

# Illuminating work

**Thomas Weiser** reports on efforts by the College and Lifebox to support safer surgery around the world

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For the first time in history humans are more likely to be killed by a surgically treatable condition than an infectious disease. Yet millions of lives are put at risk every year when lack of resources, training and systems support make an operating room unsafe. Lifebox is dedicated to making surgery and anaesthesia safer, whether it is by improving the conditions of obstetric-related operations or building global networks through partnerships with local colleagues and charities.

With a shared history of improving access to safe surgical

care, the College is supporting Lifebox's efforts to raise funds to deliver a low-cost, fit-for-purpose surgical headlight to surgeons in Liberia, West Africa.

In 2016 I was a contributor to the Lancet Commission's work that established that five billion people lack access to safe, affordable and effective surgery<sup>1</sup>. The relative risk of death following surgery is estimated to be up to 22 times higher in low- and middle-income countries (LMICs) than in high-income settings<sup>2</sup>. By developing and promoting low-cost solutions and strategies, and building the capacity of health professionals to use them, Lifebox is working with partners on the ground to make every operation safer. Lifebox offers a set of tools, training modules and workshops that focus on three essential, interrelated areas of safety, all rooted in the WHO Surgical Safety Checklist: improving anaesthesia

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safety, reducing surgical infection rates and strengthening teamwork in the operating room.

**ANAESTHESIA SAFETY**

Since 2011 Lifebox has distributed more than 20,000 affordable, durable pulse oximeters to hospitals and anaesthesia providers. Yet Lifebox estimates that 50,000 surgical and medical centres in LMICs still do not have this life-saving device<sup>3</sup>.

The Lifebox oximeter is particularly suitable for low-resource settings, with sturdy construction and rechargeable batteries for use even when the power fails. Educational materials are provided with the oximeter and distribution is usually accompanied by training to help guide safer decision making in the delivery of anaesthesia<sup>4</sup>.

**REDUCING INFECTION RATES**

Building on Lifebox's successful focus on anaesthesia safety, four years ago the organisation decided to tackle one of the greatest causes of mortality and morbidity related to surgery – postoperative infections. We have developed the Clean Cut programme to help hospitals strengthen perioperative infection-prevention practices by improving compliance with critical perioperative practices and establishing active surveillance.

The programme is grounded in the WHO Surgical Safety Checklist and





In low-income countries surgeons have to resort to operating by phone light or using torches (right)

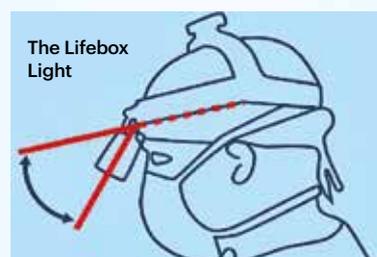


uses a team-centred, adaptive approach to improve these surgical processes. Central to the programme's success is the collection of high-quality data that are used by teams to drive continuous improvements in compliance and safety. Through ongoing support, coaching and feedback, Clean Cut builds a strong surgical-quality improvement team in the hospital.

Implemented in eight hospitals in Ethiopia to date, initial results demonstrate this programme dramatically improves use of the checklist and compliance with best practices while cutting the risk of infection nearly in half.

Recognising that sterile processing is a key to reducing

surgical infection, Lifebox developed Safer Surgical Instruments in partnership with the non-profit Sterile Processing Education Charitable Trust. This short training course is aimed at technicians and personnel involved in sterile processing, and improves instrument preparation and sterilisation processes.



## SURGICAL HEADLIGHT

Reducing surgical infection and improving safety requires the appropriate tools. The Lifebox Light is a new initiative that will provide a quality, fit-for-purpose and robust surgical headlight to address the lighting gap in low-resource settings.

Our research estimated that at least 24 million patients are at risk of harm from loss of lighting during surgery every year<sup>5</sup>. Some 80% of surgeons from low-resource settings indicate poor lighting caused patient harm during surgery<sup>6</sup>. This inspired Lifebox to assess the minimum specifications necessary for a surgical headlight in such settings and identify devices that meet these parameters.

Lifebox has tested a number of headlights in Ethiopia and is now working to deliver a low-cost solution to surgeons in Ethiopia, Liberia and Nicaragua. The College has supported the work in Liberia with a pledge of funding for this programme. The Lifebox Light is now in use and illuminating operations, improving the lives of both surgeons and patients.

Lifebox engages medical students, surgical trainees and surgeons from around the world. With partners such as the College the organisation continues to advocate for improved access to care and works to ensure that surgery is as safe and high quality as possible for all patients.

## References

1. Meara J *et al.* Global Surgery 2030: evidence and solutions for achieving health, welfare, and economic development. *Lancet* 2015; 386; 569–624
2. Uribe-Leitz T *et al.* *Lancet Global Health* 2016; 4: e165–e174
3. Lifebox estimate; does not account for the pulse oximeters needed for postop care, during transportation, or in ICU or other care settings
4. Previous projects implementing pulse oximetry along with the Surgical Safety Checklist have demonstrated a nearly 60% reduction in perioperative complications and a dramatic increase in oximetry use; Kwok AC *et al.* Implementation of the World Health Organization Surgical Safety Checklist, including introduction of pulse oximetry, in a resource-limited setting. *Ann Surg* 2013; 257: 633–639
5. Forrester JA, Torgeson K, Weiser TG. Minimum specifications for a Lifebox surgical headlight for resource-constrained settings. *JAMA Surg* 2019; 154(1): 80–82. doi:10.1001/jamasurg.2018.4205
6. Forrester JA, Boyd NJ, Fitzgerald JEF, Wilson IH, Bekele A, Weiser TG. Impact of surgical lighting on intraoperative safety in low-resource settings: a cross-sectional survey of surgical providers. *World J Surg* 2017; 41(12): 3055–3065

## The Surgical Lighting Gap

Since its founding in 2011 Lifebox has helped surgical teams in 113 countries make more than 20 million operations safer. Lifebox has distributed more than 20,000 oximeters to improve anaesthetic safety.

- **24 million** patients are at risk from inadequate or unreliable lighting during surgery
- Electricity is unreliable in **30%** of facilities in LMICs
- **400,000** surgeons are working in health facilities with lighting constraints
- Some **29%** of surgeons in LMICs have relied on their mobile phones as a source of lighting
- Only **9%** of surgeons in LMICs report that they use or have access to a headlight for surgery.

For more information on what Lifebox is doing to improve surgical safety around the world, please visit [lifebox.org](http://lifebox.org)