



Saving Limbs and Livelihoods in Kenya

Edony Nkelee is a 59-year-old from Baragoi, in rural northern Kenya. The area, known as The Great Rift Valley, is beautiful but treacherous. It is lush in the rainy season and dry during the rest of the year. This forces farmers and pastoralists to relocate through the steep terrain as the seasons change, in order to find grass for their livestock and tillable land.

Edony was in a traffic accident and suffered a compound fracture in his lower leg—a severe injury where the broken bone pierces the skin. In injuries like this, it is difficult to return the tibia bone to its proper alignment, and because of the open wound, there is significant risk of infection.

Dr. Daniel Sciuto had just spent a week at the 2018 SIGN Conference in Richland, as well as a week in San Francisco at the SMART Course, put on by the Institute for Global Orthopaedics and Traumatology (IGOT), learning how to manage and treat difficult trauma cases like this. Dr. Sciuto treated the infection and performed a muscle flap procedure—a technique he learned and practiced at the SMART Course—using a muscle from the lower leg to cover the bone in order to maintain blood supply and prevent further infections.

After four months and an additional procedure, Dr. Sciuto was confident that Edony's wound was healing, so he used a SIGN Nail to stabilize the tibia. A few days later, Edony was able to walk with crutches and leave the hospital.

He returned to the hospital four months after surgery and showed good signs of healing. Edony still had some pain, but he was able to walk. Most critically, he showed no signs of infection.

Six months after surgery, Edony was able to squat and smile with his doctors, and he is fully able to continue farming and herding. Without SIGN Surgery and the muscle flap procedure, he likely was facing amputation, which would have kept him from working and plunged his family into poverty.

Your gifts provide educational opportunities for surgeons and the orthopaedic instruments and implants to put that learning into action. Please help surgeons heal more patients like Edony by using the included form or going to signfracturecare.org/donate today.



Edony squats and smiles with Dr. Sciuto, which shows healing after a fractured tibia.

SIGN Trauma Sessions: Online Education to Save Limbs

On September 25, SIGN partnered with IGOT to host a SIGN Trauma Session/SMART Course on muscle flap procedures, which involve moving muscle from one part of the body to cover a broken bone that is not covered by skin due to injury.

Severe Trauma Injuries

This is an important technique for surgeons because it allows them to care for patients with severe trauma injuries like compound fractures or fractures with infections in the tibia. These injuries are common in motorcycle accidents, as the lower leg is exposed and vulnerable to bone and tissue injuries.

“An orthopaedic surgeon capable of performing these techniques can save many limbs that would otherwise result in chronic infection or amputation,” said Dr. David Shearer, an orthopaedic surgeon at UCSF and SIGN Board Member. In the United States, a plastic surgeon would often perform procedures like this. But many SIGN Surgeons are the only surgeons in their hospital, so this is an invaluable technique for them to help patients recover from severe tissue damage.

SMART Course

Every year, IGOT hosts a SMART Course (Surgical Management and Reconstructive Training) in coordination with the annual SIGN Conference, where they teach this procedure to SIGN Surgeons. In addition, the SIGN Bioskills Lab offers surgeons hands-on training in this procedure. The tactile training for muscle flap procedures is highly effective. SIGN and IGOT believe the digital format will expose more SIGN surgeons to these techniques for closing the wounds, and mentors will be available for consultation.

Dr. Michael Terry, a plastic surgeon from UCSF, led the training on flap procedures. SIGN Surgeons

Dr. Mapuor Mading and Dr. Daniel Sciuto, who have attended previous SMART Course trainings, shared how they are able to use these procedures in their hospitals, which both have limited resources.

The recorded session is now available for

SIGN Surgeons on [thehub](#), along with additional materials and discussion.



Dr. Shearer and Dr. Terry, from IGOT, answered questions from all over the world during the session.



Edony (see cover) is one of the patients Dr. Sciuto has treated with a flap procedure.

SIGN Trauma Sessions

October 30:
Pelvic Fractures

SIGN is providing innovative educational opportunities for surgeons around the world. In SIGN Trauma Sessions, leading surgeons from around the world present their research and case studies in their areas of expertise.

SIGN Surgeons, please look for emails from the Program & Education Team to sign up for upcoming sessions.

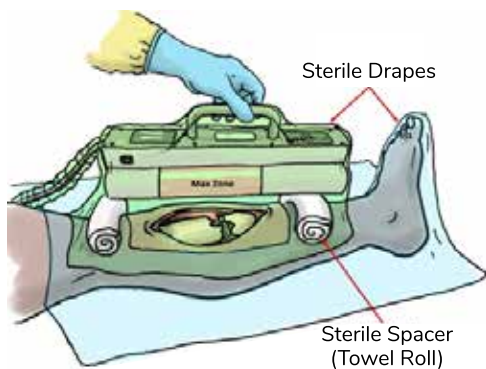
Please join us again **October 30**, when a team of SIGN Surgeons will present about pelvic fracture treatments. And please let the Program & Education Team know what kind of procedures or topics you would like to see covered in future SIGN Trauma Sessions.

Researching Infection Control

One of the many challenges that surgeons face with each procedure is controlling infections. Some patients have wounds that are already infected before they come to the hospital. And every surgery has the possibility of allowing an infection to take hold.

With the rise of antibiotic-resistant bacteria throughout the world, SIGN is researching ways that surgeons can provide low-cost, effective infection control for their patients. We can no longer depend on antibiotics alone, so we are researching alternative available methods to prevent and treat infections.

We are focusing our research on what surgeons in developing countries have available or could be made readily available at an affordable cost. Some of those solutions have been available for decades but have fallen off the radar, and others are newer treatments and devices. As with all scientific research, some of these methods will help and some may not be feasible, but SIGN is doing everything possible to provide surgeons with solutions that can make an impact in their unique hospital environments.



Small UV lights placed directly over wounds may be able to treat infections.

Ultraviolet Lights

Dr. Zirkle learned about using ultraviolet (UV) lights to kill bacteria in the surgical suite during medical school. However, lighting a whole room is very expensive, so the SIGN Engineers are researching devices and methods for small handheld UV lights that can be placed directly over the wound. UV can kill many different pathogens and has been used clinically to treat infected chronic wounds.

Photodynamic Therapy

Photodynamic Therapy uses a light-activated solution that produces a chemical reaction, which subsequently kills the targeted pathogen. This treatment is currently being used in Canada and Europe to help prevent surgical site infections by killing pathogens in the patient's nasal sinuses before surgery.

SIGN is coordinating with researchers and device manufacturers to see if it could be adapted to treat infected fractures and perhaps used inside a bone canal.

Manuka Honey

Honey is a natural antiseptic that has been used for wound care for millennia. It is often placed directly in the wound or in the dressings to help prevent infection and biofilm formation. Honey's effectiveness is based on its high sugar content and osmotic potential, which lowers the wound pH and provides a protective covering to the wound tissues. SIGN is monitoring results of hospitals currently using this technique and researching the potential of coating a SIGN Nail before insertion.

Clorpactin

Clorpactin is an over-the-counter antiseptic similar to the commonly used Dakin's solution (diluted bleach). When mixed in solution, it forms hypochlorous acid with a low pH, which is an effective combination for killing pathogens without harming human tissue cells. The solution is used to wash out wounds and the surgical site. New research is underway to determine the method of use for open fractures.

What SIGN Means to Surgeons

Dr. Mapuor Mading South Sudan



"We will continue to treat the innocent that are wounded in their tribal conflicts. They are wounded. They have nowhere to get help, but we are here to give them back their hope.

Without support from SIGN Family, I would not have energy and courage and support to treat those wounded patients."

Dr. Faruque Quasem Bangladesh



"I would like to thank you all, for the way you have kept relations with us. Whenever we meet and see each other, it feels like we just met yesterday. We are family. The people of Bangladesh, and all of our surgeons love Dr. Zirkle and SIGN. I'm sure about that."

SIGN *Silent Auction* November 12-19

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Registration and Questions

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