

Assessing the impact and implementation of a targeted introduction of pulse-oximeters into operating theatres in Malawi

Aims:

Last year 100 pulse oximeters were delivered to Malawi alongside an intensive centralised training day in Blantyre. The overall aim of this project was to assess the impact and success of this single intervention.

Objectives:

To assess

- 1) If the pulse oximeters are still working and being used?
- 2) If the training was successful or have the staff forgotten what they were taught?
- 3) Does increasing use of the pulse oximeter increase surgical safety?

Introduction

Pulse Oximetry is a key component of patient monitoring, which is known to dramatically improve both patient care and safety. Currently in Malawi only 33% of hospitals have universal access to a pulse oximeter in their operating theatres. This Country was therefore chosen by The Lifebox Charity in conjunction with The College of Anaesthetists of Ireland and The Association of Anaesthetists of Great Britain and Ireland (AAGBI) to attempt 100% availability of this equipment.

In August 2014 a team from Lifebox travelled to Malawi to deliver a training day to 100 anaesthetic providers (83 ACOs and 17 surgeons). At the end of the training each delegate was provided with their own individual pulse oximeter.

To ensure sustainability of this donation each oximeter was followed up in April-May 2015 during my medical elective (8 months post training).

Method

To assess whether the pulse oximeters were still working and to highlight any problems, each delegate was provided with a short questionnaire. As the course also covered surgical safety and the importance of the WHO checklist, an audit of the checklist's use was included.

At the training course in August a pre and post course True/False assessment was undertaken. This was repeated upon follow up to ascertain whether knowledge was retained 8 months on.

The final component of the follow up used a logbook to look at the outcomes of the first 100 consecutive patients with whom the pulse oximeter was used.

Results

Out of the 100 delegates 76 were successfully contacted and followed up between 6th April and 29th May 2015. All 76 completed both the follow up questionnaire and the True/False assessment. Only the 83 ACOs were provided with a logbook, out of which 58 were successfully collected (70%).

1) Follow up Questionnaire

3/76 (0.04%) reported that they encountered a problem with the pulse oximeter in the 8 months measured (Figure 1).

Figure 1:

	Type of defective item?	How long after receiving was the fault noticed?	Was the problem reported?	What was the problem experienced?
1	Pulse Oximeter	0-3 months	Yes	Sensor always showing as off, even when new probe tried
2	Probe	6-12 months	Yes	Spring on probe broken when pulled by an agitated patient
3	Not specified	Not Specified	Not Specified	Not specified

Figure 2 describes the results of the WHO checklist audit with 44/76 (58%) saying that the checklist was visible in their operating room.

Figure 2:

How often does your team use the WHO checklist?	No. Out of 76	%
Always	11	14.5
Most of the time	22	29
Occasionally	27	35.5
Never	9	12
Not answered	7	9

2) True/False assessment

The assessment involved 50 True/False Questions and 2 free text questions. The maximum number of marks available was 52. The average score pre training was 39.50 improving to 43.75 post training. After 8 months it dropped to 42.50 (1.25 difference).

3) Logbook

The Logbooks looked at the trend in desaturation (94 or below) over the increasing use of the pulse oximeter. For each patient the lowest recorded saturation during surgery was recorded. Figure 3 shows the average percentage of desaturation for each patient decile.

Figure 3:

Patient decile	1 st	2 nd	3 rd	4 th	5 th	6 th	7 th 10	8 th	9 th	10 th
% <94	30.5	26.7	28.0	27.0	28.2	26.1	26.5	26.6	22.9	32.5

Conclusion

With only 3 out of 76 pulse oximeters reporting a problem, the reliability and sustainability of the Lifebox machine is encouraging. This is increased by only one fault being confirmed as due to the machine itself.

The WHO checklist is a relatively new concept in Malawi and there has been some previous resistance to its use. With 43.5% saying that they used the checklist most of the time or always there has been a definite move to incorporate this into routine care. There is still room for improvement here and future training should continue to include its use and importance.

The True/False assessment mean marks prove that the training improved the participant's knowledge and that this knowledge was retained over an 8 week period, therefore confirming its success.

The logbook showed no association with length of oximeter use and patient desaturation.

Overall the results show a definite success of the Life box donation, not only with the reliability of the machines but also with the sustainability of the training. This method of donation should be continued until 100% availability across Malawi has been achieved.



Image of a Lifebox Pulse Oximeter in use in a Malawian operating theatre.