



# From Surgical Safety to Pandemic Response

Nicole C.P. Thompson, MD, FAAP

Jeremiah J. Whittington

Alexander A. Hannenberg, MD

Faye M. Evans, MD, FAAP

All of us will have a moment in our lives when either we, or a loved-one, need surgery. Whether it's due to an accident, illness, or giving birth, many of us will take access to safe surgery as a given. This is not true for the vast majority of our world's population. Globally, 5 billion people lack access to safe surgery.

Surgical teams across many areas of the world face significant challenges in providing the best-possible care to their patients. Either from a lack of adequate training or resources, the risk of death following surgery in some parts of the world can be 22 times higher than in a high-income country (*Lancet Glob Health* 2016;4:e165-74). The global nonprofit Lifebox, which is supported by the ASA Charitable Foundation, is dedicated to making surgery and anesthesia safer in low-resource contexts.

Lifebox was launched in 2011 to improve surgical safety globally, beginning with providing pulse oximeters to ORs lacking one. As anesthesiologists, we know how important this critical monitoring device is to patient care. Interestingly, a pulse oximeter is the only piece of equipment included on the WHO Surgical Safety Checklist. Yet, at Lifebox's launch,

**“Whether it's due to an accident, illness, or giving birth, many of us will take access to safe surgery as a given. This is not true for the vast majority of our world's population. Globally, 5 billion people lack access to safe surgery.”**

it was estimated that 77,000 ORs around the world lacked one. The Lifebox pulse oximeter has been specifically designed for use in low-resource settings – with robust construction and rechargeable batteries that stay on even when the power fails. To date, more than 28,000 Lifebox pulse



© Lauren Anders Brown, Lifebox

oximeters have been distributed to health care providers around the world for vital patient monitoring.

The COVID-19 pandemic has demonstrated the crucial role that pulse oximeters play in patient care beyond just surgical care. At the onset of the COVID-19 pandemic, with our expe-

rience in pulse oximetry and our wide partner network, we were in a unique position to rapidly respond to COVID-19. Our Lifebox team adapted and developed tools and strategies to create a safe care environment for patients and providers during the pandemic. Funds raised by the 2019 ASA-Lifebox Resident

*“Lifebox responded rapidly to COVID-19. In the absence of good testing, being able to have a pulse oximeter on the finger of a person with a cough and detect those with low oxygen levels has proven to be incredibly important across the world, especially in places like Sub-Saharan Africa and Latin America, where Lifebox operates. With 6,500 pulse oximeters distributed thus far, work continues apace – with Lifebox doing incredible things at scale.”*

– Dr. Atul Gawande, Lifebox Co-Founder and Chair

The Lifebox team has also worked to reduce the risk of COVID-19 infection to surgical teams operating during the pandemic. The COVID-19 Surgical Patient Checklist, developed in collaboration with the World Federation of Societies of Anaesthesiologists and Smile Train, provides prompts to surgical teams to perform key infection prevention strategies. More than 50 surgical team “Trainers” have been trained on the COVID-19 Checklist across Central America, Asia, and Sub-Saharan Africa in a Virtual Train-the-Trainer workshop.

Surgical teams around the world have continued to provide lifesaving surgery during the pandemic – even when lacking basic PPE to keep themselves safe. We have distributed 25,000 items of PPE to Ethiopia, Burkina Faso, and Uganda and supported the local purchase of PPE in Honduras and Ethiopia. Recognizing the global shortage of PPE and lack of training resources, we have worked with partners such as N95DECON to create evidence-based resources such as PPE donning and doffing protocols and its safe reuse. Underpinning this work is Lifebox's webinar series, with 7,000 health care providers tuning in for perspectives and guidance from global clinical leaders in surgery, obstetrics, and anesthesia.

As we enter the second year of the pandemic, the priority for the Lifebox team remains the same – to support colleagues as they provide safe surgical, anesthesia, and COVID-19 care during the global health emergency. By working alongside local partners, Lifebox provides the training and tools needed to save lives through safer surgery. To learn more about Lifebox and support our work, visit [www.lifebox.org](http://www.lifebox.org).



**Nicole C.P. Thompson, MD, FAAP**

Committee on Global Humanitarian Outreach, Associate Professor of Anesthesiology, and Division Chief, Global Health Anesthesiology, University of Illinois Hospital and Health Sciences System, Chicago.



**Jeremiah J. Whittington**

Medical Student, University of Illinois College of Medicine, Chicago.



**Alexander A. Hannenberg, MD**

Senior Research Scientist, Ariadne Labs, and Trustee, Lifebox Foundation, Brigham & Women's Hospital, Boston.



**Faye M. Evans, MD, FAAP**

Vice Chair, Committee on Global Humanitarian Outreach, Trustee, Lifebox Foundation, and Senior Associate in Perioperative Anesthesia, Department of Anesthesiology, Critical Care and Pain Medicine, Boston Children's Hospital.

Challenge enabled us to respond immediately to requests from front-line providers for pulse oximeters.

Pulse oximetry has been at the heart of our COVID-19 response. “Silent hypoxia” is a defining feature of the disease, with patients becoming hypoxic without the usual shortness of breath that would lead them to seek care. By the time many COVID-19 patients present to the hospital, they are already critically ill. In low-resource settings that often lack widespread testing, pulse oximetry has proven to be a critical tool in the triage of COVID-19 patients. In 2020, we distributed more than 6,500 oximeters to front-line providers across 43 countries worldwide.

To help front-line health care workers triage COVID-19 patients, we developed a ‘Pulse Oximeter COVID-19 Decision Making Tool’ with The Alliance for International Medical Action to help providers rapidly identify patients in need of oxygen therapy. The tool is available in six languages, with a multi-language training video that has had more than 170,000 views across all languages. ■