

## Lifebox

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Reports of anaesthesia and surgery in resource-poor parts of the world commonly include accounts describing shortages of personnel, equipment and drugs, limited access to surgical care, and patients who present late with severe disease.<sup>1</sup> Not surprisingly, outcomes from anaesthesia in these settings are often poor. In some parts of the world, anaesthesia-related mortality is 100- to 1 000-fold higher than in the UK.<sup>2</sup>

What can clinicians from other developed nations do to support our colleagues working under such difficult conditions? The Association of Anaesthetists of Great Britain and Ireland (AAGBI) and World Federation of Societies of Anaesthesiologists (WFSA) have been involved in supporting aspects of anaesthesia for many years. Most projects have concentrated on education and partnerships in low-income settings.

The World Health Organization (WHO) has also begun to consider the issue of surgery as a public health issue. Around 234 million operations are performed each year, and these are associated with one million deaths and seven million serious complications, half of which are likely to be preventable.<sup>3</sup> Under the leadership of Atul Gawande, renowned surgeon, writer and public health researcher, the WHO developed the *WHO Surgical Safety Checklist* to help teams work more effectively together. When piloted in a variety of settings, the checklist resulted in a greater than 30% reduction in mortality and morbidity. Backed by these findings, it is being introduced as a routine measure in many countries.<sup>3</sup>

One of the requirements of the checklist is that a pulse oximeter is used during surgery. This simple, non-invasive monitor was introduced into practice in the early 1980s. It transformed the ability of anaesthetists to monitor their patients, and quickly spread to every area of the hospital. Without doubt, millions of lives have been saved as a result of the widespread introduction of pulse oximetry.

The situation is very different for colleagues working in developing countries. Many work without access to pulse oximeters, and are required to monitor their patients with a precordial stethoscope and a finger on the pulse. There are significant price barriers to the introduction of pulse oximeters, and as is frequently the case in the developing world, difficulties in replacing components, such as probes and batteries, often lead to the device having a very short lifespan. Recently, it has been estimated that at least 70 000 operating rooms do not have a pulse oximeter,<sup>4</sup> but the overall need for oximeters in health care is much greater. All areas of the world are affected where resources are in short supply.

Recently, Atul Gawande, in partnership with the AAGBI, the WFSA, and the Harvard School of Public Health, formed a new charity, called Lifebox ([www.lifebox.org](http://www.lifebox.org)), which aims to promote the use of the *WHO Surgical Safety Checklist* in developing countries, and also to make available a good quality pulse oximeter for use in operating rooms, anywhere in the world.

Following a tender by the WFSA, a contract was awarded to Acare Technology, Taiwan, to supply a pulse oximeter that exceeds the WHO specifications, and is particularly suited to the difficult conditions experienced in low-income settings. This oximeter can be purchased, or donated, via the Lifebox website, and sent to any clinician, or non-profit making hospital, in a low- or low-middle-income country for only US\$250. Replacement probes cost only US\$25, and include a universal finger probe (one-year old to adult) and a reusable infant wraparound probe. The oximeter is robust, high quality, battery- or mains-powered, and includes a monitor with an audible tone, waveform, and adjustable alarms. (More details are available on the Lifebox website. All enquiries are welcome!)



Lifebox works to ensure that pulse oximeters are only delivered to clinicians or hospitals that have completed appropriate screening. Our favoured way of distributing pulse oximeters is to work through locally based clinical colleagues, who will help us by undertaking and offering training in the use of pulse oximetry, and also the *WHO Surgical Safety Checklist*. Additionally, local clinicians are often able to help with customs clearance and further distribution within the country.

In July 2011, the AAGBI donated 80 pulse oximeters to colleagues working in Uganda, and a team travelled from the UK to deliver the oximeters and provide checklist training at Mbarara University Teaching Hospital. The Lifebox team has been following up on the progress of the students and use of the oximeters. We have been delighted to hear about many critical identified incidents and lives saved through use of the device. Additionally, the checklist is proving to be useful where it is being taken up. However, more work is needed on this, as is the case in our own hospitals!

Lifebox welcomes donations towards the purchase of oximeters, as well as partnerships in hospitals in countries in which oximeters are not being used. Our target is to ensure that no patient undergoes anaesthesia, and that no surgery is undertaken, without use of a pulse oximeter, and the *WHO Surgical Checklist*, respectively.

Can you help us?

## References

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