

Surgical Teams' Attitudes About Surgical Safety and the Surgical Safety Checklist at 10 Years

A Multinational Survey

Denisa Urban, PhD,* Barbara K. Burian, PhD,† Kripa Patel, BSc,* Nathan W. Turley, MA,* Meagan Elam, DrPH(c),‡ Ali G. MacRobie,* Alan F. Merry, MBChB,§ Manoj Kumar, MBBS, MSc,|| Alexander Hannenberg, MD,¶ Alex B. Haynes, MD, MPH# and Mary E. Brindle, MD, MPH¶*

Objective: To assess health care professionals' attitudes on the Surgical Safety Checklist ("the Checklist") in resource-rich health systems and provide insights on strategies for optimizing Checklist use.

Background: In use for over a decade, the Checklist is a safety instrument aimed at improving operating room communication, teamwork, and evidence-based safety practices.

Methods: An online survey was sent to surgeons, nurses, and anesthesiologists in 5 high-income countries (Canada, the United States, the United Kingdom, Australia, and New Zealand). Survey results were analyzed using SPSS.

Results: A total of 2032 health care professionals completed the survey. Of these respondents, 47.6% were nurses, 70.5% were women, 65.1% were from the United States, and 50.0% had 20 years of experience or more in their role. Most respondents felt the Checklist positively impacted patient safety (70.9%), team communication (73.1%), and teamwork (58.9%). Only 50.3% of respondents were satisfied their team's use of the Checklist, and only 47.5% reported team members stopping to fully participate in the process. More nurses lacked confidence regarding their role in the Checklist process than surgeons and anesthesiologists combined (8.9% vs 4.3%). Fewer surgeons and anesthesiologists than nurses felt they received adequate training on the Checklist's use (57.8% vs 76.7%).

Conclusions: While most respondents perceive the Checklist as enhancing patient safety, not all surgical team members are actively engaging with its use. To enhance buy-in and meaningful use of the Checklist, health systems should provide more training on the Checklist with respect to its purpose and strengthening teamwork.

INTRODUCTION

The operating room (OR) is a fast-paced, stressful work environment, where multidisciplinary staff perform complex tasks requiring technical skills and nontechnical skills, all while responding to real-time information from the patient, coworkers, and monitors. This environment presents numerous opportunities for errors. With approximately 313 million surgeries performed worldwide every year,¹ these errors can translate to a substantial number of adverse events. Indeed, estimates suggest that adverse surgical events occur

in 14.4% of patients. "Never events," or serious patient safety events that should be completely avoidable by adhering to existing safety practices, have been estimated to occur in 5.2% of cases.² In addition to the toll on human lives, these outcomes place a serious burden on healthcare systems worldwide, with costly readmissions and increased length of stay. Consequently, there is growing pressure across the globe to find innovative solutions to improve patient safety while controlling costs.

A considerable proportion of preventable surgical adverse events has been linked to Human Factors,³⁻⁵ including communication breakdowns,⁶ environmental distractions,⁷⁻⁹ and

From the *Department of Surgery, University of Calgary, Calgary, AB, Canada; †NASA; ‡School of Public Health, Boston University, Boston, MA; §Department of Anesthesia, University of Auckland, Auckland, New Zealand; ||Department of Surgery, University of Aberdeen, Aberdeen, Scotland; ¶Ariadne Labs, TH Chan Harvard School of Public Health and Brigham and Women's Hospital, Boston, MA, Harvard; and #Department of Surgery, Dell Medical School, Austin, TX.

D.U. contributed to the project design, data analysis, drafted initial manuscript, manuscript development; B.K.B. is the principal investigator and contributed to the project design, manuscript development, survey design, aid in interpretation, manuscript first edits; K.P. contributed to the data collection and analysis, manuscript review and development, aided in development of tables; N.W.T. contributed to the data collection, project management, manuscript development, table development, analysis, manuscript review and revision; M.E. contributed to the manuscript review and development, analysis; A.G.Mac.R. contributed to the project management, manuscript review and development, survey design; A.F.M. contributed to the project design and manuscript review and development, analysis/interpretation of data; M.K. contributed to the project design and manuscript review and development, analysis/interpretation of data; A.H. contributed to the project design and manuscript review and development, analysis/interpretation of data; A.B.H. contributed to the project design and manuscript review and development, and analysis; M.E.B. is the principal investigator and contributed to the project design, project management data analysis, manuscript development, survey development, analysis, interpretation of data, manuscript final edits, revision, and review.

This research is supported by a Canadian Institutes of Health Research (CIHR) research grant.

Disclosure: The authors declare that they have nothing to disclose.

SDC Supplemental digital content is available for this article. Direct URL citations appear in the printed text and are provided in the HTML and PDF versions of this article on the journal's Web site (www.annalsofsurgery.com).

Reprints: Mary E. Brindle, MD, MPH, Department of Surgery, University of Calgary, Calgary, AB, Canada; and Ariadne Labs, TH Chan Harvard School of Public Health and Brigham and Women's Hospital, Boston, MA. E-mail: mbrindle@ariadnelabs.org.

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Annals of Surgery Open (2021) 3:e075

Received: 2 December 2020; Accepted: 20 May 2021

Published online 6 July 2021

DOI: 10.1097/AS9.0000000000000075

OR design.¹⁰ The World Health Organization's Surgical Safety Checklist ("the Checklist") is a low-cost safety instrument that aims to improve communication and teamwork within the OR and adherence to evidence-based safety practices. It works by promoting communication and teamwork at 3 critical time points during a procedure: before induction of anesthesia, before incision, and before the patient leaves the room.¹¹ A global pilot test of the Checklist saw a 36% decline in postsurgical complications and a 47% reduction in mortality rates in 8 participating sites.¹² These outcomes and others¹³⁻¹⁵ led to the rapid adoption of the Checklist worldwide, with at least 139 countries, or 70% of the nations of the world, currently using the tool in their ORs.¹⁶

Critics have debated the usefulness of the instrument in high-resource settings, where most of the processes targeted by the Checklist were already a requirement.¹⁷ The perceived redundancy of the checklist in addition to its impact on efficiency and a lack of appreciation of its value has led to a lack of meaningful adoption in some resource rich settings.^{18,19} Widespread dissemination of the checklist in these settings without a consistent strategy for implementation has failed to achieve significant benefits.²⁰ However, in similar settings with a comprehensive implementation program, the checklist has contributed to significant reductions in postoperative adverse events.²¹⁻²⁴ Given the benefits to patient safety and the cost-saving potential of the Checklist, our team set forth to develop a toolkit to facilitate its adaptation, implementation, and optimal utilization in high-income countries. As part of this broader effort, we took a snapshot of current attitudes and perceptions toward the Checklist in Canada, the United States, the United Kingdom, Australia, and New Zealand, in settings where the checklist is used with differing degrees of effectiveness. While current literature summarizing attitudes toward the Checklist and surgical safety culture have been published elsewhere,²⁵⁻²⁷ our aim was to perform a multinational, contemporary, and in-depth exploration of surgical culture in resource-rich systems. The goal for the present study was to provide essential insights on strategies for optimizing Checklist use.

METHODS

Between February and October 2019, a 43-question survey (Supplemental Figure 1, <http://links.lww.com/AOSO/A43>) probing healthcare professionals' views on the content and utility of the Checklist was electronically distributed to active members of medical professional societies within Canada, the United States, the United Kingdom, Australia, and New Zealand. Societies were identified through our network of experts in these 5 high-income countries, to ensure that major nursing, surgery, and anesthesia groups were included. Societies were contacted for distribution. Due to internal policies, priorities, membership overlap, and costs, a number of societies distributed the survey to members through multiple methods (direct e-mail, newsletter, website). Professional societies that did not respond were recontacted (Supplemental Table 1, <http://links.lww.com/AOSO/A43>). Participation in the survey was voluntary and without compensation. The survey was prefaced by an informed consent form. The study was reviewed and approved by the University of Calgary's Conjoint Health Research Ethics Board. Responses were anonymous, except in instances where participants indicated a willingness to be interviewed and provided their contact information. Study data were collected and managed using REDCap, an electronic data capture tool hosted at the University of Calgary.^{28,29}

Survey Development

Following a literature review of Checklist studies and discussions with clinical stakeholders, 8 domains of inquiry were identified pertaining to respondent experiences with the

instrument and its implementation. Candidate questions were derived from previous regional and national surveys exploring checklist barriers and facilitators.^{25,30,31} Questions were reviewed and down-selected by a panel of experts using the Delphi technique.³² The final survey tool consisted of nominal, Likert, and free-text questions (Supplemental Figure 1, <http://links.lww.com/AOSO/A43>).

Statistical Analysis

This study aimed to collect judgments and practical suggestions from individuals invested in surgical safety and link them to user- and site-specific characteristics. As such, nonprobability sampling of medical professional societies in 5 high-income countries was undertaken to survey OR nurses, surgeons, and anesthesiologists. In total, 88 societies were contacted, and the survey was distributed to 14, with a combined membership of more than 200,000.

Descriptive analyses were performed on respondent characteristics as well as overall measures of experience, culture, and perspectives. Subgroup analyses were performed comparing the differences in responses between individuals of different clinical roles, years of experience, and prior experience with the checklist. Differences in respondents' institution type and country were also analyzed. When subgroups of different clinical roles demonstrated differing perceptions on measures of checklist value, the independent association of gender was explored through ordinal regression analysis of outcome variables. The predictor variables in these analyses included clinical role and gender.

McNemar's test was used to analyze differences between related samples (eg, "choose all that apply" questions). Remaining categorical variables were subjected to χ^2 analysis or Fisher exact test, as appropriate. $P \leq 0.05$ was used as an indicator of statistical significance for all tests. Furthermore, for the purpose of comparative analyses Likert and 3-point scale answers were collapsed into 3 categories. Disagreement representing the sum of strongly disagree and disagree, neutral, and agreement represents the sum of agree and strongly agree. Data were analyzed using SPSS, version 26 (IBM).

RESULTS

Respondent Characteristics

A total of 2032 healthcare professionals completed at least part of the survey (an estimated response rate of 1.01%, assuming full distribution to target society members). Of these, 51.4% were nurses, 74.3% were women, 69.7% were from the United States, and 53.4% had more than 20 years of experience in their role. Although most respondents reported using the Checklist in their practice (94.5%), the adoption rate was lower in the United States than Canada (92.7% vs 99.3%; $P < 0.001$), and in ambulatory surgical centers than acute care hospitals (90.4% vs 95.0%; $P = 0.006$; Table 1).

Perceptions of Checklist Impact

Most respondents felt the Checklist had a positive impact on patient safety (88.1%), with a very small number reporting that the checklist had a negative impact (1.2%) and others feeling that the checklist had no impact (10.7%). The overall positive perceptions of impact were also seen in team communication (85.9% indicating a positive impact) and teamwork (72.0% indicating a positive impact). As well, over 94.4% of respondents indicated a preference for having the Checklist used on themselves or a close family member if they were undergoing surgery (Table 1). Nurses consistently rated the Checklist's contribution more positively than surgeons and anesthesiologists

TABLE 1.
Respondent Demographics

Characteristic	N (%)
N	2032 (100)
Surgeon	160 (8.3)
Anesthesiologist	355 (18.5)
Nurse anesthetist	16 (0.8)
Anesthesiology assistant	7 (0.4)
Nurse	968 (51.4)
Administrator	278 (14.5)
Other	134 (7.0)
Missing	114
Gender	
Female	1433 (74.3)
Male	456 (23.7)
Other	0 (0)
Prefer not to disclose	38 (2.0)
Missing	105
Age	
≤30	57 (3.0)
31–40	274 (14.2)
41–50	445 (23.1)
51–60	657 (34.1)
61–70	422 (21.9)
>70	41 (2.1)
Prefer not to disclose	31 (1.6)
Missing	105
Years in role	
0–5	197 (10.4)
6–10	248 (13.1)
11–20	440 (23.2)
20 or more	1015 (53.4)
Missing	132
Country of practice	
Canada	449 (23.7)
United States	1323 (69.7)
United Kingdom	33 (1.7)
New Zealand	40 (2.1)
Australia	53 (2.8)
Missing	134
Type of institution	
Acute care hospital	1600 (83.6)
Ambulatory surgical center	242 (12.6)
Other type of hospital	73 (3.8)
Missing	117
Acute care hospital number of beds	
≥200 beds	1120 (70.7)
<200 beds	411 (25.9)
Unsure	43 (2.7)
Not applicable	11 (0.7)
Missing/unsure	490
University affiliation	
Yes	959 (58.8)
No	672 (41.2)
Missing/unsure	401
Checklist used	
Yes	1792 (94.5)
No	104 (4.5)
Missing/unsure	136
Would use checklist on self or family member	
Yes	1714 (94.4)
No	30 (1.7)
Missing/unsure	288

combined regarding patient safety (91.5% vs 81.1%; $P < 0.001$), health system efficiency (63.1% vs 26.5%; $P < 0.001$), team communication (87.8% vs 82.5%; $P = 0.001$), and teamwork (74.9% vs 66.8%; $P < 0.001$) (Fig. 1, Supplemental Table 2a, <http://links.lww.com/AOSO/A43>). Regression analysis did not reveal any independent association between gender and perceptions of checklist impact on safety, efficiency, and teamwork or communication.

Ambulatory centers and acute care centers rated the checklist similarly in terms of its perceived impact on patient safety (84% and 89.1% positive impact; $P = 0.051$). Compared with ambulatory centers, respondents from acute care hospitals rated the impact of the instrument higher for its impact on communication (86.6% vs 79.8% positive impact; $P = 0.008$) and teamwork (72.1% vs 67.3% positive impact, $P = 0.003$, Supplemental Table 2b, <http://links.lww.com/AOSO/A43>). Healthcare professionals in the United States and Canada have similar perspectives on the impact of the checklist; however, professionals in the United States rated the impact of the Checklist higher on health system efficiency (55.1% vs 44.7% positive impact; $P < 0.001$) than their Canadian colleagues (Supplemental Table 2c, <http://links.lww.com/AOSO/A43>).

The OR Checklist Safety Culture

More respondents indicated that their organizational leadership was supportive of using the checklist (73.8%) than indicated that their clinical colleagues were supportive (59.8%) (Supplemental Table 3, <http://links.lww.com/AOSO/A43>). Only 50.3% of respondents were satisfied with the way the instrument was used by their team, and only 47.5% reported team members fully stopped to participate in the process. At the same time, 76.1% of respondents felt that, as a team member, they were responsible for ensuring Checklist completion. Regarding confidence and communication in the OR, 7.1% of respondents expressed that they were not confident about their role in the Checklist process within their team. A greater proportion of nurses expressed a lack of confidence about their role in the Checklist process, compared with the combined perceptions of surgeons and anesthesiologists (9.0% vs 4.2%; $P < 0.001$). Moreover, 11.1% of survey takers felt self-conscious about speaking up about a patient or safety concern during Checklist completion. This view was mostly held by nurses (13.4% vs 8.1%; $P = 0.001$). Despite perceiving less support from their teammates and expressing somewhat less confidence than surgeons and anesthesiologists, nurses felt more responsible for completing the process (90.6% vs 82.5%; $P < 0.001$) (Supplemental Table 4a, <http://links.lww.com/AOSO/A43>).

In addition to professional affiliations, locations of practice impacted perceptions of surgical safety culture. A greater proportion of ambulatory center respondents felt their colleagues were supportive of the instrument than acute care center respondents (77.2% vs 67.0%; $P = 0.009$). The ambulatory care respondents were also more satisfied with the way their colleagues used the checklist (70.0% vs 56.0%; $P < 0.001$), with a higher proportion noting that everyone stopped what they were doing for full participation during the Checklist process (63.0% vs 53.2%; $P = 0.023$) (Fig. 2, Supplemental Table 4b, <http://links.lww.com/AOSO/A43>). Similarly, there were some important differences between US and Canadian respondents, with a larger fraction of Canadian respondents lacking confidence in their role during the Checklist process, compared with their colleagues in the United States (4.3% vs 9.5%; $P = 0.003$). Likewise, fewer respondents from Canada than the United States reported team members fully stopping to participate in the process (45.2% vs 57.6%; $P < 0.001$) (Fig. 2, Supplemental Table 4c, <http://links.lww.com/AOSO/A43>).

Training

Just over half of respondents (63.2%) indicated they received adequate training in the Checklist. Fewer clinicians with ≤10 years of experience felt they received adequate training in the Checklist process than colleagues with ≥20 years of experience (68.5% vs 74.8%; $P = 0.018$). Moreover, these less experienced respondents were generally less satisfied with the way the

HEALTH PROFESSIONAL ATTITUDES ON CHECKLIST IMPACT

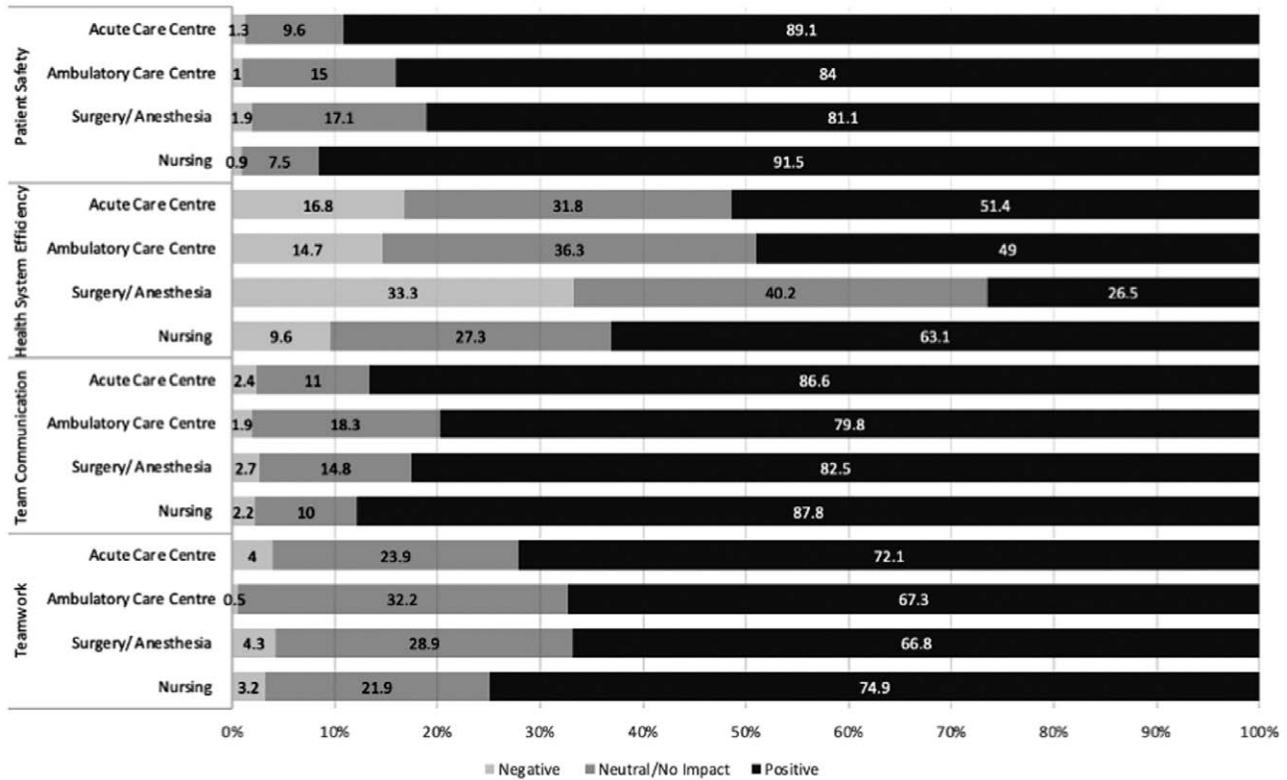


FIGURE 1. Perceptions of checklist impact on patient safety, health system efficiency, team communication, and teamwork. Perceptions of checklist impact within different domains compared between professions (nursing vs surgeons and anesthesiologists) and in healthcare workers within different systems (ambulatory vs acute care).

Differences in Agreement

	Nursing vs. Surgery/Anesthesia	≤10 Years vs. ≥20 Years Experience	Ambulatory vs. Acute Care	Canada vs. USA
Organizational leadership is NOT supportive of using the Checklist.	●	●	●	●
I received adequate training toward participating in the Checklist.	▲	▼	▲	▼
My clinical colleagues are supportive of using the Checklist.	▼	●	▲	●
I am satisfied with the way the Checklist is used by my team.	▼	▼	▲	●
When we complete the Checklist, everyone stops what they are doing and fully participates.	▼	●	▲	▼
As a team member, I am responsible for making sure the Checklist is completed.	▲	●	●	●
I do NOT feel confident about my role in the Checklist process within my team.	▲	●	●	▼
I feel self-conscious about speaking up about a patient or safety concern during Checklist completion.	▲	●	●	●
It is beneficial to engage patients in the Checklist process.	▲	●	●	●

Legend	
Symbol	Meaning
▲	Significantly higher agreement
●	No significant difference in agreement
▼	Significantly lower agreement

FIGURE 2. Differences in perception of OR culture in relation to checklist use. Perceptions of the total respondent pool on current OR culture as it relates to the Surgical Safety Checklist. Comparisons based on profession (nurse vs physician), experience (<10 vs ≥20 years), ambulatory versus acute care, and Canada versus United States. A triangle pointing up indicates that the first comparison cohort (eg, nurses) agrees more strongly with the statement than the second cohort (ie, physicians); a circle indicates agreement is similar between groups; and a triangle point down indicates that the second cohort agrees more strongly with the statement than the first cohort.

Checklist was used by their team than more experienced professionals (50.0% vs 60.0%; $P = 0.001$, Fig. 2).

In terms of professional affiliations, fewer surgeons and anesthesiologists than nurses felt they had received adequate training supporting their participation in the Checklist (58.2% vs 77.1%; $P < 0.001$). In considering the site of practice, a greater proportion of ambulatory center respondents felt they received adequate training in the use of the Checklist (80.0% vs 70.8%; $P = 0.004$). Geographically, less Canadian respondents felt they received adequate training than their counterparts in the United States (62.6% vs 76.5%; $P < 0.001$) (Supplemental Tables 4a–c, <http://links.lww.com/AOSO/A43>).

The survey takers were asked about training modalities at their clinical sites. In this regard, respondents indicated that the most frequently used strategies to encourage Checklist use were hard-copy educational materials (46.7%), audit-and-feedback intervention with practice data (45.7%), and in-person educational sessions (43.0%). Team-based training was reported as the most helpful strategy to affect meaningful Checklist use (62.1%; $P < 0.001$), followed by in-person educational sessions (57.8%; $P < 0.001$), and audit-and-feedback intervention with practice data (55.7%; $P < 0.001$) (Supplemental Table 5, <http://links.lww.com/AOSO/A43>).

Leading the Checklist

Globally, the team member most identified as leading the Checklist was the Circulating Nurse (77.1% of cases). However, perception of leadership was dependent on clinical role, and a higher proportion of nurses than surgeons and anesthesiologists combined indicated that the Checklist process was led by the Circulating Nurse (77.1% vs 56.9%; $P < 0.001$). Conversely, 57.5% of surgeons and anesthesiologists combined indicated that the process was led by the surgeon as compared with 32.5% of nurses ($P < 0.001$, Supplemental Table 6, <http://links.lww.com/AOSO/A43>). All respondents, regardless of clinical role, agreed however that leadership should be primarily taken by the surgeon (76.2%, $P < 0.001$, Table 2).

Involving Patients in the Checklist Process

Finally, we asked survey respondents to indicate their agreement with including patients in the Checklist process. Altogether, 81.1% of survey takers perceived patient engagement as beneficial (Fig. 2, Supplemental Table 3, <http://links.lww.com/AOSO/A43>). When looking specifically at surgical role, patient participation in the process was viewed more favorably by nurses than surgeons and anesthesiologists (85.9% vs 71.1%; $P < 0.001$) (Fig. 2, Supplemental Table 4a, <http://links.lww.com/AOSO/A43>).

DISCUSSION

Our study illustrates findings regarding healthcare providers' use of the Checklist and perspectives of Checklist value,

particularly perceptions related to patient safety and team performance. We additionally identified areas for improvement in the domains of checklist leadership, communication, training, and patient engagement.

The Checklist appears to have a high compliance rate among our sampling of the surgical community. Most healthcare professionals responding to our survey reported using the instrument in the OR, which echoes the literature on checklist use in resource-rich settings.³³ This observation may reflect the fact that the health systems of high-income countries have generally enforced checklist use. Respondents also perceived the Checklist as having a positive impact on patient safety, and the majority indicated that they would want the instrument used if they or a close family member underwent surgery. Despite the promising appearance of high institutional compliance, our study continues to demonstrate that the checklist is not often used as intended. Only half of survey respondents were satisfied with how checklists were used at their site, with an even smaller proportion reporting that the surgical team stopped to participate in the checklist. These findings are consistent with other multicenter studies that have shown that true compliance is often much lower than indicated by administrative audits; and meaningful use is a challenge to achieve.^{18,34} Prior studies that suggest that fidelity to the use of the Checklist as a communication tool rather than strict adherence is necessary for the checklist to be effective.^{35–37} Our study identifies opportunities for improving healthcare providers' acceptance of the Checklist, improving Checklist leadership and communication, training, and the inclusion of patients in its performance.

Perceptions of Checklist Value

We found perceptions of the Checklist to vary by professional group and institution type. Regarding professional groups, nurses viewed the impact of the Checklist more favorably than surgeons and anesthesiologists. These findings are consistent with previous studies concerning the impact of clinical role on perceptions of the Checklist.^{27,38–41} As well, more than half of respondents reported that their team members did not stop to fully participate in the Checklist process, a behavior linked to provider acceptance of the Checklist.¹⁶ Disengagement like this may be remedied through education on the Checklist's purpose, improved implementation strategies, and peer mentoring.

As for institution type, surgical teams in acute care centers perceived the checklist as having a greater impact on teamwork and communication, compared with their colleagues in ambulatory care centers. One explanation for this perceptual difference may be that surgical team members in ambulatory settings may already have familiarity between staff due to the stable composition of teams. Acute care centers, where there is less consistency in teams, may perceive greater benefits from a tool that targets the improvement of team dynamics. Identifying and distilling the factors that optimize Checklist performance in different healthcare settings could further promote Checklist performance.

Diminished Checklist buy-in has been attributed to poor design and content,^{33,42} redundancy or poor integration within existing workflows in high-resource settings.⁴³ As well, inadequate training on the Checklist's purpose and use has been cited as an additional factor.^{44,45} These issues may be mitigated through the mindful modification of the Checklist to suit local needs and intentions, rather than mandated implementation, as illustrated in other studies.^{38,46}

Leading the Checklist and Communication

While 3 quarters of respondents indicated surgeons should lead the Checklist process, surgeons were rarely perceived to be leading the Checklist—especially by other members of the

TABLE 2.
Perspectives on Which Individuals Currently Lead the Checklist and Which Individuals Should Take Part in Leading the Checklist

Choice	Percent of Cases		P
	Currently Leads	Should Lead	
Surgeon	41.9	76.2	<0.001
Anesthesiologist	17.5	41.9	<0.001
Circulating nurse	76.5	61.8	<0.001
Scrub nurse	5.8	15.3	<0.001
Other person	3.1	4.2	0.024

surgical team. Similar observations on the need for stronger surgeon leadership were made in a recent survey of surgical team members.⁴⁷ Intriguingly, when asked to identify the person who generally led the Checklist within their team, our survey's respondents attributed a greater leadership role to their own profession. These findings may be a call to develop a better system for designating Checklist leadership in the OR. For example, performance of the checklist could include a clear verbalization of leadership roles to mitigate ambiguity. Ownership of a section or phase of the Checklist can be built into the process and can positively contribute to Checklist performance. After all, leadership and teamwork are 2 sides of the same coin.

The decade leading up to the development and deployment of the World Health Organization's Surgical Safety Checklist produced considerable evidence demonstrating that effective communication and teamwork among hospital caregivers were associated with improved patient outcomes.^{48–53} Checklists emerged as cost-efficient tools for the promotion of team cohesion and communication and medical error reduction.^{54–56} Our snapshot of provider perceptions of the Checklist suggests that team climate in the OR has improved since the introduction of the instrument, with surgical staff feeling more comfortable speaking up if a problem with patient safety arises.^{57,58} Nevertheless, differences between professions persist. Notably, 13.4% of nurses indicated that they felt self-conscious about speaking up on patient-safety-related matters during the Checklist process, a significantly higher proportion compared to the 8.3% of surgeons and anesthesiologists who felt similarly. Team training on checklist use provides an opportunity to address these issues concerning leadership and communication.

Training

Less than 60% of our anesthesiologist and surgeon respondents felt they received adequate training on the Checklist, and this sentiment was shared among the less experienced respondents. Geographically speaking, in Canada, where Checklist use is mandated,⁵⁹ fewer respondents reported receiving adequate training and having mindful stops during the process compared to their peers in the United States. Not only do these findings suggest that there is room for improving education on the tool, but that context plays a role in the training that healthcare workers receive on the Checklist. One recommendation in the literature for improving education on the Checklist is that training should start early with medical students, trainees, and early career providers.^{60,61} In addition, educational tools should be designed to facilitate the provision of quality Checklist training. As most of our survey respondents indicated, this training should be completed in teams, as team training is perceived to be the most beneficial strategy in enhancing checklist performance.

Patient Involvement

Finally, as we are exploring different ways for improving Checklist use among healthcare workers, we wanted to gauge respondents' perceptions of further including patients in the performance of the Checklist. We asked 1 survey question regarding patients' involvement in the checklist; however, we postulate that enhancing patients' role in the first phase of the Checklist may influence clinicians' use, engagement, and sense of ownership of the Checklist. At this point, we simply know that more than 80% of our survey respondents believe engaging patients in the Checklist process would be beneficial. This view is shared by more nurses than surgeons and anesthesiologists.

LIMITATIONS

Our study has multiple limitations. First, we have a small sampling of a large population approached through multiple

means. An accurate determination of the response rate is difficult, as the broad and variable methods of distribution make estimations of the denominator challenging. In some instances, the questionnaire was disseminated as a link on the homepage of contacted professional medical societies for a limited time, and it is unknown how many members viewed the link. Some societies were unable or unwilling to distribute surveys to their membership. Regardless, the response rate was very low, and results cannot be generalized to the larger population of all surgical providers. As well, a large proportion of respondents were female nurses from the United States, leading to a potential source of bias in the survey. We had smaller response rates from the United Kingdom, Australia, and New Zealand. Collecting additional data, particularly from the United Kingdom, New Zealand, and Australia, may offer additional insights.

CONCLUSIONS

Preventable adverse events continue to occur in surgical systems, despite the introduction of systems-level measures to enhance patient safety.^{5,62} Our survey of healthcare professionals in 5 high-income countries suggests that improved engagement of surgical teams with the Checklist should be prioritized to recognize the Checklist's full potential. This could be accomplished by addressing differences in perceptions of teamwork between nursing and surgical staff. Moving beyond the process-based completion of the Checklist as a tick box to using the Checklist as a communicative tool to support a shared mental model between members of the surgical team would be of benefit to both the OR team and the patient. We recommend placing greater emphasis on team training in the Checklist process, enhancing surgeons' engagement to increase buy-in, and tailoring strategies to suit local needs.

ACKNOWLEDGMENT

The team would like to acknowledge funding from the Canadian Institute for Health Research (CIHR). In addition, the team would like to acknowledge the work of Saffa Aziz and Temi Toba-Oluboka in manuscript preparation.

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