiologists mainly focused on the continuum of care, and the PACU nurses mainly focused on the present but reflected on nurse anaesthetists' handover as mostly concerning information about the anaesthesia process. The nurse anaesthetists, in turn, reflected on PACU nurses as not interested in the information transferred. If the sender transfers information concerning the

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past (i.e., the anaesthesia process) that the receiver pays less attention to, because he/she is focusing on factors important to the continuing care, we might assume that the receiver will remember this information less well. According to Flin *et al.,*[25] listening is an active process, and even under ideal circumstances with an interested listener, only about one-third of what is heard is actually listened to, even less if the listener is not interested.[25] In line with this, a previous study[6]showed that of the items transferred during postoperative handover, the drugs used during anaesthesia were the items least likely to be remembered by the PACU nurses.[6]

The groups described risks when information from the OT team was transferred to the PACU team if they did not have all of the essential information from the surgeon. According to Sandberg and Targama,[15] people in an organization must have a shared understanding if cooperation is to be achieved. This involves having both a similar understanding of the collective's work in its entirety, and an understanding of their specific roles and competence in the performance of a task.[15] There is a need for the different professional groups within the OT team and between the OT team and the PACU team to have a shared understanding of the whole so as to ensure the patient's continuing care. In the present study, the participants' reflections indicate that there is room for improvement.

The professional groups described strategies for ensuring the quality of handover. At first, to focus on deviating events. This is in line with one of the recommendations for improving communication in teams made by Flin *et al.*[25]; that the message should be as brief as possible, including only the most relevant information owing to the costs of attention and cognitive resources for both the sender and the receiver.[25] Another strategy, described by

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3 the professional groups, was using a structure for the information that is handed over.
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5 Communication with high predictability can be said to contain redundancy, which facilitates
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7 the receiver's interpretation of the message.[26] The notion that there are benefits of using a
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9 structure is in line with findings from other studies.[e.g.] [27, 28] A third strategy was to see the
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11 benefits of cooperation between and within the teams as well as have a shared understanding,
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13 which is in line with earlier studies.[e.g.][9, 15, 17]
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17 It is well known that the PACU environment is marked by frequent interruptions,[6, 29] and
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19 findings in the present study were seen as these could lead to distractions. Nevertheless, both
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21 the nurse anaesthetists and PACU nurses described the benefits of the bedside handover, as it
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23 increased control of the patient. Results of a study by Frankel *et al.*[30] concerning context,
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25 culture and communication during handover suggested that a "joint focus of attention" has the
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27 greatest potential for achieving a high-quality and reliable handover. Such an approach
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29 coordinates the sender's and receiver's verbal and visual attention jointly on an artefact.
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31 Redundancy in the visual field gives a momentary "joint focus of attention" using
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33 simultaneous inputs.[30] The bedside handover, described by the nurse anaesthetists and
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35 PACU nurses in the present study, has the ability to create a "joint focus of attention". On the
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37 other hand, interruptions interfere with memory and therefore should be minimized.[6, 31]
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45 The professional groups gave different descriptions of the part of the handover that concerned
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47 responsibility. Greenberg *et al.*[32] investigated malpractice claims due to communication
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49 breakdowns during the preoperative, intraoperative and postoperative period and found that
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51 43% occurred during handover and that ambiguity about responsibilities was a commonly
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53 associated factor.[32] As in a study by Smith and Mishra,[5] the PACU nurses did not accept
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55 taking over responsibility if the handover was not completed.[5] In contrast to the nurse
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anaesthetists, the anaesthesiologists did not hand over the responsibility after handover to a PACU nurse. Since ambiguity concerning responsibility seems to be a contributing factor to adverse events the professional groups' responsibility should be clearly stated.

Strengths and weaknesses of the study

Previous studies of handovers gave rise to the notion that professions involved in postoperative handover might have different perspectives on the handover. We chose focus group interviews with profession-based groups consisting of participants with great experience of postoperative handover. The number of participants in each group was quite small. On the other hand, Kreuger and Casey[20] recommended that a group with fewer participants is preferable when the purpose is to understand an issue or behaviour, when the topic is complex, and when the participants' level of experience is high.[20] The text was analysed and discussed by two authors (MR, GM) and the subcategories and categories were discussed with all co-authors until consensus was reached to achieve credibility.[33] The first author was familiar with the context investigated, which may have threatened the confirmability. Conducting the analysis together with a co-author with a different clinical background may have decreased this risk.[34] The assistant moderator observed the interaction between the participants. All participants had opportunities to voice their opinion about the handover and everyone agreed on the summary. With a view to increase trustworthiness, we have tried to explain the context and the data analysis as thoroughly as possible in order to allow the reader to determine the transferability of the present results.[34]

Conclusion

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The present study showed similarities as well as differences between the nurse anaesthetists', anaesthesiologists', and postanaesthesia care unit nurses' descriptions of and reflections on postoperative handover. Further studies of handover are needed in order to reach a shared understanding across the professional groups and of their work in its entirety, to ensure high quality and safe care.

ACKNOWLEDGEMENTS

Assistance with the study We would like to thank the participants for their contribution to this study.

Contributors All authors (MR, ME, CLS and GM) contributed to the design, interpreted data, drafted and revised the article critically. MR and GM collected the data. Data analysis was primarily conducted by MR and GM, and the data were discussed with all authors (MR, ME, CLS and GM). MR wrote the manuscript under the supervision of ME, CLS and GM. All authors read and approved the final version of the paper.

Funding This work was supported by the Faculty of Health and Occupational Studies, University of Gävle and by the County Council Gävleborg. It was also supported by the Patient Insurance LÖF and the Swedish Society of Nursing, but these organizations had no role in the design or running of the study.

Competing interests All authors have completed the ICMJE uniform disclosure form at www.icmje.org/coi_disclosure.pdf and declare: MR has received research grants from Patient Insurance LÖF and the Swedish Society of Nursing; no other relationships or activities that could appear to have influenced the submitted work.

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Presentation The study was presented in the thesis Randmaa M., Communication and Patient Safety: transfer of information between healthcare personnel in anaesthetic clinics. Uppsala: Acta Universitatis Upsaliensis 2016. ISBN 978-91-554-9489-6

Ethics approval The Regional Ethical Review Board in Uppsala, Sweden (reg. no. 2011/061) on 9 March 2011.

Data sharing statement There are no additional data available for data sharing.

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The postoperative handover: a focus group interview study with nurse anaesthetists, anaesthesiologists, and PACU nurses

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2016-015038.R1
Article Type:	Research
Date Submitted by the Author:	07-Feb-2017
Complete List of Authors:	Randmaa, Maria; Faculty of Health and Occupational Studies, Department of Health and Caring Sciences Engström, Maria; University of Gävle, Faculty of Health and Occupational Studies; Uppsala University, Department of Public Health and Caring Sciences Leo Swenne, Christine; Uppsala University, Department of Public Health and Caring Sciences Mårtensson, Gunilla; University of Gävle, Faculty of Health and Occupational Studies; Uppsala University, Department of Public Health and Caring Sciences
Primary Subject Heading:	Communication
Secondary Subject Heading:	Anaesthesia, Qualitative research
Keywords:	Anaesthetic clinic, Handover, Postoperative, Qualitative study

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The postoperative handover: a focus group interview study with nurse anaesthetists, anaesthesiologists, and PACU nurses

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Word count: excluding title page, abstract, references, figures and tables: 4411 words

Keywords: Anaesthetic clinic, Handover, Postoperative, Qualitative study

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ABSTRACT

OBJECTIVES To investigate different professionals' (nurse anaesthetists', anaesthesiologists', and postanaesthesia care unit nurses') descriptions of and reflections on the postoperative handover.

DESIGN A focus group interview study with a descriptive design using qualitative content analysis of transcripts.

SETTING One anaesthetic clinic at two hospitals in Sweden.

PARTICIPANTS Six focus groups with 23 healthcare professionals involved in postoperative handovers. Each group was composed on the basis of profession: nurse anaesthetists (n=8), anaesthesiologists (n=7) and postanaesthesia care unit nurses (n=8).

RESULTS Patterns and five categories emerged: 1) Having different temporal focus during handover, 2) Insecurity when information is transferred from one team to another, 3) Striving to ensure quality of the handover, 4) Weighing the advantages and disadvantages of the bedside handover, and 5) Having different perspectives on the transfer of responsibility. The professionals' perception of the postoperative handover differed with regard to the temporal focus and the transfer of responsibility. All professional groups were insecure about having all information needed to ensure the quality of care. They strived to ensure quality of the handover by: focusing on matters that deviated from the normal course of events, aiding memory through structure and written information, and cooperating within and between teams. They reflected on the bedside handover as enhancing their control of the patient, but also that the bedside handover could threaten the patient's integrity and that frequent interruptions could be disturbing.

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CONCLUSIONS

The present findings revealed variations in different professionals' view on the postoperative handover. Healthcare interventions are needed that aim at minimizing the gap between professionals' perception and practice and achieving a shared understanding. Furthermore, to ensure high quality and safe care, stakeholders/decision-makers need to pay attention to the environment and infrastructure in postanaesthesia care.

Strengths and limitations of the study

- To the best of our knowledge, this is the first study investigating nurse anaesthetists', anaesthesiologists', and PACU nurses' views on postoperative handover using focus group interviews.
- Focus group interviews have the advantage of reaching a wider range of views through group interaction than individual interviews.
- A strength of the study was that personnel involved in postoperative handover was interviewed using profession-based groups to find out each group's perspective on the handover.
- A further strength was that an assistant moderator observed the focus group interviews and all participants agreed upon the summary.
- One limitation could be the small sample size in two similar centres.

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INTRODUCTION

The handover consists of three key aspects: transfer of 1) information, 2) responsibility and/or accountability, in 3) the context of teams and their work environments.[1] With regards to information transfer, studies have shown that anaesthesiologists and postanaesthesia care unit (PACU) nurses had different expectations concerning the content of information transferred [2] and opinions on what information needs to be reported.[3] Although the handover consists of transfer of responsibility and/or accountability, one study[4] revealed a lack of consensus among personnel concerning when the transfer of responsibility and/or accountability takes place.[4] Yet, another study[2] showed that, during postoperative handover, the time of transfer of responsibility varied.[2] Concerning working conditions during postoperative handover, personnel often work in teams that consist of several different professionals working together in an environment with frequent interruptions,[2, 5, 6] which interfere with the handover recipient's memory.[7] Teamwork is an essential component of achieving high reliability in health care,[8] and working atmosphere and shared understanding are factors of importance to the quality of handover.[9] Poor surgical teamwork behaviour concerning information sharing during intraoperative and handover phases has been shown to be significantly associated with more frequent postoperative complications or death.[10]

To summarize, postoperative handovers are crucial to patient safety. However, there is a lack of consensus about what constitutes a good handover.[11-13] A systematic review of postoperative handover by Møller *et al.*[14] concluded that it is important to acknowledge the role of communication, teamwork and collaboration within the setting.[14] It is important that different professionals have a shared understanding.[9, 15] To achieve such an understanding, it is essential to generate knowledge about each professional group's views on postoperative handover. Thus, to identify whether there are potential gaps between different professionals

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that can affect patient safety. Qualitative studies of postoperative handovers between anaesthesiologists and PACU nurses,[16-19] and a mixed methods study[20], have been conducted. To date, however, no study has investigated anaesthesiologists', PACU nurses' and nurse anaesthetists' views on postoperative handover using professional homogenous focus group interviews.

Aim

The aim of the present study was to investigate different professionals' (nurse anaesthetists', anaesthesiologists', and PACU nurses') descriptions of and reflections on the postoperative handover.

METHODS

Design

A focus group interview study with a descriptive design was used.[21, 22]

Setting

The participants worked in an anaesthetic clinic located at two medium sized hospitals in central Sweden, which share the same top management and are located in the same county council district, with about 130 km distance between them. In Sweden, postoperative handovers at the PACU between a nurse anaesthetist (the sender) and a specialist nurse in intensive care (the receiver) are common. Nurse anaesthetists may, with support from the anaesthesiologist, independently induce, maintain and conclude general anaesthesia. A specialist nurse in intensive care may judge, address and evaluate, e.g., analgesia and sedation.[23] During the typical postoperative handover, the

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nurse anaesthetist and PACU nurse stand nearby the patient while looking at the written anaesthetic record, the patient and the monitor. At some occasion, a theatre nurse and a licensed practical nurse are also present. Sometimes an anaesthesiologist is present during the postoperative handover or is the person doing the reporting. The written anaesthetic record contains information about the anaesthetic procedure, e.g. drugs and fluids given, blood loss, vital parameters and the performed surgery. The electronic patient record, where the patient's, e.g., clinical background and medication are documented, is located at some distance away from the patient or in another room.[6] During the period June 2014 to June 2015, 16,004 operations from different specialties (13,235 inpatients and 2,769 outpatients) were performed at the two hospitals. At the anaesthetic clinic, the communication tool Situation-Background-Assessment-Recommendation (SBAR)[24] and the WHO Surgical Safety Checklist[25] were used. The WHO Surgical Checklist was developed to increase teamwork and communication in surgery. The checklist is designed to ensure patient safety on three occasions during the surgical procedure: "Sign in (before the induction of anaesthesia), "Time out" (before the incision of the skin), and "Sign out" (before the patient leaves the OT).[25]

Data collection

A total of six focus group interviews were conducted from January to May 2015. Purposive sampling was used, and the heads of department established contact with potential participants who had at least one year's experience in the profession. The participants received oral and written information about the study, and written informed consent was obtained. Because of the interaction between respondents and the group dynamics, focus group interviews have the advantage of elucidating both individual and shared views on a topic as well as providing rich information.[21] The composition of the groups was based on the participants' similar professions, role and experience of the same issue[22], the goal being

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to identify patterns in the professional groups' descriptions of and reflections on postoperative handover. The six focus groups consisted of two groups of nurse anaesthetists, two groups of anaesthesiologists, and two groups of PACU nurses. In total, 23 respondents participated (Table 1). The study was approved by the Regional Ethical Review Board in Uppsala (reg. no. 2011/061).

Table 1. Demographic characteristics of participants

Profession	Gender Male/Female	Median age (Q1-Q3)[3]	Median years of practice[1] (Q1-Q3)[3]
Nurse Anaesthetists	2/6	40 (34-44)	3 (2-16)
Anaesthesiologists	5/2	54 (47-61)	24 (15-30)
PACU nurses[2]	0/8	59 (55-63)	34 (23-40)

[1]Years of practice in current profession. [2] PACU (Postanaesthesia care unit) nurses were all Specialist Nurses in Intensive Care, which means registered nurses with one year of training and a degree in intensive care. [3]Quartiles.

A semi-structured interview guide was used covering key topics.[22] The guide was pilot-tested on a focus group of PACU nurses in another hospital, and minor changes were made. All focus group interviews were conducted by one moderator (MR), who is a nurse anaesthetist and specialist nurse in intensive care with 22 years' experience in the professions. During the focus group interviews, the assistant moderator (GM) observed the interaction between participants in the group and made notes.[21] The focus group interviews lasted 1-1,5 hours and were held in an undisturbed room at the participants' workplace and digitally recorded. The focus group interview started with opening questions to get everyone to talk; thereafter, introductory questions were posed to introduce the topic in focus and to encourage conversation among the participants. To move the conversation closer to the key questions, transition questions were posed.[21] The key questions concerned the participants' descriptions of and reflections on the transfer of 1) information, 2) responsibilities/accountability, in 3) the context of teams and their work environment during postoperative handover. During the focus group interviews, the participants were also

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presented with an example from a transcribed verbal handover in order to stimulate the discussion.[21] Finally, questions about the ideal handover were asked. In the second part of the focus group interview, the main results of an observational study of postoperative handover[6] were presented and discussed, but this is not included in the present analysis. At the end of the focus group interview, the assistant moderator provided a summary, and concluding questions about the adequacy of the summary were posed to enable participants to reflect back on previous comments.[21]

Data analysis

The focus group interviews were analysed inductively, using qualitative content analysis.[22] The recorded focus group interviews were listened to and transcripts were read and re-read to obtain an overall impression and become familiar with the text. The three professional groups were first analysed separately, according to the study aim, in three steps in order to identify preliminary subcategories.[22] 1) Meaning units (sentences and paragraphs) were identified and condensed, abstracted, and labelled with a code. 2) Thereafter, the codes were sorted into three topics; information, responsibility and/or accountability, in the context of teams and their work environments from the interview guide. 3) The codes within each topic were thereafter grouped into preliminary subcategories. Thereafter, the preliminary subcategories for the three professional groups were put together, compared and subcategories with similar names were scrutinized and grouped together when found to have the same content. Next, the subcategories were compared for similarities and differences and grouped into five categories. The analyses were primarily carried out by the moderator (MR) and the assistant moderator (GM). During the analysis process, the subcategories and categories were discussed with all co-authors until consensus was reached.

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RESULTS

From the analysis of the nurse anaesthetists', anaesthesiologists', and PACU nurses' descriptions of and reflections on the postoperative handover, five categories emerged: "Having different temporal focus during handover", "Insecurity when information is transferred from one team to another", "Striving to ensure quality of the handover", "Weighing the advantages and disadvantages of the bedside handover", and "Having different perspectives on the transfer of responsibility." Patterns in the three professional groups' descriptions and reflections appeared, and these patterns are described in each of the categories and subcategories (Table 2). The quotations are presented in italics and the separate character "-" marks that different participant within the group are talking.

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Table 2

Table 2. Categories and subcategories that emerged for each profession, marked by an X

Category	**Having different temporal focus during handover**			**Insecurity when information is transferred from one team to another**		**Striving to ensure quality of the handover**			**Weighing the advantages and disadvantages of the bedside handover**			**Having different perspectives on the transfer of responsibility**		
Subcategory	*Focusing mainly on the past*	*Focusing mainly on the present*	*Focusing on the continuum of care*	*Insecure about having all information needed*	*Insecure about receiver's knowledge*	*Focus the information on deviating events*	*Aid memory by structure and written information*	*Cooperate within and between teams*	*Provide control and save time*	*Threats to integrity*	*The disturbing bedside environment*	*Hand over the responsibility*	*Not handover the responsibility or accountability*	*Require control before taking over responsibility*
Nurse Anaesthetists	X			X	X	X	X	X	X	X		X		
Anaesthesiologists			X	X	X	X	X	X			X		X	
PACU nurses[1]		X		X		X	X	X	X	X	X			X

[1]PACU (postanaesthesia care unit) nurses were all Specialist Nurses in Intensive Care, which means registered nurses with one year of training and a degree in intensive care.

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Having different temporal focus during handover

The three professional groups reported different temporal focus during the post-operative handover, e.g., focusing mainly on the past, on the present, and on the continuum of care in its entirety. As senders of information, the nurse anaesthetists focused mainly on what they themselves had done, i.e. the anaesthesia process, and partly on the patients' continuing care. They were uncertain concerning which information the PACU nurses considered to be essential and mentioned a disinterest in some of the information reported. The anaesthesiologists reported that they focused on the continuum of care from the OT to discharge, e.g., the surgical procedure, observations and recommendations. They stated that all personnel should focus on the continuity of care, but they were unsure whether that was the case during the reported handover. Like the nurse anaesthetists, the anaesthesiologists were uncertain about the receivers' focus during handover. As receivers of information, the PACU nurses reported focusing mainly on essential information of importance for the "here and now", e.g., which patient was to be taken care of, vital parameters and recommendations for conducting postoperative care at the PACU. They reflected on nurse anaesthetists' focus as mostly reporting information about the anaesthesia process.

-*"/…/we often report on how the anaesthesia went, if the patient was stable and such things /…/because that's the main thing for us.* "-"*/…/we report on things we're interested in and they* [PACU nurses] *have other interests."* (Nurse anaesthetists)

Insecurity when information is transferred from one team to another

All professional groups described and reflected on being uncertain as to whether all of the information needed was actually transferred from one team to another. The nurse anaesthetists reported that they were obliged to transfer all important information about the patient from the OT team to the PACU team, but like the anaesthesiologists and PACU nurses, they reported

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having doubts about whether all of the essential information from the surgeon or theatre nurse was transferred before the patient left the OT. The anaesthesiologists reported insufficient "sign out" between the main surgeon and the nurse anaesthetist before the patient left the OT and reflected on this as a risk of postoperative misjudgements. They saw improvements if important information was always communicated by the main surgeon before the patient left the OT. Furthermore, the anaesthesiologists saw several information transfers and lack of knowledge as potential risks for the patient's continued care.

-*"We don't know a thing about that* [catheters, dressings, drainage]. *The surgeon often escapes before saying anything /…/. And then we don't have answers to the PACU's questions."* (Nurse anaesthetist)

-*"/…/it's up to the team to be clear with each other before they leave the operation theatre and I think there are shortcomings there. The surgeon may have things in mind that aren't conveyed and that I don't comprehend. There are four perspectives that need to become one."* (Anaesthesiologist)

-*"/…/And how they coped with the surgery because the others* [Nurse anaesthetists] *don't have a clue, you know, what it's all about.*"-"*No, and what they* [Surgeons] *have done."*(PACU nurses)

The nurse anaesthetists also reported insecurity as to whether the information was understood, and the anaesthesiologists reported insecurity about the receivers' knowledge when they did not know the particular PACU nurse. Furthermore, the nurse anaesthetists and anaesthesiologists reflected on the need of confirmation from the receiver, so that they could be sure that the information was understood.

-*"/…/But I would probably have liked for the person who receives somewhere, for them to summarise and confirm what they have been told. Then I leave and I have made my report but I don't know whether they understood what I wanted."*(Anaesthesiologist)

Striving to ensure quality of the handover

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The three professional groups described and reflected on how they strived to ensure quality during the handover by: focusing the information on deviating events, aiding memory through structure and written information, and cooperating within and between teams. All of the groups mentioned the importance of emphasizing information on matters that deviate from the normal course of events. They expressed that information concerning the anaesthetic and surgery process that has proceeded as expected, is less important to mention. The nurse anaesthetists and anaesthesiologists also saw the importance of limiting the amount of information during postoperative handover.

-*"/…/put the focus on that, if it's something unusual/…/that sticks out or if the patient has a medical background that means you have to think a bit differently.*"-"*Yes, I think so too" – "Yes*"-"*Yes, things that occur during surgery that are out of the ordinary*"-"*/…/where do we draw the line?* "-"*Exactly*"-"*And of course we do, we make some kind of selection and if there is nothing special, the report will be shorter."* (Anaesthesiologists)

-*"And if something special has occurred.*"-"*Yes, with the patient, loss of blood pressure, the pulse increases or something like that, or extraordinary bleeding. Something that they had to do something about, basically."* (PACU nurses)

The nurse anaesthetists reported using a structure such as SBAR to aid memory when they reported essential information. The anaesthesiologists reported using a structure for their own memory during handover, and they wanted information to be communicated with a structure to serve as a reminder during handover. The PACU nurses said that they expected to receive the information with a structure. They also reflected on the importance of asking questions, in a structured manner, during the entire handover, rather than only at the end of handover. The nurse anaesthetists and the PACU nurses reflected on the importance of having written information in front of them during handover to aid memory, and they felt that the electronic patient records complicated information retrieval, because using them was considered time consuming and caused nurses to lose sight of the patient's condition.

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-*"/…/if you follow the SBAR concept, you have a main thread through the whole thing /…/*"-*"That's what xxx says about the main thread, that you find it and thinks that SBAR helps you here."* (Nurse anaesthetists)

-*"Yes, if there's anything special there I want to – but what was your thinking there? But we have been taught to ask our questions later and that's.*"-*"Not easy.*"-*"There is a risk that you forget since there's a lot going on around you. You should have the opportunity to interrupt, at least once."* (PACU nurses)

All professional groups saw benefits of cooperation. The nurse anaesthetists reflected on the need for improved cooperation within the OT team as well as for developing further collaboration between the OT team and the PACU team to increase interaction around achieving consensus before executing the handover. The PACU nurses described the advantages of the theatre nurses and the nurse anaesthetist collaborating during handover, as more information about the surgery process was transferred, but also the disadvantages, as the handover then became more unstructured. The anaesthesiologists and the PACU nurses reported benefits of cooperation within the PACU team, as it facilitated and safeguarded the handover situation.

-*"/…/need to discuss how we will report and who will do the reporting and what should be reported, and we have to have this discussion among ourselves in the OT and we need have it with the PACU nurses /…/and arrive at some consensus/…/"* (Nurse anaesthetist)

Weighing the advantages and disadvantages of the bedside handover

The professional groups described and reflected on both advantages and disadvantages with the bedside handover. Nurse anaesthetists and PACU nurses reflected on the benefits of carrying out handovers close to the patient, as this provided control over the patient's medical condition. On the other hand, it might threaten the patient's integrity because other patients might hear the report. The nurse anaesthetists described how decisions about whether the handover should be performed bedside depended on whether the information transferred was

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meant to be heard by the patient. The PACU nurses also reflected on the time-saving benefits of the bedside handover, compared with a handover in a separate room. The anaesthesiologists and the PACU nurses reflected on the disturbing bedside environment as it sometimes entailed frequent interruptions, which they felt caused stress and distraction.

-*"When you're standing at the bedside you can check the vital parameters and see that everything is fine when you hand the patient over*"-"*Yes"* (Nurse anaesthetists)

--*"/…/I prefer having the patient in front of me/…/The times the nurse anaesthetist come and report on a patient I can't see, that upsets me, because I would really like to see who they're talking about.*"-"*I want to have control."* (PACU nurses)

-*"While giving my report/…/if I'm disturbed/…/I mean if my thoughts are interrupted. I think that's dangerous, because every time it happens is harder to return to the main thread"* (Anaesthesiologist)

-*"Well, that the machines are beeping and ringing, it gets your adrenalin going, because you're used to reacting to it.*"-"*Well, then your attention easily shifts to the beeps.*"-"*That´s the way it is.*"-"*You're disturbed and distracted. And that's the idea, it is a warning signal to us."* (PACU nurses)

Having different perspectives on the transfer of responsibility

The professional groups described different perspectives on the transfer of responsibility. The nurse anaesthetists reported that they handed over responsibility when all the information was given to the PACU nurse and when they left the PACU. The anaesthesiologists handed over responsibility to other physicians, but their overall responsibility (accountability) remained even after handover to a PACU nurse. The PACU nurses stated that they required control over the patient's condition before taking over the responsibility. Uncertainty about responsibility arose when the nurse anaesthetist provided incomplete information about the patient or when the nurse anaesthetist failed to complete tasks that he/she was supposed to have done prior to handover.

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-*"When you hand information over you include what you know and then the responsibility is someone else's"* (Nurse anaesthetists)

-*"We don't transfer the responsibility just because we've transferred the patient."*-*"As a medical doctor, you still hold overall responsibility."* (Anaesthesiologists)

"/…/you have to wait before taking all of the responsibility, because they should already had found out certain things in the operating theatre/…/" "but I have to know/…/you have to know what we're going to do with this patient." (PACU nurse)

Observation of interaction during focus group interviews

During the focus group interviews the interaction between the participants was observed by the assistant moderator. A friendly atmosphere was observed, the participants seemed to be familiar with each other and no participant seemed shy or otherwise reluctant to speak. The topic engaged them with a lively discussion and "postoperative handover" did not seem to be a sensitive topic. Within the groups, no single participant dominated the discussion and each participant had roughly the same amount of time to talk. During the focus group interviews, the participants often confirmed each other non-verbally, e.g. by nodding or smiling back, and verbally, by completing each other's statements and sentences.

DISCUSSION

In the present study, the postoperative handover content time frame differed between the three professional groups. The nurse anaesthetists mainly focused on the past, the anaesthesiologists mainly focused on the continuum of care, and the PACU nurses mainly focused on the present but reflected on nurse anaesthetists' handover as mostly concerning information about the anaesthesia process. This is in line with an earlier study[2] where PACU nurses sought other information than that reported by the sender. The nurse anaesthetists, in turn, reflected on

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PACU nurses as not interested in the information transferred. If the sender transfers information concerning the past (i.e., the anaesthesia process) that the receiver pays less attention to, because he/she is focusing on factors important to the continuing care, we might assume that the receiver will remember this information less well. According to Flin *et al.*,[26] listening is an active process, and even under ideal circumstances with an interested listener, only about one-third of what is heard is actually listened to, even less if the listener is not interested.[26] In line with this, a previous study[6] showed that of the items transferred during postoperative handover, the drugs used during anaesthesia were the items least likely to be remembered by the PACU nurses.[6]

The groups reported risks when information from the OT team was transferred to the PACU team if they did not have all of the essential information from the surgeon. According to Manser *et al.,*[9] a shared understanding is an important feature of handover quality. Sandberg and Targama[15] stated that people in an organization must have a shared understanding if cooperation is to be achieved. This involves having both a similar understanding of the collective's work in its entirety, and an understanding of their specific roles and competence in the performance of a task.[15] There is a need for the different professional groups within the OT team and between the OT team and the PACU team to have a shared understanding of the whole so as to ensure the patient's continuing care. In the present study, the participants' reflections indicate that there is room for improvement.

The professional groups described strategies for ensuring the quality of handover. At first, to focus on deviating events. This is in line with one of the recommendations for improving communication in teams made by Flin *et al.*[26]; that the message should be as brief as

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possible, including only the most relevant information owing to the costs of attention and cognitive resources for both the sender and the receiver.[26] Another strategy, described by the professional groups, was using a structure for the information that is handed over. This is in line with an integrative review of postoperative handover[27] showing that information transfer, technical errors and high-risk events were positively influenced by the use of structured handover tools. Communication with high predictability can be said to contain redundancy, which facilitates the receiver's interpretation of the message.[28] The notion that there are benefits of using a structure is in line with findings from other studies.[e.g.][29, 30] A third strategy was to see the benefits of cooperation between and within the teams as well as have a shared understanding, which is in line with earlier studies.[e.g.] [9, 15, 17] Furthermore, the nurse anaesthetists and the PACU nurses wanted written information in front of them; they saw disadvantages of electronic patient records, because these records were not in the immediate vicinity of the patient. In line with this, a study by Redley *et al.*[20] showed that clinicians saw difficulties, during postoperative handover, when documents were incomplete or not immediately available.[20] Electronic patient records should therefore be designed to be user-friendly and placed near the patient.

It is well known that the PACU environment is marked by frequent interruptions,[6, 31] and findings in the present study were seen as these could lead to distractions. Nevertheless, both the nurse anaesthetists and PACU nurses reported benefits of the bedside handover, as it increased control of the patient. Results of a study by Frankel *et al.*[32] concerning context, culture and communication during handover suggested that a "joint focus of attention" has the greatest potential for achieving a high-quality and reliable handover. Such an approach coordinates the sender's and receiver's verbal and visual attention jointly on an artefact. Redundancy in the visual field gives a momentary "joint focus of attention" using

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simultaneous inputs.[32] The bedside handover, described by the nurse anaesthetists and PACU nurses in the present study, has the potential to create a "joint focus of attention". On the other hand, interruptions interfere with memory and therefore should be minimized.[6, 33]

The professional groups gave different descriptions of the part of the handover that concerned responsibility. Greenberg *et al.*[34] investigated malpractice claims due to communication breakdowns during the preoperative, intraoperative and postoperative period and found that 43% occurred during handover and that ambiguity about responsibilities was a commonly associated factor.[34] As in a study by Smith and Mishra,[5] the PACU nurses did not accept taking over responsibility if the handover was not completed. In contrast to the nurse anaesthetists, the anaesthesiologists did not hand over the responsibility after handover to a PACU nurse. Since ambiguity concerning responsibility seems to be a contributing factor to adverse events the professional groups' responsibility should be clearly stated.

Strengths and weaknesses of the study

Previous studies of handovers gave rise to the notion that professions involved in postoperative handover might have different perspectives on the handover. We chose focus group interviews with profession-based groups consisting of participants with great experience of postoperative handover. One limitation could be the small sample size in two similar centres. The number of participants in each group was quite small. On the other hand, Krueger and Casey[21] recommended that a group with fewer participants is preferable when the purpose is to understand an issue or behaviour, when the topic is complex, and when the participants' level of experience is high.[21] In the present study, trustworthiness is described and enhanced by the criteria of credibility, dependability, confirmability and transferability.

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The text was analysed and discussed by two authors (MR, GM) and the subcategories and categories were discussed with all co-authors until consensus was reached to achieve credibility and dependability.[35] Furthermore, representative quotes from the transcribed text were used to enhance credibility. The first author was familiar with the context investigated, which may have threatened the confirmability. Conducting the analysis together with a co-author with a different clinical background may have decreased this risk.[36] The assistant moderator observed the interaction between the participants. All participants had opportunities to voice their opinion about the handover and everyone agreed on the summary. We have tried to explain the context as thoroughly as possible to allow the reader to determine the transferability of the present results. With a view to increasing trustworthiness, we have explained the data analysis as thoroughly as possible to meet the criteria of dependability.[36]

Conclusion

The present findings revealed variations in different professionals' view on the postoperative handover. Healthcare interventions are needed that aim to minimize the gap between professionals' perception and practice and to acheive a shared understanding. Furthermore, to ensure high quality and safe care, stakeholders/decision-makers need to pay attention to the environment and infrastructure in postanaesthesia care.

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ACKNOWLEDGEMENTS

Assistance with the study We would like to thank the participants for their contribution to this study.

Contributors All authors (MR, ME, CLS and GM) contributed to the design, interpreted data, drafted and revised the article critically. MR and GM collected the data. Data analysis was primarily conducted by MR and GM, and the data were discussed with all authors (MR, ME, CLS and GM). MR wrote the manuscript under the supervision of ME, CLS and GM. All authors read and approved the final version of the paper.

Funding This work was supported by the Faculty of Health and Occupational Studies, University of Gävle and by the County Council Gävleborg. It was also supported by the Patient Insurance LÖF and the Swedish Society of Nursing, but these organizations had no role in the design or running of the study.

Competing interests All authors have completed the ICMJE uniform disclosure form at www.icmje.org/coi_disclosure.pdf and declare: MR has received research grants from Patient Insurance LÖF and the Swedish Society of Nursing; no other relationships or activities that could appear to have influenced the submitted work.

Presentation The study was presented in the thesis Randmaa M., Communication and Patient Safety: transfer of information between healthcare personnel in anaesthetic clinics. Uppsala: Acta Universitatis Upsaliensis 2016. ISBN 978-91-554-9489-6

Ethics approval The Regional Ethical Review Board in Uppsala, Sweden (reg. no. 2011/061) on 9 March 2011.

Data sharing statement There are no additional data available for data sharing.

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COREQ 32-item checklist

No	Item	Guide questions/description	Answers
Domain 1: Research team and reflexivity			
Personal Characteristics			
1.	Interviewer/facilitator	Which author/s conducted the interview or focus group?	Maria Randmaa conducted all the focus group interviews and Gunilla Mårtensson was an assistant moderator during all the focus group interviews
2.	Credentials	What were the researcher's credentials? *E.g. PhD, MD*	Maria Randmaa, RNA, PhD; Maria Engström, RN, PhD, Professor; Christine Leo Swenne, RN, PhD, Assoc. prof; Gunilla Mårtensson, RN, PhD, Assoc. prof.
3.	Occupation	What was their occupation at the time of the study?	Maria Randmaa, lecturer Faculty of Health and Occupational Studies, University of Gävle, Sweden; Centre for Research and Development, Uppsala University/County Council of Gävleborg, Sweden; PhD-student Department of Public Health and Caring Sciences, Uppsala University, Sweden Maria Engström, Professor Faculty of Health and Occupational Studies, University of Gävle, Sweden; Associate researcher Department of Public Health and Caring Sciences, Uppsala University, Sweden; Nursing Department, Medicine and Health College, Lishui University, China Christine Leo Swenne, Senior lecturer Department of Public Health and Caring Sciences, Uppsala University, Sweden Gunilla Mårtensson, Senior lecturer Faculty of Health and Occupational Studies, University of Gävle, Sweden; Associate researcher Department of Public Health and Caring Sciences, Uppsala

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			University, Sweden
4.	Gender	Was the researcher male or female?	All researchers are female
5.	Experience and training	What experience or training did the researcher have?	Maria Randmaa had no previous experience of focus group interviews. Maria Engström had previous experience of individual interviews and focus group interviews. Christine Leo Swenne had previous experience of individual interviews. Gunilla Mårtensson had previous experience of individual interviews.
Relationship with participants			
6.	Relationship established	Was a relationship established prior to study commencement?	Yes, a relationship was established prior to the study commencement.
7.	Participant knowledge of the interviewer	What did the participants know about the researcher? e.g. *personal goals, reasons for doing the research*	The participants knew the reasons for doing the research.
8.	Interviewer characteristics	What characteristics were reported about the interviewer/facilitator? e.g. *Bias, assumptions, reasons and interests in the research topic*	The participants were aware of the interviewer's interest in the research topic.
Domain 2: study design			
Theoretical framework			
9.	Methodological orientation and Theory	What methodological orientation was stated to underpin the study? *e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis*	The methodological orientation was content analysis
Participant selection			
10.	Sampling	How were participants selected? *e.g. purposive, convenience, consecutive, snowball*	Purposive sampling was used.
11.	Method of approach	How were participants approached? e.*g. face-to-face, telephone, mail, email*	The heads of department established contact with potential participants who had at least one year's experience in the profession.
12.	Sample size	How many participants were in the study?	Six focus groups with 23 healthcare professionals involved in postoperative handovers. Each group was composed on the basis of profession: nurse anaesthetists (n=8), anaesthesiologists (n=7) and

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			postanaesthesia care unit nurses (n=8).
13.	Non-participation	How many people refused to participate or dropped out? Reasons?	No participants dropped out.
Setting			
14.	Setting of data collection	Where was the data collected? e.g. *home, clinic, workplace*	The interviews were held in an undisturbed room at the participants' workplace.
15.	Presence of non-participants	Was anyone else present besides the participants and researchers?	No.
16.	Description of sample	What are the important characteristics of the sample? *e.g. demographic data, date*	The interviews were conducted from January to May 2015. Demographic data such as profession, gender, age and years of practice were described.
Data collection			
17.	Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	A semi-structured interview guide was used covering key topics. The guide was pilot-tested on a focus group of PACU nurses in another hospital, and minor changes were made.
18.	Repeat interviews	Were repeat interviews carried out? If yes, how many?	No, there were no repeated interviews.
19.	Audio/visual recording	Did the research use audio or visual recording to collect the data?	The interviews were digitally audio-recorded.
20.	Field notes	Were field notes made during and/or after the interview or focus group?	During the interviews, the assistant moderator observed the interaction between participants in the group and made notes.
21.	Duration	What was the duration of the interviews or focus group?	The focus group interviews lasted 1-1.5 hours.
22.	Data saturation	Was data saturation discussed?	Data saturation, as seen from the concept of grounded theory, was employed, However, our data are rich in content.
23.	Transcripts returned	Were transcripts returned to participants for comment and/or correction?	No, but at the end of the interview, the assistant moderator provided a summary, and concluding questions about the adequacy of the summary were posed to enable participants to reflect back on previous comments.
Domain 3: analysis and findings			
Data analysis			
24.	Number of data coders	How many data coders coded the data?	The analyses were primarily carried out by the first and last author.

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			During the analysis process, the subcategories and categories were discussed with all co-authors until consensus was reached.
25.	Description of the coding tree	Did authors provide a description of the coding tree?	Yes, the authors did provide a description of the coding tree.
26.	Derivation of themes	Were themes identified in advance or derived from the data?	No, no themes were identified, the subcategories were grouped into five categories based on similarities and differences.
27.	Software	What software, if applicable, was used to manage the data?	Analyses of demographic characteristics of participants were performed using IBM SPSS 20.0. Otherwise, no software was used.
28.	Participant checking	Did participants provide feedback on the findings?	No
Reporting			
29.	Quotations presented	Were participant quotations presented to illustrate the themes / findings? Was each quotation identified? *e.g. participant number*	Yes, quotations were presented to illustrate the findings. The quotations were identified by professional group.
30.	Data and findings consistent	Was there consistency between the data presented and the findings?	Yes.
31.	Clarity of major themes	Were major themes clearly presented in the findings?	No, no themes were identified, but the five categories were clearly presented.
32.	Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	No, there is no description of diverse cases. All data related to the aim of the study were included in the five categories.

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The postoperative handover: a focus group interview study with nurse anaesthetists, anaesthesiologists, and PACU nurses

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2016-015038.R2
Article Type:	Research
Date Submitted by the Author:	10-Apr-2017
Complete List of Authors:	Randmaa, Maria; Faculty of Health and Occupational Studies, Department of Health and Caring Sciences Engström, Maria; University of Gävle, Faculty of Health and Occupational Studies; Uppsala University, Department of Public Health and Caring Sciences Leo Swenne, Christine; Uppsala University, Department of Public Health and Caring Sciences Mårtensson, Gunilla; University of Gävle, Faculty of Health and Occupational Studies; Uppsala University, Department of Public Health and Caring Sciences
Primary Subject Heading:	Communication
Secondary Subject Heading:	Anaesthesia, Qualitative research
Keywords:	Anaesthetic clinic, Handover, Postoperative, Qualitative study

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The postoperative handover: a focus group interview study with nurse anaesthetists, anaesthesiologists, and PACU nurses

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Word count: Excluding title page, abstract, references, and tables: 4660 words

Keywords: Anaesthetic clinic, Handover, Postoperative, Qualitative study

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ABSTRACT

OBJECTIVES To investigate different professionals' (nurse anaesthetists', anaesthesiologists', and postanaesthesia care unit nurses') descriptions of and reflections on the postoperative handover.

DESIGN A focus group interview study with a descriptive design using qualitative content analysis of transcripts.

SETTING One anaesthetic clinic at two hospitals in Sweden.

PARTICIPANTS Six focus groups with 23 healthcare professionals involved in postoperative handovers. Each group was homogeneous regarding participant profession, resulting in two groups per profession: nurse anaesthetists (n=8), anaesthesiologists (n=7) and postanaesthesia care unit nurses (n=8).

RESULTS Patterns and five categories emerged: 1) Having different temporal foci during handover, 2) Insecurity when information is transferred from one team to another, 3) Striving to ensure quality of the handover, 4) Weighing the advantages and disadvantages of the bedside handover, and 5) Having different perspectives on the transfer of responsibility. The professionals' perceptions of the postoperative handover differed with regard to temporal foci and transfer of responsibility. All professional groups were insecure about having all information needed to ensure the quality of care. They strived to ensure quality of the handover by: focusing on matters that deviated from the normal course of events, aiding memory through structure and written information, and cooperating within and between teams. They reported that the bedside handover enhances their control of the patient, but also that it could threaten the patient's privacy and that frequent interruptions could be disturbing.

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CONCLUSIONS

The present findings revealed variations in different professionals' views on the postoperative handover. Healthcare interventions are needed to minimize the gap between professionals' perceptions and practices and to achieve a shared understanding of postoperative handover. Furthermore, to ensure high-quality and safe care, stakeholders/decision-makers need to pay attention to the environment and infrastructure in postanaesthesia care.

Strengths and limitations of the study

- To the best of our knowledge, this is the first study investigating nurse anaesthetists', anaesthesiologists', and PACU nurses' views on postoperative handover using focus group interviews.
- Focus group interviews have the advantage of reaching a wider range of views through group interaction than individual interviews.
- A strength of the study was that personnel involved in postoperative handover were interviewed using profession-based groups, the goal being to try to understand each group's perspective on the handover.
- A further strength was that an assistant moderator observed the focus group interviews and all participants agreed upon the summary.
- One limitation could be the small sample size drawn from two similar hospitals.

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INTRODUCTION

The handover consists of three key aspects: transfer of 1) information, 2) responsibility and/or accountability, in 3) the context of teams and their work environments.[1] With regard to information transfer, studies have shown that anaesthesiologists and postanaesthesia care unit (PACU) nurses had different expectations concerning the content of information transferred[2] and opinions on what information needs to be reported.[3] Although the handover consists of transfer of responsibility and/or accountability, one study revealed a lack of consensus among personnel concerning when the transfer of responsibility and/or accountability takes place.[4] Yet another study showed that, during postoperative handover, the time of transfer of responsibility varied.[2] Concerning working conditions during postoperative handover, personnel often work in teams that consist of several different professionals working together in an environment characterized by frequent interruptions,[2, 5, 6] which interfere with the handover recipient's memory.[7] Teamwork is an essential component of achieving high reliability in health care,[8] and working atmosphere and shared understanding are factors of importance to the quality of handover.[9] Poor surgical teamwork behaviour concerning information sharing during intraoperative and handover phases has been shown to be significantly associated with more frequent postoperative complications or death.[10]

To summarize, postoperative handovers are crucial to patient safety. However, there is a lack of consensus about what constitutes a good handover.[11-13] A systematic review of postoperative handover by Møller *et al.*[14] concluded that it is important to acknowledge the role of communication, teamwork and collaboration within the setting. Furthermore, it is important that different professionals have a shared understanding.[9, 15] To achieve such an

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understanding, it is essential to generate knowledge about each professional group's views on postoperative handover. Thus, there is need to identify whether there are potential gaps between different health professionals' perceptions of postoperative handover that can affect patient safety. Qualitative studies of postoperative handovers between anaesthesiologists and PACU nurses[16-19] and a mixed methods study[20] have been conducted. To date, however, no study has investigated anaesthesiologists', PACU nurses' and nurse anaesthetists' views on postoperative handover using profession homogenous focus group interviews.

Aim

The aim of the present study was to investigate different professionals' (nurse anaesthetists', anaesthesiologists', and PACU nurses') descriptions of and reflections on the postoperative handover.

METHODS

Design

A qualitative descriptive design was used.

Setting

The participants worked in an anaesthetic clinic located at two medium sized hospitals in central Sweden, which share the same top management and are located in the same county council district, with about 130 km distance between them. In Sweden, postoperative handovers at the PACU between a nurse anaesthetist (the sender) and a specialist nurse in intensive care (the receiver) are common. Nurse anaesthetists may, with support from the anaesthesiologist, independently induce, maintain and conclude general anaesthesia. A

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specialist nurse in intensive care may judge, address and evaluate medical and nursing interventions.[21] During the typical postoperative handover, the nurse anaesthetist and PACU nurse stand nearby the patient while looking at the written anaesthetic record, the patient and the monitor. On some occasions, a theatre nurse and a licensed practical nurse are also present. Sometimes an anaesthesiologist is present during the postoperative handover or is the person doing the reporting. The written anaesthetic record contains information about the anaesthetic procedure, drugs and fluids given, blood loss, vital parameters and the performed surgery. The electronic patient record, where the patient's clinical background and medication are documented, is located at some distance away from the patient or in another room, i.e., not in direct proximity to where most of the postoperative handovers take place.[6] During the period June 2014 to June 2015, 16,004 operations from different specialties (13,235 inpatients and 2,769 outpatients) were performed at the two hospitals. At the anaesthetic clinic, the communication tool Situation-Background-Assessment-Recommendation (SBAR)[22] and the WHO Surgical Safety Checklist[23] were used. The WHO Surgical Checklist was developed to increase teamwork and communication in surgery. The checklist is designed to ensure patient safety on three occasions during the surgical procedure: "Sign in (before the induction of anaesthesia), "Time out" (before the incision of the skin), and "Sign out" (before the patient leaves the operating theatre (OT)).[23]

Data collection

A total of six focus group interviews were conducted from January to May 2015. Purposive sampling was used, and the heads of department established contact with potential participants who had at least one year's experience in the profession. The participants received oral and written information about the study, and written informed consent was obtained. Because of the interaction between respondents and the group dynamics, focus

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group interviews have the advantage of elucidating both individual and shared views on a topic as well as providing rich information.[24] The homogenous composition of the groups was based on the participants' similar professions, role and experience of the same issue,[25] the goal being to identify patterns in the professional groups' descriptions of and reflections on postoperative handover. The six focus groups consisted of two groups of nurse anaesthetists, two groups of anaesthesiologists, and two groups of PACU nurses. In total, 23 respondents participated (Table 1). The study was approved by the Regional Ethical Review Board in Uppsala (reg. no. 2011/061).

Table 1. Demographic characteristics of participants

Profession	Gender Male/Female	Median age (Q1-Q3)[3]	Median years of practice[1] (Q1-Q3)[3]
Nurse Anaesthetists	2/6	40 (34-44)	3 (2-16)
Anaesthesiologists	5/2	54 (47-61)	24 (15-30)
PACU nurses[2]	0/8	59 (55-63)	34 (23-40)

[1]Years of practice in current profession. [2] PACU (Postanaesthesia care unit) nurses were all Specialist Nurses in Intensive Care, which means registered nurses with one year of training and a degree in intensive care. [3]Quartiles.

A semi-structured interview guide was used covering opening questions, introductory questions, transition questions, and key questions. The interview guide was pilot-tested on a focus group of PACU nurses in another hospital, and minor changes were made. The focus group interview started with opening questions to get everyone to talk; thereafter, introductory questions were posed to introduce the topic in focus and to encourage conversation among the participants. To move the conversation closer to the key questions, transition questions were posed.[24] The key questions concerned the participants' descriptions of and reflections on the transfer of information during handover, the transfer of responsibility and/or accountability and the context of teams and their work environment. One example of a key question is: "Can you talk about what kind of information you usually get and what kind you try in particular to focus on and listen to? Why do you focus especially on this information?

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Probes were used to go into more depth on a certain topic. In order to stimulate discussion during the focus group interviews, the participants were also presented with an example from a transcribed verbal handover.[24] Finally, questions about the ideal handover were asked. In the second part of the focus group interview, the main results of an observational study of postoperative handover[6] were presented and discussed, but this is not included in the present analysis. All focus group interviews were conducted by one moderator (MR), who is a nurse anaesthetist and specialist nurse in intensive care with 22 years' experience in the professions. During the focus group interviews, the assistant moderator (GM) observed the interaction between participants in the group and made notes.[24] At the end of the focus group interview, the assistant moderator provided a summary, and concluding questions about the adequacy of the summary were posed to enable participants to reflect back on previous comments.[24] The focus group interviews lasted 1-1.5 hours; they were held in a quiet room at the participants' workplace and digitally recorded.

Data analysis

The focus group interviews were analysed inductively, using qualitative content analysis.[25] The recorded focus group interviews were listened to and transcripts were read and re-read to obtain an overall impression and become familiar with the text. The three professional groups were first analysed separately, according to the study aim, in three steps, the goal being to identify preliminary subcategories.[25] The steps were: 1) Meaning units (sentences and paragraphs) were identified and condensed, abstracted, and labelled with a code. 2) The codes were sorted into three topics from the interview guide – information, responsibility and/or accountability – in the context of teams and their work environments. 3) The codes within each topic were grouped into preliminary subcategories. Thereafter, the preliminary subcategories for the three professional groups were put together and compared, and

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subcategories with similar names were scrutinized and grouped together when found to have the same content. Next, the subcategories were compared for similarities and differences and grouped into five categories. The analyses were primarily carried out by the moderator (MR) and the assistant moderator (GM). During the analysis process, the subcategories and categories were discussed with all co-authors until consensus was reached.

RESULTS

From the analysis of the nurse anaesthetists', anaesthesiologists', and PACU nurses' descriptions of and reflections on the postoperative handover, five categories emerged: "Having different temporal foci during handover", "Insecurity when information is transferred from one team to another", "Striving to ensure quality of the handover", "Weighing the advantages and disadvantages of the bedside handover", and "Having different perspectives on the transfer of responsibility." Patterns in the three professional groups' descriptions and reflections appeared, and these patterns are described in each of the categories and subcategories (Table 2). The quotations are presented in italics and the notional sign "-" marks when another participant, within the group, interjects a comment or continues the discussion.

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Table 2

Table 2. Categories and subcategories that emerged for each profession, marked by an X

Category	**Having different temporal foci during handover**			**Insecurity when information is transferred from one team to another**		**Striving to ensure quality of the handover**			**Weighing the advantages and disadvantages of the bedside handover**			**Having different perspectives on the transfer of responsibility**		
Subcategory	*Focusing mainly on the past*	*Focusing mainly on the present*	*Focusing on the continuum of care*	*Insecure about having all information needed*	*Insecure about receiver's knowledge*	*Focus the information on deviating events*	*Aid memory by structure and written information*	*Cooperate within and between teams*	*Provide control and save time*	*Threats to integrity*	*The disturbing bedside environment*	*Hand over the responsibility*	*Not handover the responsibility or accountability*	*Require control before taking over responsibility*
Nurse Anaesthetists	X			X	X	X	X	X	X	X		X		
Anaesthesiologists			X	X	X	X	X	X			X		X	
PACU nurses[1]		X		X		X	X	X	X	X	X			X

[1]PACU (postanaesthesia care unit) nurses were all Specialist Nurses in Intensive Care, which means registered nurses with one year of training and a degree in intensive care.

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Having different temporal foci during handover

The three professional groups reported different temporal foci during the post-operative handover, e.g., focusing mainly on the past, on the present, and on the continuum of care in its entirety. As senders of information, the nurse anaesthetists focused mainly on what they themselves had done, i.e. the anaesthesia process, and partly on the patient's continuing care. They were uncertain concerning which information the PACU nurses considered to be essential and mentioned a disinterest in some of the information reported. The anaesthesiologists reported that they focused on the continuum of care from the OT to discharge, e.g., the surgical procedure, observations and recommendations. They stated that all personnel should focus on the continuity of care, but they were unsure whether that was the case during the reported handover. Like the nurse anaesthetists, the anaesthesiologists were uncertain about the receivers' focus during handover. As receivers of information, the PACU nurses reported focusing mainly on essential information of importance for the "here and now", e.g., which patient was to be taken care of, vital parameters and recommendations for conducting postoperative care at the PACU. They related that the nurse anaesthetists' focus was mostly on reporting information about the anaesthesia process.

-*"/…/we often report on how the anaesthesia went, if the patient was stable and such things /…/because that's the main thing for us.* "-"*/…/we report on things we're interested in and they* [PACU nurses] *have other interests."* (Nurse anaesthetists)

-*" It can sometimes be very frustrating, I must say, because some nurses aren't interested in what you have to say." "-"/…/ but that it's difficult, that I don't really know what they're interested in." "-" /…/ they [PACU nurses] say,"I'm not all that interested in the anaesthesia process, but more in drainage and continued prescription of medications."* (Nurse anaesthetists)

Insecurity when information is transferred from one team to another

All professional groups described and reflected on being uncertain as to whether all of the information needed was actually transferred from one team to another. The nurse anaesthetists

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reported that they were obliged to transfer all important information about the patient from the OT team to the PACU team, but like the anaesthesiologists and PACU nurses, they reported having doubts about whether all of the essential information from the surgeon or theatre nurse was transferred before the patient left the OT. The anaesthesiologists reported insufficient "sign out" between the main surgeon and the nurse anaesthetist before the patient left the OT and considered this to entail the risk of postoperative misjudgements. They saw improvements in continuity of care if important information was always communicated by the main surgeon before the patient left the OT. Furthermore, the anaesthesiologists felt that several information transfers and lack of knowledge posed potential risks to the patient's continued care.

-*"We don't know a thing about that* [catheters, dressings, drainage]. *The surgeon often escapes before saying anything /.../. And then we don't have answers to the PACU's questions."* (Nurse anaesthetist)

-*"/.../it's up to the team to be clear with each other before they leave the operation theatre and I think there are shortcomings there. The surgeon may have things in mind that aren't conveyed and that I don't comprehend. There are four perspectives that need to become one."* (Anaesthesiologist)

-*"/.../And how they coped with the surgery because the others* [Nurse anaesthetists] *don't have a clue, you know, what it's all about.*"-"*No, and what they* [Surgeons] *have done."*(PACU nurses)

The nurse anaesthetists also reported insecurity as to whether the information was understood, and the anaesthesiologists reported insecurity about the receiver's knowledge when they did not know the PACU nurse involved. Furthermore, the nurse anaesthetists and anaesthesiologists reflected on the need for confirmation, by the receiver, of the information given; thus they wanted to be sure the information was understood.

-*/.../"So I assume that if I report to PACU and they don't understand what I'm talking about then I really hope they say something and ask, like "now I don't know what you mean here". "/.../ but sometimes I think they do, though some of them look bewildered."* (Nurse

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3 anaesthetists)
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5 -*"/.../But I would probably have liked for the person who receives somewhere, for them to*
6 *summarise and confirm what they have been told. Then I leave and I have made my report but*
7 *I don't know whether they understood what I wanted."*(Anaesthesiologist)
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11 **Striving to ensure quality of the handover**
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14 The three professional groups described and reflected on how they strived to ensure quality
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16 during the handover by: focusing the information on deviating events, aiding memory through
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18 structure and written information, and cooperating within and between teams. All of the
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21 groups mentioned the importance of emphasizing information on matters that deviate from the
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23 normal course of events. They reported that information concerning an anaesthetic and
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25 surgical process that has proceeded as expected is less important to mention. The nurse
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27 anaesthetists and anaesthesiologists also saw the importance of limiting the amount of
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30 information during postoperative handover.
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33 -*"/.../put the focus on that, if it's something unusual/.../that sticks out or if the patient has a*
34 *medical background that means you have to think a bit differently.*"-"*Yes, I think so too" –*
35 *"Yes*"-"*Yes, things that occur during surgery that are out of the ordinary*"-"*/.../where do we*
36 *draw the line?* "-"*Exactly*"-"*And of course we do, we make some kind of selection and if there*
37 *is nothing special, the report will be shorter."* (Anaesthesiologists)
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41 -*"And if something special has occurred.*"-"*Yes, with the patient, loss of blood pressure, the*
42 *pulse increases or something like that, or extraordinary bleeding. Something that they had to*
43 *do something about, basically."* (PACU nurses)
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47 The nurse anaesthetists and the anaesthesiologists reported using a structure such as SBAR to
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49 aid memory when they reported essential information. The anaesthesiologists and the PACU
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51 nurses expected to receive the information within a structure. The PACU nurses also reflected
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53 on the importance of asking questions, in a structured manner, during the entire handover,
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56 rather than only at the end of the handover. The nurse anaesthetists and the PACU nurses
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reflected on the importance of having written information in front of them during handover to aid memory; they felt that the electronic patient records complicated information retrieval, because using them was, in their view, time consuming and caused nurses to lose sight of the patient's condition.

-*"/…/if you follow the SBAR concept, you have a main thread through the whole thing /…/*"-"*That's what xx says about the main thread, that you find it and thinks that SBAR helps you here."* (Nurse anaesthetists)

-*"Yes, if there's anything special there I want to – but what was your thinking there? But we have been taught to ask our questions later and that's.*"-"*Not easy.*"-"*There is a risk that you forget since there's a lot going on around you. You should have the opportunity to interrupt, at least once."* (PACU nurses)

All professional groups saw the benefits of cooperation. The nurse anaesthetists reflected on the need for improved cooperation within the OT team as well as for developing further collaboration between the OT team and the PACU team to increase interaction around achieving consensus on how handovers should always be carried out. The PACU nurses described the advantages of the theatre nurses and the nurse anaesthetist collaborating during handover, as collaboration meant transfer of more information about the surgical process. However, they also mentioned the disadvantages, in that collaboration of this kind also meant a more unstructured handover. The anaesthesiologists and the PACU nurses reported the benefits of cooperation within the PACU team, which they said facilitated and safeguarded the handover situation.

-*"/…/need to discuss how we will report and who will do the reporting and what should be reported, and we have to have this discussion among ourselves in the OT and we need have it with the PACU nurses /…/and arrive at some consensus/…/"* (Nurse anaesthetist)

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Weighing the advantages and disadvantages of the bedside handover

The professional groups described and reflected on both the advantages and the disadvantages associated with the bedside handover. Nurse anaesthetists and PACU nurses reflected on the benefits of carrying out handovers close to the patient, as this provided control over the patient's medical condition. On the other hand, it might threaten the patient's privacy because other patients might hear the report. The nurse anaesthetists described how decisions about whether the handover should be performed bedside depended on whether the information transferred was meant to be heard by the patient. The PACU nurses also reflected on the time-saving benefits of the bedside handover, compared with a handover in a separate room. The anaesthesiologists and the PACU nurses reflected on the disturbing bedside environment, which sometimes entailed frequent interruptions they felt caused stress and distraction.

-*"When you're standing at the bedside you can check the vital parameters and see that everything is fine when you hand the patient over*"-"*Yes"* (Nurse anaesthetists)

--*"/…/I prefer having the patient in front of me/…/The times the nurse anaesthetists come and report on a patient I can't see, that upsets me, because I would really like to see who they're talking about.*"-"*I want to have control."* (PACU nurses)

-*"While giving my report/…/if I'm disturbed/…/I mean if my thoughts are interrupted. I think that's dangerous, because every time it happens is harder to return to the main thread"* (Anaesthesiologist)

-*"Well, that the machines are beeping and ringing, it gets your adrenalin going, because you're used to reacting to it.*"-"*Well, then your attention easily shifts to the beeps.*"-"*That´s the way it is.*"-"*You're disturbed and distracted. And that's the idea, it is a warning signal to us."* (PACU nurses)

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Having different perspectives on the transfer of responsibility

The professional groups described different perspectives on the transfer of responsibility. The nurse anaesthetists reported that they handed over responsibility when all the information was given to the PACU nurse and when they left the PACU. The anaesthesiologists handed over responsibility to other physicians, but their overall responsibility (accountability) remained even after handover to a PACU nurse. The PACU nurses stated that they required control over the patient's condition before taking over the responsibility. Uncertainty about responsibility arose when the nurse anaesthetist provided incomplete information about the patient or when the nurse anaesthetist failed to complete tasks that he/she was supposed to have done prior to handover.

-*"When you hand information over you include what you know and then the responsibility is someone else's"* (Nurse anaesthetists)

-*"We don't transfer the responsibility just because we've transferred the patient.*"-"*As a medical doctor, you still hold overall responsibility."* (Anaesthesiologists)

"/.../you have to wait before taking all of the responsibility, because they should already have found out certain things in the operating theatre/.../" "but I have to know/.../you have to know what we're going to do with this patient." (PACU nurse)

Observation of interaction during focus group interviews

During the focus group interviews, the interaction between the participants was observed by the assistant moderator. Overall, the atmosphere in all six focus groups was judged to be friendly. The participants seemed to be familiar with each other and no participant seemed shy or otherwise reluctant to speak. The topic engaged them in a lively discussion and "postoperative handover" did not seem to be a sensitive topic. Within the groups, no single participant dominated the discussion and each participant had roughly the same amount of

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time to talk. During the focus group interviews, the participants often confirmed each other's statements non-verbally, e.g. by nodding or smiling, and verbally, by completing each other's statements and sentences.

DISCUSSION

In the present study, the temporal foci differed between the three professional groups. The nurse anaesthetists mainly focused on the past, the anaesthesiologists mainly focused on the continuum of care, and the PACU nurses mainly focused on the present, but did report that the nurse anaesthetists' handovers mostly concerned information about the anaesthesia process. This is in line with an earlier study showing that PACU nurses sought information other than that reported by the sender.[2] A previous study showed that, of the items transferred during postoperative handover, the drugs used during anaesthesia were the items least likely to be remembered by the PACU nurses.[6] In the present study, the nurse anaesthetists reported feeling that the PACU nurses were not interested in the information transferred. If the sender transfers information concerning the past (i.e., the anaesthesia process) that the receiver pays less attention to, because the receiver is focusing on factors important to the continuing care, we can assume that passive listening during handover on the part of the receiver will result in information loss. This is in line with Flin *et al.*[26], who suggested that listening is an active process, and that even under ideal circumstances with an interested listener, only about one-third of what is heard is actually listened to, even less if the listener is not interested.

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The groups reported risks when information from the OT team was transferred to the PACU team if the sender of information did not have all of the essential information from the surgeon. According to Manser *et al.,*[9] a shared understanding is an important feature of handover quality. Sandberg and Targama[15] suggested that people in an organization must have a shared understanding if cooperation is to be achieved. This involves having both a similar understanding of the collective's work in its entirety, and an understanding of their specific roles and competence in the performance of a task.[15] There is a need for the different professional groups within the OT team and between the OT team and the PACU team to have a shared understanding of the whole so that they can together ensure the patient's continuing care. In the present study, the participants' reflections indicate that there is room for improvement.

The professional groups described strategies for ensuring the quality of handover. One initial strategy is to focus on deviating events. This is in line with one of the recommendations for improving communication in teams made by Flin *et al.*[26], who suggested that the message should be as brief as possible, including only the most relevant information owing to the costs of attention and cognitive resources for both the sender and the receiver. Another strategy, described by the professional groups, was using a structure for the information that is handed over. This is in line with an integrative review of postoperative handover showing that information transfer, technical errors and high-risk events were positively influenced by the use of structured handover tools.[27] Communication with high predictability can be said to contain redundancy, which facilitates the receiver's interpretation of the message.[28] A third strategy was to see the benefits of cooperation between and within the teams, which is in accordance with a previous study.[17] Moreover, the professional groups thought that having a shared understanding would improve the postoperative handover, which is in line with

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earlier studies.[9, 15] Furthermore, the nurse anaesthetists and the PACU nurses wanted written information in front of them; they saw disadvantages associated with electronic patient records, because these records were not in the immediate vicinity of the patient. In line with this, a study by Redley *et al.*[20] showed that clinicians saw difficulties, during postoperative handover, when documents were incomplete or not immediately available. We therefore suggest that postoperative handovers be performed in a structured way, such as when using SBAR, and that the electronic patient records be designed to be user-friendly and placed near the patient.

It is well known that the PACU environment is marked by frequent interruptions,[6, 29] and in the present study such interruptions were seen as possibly causing distractions. Nevertheless, both the nurse anaesthetists and PACU nurses mentioned the benefits of the bedside handover, as it increased control of the patient. Results of a study by Frankel *et al.*[30] concerning context, culture and communication during handover suggested that a "joint focus of attention" has the greatest potential for achieving a high-quality and reliable handover. Such an approach coordinates the sender's and receiver's verbal and visual attention jointly on an artefact. Redundancy in the visual field gives a momentary "joint focus of attention" using simultaneous inputs.[30] The bedside handover, described by the nurse anaesthetists and PACU nurses in the present study, has the potential to create a "joint focus of attention". On the other hand, interruptions interfere with memory and therefore should be minimized.[6, 31]

The professional groups gave different descriptions of the part of the handover that concerned responsibility. Greenberg *et al.*[32] investigated malpractice claims due to communication

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breakdowns during the preoperative, intraoperative and postoperative period and found that 43% occurred during handover and that ambiguity about responsibilities was a commonly associated factor. As in a study by Smith and Mishra,[5] the PACU nurses did not accept taking over responsibility if the handover was not completed. In contrast to the nurse anaesthetists, the anaesthesiologists stated that they did not hand over the responsibility after handover to a PACU nurse. Because ambiguity concerning responsibility seems to be a contributing factor to adverse events, the professional groups' responsibility should be clearly stated.

Strengths and weaknesses of the study

Previous studies of handovers have taken up the notion that professions involved in postoperative handover might have different perspectives on the handover. We chose focus group interviews with profession homogeneous groups consisting of participants with considerable experience of postoperative handover. One limitation could be the small sample size drawn from two similar hospitals. The number of participants in each group was quite small, which entails the potential risk that data saturation was not reached. On the other hand, Krueger and Casey[24] recommended that a group with fewer participants is preferable when the purpose is to understand an issue or behaviour, when the topic is complex, and when the participants' level of experience is high. In the present study, trustworthiness is described and enhanced by the criteria of credibility, dependability, confirmability and transferability. The text was analysed and discussed by two authors (MR, GM); to achieve credibility and dependability, the subcategories and categories were discussed by all co-authors until consensus was reached.[33] Furthermore, representative quotes from the transcribed text were used to enhance credibility. The first author was familiar with the context investigated, which may have threatened the confirmability. Conducting the analysis together with a co-

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author with a different clinical background may have decreased this risk.[34] The assistant moderator observed the interaction between the participants. All participants had opportunities to voice their opinion about the handover and everyone agreed on the summary. However, member checking was not used, which is a potential threat to data credibility. We have tried to explain the context as thoroughly as possible to allow the reader to determine the transferability of the present results. With a view to increasing trustworthiness, we have explained the data analysis as thoroughly as possible to meet the criteria of dependability.[34]

Conclusion

The present findings revealed variations in different professionals' views on the postoperative handover. Healthcare interventions are needed that aim to minimize the gap between professionals' perceptions and practices and to achieve a shared understanding. Furthermore, to ensure high-quality and safe care, stakeholders/decision-makers need to pay attention to the environment and infrastructure in postanaesthesia care.

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ACKNOWLEDGEMENTS

Assistance with the study We would like to thank the participants for their contribution to this study.

Contributors All authors (MR, ME, CLS and GM) contributed to the design, interpreted data, drafted and revised the article critically. MR and GM collected the data. Data analysis was primarily conducted by MR and GM, and the data were discussed with all authors (MR, ME, CLS and GM). MR wrote the manuscript under the supervision of ME, CLS and GM. All authors read and approved the final version of the paper.

Funding This work was supported by the Faculty of Health and Occupational Studies, University of Gävle and by the County Council Gävleborg. It was also supported by the Patient Insurance LÖF and the Swedish Society of Nursing, but these organizations had no role in the design or running of the study.

Competing interests All authors have completed the ICMJE uniform disclosure form at www.icmje.org/coi_disclosure.pdf and declare: MR has received research grants from Patient Insurance LÖF and the Swedish Society of Nursing; there are no other relationships or activities that could appear to have influenced the submitted work.

Presentation The study was presented in the thesis Randmaa M., Communication and Patient Safety: transfer of information between healthcare personnel in anaesthetic clinics. Uppsala: Acta Universitatis Upsaliensis 2016. ISBN 978-91-554-9489-6

Ethics approval The Regional Ethical Review Board in Uppsala, Sweden (reg. no. 2011/061) on 9 March 2011.

Data sharing statement There are no additional data available for data sharing.

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COREQ 32-item checklist

No	Item	Guide questions/description	Answers
Domain 1: Research team and reflexivity			
Personal Characteristics			
1.	Interviewer/facilitator	Which author/s conducted the interview or focus group?	Maria Randmaa conducted all the focus group interviews and Gunilla Mårtensson was an assistant moderator during all the focus group interviews
2.	Credentials	What were the researcher's credentials? *E.g. PhD, MD*	Maria Randmaa, RNA, PhD; Maria Engström, RN, PhD, Professor; Christine Leo Swenne, RN, PhD, Assoc. prof; Gunilla Mårtensson, RN, PhD, Assoc. prof.
3.	Occupation	What was their occupation at the time of the study?	Maria Randmaa, lecturer Faculty of Health and Occupational Studies, University of Gävle, Sweden; Centre for Research and Development, Uppsala University/County Council of Gävleborg, Sweden; PhD-student Department of Public Health and Caring Sciences, Uppsala University, Sweden Maria Engström, Professor Faculty of Health and Occupational Studies, University of Gävle, Sweden; Associate researcher Department of Public Health and Caring Sciences, Uppsala University, Sweden; Nursing Department, Medicine and Health College, Lishui University, China Christine Leo Swenne, Senior lecturer Department of Public Health and Caring Sciences, Uppsala University, Sweden Gunilla Mårtensson, Senior lecturer Faculty of Health and Occupational Studies, University of Gävle, Sweden; Associate researcher Department of Public Health and Caring Sciences, Uppsala

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			University, Sweden
4.	Gender	Was the researcher male or female?	All researchers are female
5.	Experience and training	What experience or training did the researcher have?	Maria Randmaa had no previous experience of focus group interviews. Maria Engström had previous experience of individual interviews and focus group interviews. Christine Leo Swenne had previous experience of individual interviews. Gunilla Mårtensson had previous experience of individual interviews.
Relationship with participants			
6.	Relationship established	Was a relationship established prior to study commencement?	Yes, a relationship was established prior to the study commencement.
7.	Participant knowledge of the interviewer	What did the participants know about the researcher? e.g. *personal goals, reasons for doing the research*	The participants knew the reasons for doing the research.
8.	Interviewer characteristics	What characteristics were reported about the interviewer/facilitator? e.g. *Bias, assumptions, reasons and interests in the research topic*	The participants were aware of the interviewer's interest in the research topic.
Domain 2: study design			
Theoretical framework			
9.	Methodological orientation and Theory	What methodological orientation was stated to underpin the study? *e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis*	The methodological orientation was content analysis
Participant selection			
10.	Sampling	How were participants selected? *e.g. purposive, convenience, consecutive, snowball*	Purposive sampling was used.
11.	Method of approach	How were participants approached? *e.g. face-to-face, telephone, mail, email*	The heads of department established contact with potential participants who had at least one year's experience in the profession.
12.	Sample size	How many participants were in the study?	Six focus groups with 23 healthcare professionals involved in postoperative handovers. Each group was composed on the basis of profession: nurse anaesthetists (n=8), anaesthesiologists (n=7) and

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			postanaesthesia care unit nurses (n=8).
13.	Non-participation	How many people refused to participate or dropped out? Reasons?	No participants dropped out.
Setting			
14.	Setting of data collection	Where was the data collected? e.g. *home, clinic, workplace*	The interviews were held in an undisturbed room at the participants' workplace.
15.	Presence of non-participants	Was anyone else present besides the participants and researchers?	No.
16.	Description of sample	What are the important characteristics of the sample? *e.g. demographic data, date*	The interviews were conducted from January to May 2015. Demographic data such as profession, gender, age and years of practice were described.
Data collection			
17.	Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	A semi-structured interview guide was used covering key topics. The guide was pilot-tested on a focus group of PACU nurses in another hospital, and minor changes were made.
18.	Repeat interviews	Were repeat interviews carried out? If yes, how many?	No, there were no repeated interviews.
19.	Audio/visual recording	Did the research use audio or visual recording to collect the data?	The interviews were digitally audio-recorded.
20.	Field notes	Were field notes made during and/or after the interview or focus group?	During the interviews, the assistant moderator observed the interaction between participants in the group and made notes.
21.	Duration	What was the duration of the interviews or focus group?	The focus group interviews lasted 1-1.5 hours.
22.	Data saturation	Was data saturation discussed?	Data saturation, as seen from the concept of grounded theory, was employed, However, our data are rich in content.
23.	Transcripts returned	Were transcripts returned to participants for comment and/or correction?	No, but at the end of the interview, the assistant moderator provided a summary, and concluding questions about the adequacy of the summary were posed to enable participants to reflect back on previous comments.
Domain 3: analysis and findings			
Data analysis			
24.	Number of data coders	How many data coders coded the data?	The analyses were primarily carried out by the first and last author.

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			During the analysis process, the subcategories and categories were discussed with all co-authors until consensus was reached.
25.	Description of the coding tree	Did authors provide a description of the coding tree?	Yes, the authors did provide a description of the coding tree.
26.	Derivation of themes	Were themes identified in advance or derived from the data?	No, no themes were identified, the subcategories were grouped into five categories based on similarities and differences.
27.	Software	What software, if applicable, was used to manage the data?	Analyses of demographic characteristics of participants were performed using IBM SPSS 20.0. Otherwise, no software was used.
28.	Participant checking	Did participants provide feedback on the findings?	No
Reporting			
29.	Quotations presented	Were participant quotations presented to illustrate the themes / findings? Was each quotation identified? *e.g. participant number*	Yes, quotations were presented to illustrate the findings. The quotations were identified by professional group.
30.	Data and findings consistent	Was there consistency between the data presented and the findings?	Yes.
31.	Clarity of major themes	Were major themes clearly presented in the findings?	No, no themes were identified, but the five categories were clearly presented.
32.	Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	No, there is no description of diverse cases. All data related to the aim of the study were included in the five categories.

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