Factors influencing long-term adherence to two previously implemented hospital guidelines

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Abstract

Objective and Setting. After successful implementation, adherence to hospital guidelines should be sustained. Long-term adherence to two hospital guidelines was audited. The overall aim was to explore factors accounting for their long-term adherence or non-adherence.

Design and Participants. A fluid balance guideline (FBG) and body temperature guideline (BTG) were developed and implemented in our hospital in 2000. Long-term adherence was determined retrospectively based on data from patient files. Focus groups were launched to explore nurses’ perceptions of barriers and facilitators regarding long-term adherence. The predominant themes from the nurses’ focus groups were posed to clinicians in questionnaires.

Results. Nurses involved in the FBG (overall adherence 100%) stated that adherence has immediate advantages in terms of safety and a gain in time. Nurses and oncologists acted unanimously which was thought to enhance adherence. On the other hand, opinions differed on the BTG within the nursing teams and medical staff (overall adherence 50%). Although the guideline discourages routine postoperative body temperature measurements, temperature should be measured according to the guideline in a considerable number of cases due to changes in patient characteristics since the year 2000. Therefore, adherence was judged to be rather complex.

Conclusions. To secure adherence to hospital guidelines after their successful implementation, guidelines should preferably be comprehensive in terms of being applicable to the majority of the patients in that particular setting and to the most common clinical situations. All healthcare professionals involved should be aware of its immediate benefits for themselves or to their patients.

Keywords: practice guideline, guideline adherence, factors accounting for long-term adherence and non-adherence, focus groups

Introduction

Clinical guidelines seek to enhance uniform and appropriate patient care through the translation of scientific evidence on effectiveness or efficiency into clinical recommendations [1]. In hospital practice, guidelines can help to establish evidence-based patient care throughout multiple disciplines. However, the mere existence of a hospital guideline does not guarantee its actual application and sustained use in daily clinical practice [2].

The probability of using a new hospital guideline was found to be higher when the topic was clinically relevant and when the guideline was evidence-based and methodologically sound [3, 4]. Adherence was also found to be more likely when guidelines were user-friendly and contained precise definitions of recommended performance [3, 5, 6]. Subsequently, hospital specific characteristics like capacity, mission, professionalism and patient population influence guideline adherence as well [7, 8].

Besides improving guideline characteristics and optimizing the hospital setting characteristics, as far as this is possible, implementation strategies aim to secure guideline adherence. Until now, no dissemination and implementation strategy...
has been identified that is effective in all circumstances [2, 9–11]. The effects of audit and feedback of guideline adherence are small to moderate and such strategies are probably most effective when initial adherence is low [12, 13]. Educational outreach visits have small to modest improvements on professional practice [14]. Local opinion leaders are capable of improving evidence-based practice, but the feasibility of its widespread use remains uncertain [15]. Multifaceted implementation interventions have been most effective and are therefore recommended nowadays, although the relative efficacy of each component within the multifaceted approach remains unclear [16, 17].

After completion of the active implementation phase, hospital guidelines should ideally maintain their successful adherence rate in order to sustain the deliverance of uniform and best care. Likewise, changes in professional performance should not wear out in time, despite turnover in personnel and alterations in the hospital setting. Little is known about how to ensure long-term adherence to guidelines in a hospital setting. Some studies found that adherence could be maintained over several years, but external or internal factors influencing these results were not measured [18, 19].

In this study the long-term adherence to two hospital guidelines, which were developed and implemented within our hospital in the year 2000, was audited. The second and overall aim was to explore factors accounting for their long-term adherence or non-adherence.

**Methods**

**Setting**

This study was performed in a 1000 beds university teaching hospital in The Netherlands. All nursing and medical head managers of the seven wards (176 beds), at which one of the guidelines was implemented in 2000, gave permission to perform the current study at their wards.

**Guidelines**

The included guidelines were developed within our hospital (Table 1). Since evidence on both subjects was lacking, clinical trials were performed which served as basis for the guidelines [20, 21]. Both clinicians and nurses were involved in the original studies as well as in the guideline development processes.

The first guideline addressed oncology patients receiving intravenous hyperhydration. The nurses’ routine of calculating fluid balances thrice daily, and the oncologists’ routine of assessing these fluid balances to detect fluid overload was abandoned in the guideline (‘fluid balance’ guideline: FBG).

The second guideline concerned postoperative patients. The routine of nurses measuring body temperature twice a day, and the surgeons’ routine of assessing these measures, to detect postoperative infections early was abolished (‘body temperature’ guideline: BTG).

Both guidelines were actively disseminated in 2000, using a validated model for implementing changes [22]. Persuasion was needed during the active implementation phase of the BTG, as opposed to the FBG which was incorporated immediately. But after the active implementation phase of the BTG, a satisfying initial adherence rate of 91% was measured [23].

**Assessment of long-term adherence rates**

**Fluid balance guideline.** To assess long-term adherence, all oncology patients receiving on or more courses of hyperhydration treatment between January and May 2007 were included. Fluid balances and medical orders for fluid balances were searched for in all patient charts on the wards involved: Oncology/Hematology, Gynecology and Pulmonary Diseases. Whenever a medical order or an actual fluid balance was identified, relevant documents were searched for valid reasons to monitor fluid balance, i.e. the impossibility to weigh a patient or the necessity to register fluid intake and output for other reasons than monitoring fluid overload.

**Body temperature guideline**

Postoperative patients

In a diagnostic accuracy study was found that routine body temperature measurements have low sensitivity and low positive predictive value in detecting postoperative infections [21]. The routine of nurses measuring body temperature twice a day, and the surgeons’ routine of assessing these measures, is abolished.

Surgeons should order diagnostic tests when clinical signs and symptoms of a postoperative infection arise.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Hospital guidelines successfully implemented in 2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluid balance guideline</td>
<td>Body temperature guideline</td>
</tr>
<tr>
<td><strong>Patients</strong></td>
<td>Oncology patients receiving intravenous hyperhydration to reduce adverse effects of nephrotic chemotherapy</td>
</tr>
<tr>
<td>Evidence</td>
<td>In a prospective cohort study was found that fluid balances are unreliable to detect fluid overload [20]</td>
</tr>
<tr>
<td>Practical recommendation</td>
<td>The nurses’ routine of calculating fluid balances thrice daily, and the oncologists’ routine of assessing these fluid balances, is abandoned. It is now safe for oncologists to trust on regularly assessed patient body weight to detect fluid overload</td>
</tr>
<tr>
<td><strong>Postoperative patients</strong></td>
<td>In a diagnostic accuracy study was found that routine body temperature measurements have low sensitivity and low positive predictive value in detecting postoperative infections [21]. The routine of nurses measuring body temperature twice a day, and the surgeons’ routine of assessing these measures, is abolished. Surgeons should order diagnostic tests when clinical signs and symptoms of a postoperative infection arise</td>
</tr>
</tbody>
</table>
Long-term adherence was defined as the number of appropriately monitored and omitted fluid balances relative to the total number of fluid balances that would have been monitored, i.e. thrice daily during each course of hyperhydration, according to the pre-guideline routine.

**Body temperature guideline.** Long-term adherence was retrospectively determined on four surgical wards. Medical and nursing records were studied of every fifth admitted patient who had undergone elective surgery between January and March 2007, until discharge or 14 days postoperatively. It was checked how many times body temperature was actually measured or omitted, and if a valid reason to measure body temperature was present: (1) during blood transfusion; (2) when a patient was operated for an infection; and (3) when a patient developed a postoperative infection.

Long-term adherence was defined as the number of appropriately measured and omitted body temperatures relative to the total number of temperature measurements that would have been obtained in these patients according to the pre-guideline routine, i.e. two routine measurements per day.

An independent investigator checked this process by repeating a random sample of 10 patients per guideline. No discrepancies were found. In case of uncertainty, an independent clinician was consulted to reach consensus.

**Exploration of factors influencing nurses’ long-term adherence**

While long-term adherence was audited, focus groups were launched to explore nurses’ perceptions of barriers and facilitators regarding long-term adherence to their guideline (either FBG or BTG [24, 25]). It was aimed to perform two focus groups for each ward at the transition between day shift and evening shift. All nurses present were invited to participate by their staff nurse.

Firstly, the moderator outlined the aim of the focus group. It was emphasized that participants did not have to agree with each other, their answers could neither be wrong nor right, and all data would be processed anonymously. An introductory question was asked about the participants’ awareness of the guideline.

The key question was addressed by means of two exercises. Nurses were first asked to individually write down as many reasons they could think of to adhere to or ignore the guideline on separate notepapers, in order to attain individual and unbiased perceptions. Second, nurses plenary discussed all individual notes and grouped similar notes together. In this process, the moderator summarized and concretized the barriers and facilitators mentioned, in order to maintain a focused discussion. Attendees were also encouraged to bring up new issues, since group dynamics can multiply and broaden perceptions [26].

In the meantime, the observer made additional notes on the barriers and facilitators discussed [26]. Afterwards, the moderator and observer evaluated each focus group to complete the nurses’ individual notes with perceptions mentioned or observed during group discussion.

Based on all notes, three investigators independently opened-coded the data gathered in the focus groups into keywords. Subsequently, the applicability of each keyword was discussed collectively and they were combined or rephrased if necessary. Moreover, related keywords were grouped into thematic categories.

The thematic categories defined were then assigned to a theoretical framework, comprising five levels of barriers to and incentives for change [27]. The investigators independently assigned each thematic category to one of its levels: the innovation itself, individual professionals, social context, organizational context or economic and political context. Disagreements in classification were reconciled by discussion.

**Exploration of factors influencing clinicians’ long-term adherence**

In daily clinical practice, it turned out to be impossible to bring all clinicians together in focus groups. Therefore we proposed the frequently emerging themes from the nurses’ focus groups in seven multiple choice questions during a regular meeting and by e-mail (Appendices 1 and 2).

**Results**

**Long-term adherence rates**

*Fluid balance guideline.* Hyperhydration during chemotherapy was given 178 times to 68 patients (Table 2). In all, long-term adherence was 100%. According to the pre-guideline routine, 534 fluid balances would have been calculated. In 526 cases no medical orders for fluid balances and no actual fluid balances were found in the patient charts (guideline compliant

| Table 2 Long-term adherence to the fluid balance and body temperature guidelines |
|-------------------------------|-------------------------------|
| Pre-guideline routine          | 534 fluid balances monitored |
| To monitor according to guideline | 526                           |
| Guideline compliant monitoring | 100% (8/8)                    |
| Overall long-term adherence    | 100% (534/534)                |
| Body temperature guideline     | 1226 body temperature measurements |
| To omit according to guideline | 547                           |
| Guideline compliant omission   | 39% (214/547)                 |
| Overall long-term adherence    | 50% (617/1226)                |
 omission of fluid balance monitoring 100%). Eight fluid balances were calculated because of the inability to weigh a patient or for monitoring a high-output stoma (guideline compliant monitoring of fluid balance 100%).

Body temperature guideline. On the surgery wards a sample of 102 patients who had undergone elective surgery was randomly selected (Table 2). Overall long-term adherence was 50%. As to the pre-guideline routine, 1226 postoperative body temperature measurements would have been taken. Nowadays, in 547 out of the 1226 occasions body temperature should not have been measured according to the guideline, which was adhered to 214 times (guideline compliant omission of body temperature 39%). In the other 679 cases body temperature should have been measured according to the guideline, mostly because a preoperative or postoperative infection was present. This was adhered to 403 times (guideline compliant measurement of body temperature 59%).

Factors influencing nurses’ long-term adherence

Fluid balance guideline. Five focus group meetings, lasting 40 min on average, were attended by 15 nurses (range 2–5 nurses per focus group, including two staff nurses, 11 registered nurses and two student nurses). After evaluation of the fifth focus group, no new factors accounting for long-term (non-)adherence were mentioned. Therefore, no new focus groups were organized [28].

Nurses mainly mentioned factors contributing to the adherence to the FBG. They stated that the innovation, in which the routine of monitoring fluid balances had been abolished, saved them a lot of time and trouble (Table 3). They had always suspected that it was unnecessary to both weigh patients and compose daily fluid balances (individual level). Nurses reminded each other and oncologists about applying the guideline, leading to a favorable social context of the guideline. On an organizational level, nurses indicated that they are required to follow strict protocols during courses of chemotherapy. Because the guideline had been incorporated in the existing chemotherapy protocol, they perceived adherence to the FBG to be non-problematic. No factors accounting for guideline non-adherence emerged in the meetings.

Body temperature guideline. Seven focus group meetings were attended by 47 nurses (range 5–8 nurses per focus group, including four senior nurses, 38 registered nurses and five student nurses) and lasted 60 min on average. After seven focus groups, a saturation point was reached as no new issues came up. Therefore, no new focus groups were organized [28].

Nurses of the surgery wards mainly mentioned factors accounting for non-adherence to the BTG (all factors grouped together in thematic categories in Table 3). Nurses particularly claimed that the innovation within the guideline had made daily clinical practice complex, because there were too many patients on their wards who did not meet the guideline criteria to omit regular body temperature measurements. Other nurses stated that application of the guideline prevented patients from unnecessary diagnostic research due to false-positive body temperature measurements. Regarding individual factors, nurses still believed body temperature to be an objective as well as a more reliable measure than their clinical judgment to demonstrate or exclude a postoperative infection, despite evidence stating the opposite. Within the social context, many nurses appeared to remind each other to stick to the old routine of measuring body temperature twice a day. They were also encouraged by orders of surgeons and expectations of patients to measure body temperature.

Factors influencing clinicians’ long-term adherence

Fluid balance guideline. The multiple choice questions based on the nurses’ focus groups were answered by 25 out of 44 oncologists (57%). Although the majority of the oncologists was unaware of the FBG or its exact content (17 out of 25; 68%, Appendix 1), they did follow its practical recommendations stating to rely only on the patients’ weight to detect fluid overload (18 out of 25; 72%).

Body temperature guideline. Thirty out of 51 surgeons responded to the multiple choice questions (59%). About half of the surgeons were aware of the BTG (14 out 30; 47%, Appendix 2). However, they appeared to have misinterpreted its content. While all routine body temperature measurements should be abolished, 20 of the 30 surgeons (67%) claimed they still checked body temperature to diagnose a postoperative infection when clinical signs or symptoms of a possible postoperative infection were observed. The same number of surgeons (67%) did not always trust nurses in their clinical judgment to notice significant signs and symptoms of a postoperative infection. This led them to assign nurses to measure body temperature routinely in order to ‘objectify’ the presence or absence of any postoperative infection.

Discussion

Seven years after successful implementation of two hospital guidelines we found 100% adherence to the FBG versus only 50% for the BTG. Factors accounting for this (non-)adherence particularly regarded the presence of direct advantages to applying the guideline, the number of patients that fit the guideline’s criteria and the interaction between clinicians and nurses involved.

Long-term adherence was attributed to immediate advantages to the nurses involved of applying the guideline. This confirms the finding of a previous study in primary and acute care trusts in the UK, where long-term adherence was achieved when practitioners and managers saw immediate advantages to adoption of pieces of guideline [29]. Clinicians stated that patient-oriented advantages of guideline adherence, such as decreased mortality and morbidity due to cardiac events, were major stimulators for long-term adherence to ischemic heart disease guidelines [30]. Eventually, the perceived benefits of adhering to a guideline must outweigh its barriers, as was found with the implementation of guidelines of hand hygiene in health care [31].
### Table 3: Fluid balance and body temperature guidelines: factors accounting for guideline (non-)adherence, mentioned by nurses

<table>
<thead>
<tr>
<th>Level</th>
<th>Fluid balance guideline adherence</th>
<th>Fluid balance guideline non-adherence</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Innovation itself</strong></td>
<td>It is less labor-intensive to only weigh patients</td>
<td>None mentioned</td>
</tr>
<tr>
<td></td>
<td>I gain in time because I do not have to compose fluid balances anymore</td>
<td></td>
</tr>
<tr>
<td></td>
<td>It was hard to compose a fluid balance accurately</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Our own safety improves due to less contact with cytostatic urine</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The guideline is evidence-based: it was proven that weighing patients is accurate and composing fluid balances is not</td>
<td></td>
</tr>
<tr>
<td><strong>Individual professional</strong></td>
<td>None mentioned</td>
<td>None mentioned</td>
</tr>
<tr>
<td><strong>Social context</strong></td>
<td>We already suspected that it was unnecessary to both weigh patients and compose daily fluid balances</td>
<td>None mentioned</td>
</tr>
<tr>
<td></td>
<td>We remind each other and oncologists to follow the guideline</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Oncologists support the guideline as well</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The investigator of the original study engaged us in the study and in implementation, leading to a guideline that was tailored to daily clinical practice</td>
<td></td>
</tr>
<tr>
<td><strong>Organizational context</strong></td>
<td>We follow strict protocols during chemotherapy. Including the guideline in these protocols ensures adherence</td>
<td>None mentioned</td>
</tr>
<tr>
<td><strong>Economic/political context</strong></td>
<td>The government indirectly stimulated adherence by paying extra attention to a safe work environment in health care</td>
<td>None mentioned</td>
</tr>
<tr>
<td><strong>Level</strong></td>
<td>Body temperature guideline adherence</td>
<td>Body temperature guideline non-adherence</td>
</tr>
<tr>
<td><strong>Innovation itself</strong></td>
<td>The guideline stimulates the development of my clinical eye</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A study showed that routine postoperative body temperature measurements are meaningless</td>
<td></td>
</tr>
<tr>
<td><strong>Individual professional</strong></td>
<td>I am confident with my clinical eye considering the detection of signs and symptoms of a postoperative infection</td>
<td>Body temperature measurements reflect how the patient is doing, clinical findings can be misleading</td>
</tr>
<tr>
<td><strong>Social context</strong></td>
<td>Everybody on our ward supports the guideline, including the surgeons</td>
<td>Routine body temperature measurements is a persistent routine, nurses correct each other when a measurement was omitted</td>
</tr>
<tr>
<td><strong>Organizational context</strong></td>
<td>It is hard to find thermometers on the ward</td>
<td>None mentioned</td>
</tr>
<tr>
<td><strong>Economic/political context</strong></td>
<td>None mentioned</td>
<td>Taking routine body temperature measurements is still instructed at nursing school</td>
</tr>
</tbody>
</table>
Adherence to the BTG was found to be troublesome in the long run. Our adherence measurement revealed that, although the guideline discourages routine postoperative body temperature measurements, in current clinical practice body temperature should nevertheless be measured according to the guideline in a considerable number of cases. This might be explained by changes in patient characteristics over the years. When preoperative and postoperative infections are more prevalent, the number of body temperature measurements that should be taken increases, particularly because these patients will stay longer on the surgical ward.

Some patient groups, like pancreatic cancer patients, are admitted to our surgical wards in considerably large numbers nowadays. However, they were not represented in the diagnostic study on which the guideline was based at that time [21]. It was uncertain for surgeons and nurses involved whether these severely ill patients fitted the guideline criteria for omitting routine body temperature measurements. This drawback of individual patients not meeting guideline criteria has been described more often. It may even have harmful effects. For example, patients’ lipid profile on admission for ischemic stroke was the least likely to be at guideline recommended levels for patients at the greatest risk of cardiovascular events [32]. Moreover, female patients with acute coronary syndromes and extensive co-morbidities were less likely to be treated with recommended acute therapies and recommended discharge therapies [33].

Adherence to the BTG was also hampered because of misinterpretation: surgeons still tended to check body temperature when clinical signs or symptoms of a possible postoperative infection were observed, and nurses still believed body temperature to be an objective as well as a reliable measure to demonstrate or exclude a postoperative infection. A lack of self-efficacy or disbelief in the evidence base of the guideline could underpin these findings [34], but these possible barriers were neither confirmed in the focus groups for nurses nor in the questionnaires for clinicians.

Social interaction between the healthcare professionals involved appeared to influence long-term adherence in both positive and negative ways. With respect to the FBG, nurses and oncologists acted unanimously which was thought to enhance adherence. In several previous studies peer support, teamwork and leadership support have shown to be important to the implementation of other guidelines [15, 35, 36].

In the opposite direction, opinions differed on the BTG within the nursing teams and medical staff, as well as between these disciplines, which was thought to hinder long-term adherence.

Some potential limitations of this study should be discussed. We focused on only two guidelines within a single hospital setting, which inevitably limits the external validity of our findings. Secondly, we limited our study to individual opinions of nurses and clinicians. This means that we could not find a causal relation between guideline characteristics or system characteristics and long-term guideline adherence. However, by adding a qualitative approach to a quantitative measurement, we have gathered some signs that may be worth further study regarding their potential to influence long-term guideline adherence in the hospital setting [37, 38].

In conclusion, to secure long-term hospital guideline adherence, guidelines are preferably comprehensive in being applicable to the majority of patients aimed at, and being applicable to the most common clinical situations. All healthcare professionals involved should be aware of its immediate benefits to themselves or to their patients. Adherence to guidelines should be monitored repeatedly. If adherence rates appear to diminish over time, we suggest that barriers to guideline adherence should be explored both among the individual healthcare professionals involved as well as regarding the characteristics of the hospital setting. In a postinitial implementation strategy, we suggest interventions should be tailored to the newly revealed barriers and direct advantages of applying the guideline should be emphasized to the healthcare professionals involved. Adherence to hospital guidelines after the active and successful initial implementation phase cannot be taken for granted.

Acknowledgements

We thank the oncologists, surgeons and the nurses of the Oncology/Hematology ward, Gynecology ward, Pulmonary Diseases ward and the four Surgical wards for their cooperation and frankness in this study. We are grateful to M.M. Dekker for her intellectual input during the design of the study and to F.R. Gärtner for critical revision of the manuscript for important intellectual content.

Appendix I Oncologists’ guideline adherence: questions derived from the nurses’ focus groups

<table>
<thead>
<tr>
<th>Fluid balance guideline adherence: questions for oncologists</th>
<th>% (n)</th>
</tr>
</thead>
</table>
1. To detect fluid overload in patients with intravenous hyperhydration, I want to know: |       |
   a. Fluid balance every 8 h | 12 (3) |
   b. Body weight every 8 h | 72 (18) |
   c. Fluid balance and body weight every 8 h | 16 (4) |
   d. Otherwise | 0 (0) |

(continued)
Appendix 1  Continued

2. When I ask for a fluid balance, this is because:
   a. I do it out of routine 24 (6)
   b. My colleagues expect me to do so 8 (2)
   c. The nurses hand me the fluid balance 12 (3)
   d. I never ask for a fluid balance 44 (11)

3. Are you aware of the guideline regarding the omission of fluid balances to detect fluid overload?
   a. Yes, and I adhere to the guideline 28 (7)
   b. Yes, but I do not adhere to the guideline 0 (0)
   c. Yes, but I am not aware of the exact content of the guideline 24 (6)
   d. No, I am not aware of this guideline at all 44 (11)

4. Do your patients fit this guideline?
   a. Yes, most of them do 80 (20)
   b. No, it is impossible to weigh most patients 4 (1)
   c. No, I often want to have a fluid balance monitored for other reasons 4 (1)

5. Do you feel that the evidence base of this guideline is sufficient to apply the guideline?
   a. Yes, sufficient to apply the guideline 32 (8)
   b. More research is needed before I am willing to apply the guideline 0 (0)
   c. No, the evidence base is insufficient 0 (0)
   d. Not applicable, I am not aware of the evidence or the guideline 64 (16)

6. Are you confident in detecting fluid overload without knowing fluid balance?
   a. Yes, weighing patients is sufficient to detect fluid overload 80 (20)
   b. No, balances are unreliable 0 (0)
   c. No, I do not trust the nurses 0 (0)
   d. No, I want a fluid balance to be monitored to be sure that I will not miss out on fluid overload 16 (4)

Appendix 2  Surgeons’ guideline adherence: questions derived from the nurses’ focus groups

Body temperature guideline adherence: questions for surgeons % (n)

1. To detect a postoperative infection in a non-infected patient, I want to know body temperature:
   a. On a daily basis 23 (7)
   b. When signs or symptoms of an infection occur 67 (20)
   c. Only in seriously ill patients 3 (1)
   d. Never 3 (1)

2. When I ask to measure body temperature in a non-infected patient, this is because:
   a. I do it out of routine 40 (12)
   b. My colleagues expect me to do so 10 (3)
   c. The nurses tell me the body temperature 20 (6)
   d. I never ask for a body temperature 30 (9)

3. Are you aware of the guideline in which routine body temperature measurements are omitted?
   a. Yes, and I adhere to the guideline 23 (7)
   b. Yes, but I do not adhere to the guideline 23 (7)
   c. Yes, but I am not aware of the exact content of the guideline 33 (10)
   d. No, I am not aware of this guideline at all 20 (6)

4. Do your patients fit this guideline?
   a. Yes, most of them do 77 (23)
   b. No, a considerable number of patients have a preoperative infection 0 (0)
   c. No, a considerable number of patients develop a postoperative infection 17 (5)

5. Do you feel that the evidence base of this guideline is sufficient to apply the guideline?
   a. Yes, sufficient to apply the guideline 37 (11)

(continued)
## Appendix 2 Continued

Body temperature guideline adherence: questions for surgeons

<table>
<thead>
<tr>
<th>Question</th>
<th>Agree (%)</th>
<th>% (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Are you confident in detecting a postoperative infection without knowing body temperature?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Yes, routine temperature measurements are not needed to detect a postoperative infection</td>
<td></td>
<td>50 (15)</td>
</tr>
<tr>
<td>b. No, when I suspect a postoperative infection, I want the body temperature to be measured</td>
<td></td>
<td>47 (14)</td>
</tr>
<tr>
<td>c. No, I always want to know body temperature so that I will not miss a postoperative infection</td>
<td></td>
<td>3 (1)</td>
</tr>
<tr>
<td>2. Do you trust nurses to notice significant signs and symptoms of a postoperative infection?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Yes, routine temperature measurements are not needed to detect a postoperative infection</td>
<td></td>
<td>33 (10)</td>
</tr>
<tr>
<td>b. No</td>
<td></td>
<td>67 (20)</td>
</tr>
</tbody>
</table>

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