Project Title

Improving Surgical Safety Culture in SGH by Reimplementing the SGH Surgical Safety Checklist

Project Lead and Members

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Organisation(s) Involved

Singapore General Hospital

Healthcare Family Group(s) Involved in this Project

Medical, Nursing

Applicable Specialty or Discipline

Surgery

Project Period

Start date: Apr 2019

Completed date: Jul 2022

Aims

To improve the surgical safety culture by revising and reimplementing the SSC in SGH and National Heart Centre Singapore (NHCS).

Background

See poster appended/ below.

Methods

See poster appended/ below

Results

See poster appended/ below

Lessons Learnt

Although SGH has adopted the WHO checklist in 2009, revision and re-evaluation of the SSC was opportune as mind-set, work demands, and safety culture have changed over time. It was important to realise that over time, the intent of the SSC was forgotten. Time needs to be invested to engage stakeholders to create the urgency for change and to follow through with sharing of outcomes so that they can see the results of their efforts and take ownership. The fortnightly meeting between the core team and Ariadne Labs from multidisciplinary backgrounds allow the team to problem-solve and to stay on track. Team members must be supported and given protected project time as many still have their regular work obligations. Strong support from the senior leadership, the nursing team, HODS and all the relevant departments together with a dedicated team leader reduce many hurdles. As this project involves many stakeholders of various departments and ranks, it is critical for team members to be inclusive and flatten workplace hierarchies. As implementation requires time for staff to adapt, it is important to focus on the early adopters and not be discouraged by the resistant few. Other aspects that the team could potentially look into is improving staff psychological safety, and address disruptive behaviours in the healthcare team.

Conclusion

See poster appended/ below

Project Category

Care & Process Redesign, Quality Improvement, Design Thinking, Value Based Care, Safe Care, Adherence Rate

Training & Education, Learning Culture

Keywords

Checklist, Surgical Safety Checklist (SSC), Operating Theatres (OP), Safety Culture, Adherence Checklist

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BACKGROUND

- Singapore General Hospital (SGH) adapted the World Health Organization Surgical Safety Checklist (SSC) to improve communication and teamwork in the operating theatres (OT) since 2009 with the aim of reducing adverse events.
- However, despite the SSC, surgical safety incidents still occur.
- From root cause analyses and feelings on the ground, these incidents were in part due to the perfunctory use of the SSC, i.e., the boxes were checked without full attention to the intent of the checklist.
- In partnership with Ariadne Labs, a workgroup was formed, and champions from each surgical department were identified to be part of the larger implementation team.

AIM

To improve the surgical safety culture by revising and reimplementing the SSC in SGH and National Heart Centre Singapore (NHCS).

METHODS & INTERVENTIONS

Sources of data collection & Types of measurements

Incident data and reports from the hospital patient safety team

- Number of serious adverse events in the OT.
- Root cause analysis reports and recommendations.

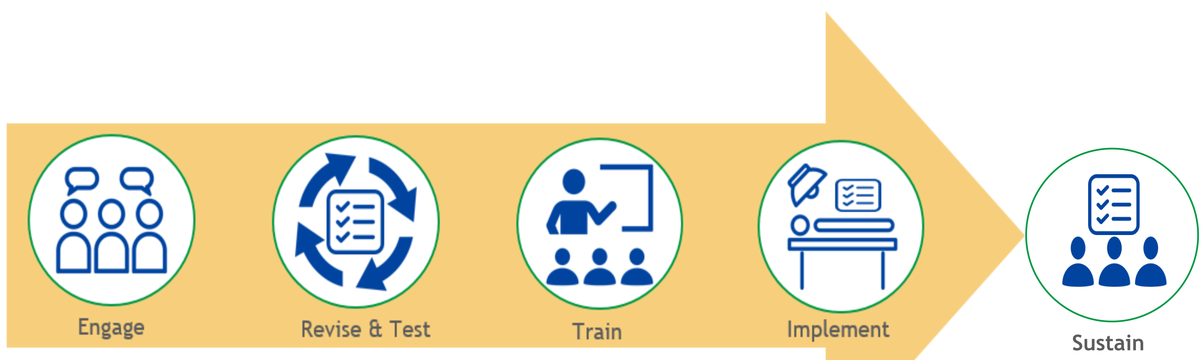
Self-reported surveys

- Culture of safety survey on OT safety culture at baseline and endpoint.
- Surgical safety survey & follow-up interviews to measure attitudes toward the SSC, factors and barriers to proper usage of the SSC, and feedback on improving the SSC processes and the surgical culture. Follow-up interviews were performed to gain further insights on the SSC processes and any issues to the SSC workflow by the various OT roles.
- Implementation readiness survey using ATLAS assessment tool.

Live OT observations by trained observers at baseline and endpoint

- Device-related interruptions (DRIs). Six types: (1) improper/challenging assembly, (2) device failure, (3) loss of sterility, (4) disconnection, (5) absent/wrong device, and (6) other.
- Oxford non-technical skills rating scale (NOTECHS) to assess sub-teams on (1) leadership and management, (2) teamwork and cooperation, (3) problem solving and decision-making, and (4) situation awareness.
- SSC adherence checklist.

Summary of the 5 key phases of SSC reimplementation



Engage
- Form a team
- Evaluate current state early using multiple data sources
- Set goals and plan measurement strategy
- Develop key messages and messaging strategy & socialize project
- Obtain feedback and identify champions
- Stay engaged throughout the process with regular updates to champions and staff

Revise & Test
- Determine modifications by reviewing findings
- Small test of changes with implementation team first
- Plan-do-study-act (PDSA) cycles with pilot prototypes by a few champions
- Revise and refine checklist
- Larger scale testing until a stable checklist is reached
- Present checklist to staff and surgical HODs for face validity
- Seek Medical Board approval for final version

Train
- Create video demonstration of each part of the checklist
- Gather feedback and refine training
- Create mandatory e-learning module with videos, slideshows with checklist rationale and quiz questions
- Department training by champions

Implement
- Promote and launch checklist and mandatory e-learning module
- Update electronic version of SSC with user acceptance testing prior to launch
- Checklist poster in each OT as launch publicity and visual reference
- Conduct ongoing coaching
- A one month washout period to allow staff to get used to using checklist and monitor feedback
- PDSA cycles to review progress
- Final revision to checklist and its processes if necessary

Sustain
- Plan for sustainment and establish improvement cycles for future evaluation and modification
- Develop long term plan and checklist ownership
- Conduct regular audits using the CheckPOINT tool for quality monitoring and provide feedback
- Conduct periodic evaluation and revisions via the PDSA cycle

Final revised version of SGH SSC and DBT, with specific staff leading each section

Singapore General Hospital: Surgical Safety Checklist

Sign-In

Before induction of anaesthesia

Anaesthetist (senior MO or higher) asks:
- ❑ Is everyone ready for sign-in?

OT nurse confirms with patient:
- ❑ Name and IC / Registration number
- ❑ Consent for surgery and anaesthesia
- ❑ Consent for blood products
- ❑ Drug allergy

Primary surgeon (or designated doctor) confirms:
- ❑ Procedure, side, site, and expected duration
- ❑ Expected blood loss
- ❑ Arrow marking present
- ❑ DVT prophylaxis
- ❑ Implant, devices, and special equipment available - *consider Device Briefing Tool***

Anaesthetist confirms:
- ❑ Antibiotic prophylaxis
- ❑ Contact/health precautions

Time-Out

Before incision

Primary surgeon (or designated surgeon) asks:
- ❑ Is everyone ready for time-out?
- ❑ Please state your name and role

Circulating nurse confirms with entire team:
- ❑ Patient name and IC / Registration number

To primary surgeon:
- ❑ Procedure, side, and site?
- ❑ Operation plan and potential difficulties?
- ❑ Expected blood loss?

To anaesthetist:
- ❑ Blood products available?
- ❑ Antibiotics given within last 60 minutes?

To entire team:
- ❑ Arrow, side/site marking visible after draping *OR* no marking required
- ❑ Images displayed and labeled
- ❑ Correct positioning
- ❑ Implants, devices, and special equipment ready**

Primary surgeon (or designated surgeon) asks:
- ❑ Please speak up anytime if you have a concern. Does anyone have any now?

Sign-Out

Before primary surgeon leaves OT

Circulating nurse asks:
- ❑ Is everyone ready for sign-out?

To primary surgeon:
- ❑ Procedure is listed as [*read procedure name*]. Any change to the procedure name?
- ❑ Any concerns or instructions for recovery?
- ❑ Who will verify specimens?

Before patient leaves OT

Circulating nurse asks:
- ❑ Is everyone ready to complete sign-out?

To anaesthetist:
- ❑ Estimated blood loss? Blood products given?
- ❑ Any concerns or instructions for recovery?

To entire team:
- ❑ Sponge, needle, sharps, and instrument counts correct
- ❑ Equipment problems to be addressed?
- ❑ Specimen verification complete?
  - Name and MRN
  - Nature of specimen
  - Presence of specimen in receptacle
  - Tally with forms

****Device Briefing Tool**

For all new or complex devices

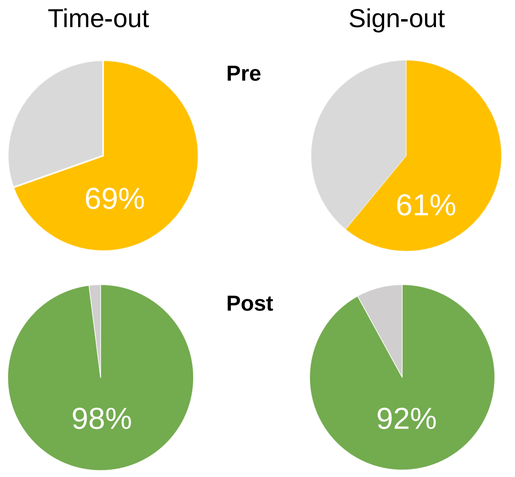
Primary surgeon (or designated doctor) states:
- ❑ This device is intended to [*insert key function*]
- ❑ Has everyone reviewed instructional materials or received training on this device?
- ❑ Are instructional materials available?
- ❑ Does anyone have any questions?

If necessary:
- ❑ Please ask a device representative to come into the OT for assistance

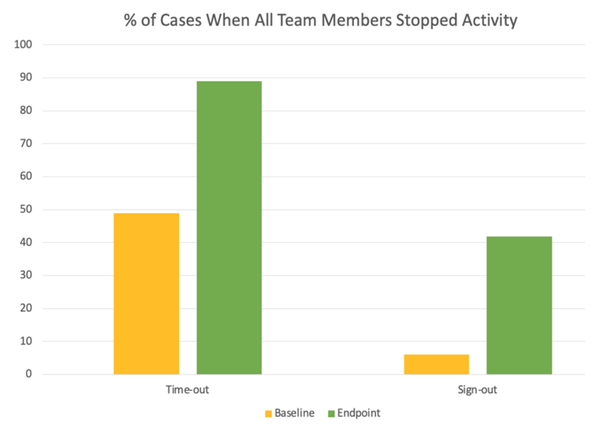
Version 5.8: Approved 19 Oct 2021

IMPACT OF INTERVENTIONS

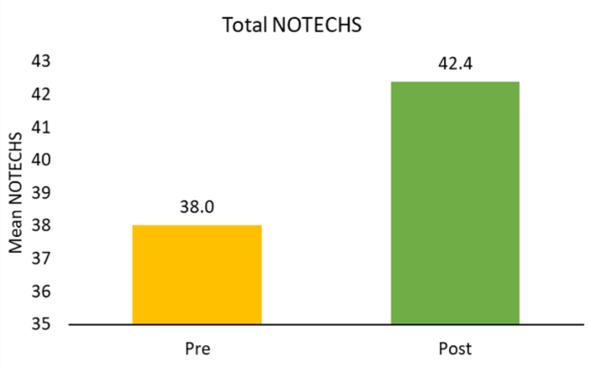
Improvement in checklist item adherence



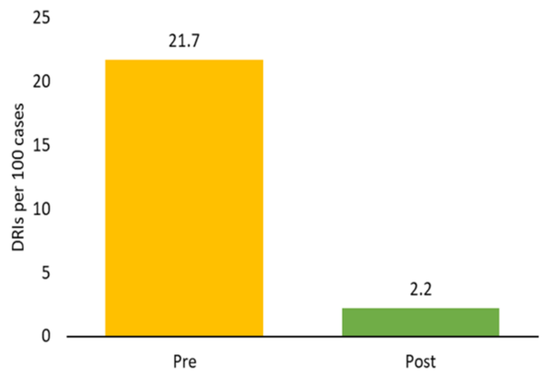
Increased % of activity suspension at time-out and sign-out



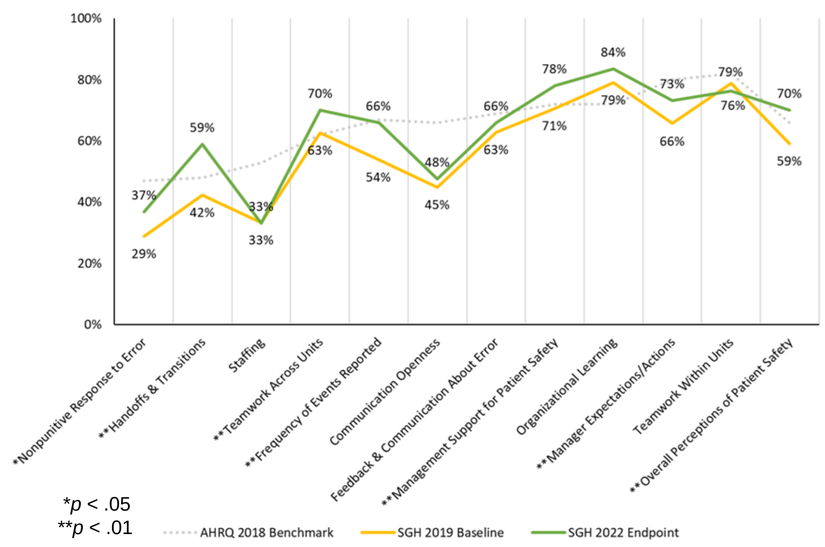
4.3-point increase in mean total NOTECHS score ($p < .01$)



86% reduction in DRIs ($p = .025$)

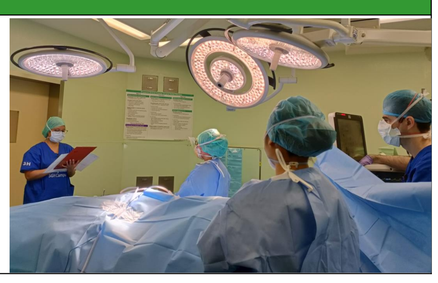


Baseline and endpoint scores for safety culture survey



- Note that endpoint scores and the comparisons of baseline and endpoint results are based on interim analyses. Data collection for endpoint survey is still ongoing.
- SGH scores at baseline and endpoint are also benchmarked against the Agency for Healthcare Research and Quality (AHRQ) 2018 US database.
- *P*-values are for SGH baseline and endpoint data comparisons only.

Since the pilot testing of the modified SSC prototypes in July 2021 and the official launch of the finalized SSC in December 2021, there has a reduction in patient safety and near-miss events.

CONCLUSION

- The SGH SSC was redesigned and reimplemented to promote teamwork and communication.
- The effectiveness and success of the SSC is not just about SSC adherence; it is also about quality of the interaction between team members.
- When the SSC is performed effectively with staff engagement, the SSC gives team members a voice to speak up, pause, and share critical safety steps.
- The SSC can contribute positively to team performance and reduce adverse events in a complex and high pressured OT environment.
- The staff at SGH will continue to strive for consistent high quality care to target zero harm.