A Qualitative Evaluation of the Barriers and Facilitators Toward Implementation of the WHO Surgical Safety Checklist Across Hospitals in England

Lessons From the “Surgical Checklist Implementation Project”

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Objectives: To evaluate how the World Health Organization (WHO) surgical safety checklist was implemented across hospitals in England; to identify barriers and facilitators toward implementation; and to draw out lessons for implementing improvement initiatives in surgery/health care more generally.

Background: The WHO checklist has been linked to improved surgical outcomes and teamwork, yet we know little about the factors affecting its successful uptake.

Methods: A longitudinal interview study with operating room personnel was conducted across a representative sample of 10 hospitals in England between March 2010 and March 2011. Interviews were audio recorded over the phone. Interviewees were asked about their experience of how the checklist was introduced and the factors that hindered or aided this process. Transcripts were submitted to thematic analysis.

Results: A total of 119 interviews were completed. Checklist implementation varied greatly between and within hospitals, ranging from preplanned/phased approaches to the checklist simply “appearing” in operating rooms, or staff feeling it had been imposed. Most barriers to implementation were specific to the checklist itself (eg, perceived design issues) but also included problematic integration into preexisting processes. The most common barrier was resistance from senior clinicians. The facilitators revealed some positive steps that can be taken to prevent/address these barriers, for example, modifying the checklist, providing education/training, feeding-back local data, fostering strong leadership (particularly at attending level), and instilling accountability.

Conclusions: We identified common themes that have aided or hindered the introduction of the WHO checklist in England and have translated these into recommendations to guide the implementation of improvement initiatives in surgery and wider health care systems.

Keywords: WHO surgical safety checklist, implementation, barriers and facilitators, patient safety, interview study, surgery, operating room, operating theatre

The World Health Organization’s (WHO) surgical safety checklist was a key output of their 2007 “Safe Surgery Saves Lives” campaign.1,2 The checklist comprises 3 components: “sign-in,” “time-out,” and “sign-out,” which are carried out when the patient arrives into the operating room (OR) complex, just before the surgical procedure starting and upon completion of the procedure, respectively. The purpose of this tool was to create a standardized framework to improve patient safety and reduce the morbidity and mortality associated with potential deviations from best practice, for example, with regard to antibiotic and deep vein thrombosis prophylaxis, as well as avoidable error in the surgical setting.3,4

The checklist was pilot-tested in a global study across 8 hospitals in the developed and developing world. The results were published in January 2009 and showed a significant reduction in mortality and morbidity after checklist implementation.2 As a result of these findings, a modified version of the checklist was mandated by the UK’s Department of Health (through the then called “National Patient Safety Agency,” NPSA) for use in all surgical procedures carried out within the National Health Service (NHS) in England and Wales (including day surgery).6 Hospitals were given 12 months to fully implement the checklist (until January 2010). Some guidance regarding implementation, modification, and the correct use of the checklist was made available online7 and the checklist was also highlighted as part of the “Patient Safety First” campaign, which was active between June 2008 and March 2010 and aimed to promote patient safety across the NHS.3 To date, the WHO checklist, or a version of it, has been introduced as best practice in several other countries, including the United States.5

To prospectively evaluate how the checklist was introduced and implemented within England, after the introduction of the WHO checklist as national policy our research team set up the “Surgical Checklist Implementation Project” in 2009. Here, we report longitudinal interview data collected between 2010 and 2011 on how the checklist was received across a nationally representative sample of hospitals in England. The following specific research questions were addressed:

1. How was the WHO checklist initially implemented within English hospitals?
2. What were the key barriers and facilitators to its implementation?
3. What lessons can we extract for informing how to optimize the diffusion and uptake of improvement initiatives in surgery and wider health care systems?

METHODS

Setting and Participants

Surgical Checklist Implementation Project was a multiphase large research program. For this study, OR personnel were sampled from 10 English hospitals to take part in the interviews. The 10 hospitals were selected to be nationally representative using the following stratification criteria:

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integrated research application system for health research and were audio-recorded, and later were transcribed verbatim for data collection.

- Type and size: the Department of Health has a hospital classification “clustering” system based on hospital type (eg, teaching vs community) and size (small vs medium vs large)—the latter based on number of beds/admissions.

- Safety incident reporting levels: all English hospitals are linked into a national incident reporting system, termed the “National Reporting and Learning System,” NRLS (www.nrls.npsa.nhs.uk).

A database is maintained of the volume of incidents reported by each hospital, which classifies them into low, medium, and high reporting hospitals. This criterion was used in light of the evidence that shows that increased reporting to the NRLS is positively linked to safety culture within hospitals, which can affect how a safety intervention like the WHO checklist gets implemented.

- Checklist implementation early response: after introduction of the WHO checklist as national policy in 2009, the Department of Health maintained a database of hospitals regarding where they were on their implementation pathway (not acknowledged, acknowledged, ongoing, completed). Hospitals were required to have reached the stage of “completed” by February 2010.

To achieve representativeness of responses, the sampling took place in 2 stages. In the first stage a random set of hospitals across the above criteria was generated by the NPSA. In the second stage, the research team cross-tabulated the criteria, identified hospitals that fulfilled the cross-stratification as much as this was feasible (eg, there were only 2 institutions that were listed as not having acknowledged the checklist policy, as should be expected), and then randomly selected within those. Hospitals were identified with a 3-letter acronym provided by the Department of Health, to which the research team was kept blinded until after the final selection had been made.

Within the 10 selected hospitals, all OR personnel were identified via the human resources department of each hospital. All personnel subsequently received an electronic survey of their views on the WHO checklist (data not reported here). Participants who completed the survey had the option to provide their details so they could be interviewed regarding the WHO checklist—that is, an “opt in” approach. Participants who were not interviewed varied widely in their experience of working in ORs, due to clinical commitments. The 119 participants who were interviewed (response rate: 84.4%) were interviewed (response rate: 84.4%). Participants who were not interviewed did so because of logistical problems—that is, holidays, lack of availability of time for the interview, or cancelation of interview due to clinical commitments. The 119 participants who were interviewed varied widely in their experience of working in ORs, ranging from 6 months to more than 30 years. Table 1 displays the participant demographics according to professional group and hospital size.

All hospitals had implemented the checklist 6 to 12 months before data collection.

**Analyses**

Audio-recorded interviews were anonymized and responses were transcribed verbatim. All transcripts were analyzed by a trained psychologist researcher (S.J.R.) using an inductive approach, evolving an interpretive framework to fit the data. Thematic analysis was undertaken, extracting specific themes from the transcripts regarding (1) how the checklist had been implemented and (2) the perceived barriers (factors that hinder uptake) and facilitators (factors that improve uptake) surrounding its implementation. Themes were extracted until the standard criterion for qualitative studies of “saturation” was reached—that is, no further codes were needed to describe the participants’ views. A senior psychologist with expertise in surgical safety (N.S.) reviewed the analyses to control for bias in theme extraction.

To provide a framework for the coding of the interviews, themes representing barriers and facilitators were grouped according to whether they related to organizational, systems, team, or checklist-specific factors. These were based on the large evidence base on factors affecting safety in surgery and were defined as follows:

- Organizational: Themes relating to financial resources and constraints; organizational structure; policy, standards, and goals; strategy and planning; safety culture and priorities,11,12
- Systems: Themes relating to the integration of the checklist into existing systems, protocols, and procedures (eg, efficiency, repetition),11–13
- Team: Themes relating to teamwork (eg, communication, cohesion), team structure/membership (eg, leadership), and team buy-in and ownership of the checklist.11–13
- Checklist-specific: Themes relating specifically to either checklist design, content, applicability or process, and/or the evidence base behind the checklist.13,15

**RESULTS**

**Participant Demographic Information**

A total of 141 participants “opted in” to be interviewed, of whom a final sample of 119 OR personnel across 10 NHS hospitals were interviewed (response rate: 84.4%). Participants who were not interviewed did so because of logistical problems—that is, holidays, lack of availability of time for the interview, or cancelation of interview due to clinical commitments. The 119 participants who were interviewed varied widely in their experience of working in ORs, ranging from 6 months to more than 30 years. Table 1 displays the participant demographics according to professional group and hospital size.

All hospitals had implemented the checklist 6 to 12 months before data collection.
TABLE 1. Respondent Profiles

<table>
<thead>
<tr>
<th>N = 119</th>
<th>N (% of Sample)</th>
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<tbody>
<tr>
<td>Professional group</td>
<td></td>
</tr>
<tr>
<td>Surgeon</td>
<td>37 (31)</td>
</tr>
<tr>
<td>Attending</td>
<td>19 (16)</td>
</tr>
<tr>
<td>Other</td>
<td>18 (15)</td>
</tr>
<tr>
<td>Anesthesiologist</td>
<td>31 (26)</td>
</tr>
<tr>
<td>Attending</td>
<td>18 (15)</td>
</tr>
<tr>
<td>Other</td>
<td>13 (11)</td>
</tr>
<tr>
<td>Nurse</td>
<td>23 (19)</td>
</tr>
<tr>
<td>Operating department practitioner (anesthetic nurse/technician)</td>
<td>18 (15)</td>
</tr>
<tr>
<td>Radiographer</td>
<td>10 (8)</td>
</tr>
<tr>
<td>Trust size</td>
<td></td>
</tr>
<tr>
<td>Small</td>
<td>34 (29)</td>
</tr>
<tr>
<td>Medium</td>
<td>27 (23)</td>
</tr>
<tr>
<td>Large</td>
<td>25 (21)</td>
</tr>
<tr>
<td>Acute teaching</td>
<td>33 (28)</td>
</tr>
</tbody>
</table>

How Was the WHO Checklist Initially Implemented?

The manner in which the checklist was initially implemented varied greatly, both between and within hospitals, and fell under 3 broad themes:

1. Planned implementation approach
2. Limited/no implementation approach
3. Imposed implementation approach

Each of these themes is described in Table 2 with illustrative quotes.

Planned implementation refers to interviewees’ reports, which outlined a clear, articulated strategy for introducing the checklist with senior leadership and local facilitation—including producing early modifications of the form, trialling implementation in 1 or 2 ORs initially to allow troubleshooting, electing “checklist champions” who acted as local leaders and also a “go-to” person for frontline personnel regarding queries, and providing education and training sessions around the importance and use of the checklist. In contrast, limited/no implementation emerged from interviewees’ reports that emphasized a lack of awareness of any preplanned implementation strategy and a perception that the checklist had simply “appeared” one day in ORs. Some staff mentioned that they had received an e-mail or saw posters relating to the checklist’s introduction but that this was not formally consolidated by any further implementation exercises. Finally, imposed implementation refers to interviewees’ reports of feeling forced to use the checklist or of an overtly top-down approach (ie, from hospital senior management or the Department of Health) with no opportunity for frontline personnel feedback or involvement. Individuals within the same hospital often reported quite different implementation experiences, depending on what professional group they belonged to, or what shifts they worked. For example, certain specialties may have provided some training and education around the initiative during audit days whereas other specialties did not, and individuals working night shifts often reported missing relevant meetings and education sessions.

Barriers and Facilitators to WHO Checklist Implementation

A total of 11 themes were extracted that represented barriers to checklist implementation and 9 themes that represented facilitators. These themes are presented in Tables 3 and 4 along with illustrative quotes. We found no apparent differences between the responses of individuals who were interviewed at the start of the 1-year data collection period compared with those interviewed at the end, nor did we find a difference between those who had implemented the checklist earlier rather than later after the initial mandate.

Barriers

Organizational Barriers

Two themes reflected organizational barriers. The first, reported by 24% of the sample, related to the style in which the checklist was initially implemented within the hospital. When there was no planned approach to implementation (eg, a lack of education or training, a perceived lack of support from management, no customization to the local context), or indeed an imposed approach, staff buy-in to the tool was jeopardized because of a lack of ownership over the initiative and because the local relevance of the tool had not been communicated. The same proportion of staff held the perception that the culture within their hospital was that of a general resistance to the introduction of change, whatever form it takes, particularly from more senior members of staff. Some stated that this had resulted from too many changes being made to recommended practice in England, and the feeling that “if it’s not broke, why fix it.”

Systems Barriers

Two further barriers related to problems integrating the checklist into existing systems. Almost a third of the sample (29%) reported that the checklist took too long to complete, creating inefficiency in the running of the operating list. And a quarter of the sample perceived the checklist to be directly repetitive of existing safety practices already in place, therefore failing to contribute anything “extra” in terms of safety to the system (eg, where local checklists had already been developed and were not removed before the WHO checklist was introduced).

Team Barriers

The most common barrier to checklist implementation, reported by 51% of the sample, was active resistance or passive non-compliance from individuals in the OR team, most frequently (84% of the time) from senior surgeons and/or anesthesiologists. This often made it very challenging for the person leading the checks (often a nurse) to complete them in the intended manner, or without feeling personally attacked.

Checklist-Specific Barriers

The majority of barriers that emerged were specific to the checklist itself. A third of the sample (34%) reported design issues with regard to the content of the checklist’s (eg, the awkward wording of certain checks such as “are there any unexpected steps?”—interviewees commented that if something is unexpected it follows it cannot be anticipated in advance), or physical structure/layout (eg, there being no space to write answers to questions or to provide the date). Others (27%) perceived there to be issues with the timing at which certain checks are carried out, for example, with the time-out often being perceived as being too late to correct errors or disrupting staff at a critical time, and the sign-out suffering from staff leaving the OR before the end of the procedure. The checklist was also perceived by 28% of the sample to be inappropriate for certain surgical procedures; either specific surgical specialties (eg, ophthalmic surgery, obstetrics) or certain contexts (eg, time-pressured emergencies, rapid turnover day-cases). Similarly, some respondents (14%) were concerned about the reaction patients might have toward the checks. For example, some stated that patients often did not understand why they had to confirm their ID/procedure, etc; so many times during their surgical pathway, and others felt that specific questions around blood loss and difficult airway (part of the sign-in checks) would be anxiety
TABLE 2. Reported Checklist Implementation Approaches

<table>
<thead>
<tr>
<th>Implementation Approach</th>
<th>Illustrative Quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planned implementation approach:</td>
<td>A well-planned and articulated strategy was in place for introducing the checklist in a manner that would optimize its smooth integration and/or staff-buy-in to the tool.</td>
</tr>
<tr>
<td>Planned implementation approach:</td>
<td>It was introduced into one of the orthopaedic ORs and so what they did is they, just on one of the Attending surgeon's list they used that as an early implementer theatre. And so that team did it and worked through what we had to make sure that what we had worked and that people were happy and then they rolled it out.</td>
</tr>
<tr>
<td>Operating Room Manager (Nurse), Small Hospital</td>
<td>We started straight away. We set up a committee group. We looked at the form and how we might possibly alter it for our own hospital. We put a suggestion box where people could write notes about what they thought and we took those on board and produced a second draft to optimize all these comments. The uptake was 100% I would say within 8 or 9 months.</td>
</tr>
<tr>
<td>Operating Room Manager (Nurse), Medium Hospital</td>
<td>It was the agenda for most meetings. And the form was put out there, we talked about it at staff meetings before it went out for people to comment on. We took the DVD that was offered from Patient Safety First and played it on education afternoons, the good, the bad and the ugly sort of thing, so that everyone understood where it had come from. We also elected local checklist champions who acted as a 'go to' point for questions and queries and really drove use of the tool on the ground.</td>
</tr>
<tr>
<td>Operating Room Manager (Nurse), Medium Hospital</td>
<td>Mostly word of mouth, I think. I don't know about any other ORs but we just disseminated it amongst ourselves, and I had a bit of a read, and there was a fair amount from the matron on her emails, and there was a poster up.</td>
</tr>
<tr>
<td>Operating Room Manager (Nurse), Medium Hospital</td>
<td>I'm not sure, it's just something that, as far as I was concerned in my role, it was just something that they were suddenly doing one day.</td>
</tr>
<tr>
<td>Limited/no implementation approach:</td>
<td>Staff were unaware of any structured approach to implementation other than what they heard via e-mail/posters or word of mouth. In many cases the checklist just seemed to “appear” in ORs.</td>
</tr>
<tr>
<td>Limited/no implementation approach:</td>
<td>It just appeared rather than there really being any kind of formal introduction of the checklist. Now I may have missed that and that is part of the problem isn’t it, when you’re a trainee and you’re not in every day, that there may have been a scheduled meeting that we didn’t get to go to, I don’t know.</td>
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<td>Limited/no implementation approach:</td>
<td>Yeah exactly from the surgical staff point of view certainly I don’t know whether the theatre staff got any briefing in terms of filling out the checklist but from a surgical point of view it was very much just one day there it is, read the boxes and fill it out. There was no discussion or introduction or anything. Typical.</td>
</tr>
<tr>
<td>Imposed implementation approach:</td>
<td>The checklist was imposed on staff from the top-down (eg, hospital management/Department of Health) and there was little or no opportunity for frontline staff to be involved or to modify the tool early on.</td>
</tr>
<tr>
<td>Imposed implementation approach:</td>
<td>Our manager just said, I think this was on the Thursday, as of Monday we’re using the WHO checklist, and that’s that.</td>
</tr>
<tr>
<td>Imposed implementation approach:</td>
<td>It’s like many other directives from the Department of Health that we get these days, there is no, or very little discussion about what happens, we’re just told to do things and that’s the end of it.</td>
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### TABLE 3. Barriers to Checklist Implementation

<table>
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<th>Barriers</th>
<th>N (%)</th>
<th>Illustrative Quotes</th>
</tr>
</thead>
</table>
| Implementation approach: The manner in which the checklist was introduced prevented buy-in and created adversity. | 28 (24) | *The main issue was the way it was introduced, which was top down, accompanied by, well this is a new checklist and if the staff don’t fill it in they’ll be punished. Also there were mixed messages from management about whether we were allowed to modify the checklist or not.*  
**Attending Anesthesiologist, Acute Teaching Hospital**  
Cruelly there was no training or education given in how to do a checklist, we were just told the checklist is coming, this is what it looks like, and you will do it. That created the impression that it was just another piece of regulatory paperwork.  
**Attending Anesthesiologist, Acute Teaching Hospital**  
Crucially there was no training or education given in how to do a checklist, we were just told the checklist is coming, this is what it looks like, and you will do it. That created the impression that it was just another piece of regulatory paperwork. |
| Lack of culture for change: The culture within the hospital is that of a general resistance to change and new practice. | 28 (24) | *A lot of people don’t like change and they don’t like new things, and if they’ve been doing it this way for the last 20 years and it’s not broken why fix it?*  
**ODP, Large, Hospital**  
Just personal interest and refusal to change, unable to adapt. Some doctors feel uncomfortable when you’re trying to change. I will add they are senior members of their respective teams.  
**Attending Anesthesiologist, Medium Hospital**  
Crucially there was no training or education given in how to do a checklist, we were just told the checklist is coming, this is what it looks like, and you will do it. That created the impression that it was just another piece of regulatory paperwork. |
| Time wasting: The checklist causes unnecessary delay to the operating list. | 34 (29) | *Yet more delay! Oh gosh, we’re going to get less work done for the patients.*  
**Attending Surgeon, Acute Teaching Hospital**  
The first and second part of the checklist will delay things because you’re delaying starting the anesthetic room and you’re delaying starting on the operating table.  
**Attending Anesthesiologist, Acute Teaching Hospital**  
I think the problem is that, with it being a standardized checklist, is that hospitals have their own checklists as well and you end up having two or three checklists, all checking the same sort of thing so you get some overlap. |
| Repetition: The checklist duplicates existing safety procedures, failing to add anything to the system. | 30 (25) | *When it was introduced, no one looked at withdrawing what the checklist is replacing. So staff now fill in the checklist and everything else they used to fill in as well.*  
**ODP, Medium Hospital**  
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**Attending Anesthesiologist, Acute Teaching Hospital**  
I think the problem is that, with it being a standardized checklist, is that hospitals have their own checklists as well and you end up having two or three checklists, all checking the same sort of thing so you get some overlap. |
| Resistance and noncompliance: Certain individuals within the team make it very difficult to complete the checklist without confrontation, or certain individuals are not engaged in the checks. | 61 (51) | *The checklist itself is very easy. Getting the answer to some of the questions from the surgeons and the anaesthetists isn’t, and that’s the fall down.*  
**ODP, Large Hospital**  
When the surgeons weren’t on board you were told to “oh shut up and let’s get on with it.” During introductions we had surgeons look up and say “oh God, I’m so and so, Prince of Darkness, if you don’t know me by now get out of my operating room.”  
**Operating Room Nurse, Small Hospital** |

(Continued)
### TABLE 3. (Continued)

<table>
<thead>
<tr>
<th>Barriers</th>
<th>N (%)</th>
<th>Illustrative Quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tool-specific factors</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Design problems- content/structure:           | 40 (34) | *It asks questions on there but without any definite answers. It’ll ask about the patient’s ASA grade, so you just tick it and say yes. It doesn’t mention what the code is or what relevance that has to anything or anything like that. So it’s a bit bizarre and there’s a sense of, I’m not actually progressing the patient care with this question.*  
  **ODP, Large Hospital**  
  *Some of the questions are like a red-nag to a bulk, like “are you expecting the unexpected?”*  
  **Operating Room Nurse, Large Hospital**  
  *There is no column for the date—I think it requires date input because you can have the same patient having repeated surgery.*  
  **ODP, Acute Teaching Hospital**  
  *Where people have had problems with it has been in specialties like ophthalmology. I know people have said it has been overkill for them.*  
  **Attending Surgeon, Small Hospital**  
  *Where the answer to checks is in 999 out of 1000 cases a “no” or “not applicable,” the team might become complacent about the checks and use the tool as a tick-box exercise, failing to pick up the one case where the answer was a “yes.” This is harmful because it de-sensitizes staff and an error can occur.*  
  **Anesthesiologist, Registrar, Small Hospital**  
  *One of the things that the patients don’t like, and we’ve had this from the patient surveys we’ve done, is being bombarded with question after question, and then have the same ones asked again.*  
  **ODP, Large Hospital**  
  *The two main areas that always caused raised eyebrows with patients are discussion of blood loss, especially for operations where the patient didn’t expect to bleed. All of a sudden their simple eye operation was turning into a potential blood bath and a threat to their life, and discussion of difficult airway.*  
  **Trainee Anesthesiologist, Acute Teaching Hospital**  
  *I think it’s a knee jerk reaction to the problem and I’m not sure there’s a huge amount of evidence that, within the context of hospitals in developed countries, that it will do very much.*  
  **Attending Surgeon, Medium Hospital**  
  *It seems to concentrate entirely on things for which there is pretty dodgy evidence. It’s selective in that there are other things to do with preventing surgical site infections, for which there is better evidence, which are not addressed.*  
  **Attending Anesthesiologist, Acute Teaching Hospital** |
| Not applicable to all surgeries:               | 33 (28) | *Where people have had problems with it has been in specialties like ophthalmology. I know people have said it has been overkill for them.*  
  **Attending Surgeon, Small Hospital**  
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  **Attending Anesthesiologist, Acute Teaching Hospital** |
| Unsuitable timing of checks:                  | 32 (27) | *Where people have had problems with it has been in specialties like ophthalmology. I know people have said it has been overkill for them.*  
  **Attending Surgeon, Small Hospital**  
  *Where the answer to checks is in 999 out of 1000 cases a “no” or “not applicable,” the team might become complacent about the checks and use the tool as a tick-box exercise, failing to pick up the one case where the answer was a “yes.” This is harmful because it de-sensitizes staff and an error can occur.*  
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  *I think it’s a knee jerk reaction to the problem and I’m not sure there’s a huge amount of evidence that, within the context of hospitals in developed countries, that it will do very much.*  
  **Attending Surgeon, Medium Hospital**  
  *It seems to concentrate entirely on things for which there is pretty dodgy evidence. It’s selective in that there are other things to do with preventing surgical site infections, for which there is better evidence, which are not addressed.*  
  **Attending Anesthesiologist, Acute Teaching Hospital** |
| Intended negative effects:                    | 20 (17) | *Where people have had problems with it has been in specialties like ophthalmology. I know people have said it has been overkill for them.*  
  **Attending Surgeon, Small Hospital**  
  *Where the answer to checks is in 999 out of 1000 cases a “no” or “not applicable,” the team might become complacent about the checks and use the tool as a tick-box exercise, failing to pick up the one case where the answer was a “yes.” This is harmful because it de-sensitizes staff and an error can occur.*  
  **Anesthesiologist, Registrar, Small Hospital**  
  *One of the things that the patients don’t like, and we’ve had this from the patient surveys we’ve done, is being bombarded with question after question, and then have the same ones asked again.*  
  **ODP, Large Hospital**  
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  **Attending Anesthesiologist, Acute Teaching Hospital** |
| Patient perceptions:                          | 17 (14) | *Where people have had problems with it has been in specialties like ophthalmology. I know people have said it has been overkill for them.*  
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  **Attending Anesthesiologist, Acute Teaching Hospital** |
| Scepticism regarding the evidence base:       | 13 (11) | *Where people have had problems with it has been in specialties like ophthalmology. I know people have said it has been overkill for them.*  
  **Attending Surgeon, Small Hospital**  
  *Where the answer to checks is in 999 out of 1000 cases a “no” or “not applicable,” the team might become complacent about the checks and use the tool as a tick-box exercise, failing to pick up the one case where the answer was a “yes.” This is harmful because it de-sensitizes staff and an error can occur.*  
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  **Attending Anesthesiologist, Acute Teaching Hospital** |

*N (%) of sample reporting the barrier.*
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<th>Facilitators</th>
<th>N (%)</th>
<th>Illustrative Quotes</th>
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| **1. Education/training: Staff buy-in and**  | 40 (34) | Education’s probably the most important thing. Education programs to everybody, not just medical staff, but operating room staff as well. It needs to be incorporated into clinical governance days or something, about why you’re doing the checklist, and what improvements it has made.  
**Anesthesiologist, CT 1–3, Small Hospital**  
We should have all had training in it, explaining what they want, why it was important, why they wanted us to do it, and how to deal with resistant team members.  
**Operating Room Nurse, Large Hospital**  
I think that if you could produce data to show that untoward events are being reduced locally, even in the relatively short time it’s been rolled out, I think that would galvanise people into using it.  
**Attending Surgeon, Medium Hospital**  
What I’m starting to do now is ask people to record when it flags something up, so I can stand up at a staff meeting once a month and say the surgical safety checklist this month has prevented 16 near misses - this would promote its use even more.  
**Operating Room Manager (Nurse), Medium Hospital**  
Another thing that could be done is the higher management could start to have teeth, if you like, start to take people aside and say, you do this, or else, but you do find in medical professions that doesn’t happen much.  
**Attending Anesthesiologist, Medium Hospital**  
The organization now have put out that if the WHO Checklist isn’t done and there’s people resisting, the surgeons and the staff can get reported to their registered bodies. It’s a threat, but it works.  
**Operating Room Manager (Nurse), Medium Hospital**  
Management have to play a little, management means the managers, not the doctors, they have to show clinicians all over the hospital that this is not just their job, but our job together.  
**Attending Anesthesiologist, Acute Teaching Hospital**  
It’s a few dinosaurs that we have, but the chief executive at this hospital is trying to audit now through our operating room management system so that she can try and address it.  
**Operating Room Manager (Nurse), Small Hospital**  
**2. Feedback on local data: Regular**  
feedback of local data and anecdotal evidence supporting a beneficial impact of the checklist reinforces that it is not just a tick-box exercise.  
**Attending Anesthesiologist, Small Hospital**  
We now print it on the back of our pre-op checklist, so it’s then just one sheet. It’s now on a care plan we also tick that we’ve done it, so we’ve got evidence that we’ve done it if that sheet is also lost.  
**Operating Room Nurse, Medium Hospital**  
**3. Accountability for non-compliance:**  
Rapifications for active noncompliance with the checklist are desired and thought to improve effectiveness of the tool.  
**Attending Surgeon Small Hospital**  
It’s about assertiveness at the end of the day, you don’t have to be aggressive, but you have to be assertive but firm, and give them reasons why you’re saying what you’re saying.  
**Trainee Anesthesiologist, Medium Hospital**  
That’s because I particularly did work with one Attending surgeon who is in favour of the WHO checklist and he has been able to improve upon everybody about the importance of the form. Once we get the surgical team on board it’s history and it flows for everyone.  
**Trainee Anesthesiologist, Medium Hospital**  
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**Trainee Anesthesiologist, Medium Hospital**  
**4. Support from hospital management:**  
Visible, flexible and active support from hospital management during implementation and beyond reinforces the importance of using the checklist.  
**Attending Surgeon, Acute Teaching Hospital**  
Some people are much better at it than others. Some people have got a clear voice, they’re committed to doing it and they do it formally. Other people not really into it, they mumble, they answer their own questions, which completely takes away the safety aspect of it.  
**Operating Room Manager (Nurse), Small Hospital**  
**5. Integration with existing processes:**  
The checklist should be incorporated into existing paperwork/processes to streamline and remove repetition.  
**Trainee Surgeon, Small Hospital**  
That’s because I particularly did work with one Attending surgeon who is in favour of the WHO checklist and he has been able to improve upon everybody about the importance of the form. Once we get the surgical team on board it’s history and it flows for everyone.  
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**Trainee Anesthesiologist, Medium Hospital**  
**6. Senior clinical buy-in: When senior surgeons and anesthesiologists drive use of the checklist it is used more effectively.**  
**Attending Surgeon, Small Hospital**  
That’s because I particularly did work with one Attending surgeon who is in favour of the WHO checklist and he has been able to improve upon everybody about the importance of the form. Once we get the surgical team on board it’s history and it flows for everyone.  
**Trainee Anesthesiologist, Medium Hospital**  
It’s about assertiveness at the end of the day, you don’t have to be aggressive, but you have to be assertive but firm, and give them reasons why you’re saying what you’re saying.  
**Trainee Anesthesiologist, Medium Hospital**  
**7. Leadership skills:**  
Strong individual leadership skills and passionate leaders engender participation from the rest of the team.  
**Trainee Anesthesiologist, Medium Hospital**  
It’s about assertiveness at the end of the day, you don’t have to be aggressive, but you have to be assertive but firm, and give them reasons why you’re saying what you’re saying.  
**Trainee Anesthesiologist, Medium Hospital**  
**(Continued)**
TABLE 4. (Continued)

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<th>Facilitators</th>
<th>N (%)</th>
<th>Illustrative Quotes</th>
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| Involving the entire OR team in the implementation and modification of the checklist improves uptake. | 18 (15) | “I think they need to actually get a whole bunch of people from different backgrounds in and say, which bits of this do and don’t work.”
| Tool-specific factors | 67 (56) | “We’re evolving it now to a whiteboard, so that we will mark it on a white board rather than physically stand there with a sheet in our hand, because I think that’s what sends surgeons and anesthesiologists cold really, reading from a set.”
| 9. Modification/adaptation: Ownership and effective use of the checklist improved by customization of the layout and/or content to the specific surgical context. | “So we use different versions of the checklist depending on the surgical specialty and role. And that’s made a huge difference to acceptance, because what people really didn’t like about it at the beginning was the one-size-fits-all approach.”

Facilitators

Organizational Facilitators

Four of the 9 facilitators to checklist implementation represented organizational factors. A third of the sample reported that the provision of education and training around the checklist would be a powerful facilitator to its successful implementation. Many expressed a desire to be provided with information about the background to its development, the evidence supporting its efficacy and why it was relevant to the context of their local OR. Similarly, training sessions teaching best practice in use of the tool and/or how to deal with resistant team members when carrying out the checks were suggested. A comparable proportion of respondents felt that the regular provision of data and feedback (eg, at audit days) regarding benefits that the checklist was achieving locally (eg, reductions in complications and incidents, improved outcomes, anecdotal clinical stories of near misses prevented by the checklist) would significantly increase buy-in to the tool, particularly for those doubting its relevance to English ORs. Next, 15% of the sample expressed the desire for there to be consequences for noncompliance with the checklist such that resistant individuals are held accountable at a management level for their actions. However, it was also mentioned that this kind of enforced accountability was rare in the medical profession (although it was more applicable to OR nurses). Finally, and related to this, 15% of staff mentioned that there being visible support and alignment from hospital management around the checklist during implementation and beyond was critical to gaining buy-in from frontline staff, because it emphasized that the initiative was a priority throughout the organization.

Systems Facilitators

A number of respondents (16%) reported that use of the checklist could be facilitated by integrating it with existing paperwork and processes (eg, integrating it into the patient care plan to avoid lots of loose pieces of paper and removing existing checks that the checklist was replicating)—acting to reduce the feeling of too much repetition and extra workload.

Team Facilitators

Three facilitators were associated with the OR team and how they drove use of the checklist. First, participants (22%) reported that the checks were completed best when the person leading them had strong leadership skills and an assertive presence in the OR. This meant that any resistance could be overturned and the entire
team was more likely to engage and listen rather than the checks simply “happening” in the background. “Checklist champions” (passionate individuals who promoted the tool on the ground and acted as a “go-to” point for queries) were also described as powerful facilitators to uptake. Second, and related to this, an optimal condition according to approximately a quarter of the sample, was if senior clinicians (ie, surgeons and anesthetists at Attending level) showed visible leadership of the checklist. In particular, if Attending surgeons and anesthesiologists led the checks themselves or actively drove use of the checklist, it was said to foster engagement from the team as a whole and impress on everyone the significance of the tool. Finally, although senior clinical leadership was thought to be a key, inclusive input around the introduction and customization of the checklist from the entire multidisciplinary team was also reported to be important.

**Checklist-Specific Facilitators**

The most commonly reported facilitator to implementation of the checklist (by 56% of the sample) was modification of the tool to suit the specific surgical context and/or to make it more user-friendly. A number of respondents reported that the checklist had been successfully adapted to suit a particular surgical specialty (either through local customization or by adopting one of the modified versions made available by the NPSA), and others outlined more general customizations that had been made to the tool, for example, displaying the checklist on the OR wall rather than using the paper form (which was perceived to make it less of a tick-box exercise and more of a safety discussion).

**What Lessons Can We Extract for Informing How to Optimize the Diffusion and Uptake of Improvement Initiatives in Surgery/Health Care?**

On the basis of the themes extracted from OR personnel’s comments, a set of guidelines have been put together that apply broadly to the implementation of improvement within health care systems and indicate the strategies that should be considered during the early phases of introducing an improvement initiative (Box 1).

**Box 1. Lessons for Implementing Change in Health Care**

A plan for implementation should be devised before introduction of the initiative, which is tailored toward all relevant stakeholders (aligning all levels of the organization) and takes into account unusual shift patterns etc. Practical steps that should be considered when formulating this plan are as follows:

- **Modification** of the initiative to suit the local context is very important (2 or more different versions of the tool or process may be required). Modifications should focus on how best to integrate the initiative within existing processes to streamline and remove repetition. The focus should be making the initiative user-friendly. Frontline staff involvement in the process of modification is key for optimizing buy-in.

- **Education** around the evidence base for the improvement initiative is critical. This education should be tailored to reach all stakeholders and should hold relevance to the local teams and organization. Education should include an emphasis of the reasons why there is a need for the improvement in the first place.

- **Training** on the practical application of the improvement should be included. This should focus both on the optimal day to day use of the initiative as well as how to deal with resistant members of staff or other potential barriers that might emerge. Training should be multidisciplinary, rather than being delivered to different professional groups independently.

- **Data highlighting the local impact** of the initiative should be fed-back to staff periodically. This will reinforce the personal relevance of the initiative for local teams. Anecdotal staff stories highlighting the benefits of the initiative are particularly powerful and should be shared within multidisciplinary forums.

- **Champions or early adopters** should be identified, elected, and nurtured to promote uptake of the initiative on the ground and to act as a “go to” point for queries around implementation. Social forums or communication channels by which these individuals might influence others should be supported.

- **Buy-in from senior staff** should be sought at the very early stages of implementation. Senior staff members are particularly powerful advocates for the introduction of change and should be harnessed wherever possible to communicate to others their commitment to the new initiative, setting the example from the top.

- **Management should be seen to be involved and supportive** of frontline staff during introduction of the initiative and beyond, such that it is seen as an organizational priority from the outset and all levels of the organization are aligned on a common goal.

- **A system that holds people accountable** for improper behavior or use of the initiative should be considered.

- **Auditing of the initiative should be carefully thought through** such that the “how” it is being used can be captured as well as the “if.” Observations of its use in practice are strongly encouraged. This will inform on specific local barriers and facilitators surrounding its use, whether it is being used in the intended manner and whether there are any unintended consequences of its introduction. It will also aid the provision of comprehensive feedback to team members for quality improvement.

**DISCUSSION**

This study was part of a national evaluation of the implementation of the WHO surgical safety checklist across England (the Surgical Checklist Implementation Project). To our knowledge, this qualitative study is the first of its kind and size to be reported, covering a representative sample of English hospitals. It aims to understand the behaviors and strategies that have led to successful implementation of the checklist, and those that have hindered it. Thus, it aims to inform practical steps that hospitals might take to better embed the tool into practice and to extract lessons to reduce current variation and better inform the implementation and uptake of quality improvement initiatives more generally.16–18

**Key Findings**

There was large variation in how the checklist was initially implemented, both between and within hospitals. This ranged from apparently very well-orchestrated strategies in some hospitals, to others, where the checklist simply appeared without prior warning, often leaving staff to feel like it was being imposed upon them. Although
there was guidance available for implementing the initiative (from the NPSA), not all hospitals utilized this effectively. This is important because a poor implementation strategy was identified as an important organizational barrier to effective uptake of the checklist. For safety and quality interventions to realize their potential benefit, a concrete, multiphased implementation plan needs to be developed before their introduction.

Numerous additional barriers and facilitators to checklist implementation emerged from the interviews, which included organizational and system-, team-, and checklist-specific factors. The majority of the barriers concerned the checklist itself (eg, perceived design issues and doubts surrounding the evidence), but duplication of processes and difficulties in integrating the checklist with existing systems were also reported. The most common barrier was resistance or noncompliance from individual members of the OR team (particularly at Attending level), which in many cases prevented the checklist from being used in the manner it was intended. This supports recent observational data, which demonstrates poor compliance with the checklist in practice. The checklist is essentially an aid to enhance team performance, communication, and vigilance; however, here it has been demonstrated that when poorly or improperly used without adequate buy-in it can adversely affect the OR team.

The facilitators that emerged demonstrate the positive and proactive strategies that have been developed to mitigate the various barriers and greatly increase the chances of proper use of the checklist and of full implementation. These centered around modifying the tool to suit the local context to complement existing systems; conveying the relevance and importance of the tool to local teams and individuals (through education/training and feedback of local data); identifying strong leaders and advocates for the initiative (particularly at Attending level); considering methods of instilling accountability; and aligning strategic priorities across the hospital (from frontline personnel to hospitals’ executive boards). These steps are evidenced by quotations from the sample and are in line with previous literature. They form the basis of our recommendations (Box 1) and should be incorporated into local efforts to aid implementation of the checklist and other surgical safety initiatives.

Strengths and Limitations

The current study has certain limitations. The number of hospitals from which participants were sampled is small compared to the overall number of English hospitals, thereby potentially limiting generalizability. Furthermore, the opt-in sampling strategy may mean that we have captured the individuals with the strongest views (either positive or negative) around the checklist who are most passionate about sharing them, meaning that we may have missed some valuable feedback from those who are more impartial. In addition, for practical reasons, data collection took place over the period of 1 year after the official national deadline for implementing the checklist, which practically means that some respondents will have been using the checklist for longer than others at the time of interview; this could have influenced some of the responses we collected. We did, however, examine the themes extracted from earlier versus later interviews and from earlier versus later implementers and found no apparent patterns or differences distinguishing these groups. We therefore conclude that factors associated with the timeline of the study are not likely to have affected our dataset. Finally, we have captured the views of OR personnel only, and while this is important it might also be instructive to capture the views of managerial staff and the views of those from the wider regulatory bodies who were involved in implementation of the checklist, such as the Department of Health. This would provide a potentially fuller picture of the challenges and enablers encountered throughout the process of implementation. The current research also has some notable strengths. First, to the best of our knowledge, this is the first nationally representative evaluation of the checklist with a multicenter hospital sample and therefore these findings are generalizable to a certain level. The themes revealed by this study likely represent the barriers and facilitators at play during the implementation of many change initiatives in health care and hence present a valuable learning opportunity. Second, the qualitative approach undertaken allowed for a detailed analysis of the barriers and facilitators to the implementation of the checklist, which would not have been possible using a broader survey approach. The accounts generated from the interviews were detailed, and reaching saturation in the thematic extraction of these interviews suggests that the analysis was exhaustive. Finally, theme extraction was reviewed and checked by 2 psychologists with expertise in both the methodology and patient safety research, to ensure accuracy and control of bias in the analysis.

Future Directions

Similar barriers and facilitators to the implementation of the checklist have been previously identified as factors influencing the implementation of change in health care and also in other industries, and as such have been translated into recommendations for implementation already. This presents the difficult question—why are some institutions failing to take advantage of existing knowledge and guidelines about how to introduce an intervention successfully? The centralized structure of the English health care system should allow the introduction of improvement initiatives, with the potential to positively influence the care of millions of patients, but interventions often struggle to achieve full implementation. Further systematic research can shed light on what differentiates teams and organizations that employ an effective implementation strategy from those who fail or struggle.

In addition, although getting the implementation strategy right is key in order for an initiative such as the checklist to fulfill its potential (or conversely to avoid unintended negative impacts on safety), ultimately it must be demonstrated that this variation in implementation has tangible and sustained impacts on patient care at the local level. This means that continuous evaluation of an intervention should be part of its implementation (and not an afterthought). Locally collected data are more personally relevant and more persuasive to clinical teams—and indeed if we are to shift to a culture of intelligent data usage aimed at continuous quality and safety improvement, we take the view that data ought to be collected, fed-back, and discussed regularly. This study clearly demonstrates that not doing so ultimately jeopardizes buy-in, which we believe applies not just to the checklist but to any such intervention. It is therefore important to focus efforts on developing methods by which the impact of the checklist can be measured and fed-back to teams. Routinely collected data, observations as well as anecdotal examples, and clinical stories relating to the benefits brought about by the checklist all have a role to play.

CONCLUSIONS

The WHO surgical safety checklist was a high profile and mandatory safety improvement initiative that was required to be implemented throughout English ORs. This nationally representative study has identified a large degree of variation in the approach taken to introduce the checklist and a number of factors representing barriers and facilitators to the success of the implementation across 10 hospitals. We have translated these findings into a number of lessons that should be considered when implementing change in surgery and health care more broadly. Implementation guidance should include explicit attention to barriers and facilitators and the development of a proactive implementation strategy at a local level. Local data collection and feedback in relation to how initiatives like the checklist...
work in practice will also be necessary to engage clinical teams and to highlight areas where further intervention or training is needed.

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REFERENCES