Safer surgery through simulation: increasing compliance with the 5 Steps to Safer Surgery through an in-situ simulation based training programme at Guy’s and St Thomas’ NHS Foundation Trust

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INTRODUCTION
The WHO Surgical Safety Checklist is shown to reduce mortality from 1.5% to 0.8% and inpatient complications from 11% to 7%. Following a review, the National Patient Safety Agency added briefing and debriefing to the checklist to create the 5 Steps to Safer Surgery (5SSS). At Guy’s and St Thomas’ NHS Foundation Trust, the Care Quality Commission (CQC) and local audits reported less than optimal compliance with the 5SSS across all operating theatres, particularly with the debrief, where completion of this was as low as 0% in some departments. One reason was a lack of engagement from surgical consultants. Studies have shown that a high regard for the checklist and participation in team training with a focus on healthcare crew resource management (also known as Non-Technical or Human Factor (HF) skills) is associated with fewer post-operative complications. Therefore, we created an in-situ simulation based training programme to enhance compliance with the 5SSS and the safety culture within the Trust.

METHODS
The half-day training programme was run three times between August and November 2017 for doctors, nurses and radiologists of the Interventional Radiology (IR) department, a para-surgical specialty with one of the lowest compliance rates in the Trust. Each day began by going through an introduction, including an icebreaker, aims for the day, an overview of the 5SSS and HF and their contribution to preventing errors and improving safety. The group was then taken to the IR lab where a scenario based on going through the 5SSS in a repeat cycle deliberate practice manner was run. This was designed in collaboration with IR consultants and involved the use of a manikin, patient notes and theatre list. Throughout the simulation, participants had the opportunity to interrupt with issues encountered at stages of the checklist and changes that could be made to overcome these. The suggestions were shared with departmental leads.

Pre- and post-programme questionnaires were completed by all participants and paired t-tests were carried out to compare the results. Audit data on compliance with the 5SSS was also collected before and after the programme. Theatre matrons instructed staff to collect data for 2 weeks in October 2016 using an observation tool, identifying whether each step had been completed for each surgical list and each procedure. The process was repeated between January and February 2018.

RESULTS
From the IR department, 31% (5/16) of doctors, 36% (10/28) of nurses and 20% (10/49) of radiographers attended the training programme. The participants’ pre- and post-programme questionnaires showed a significant improvement in the knowledge and confidence required to conduct the 5SSS as well as in opinions on the value of the 5SSS in teamwork and patient safety (p<0.00001). The questionnaires also asked participants to rate their ability within components of the validated HF skills for healthcare instrument. Although there was no significant difference in HF skills self-efficacy overall, a subanalysis revealed a significant increase in being able to ‘constructively manage others’ negative emotions at work’, ‘communicating effectively with a colleague with whom you disagree’ and ‘dealing with uncertainty in the decision making process’ (p<0.05).

Round one of the audit conducted in the IR department in 2016 resulted in 38 lists and 121 checklists being evaluated. Round two, conducted in 2018 following the programme, resulted in 29 lists and 96 checklists being evaluated. The results are given in table 1. An improvement in compliance with all of the 5SSS is shown, most significantly in ‘all three stages of the checklist being done at the correct time’, which increased by 23%. Trust-wide compliance in ‘all three stages of the checklist being done at the correct time’ only increased by 10%.

DISCUSSION
This pilot, though limited by the small number of participants, has demonstrated potential in increasing compliance with the 5SSS. The checklist has been adapted to suit the needs of local departments and trusts worldwide, and this programme allowed a discussion on the way it could be localised to this particular department. One of the suggested changes to the checklist was to add a space for a name after the question ‘have any equipment problems been identified that need to be addressed’, so that someone is made responsible for resolving the issue. The importance of carrying out all steps, including the debrief, was stressed and it was agreed...
Table 1 Compliance rates with the 5 Steps to Safer Surgery (5SSS) within the Interventional Radiology (IR) Department and across the Trust before and after the training programme

|                     | Lists with complete team briefing | Lists with complete team debriefing | All three stages of the checklist done in full at the correct time |
|---------------------|-----------------------------------|------------------------------------|-----------------------------------------------------------------|
| IR before programme | 36/38 = 95%                       | 1/38 = 3%                          | 91/121 = 75%                                                    |
| IR after programme  | 29/29 = 100%                      | 1/29 = 10%                         | 95/96 = 99%                                                    |
| Trust before programme | 300/325 = 92%                    | 128/325 = 39%                     | 772/946 = 82%                                                  |
| Trust after programme | 482/492 = 98%                    | 216/492 = 44%                     | 1310/1429 = 92%                                               |

that they did not have to be led by the most senior member of the team.

This brings in the contribution of HF skills to the programme. A number of issues were explored, in particular targeting the comment by the CQC that a reason for non-compliance with the 5SSS was a lack of engagement from seniors and the programme was able to provide tools to challenge such behaviour. This is reflected in the significant change in rated ability to ‘communicate effectively with a colleague with whom you disagree’. As the change in self-efficacy was not universal to all components of the HF in healthcare instrument, a need for a greater focus on HF skills within the programme is highlighted.

Looking into the wider effect of this programme through audit data on 5SSS compliance, an improvement is seen within the IR department in all areas. Though it is difficult to determine how much of this change can be attributed to the programme itself, this improvement is greater than that seen in Trust-wide results in both ‘completing all three stages of the checklist at the correct time’ and ‘debriefing’. The programme can now be applied to other departments to raise the overall standard of practice.

In summary, the 5SSS has incredible potential in reducing the morbidity and mortality related to surgical errors. The driving force towards compliance with the steps and an enhanced safety culture is the knowledge, skills and confidence of the staff that work within the organisation. These can be influenced by training programmes, such as this one, that emphasise the importance of safety measures and empower participants to make changes to implement them effectively.

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