

News from the American College of Surgeons

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### **Surgical Checklist Can Help Prevent Life-Threatening Infections for Patients in Low Resource Settings**

*Process maps for infection prevention can provide a means for improving surgical safety in low- and middle-income countries*

SAN DIEGO: Preventing infections after a surgical procedure is important in any setting, but these complications can be particularly dangerous to surgical patients in low- and middle-income countries (LMICs). To address the situation, the global organization, Lifebox, brought together researchers from Stanford University, Stanford, Calif., and Jimma University, Jimma, Ethiopia, in a collaboration to address the morbidity and mortality caused by surgical site infections in LMICs. The resulting checklist-based intervention helps surgical teams comply with infection prevention standards. Highlights from their research initiative were presented today at the American College of Surgeons Clinical Congress 2017.

The Surgical Safety Checklist, created by Atul Gawande, MD, FACS, for the World Health Organization, provides the framework for Lifebox's evidence-based approach to improving surgical safety in LMICs, and for this checklist-based program called Clean Cut. Developed by general surgery resident, Jared Forrester, MD (Stanford Health Care), and colleagues, Clean Cut is an intervention based around the use of process maps to improve compliance with perioperative infection prevention standards. The research team initially implemented Clean Cut at a pilot site in Jimma, where they saw a 180 percent improvement in the use of appropriate hand hygiene prior to surgery, a 92 percent improvement in proper timing of prophylactic antibiotics, and an increase in the use of sterile indicators to confirm use of sterility of surgical instruments from 7 percent to 87 percent, among other noted improvements.

After effectively piloting Clean Cut, the research team is now at two hospitals in Addis Ababa, Ethiopia, with plans to adapt the process map for use in 10 other hospitals within the next year, at least one in each region of the country.

“Surgical site infections are an incredible cause of morbidity and mortality, especially in low resource settings, where you can have up to five times the amount of surgical infections after an

operation,” Dr. Forrester said. “We already know basic infection prevention practices that can reduce risk, wherever you are in the world, if you use them effectively. So for Lifebox, this research wasn’t aiming to reinvent infection prevention, it was about understanding how to implement existing best practices. The goal of Clean Cut was to develop a scalable program where we could improve basic infection prevention strategies.”

The Clean Cut checklist-based intervention includes the following infection prevention standards:

1. Hand and surgical site decontamination
2. Integrity of gowns, drapes, and gloves
3. Instrument sterility
4. Prophylactic antibiotic administration
5. Surgical gauze tracking
6. Checklist compliance

Three of the standards are embedded in the checklist, Dr. Forrester explains, with focus on appropriate timing and selection of prophylactic antibiotics before surgery; ensuring surgical instruments are sterile; and decreasing retained surgical items through standardized counts. Two of the other standards are inherent to safe surgery, with focus on proper skin decontamination and maintenance of a sterile field through using intact and sterile gowns, drapes, and gloves. The last standard is compliance with the full checklist, which has been shown to improve communication and surgical safety.

The research team believes the program provides a model that can be successfully adapted for other low-resource settings. However, Dr. Forrester acknowledged there are certain challenges in changing a hospital’s environment to successfully implement a checklist program. He estimates that about a third of hospitals will readily try to pick up new changes, another third will need coaching and ongoing mentorship, and the final third will be more difficult to change current practices.

“Behavior change is really hard,” Dr. Forrester said. “There are plenty of guidelines, but there is a gap in terms of how to actually implement them. The Clean Cut process maps can serve as a method and strategy for management and clinicians alike to be able to identify areas in their process where there is a problem, and be able to make changes around it.”

Dr. Forrester related the importance of process maps for surgical infection prevention to the coffee production process—a major industry in Ethiopia. “There are a lot of steps between harvesting the coffee bean in rural Ethiopia to getting a cup of coffee at a coffee shop. If any of the processes along the way are not functioning well, then the end product will suffer,” he said. “The big thing for global surgery is developing implementation strategies and to try to walk people through these steps on how to improve.”

The research team found that process mapping the steps involved in infection prevention and plotting solutions specific to each site results in higher compliance with antiseptic standards. “Simplifying these process maps into an adaptable tool could be a powerful means for improving safe surgery delivery in LMICs,” the researchers concluded.

Other study participants include Luca A. Koritsanszky, MPH; Menbere Hailu, Nursing; Demisew Amenu, MD; Alex B. Haynes, MD, MPH; William Berry, MD, MPH; Seifu Alemu, MD; Fekadu Jiru, MD, MPH; and Thomas G. Weiser, MD, FACS.

*“FACS” designates that a surgeon is a Fellow of the American College of Surgeons.*

[Lifebox](#) is a global nonprofit working to make surgery and anesthesia safer in low-resource settings. Chaired by Atul Gawande, MD, FACS, and co-founded by the Association of Anaesthetists of Great Britain and Ireland, the Brigham and Women’s Hospital, the Harvard T. H. Chan School of Public Health and the World Federation of Societies of Anaesthesiologists, Lifebox partners with colleagues in more than 100 countries.

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### **About the American College of Surgeons**

The American College of Surgeons is a scientific and educational organization of surgeons that was founded in 1913 to raise the standards of surgical practice and improve the quality of care for all surgical patients. The College is dedicated to the ethical and competent practice of surgery. Its achievements have significantly influenced the course of scientific surgery in America and have established it as an important advocate for all surgical patients. The College has more than 80,000 members and is the largest organization of surgeons in the world. For more information, visit [www.facs.org](http://www.facs.org).