

Evaluation of different methods of implementation of the WHO Surgical Safety Checklist in Guinea

Introduction

The World Health Organisation (WHO) Surgical Safety Checklist significantly improves surgical outcomes in resource poor settings.^{1,2} The key question is no longer 'does the checklist work?' but 'how can we *make* the checklist work?' We aimed to undertake a descriptive observational study of three different methods of checklist training with evaluation at 3-6 months.

Mercy Ships operates the *Africa Mercy* which is a surgical hospital ship with 5 operating rooms, 5 wards, and a standard of care equivalent to most UK hospitals. We visit countries at the invitation of their Government / President to deliver surgical services and train healthcare providers on board the ship. From September 2012 to June 2013 we were in Guinea which, is one of the poorest countries in the world, ranked 10th from bottom in the United Nations, Human Development Index.³ There are 7 main government hospitals all of which lack reliable water and electricity supply; spinals and ketamine are the mainstay of anaesthesia. Five out of 7 hospitals have no oxygen or pulse oximetry and patients are never intubated.

Methods

The Minister of Health and all participants gave approval for the observational study, therefore in the absence of a formal IRB process in Guinea, we took this as constituting ethical approval.

We compared three methods of checklist training and evaluated outcome at 3-6 months:

1. Team training on board ship (surgeon PLUS anaesthesia or ward nurse from same institution).
2. Individual training on board ship (single surgeon or anaesthesia provider).
3. One day classroom training.

Training on board ship comprised one-to-one explanation, watching and active participation in the checklist. Classroom training consisted of lectures and role-play.

Effectiveness of training was evaluated by hospital visits and structured interview at 3-6 months. The interview focussed on 3 of the 4 areas of patient care covered by the Safe Surgery Saves Lives framework: Teamwork, Anaesthesia, Infection Control. Where possible the hospital director and other staff were interviewed to corroborate findings. Follow-up questions were asked focussing on the 6 essential safety steps:

1. Confirmation of identity of patient and surgical procedure
2. Assessment of risk of placing breathing tube
3. Assessment of risk of major blood loss
4. Antibiotics given within 1 hour of the start of surgery
5. Use of pulse oximetry
6. Counting of sponges and instruments

Results

The hospitals, specialty of participants, and training received are shown in Table 1

Table 1

Type of Training	Participants	Length of training	Number of days	Hospital
Team	Surgeon and anaesthetist	1-2 days per week for 8-12 weeks	20 (Surgeon) 8 (Anaesthetist)	A
Team	Surgeon Anaesthetist	Every day for 2 weeks Every day for 2 weeks	10 (Surgeon) 10 (Anaesthetist)	C
Team	Surgeon Anaesthetist	Every day for 2 weeks Every day for 1 week	10 (Surgeon) 5 (Anaesthetist)	D
Team	Surgeon Ward nurses	Every day for 2 weeks Everyday for 1 week	10 (Surgeon) 10 (Ward nurses)	F
Individual	Anaesthetist	1- 2 days per week for 8 weeks	10	A
Individual	Anaesthetist	Every day for 2 weeks	10	B
Individual	Surgeon	Every day for 2 weeks	10	E
One day course	Anaesthetist	1 day	1	A
One day Course	Anaesthetist	1 day	1	B

The individual participants' perception of the effect of training on the 3 key areas of Save Surgery Saves Lives initiative are shown in Table 2.

Table 2 Individual participants' perception of the effect of training (yes / no) on 3 key areas of Save Surgery Saves Lives Initiative.

Type of training (Hospital)	Participants	Teamwork	Organisation and Safety of Anesthesia	Infection Control
Team (A)	Surgeon Anaesthetist	yes	yes	yes
Team (C)	Surgeon Anaesthetist	yes	yes	yes
Team (D)	Surgeon Anaesthetist	yes	yes	yes
Team (F)	Surgeon Ward nurses	yes	yes	yes
Individual (A)	Anaesthetist	no	yes	yes
Individual (B)	Anaesthetist	no	yes	yes
Individual (E)	Surgeon	no	no	Yes
Classroom course (A)	Anaesthetist	no	Yes	no
Classroom Course (B)	Anaesthetist	no	yes	no

Only participants who had undergone team training were able to implement a form of the checklist in their own environment. Specifically in relation to the 6 essential safety steps: all participants said they already confirmed the identity of the patient and gave antibiotics on time. Four out of 6 hospitals did not intubate patients, had no oxygen or pulse oximetry available so they considered these questions irrelevant. Only those undergoing team training managed to implement discussions about blood loss. None of the surgeons counted sponges or instruments prior to training but all successfully implemented this afterwards. However, none of the Anaesthetists were able to implement counting unless the surgeon had received training.

Discussion

Team training on board ship was more successful than individual or classroom training. The biggest impact was when a surgeon plus another healthcare provider (Anaesthetists or nurses) received training together, discussing, watching and taking part in the WHO checklist. Anaesthetists who trained alone were unable to implement any changes in their home environment. This could be explained by a very surgeon-led culture in Guinean hospitals. Even the Chief of Anesthesia in a large government hospital said he was powerless to change surgeon's behavior in his hospital. This underlies the importance of understanding the culture and directing training to those with the most power to effect change. Two hospitals commented that it was better to have more than just the surgeon receiving training because 'if only one person comes back with new ideas, then people don't believe them and this makes it hard to implement change'. They also said two people were better because they can learn different things. 'It is too much for the doctor to do alone'.

Although team training was more effective, even those who received individual or classroom training reported improvement in at least one key area (table 2). Our results question the effectiveness of running a one day course for single groups of Anaesthetists. We did not examine if one-day classroom training *in* teams would be effective. Neither did we examine the effect of training in the local hospital versus role-model training on board ship. These are areas of further study.

Our study is limited to data obtained by interview rather than actually watching the teams perform so is open to responder bias. We tried to control this by interviewing other staff and hospital directors as well as participants.

In conclusion, team training was more effective than individual training. The main areas of impact were: (i) teamwork (ii) organization of anesthesia; (iii) infection control; (iv) counting sponges.

References

1. Haynes AB *et al.* A Surgical Safety Checklist to Reduce Morbidity and Mortality in a Global Population. *N Engl J Med* 2009;360: 491-9
2. Kwok ACL *et al.* Implementation of the World Health Organisation Surgical Safety Checklist, including introduction of pulse oximetry in a resource limited setting. *Ann Surg* 2012 Nov 30
3. United Nations Health Development Index. <http://www.un.org/en/development/index.shtml> Accessed July 25th 2013.