

WALANT Decreases Costs of Surgery to Increase Access and Help Alleviate Poverty in East Africa

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Summary: Surgery is essential to help people regain health and get back to work. Many Africans cannot afford traditional surgery because the sedation and main operating room sterility components are much too expensive. This often results in crushing debt for African families. Lack of access to surgery leads to poverty and poverty leads to lack of access to surgery. Wide-awake local anesthesia no tourniquet surgery, minimal pain tumescent local anesthesia, and evidence-based sterility are 3 disruptive game-changing innovations that eliminate the expensive general anesthesia and/or main operating room sterility components for many operations. Eliminating the tourniquet removes its need for sedation. Minimal pain tumescent local anesthesia enables comfortable numbing of large areas of the body to perform sedation-free operations such as soft tissue facial reconstruction, long bone fracture fixation, breast surgery, hernia repair, extremity surgery, and skin grafting. Evidence-based sterility has proven that many operations can be performed with field sterility outside of the main operating room environment with no significant increase in infection rates. No sedation also means no need for the main operating room environment. Moving some surgery out of the main operating room increases access for other operations that need full sterility to be accomplished. Since January 2020, these 3 disruptive changes have been adopted in 75 hospitals in 8 East African countries. This article documents how these changes have decreased the costs of surgery for the patients and, therefore, increased access to surgery, which helps alleviate poverty. (*Plast Reconstr Surg Glob Open* 2025;13:e6572; doi: [10.1097/GOX.00000000000006572](https://doi.org/10.1097/GOX.00000000000006572); Published online 21 March 2025.)

THE PROBLEM: THE VICIOUS CYCLE OF POVERTY AND SURGERY

Lack of access to surgery leads to poverty because people cannot recover from surgically curable illnesses or injuries. Poverty leads to a lack of access to surgery because the poor cannot afford surgery. This vicious cycle is a big

problem for at least 5 billion people who lack access to surgical care.¹ This is especially true in low-income and middle-income countries where up to 94% of people lack access to basic surgical care.² For example, in a 2017 study in Malawi, 24% of deaths were due to conditions that could have been treated with surgery. At that time, 35% of the population were living with problems such as a mass, congenital birth defect, or burn contracture that would have benefited from surgery if there was access to surgery.³ Similar statistics have been published from other circumstances, such as in refugee populations in Sierra Leone, Uganda, and Nepal.⁴ For those who borrow money to have essential surgery, the debt is often catastrophic and leads to family ruin.⁵

THE SOLUTION: COSTS OF TRADITIONAL SURGERY CAN BE REDUCED TO INCREASE ACCESS TO SURGERY

The main thing that makes surgery inaccessible is that it is too expensive. Two of the things that make traditional

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surgery very costly and, therefore, unaffordable are (1) sedation anesthesia and (2) main operating room full sterility. Three recent disruptive game-changing advances have eliminated the need for those 2 things in a large number of surgical procedures in the last 15 years.

1) Wide-awake Local Anesthesia No Tourniquet Eliminates the Need for Tourniquet and Sedation

The first major cost reducer is the use of wide-awake local anesthesia no tourniquet (WALANT) surgery. Traditional upper and lower limb surgery is performed with a tourniquet to improve visibility by decreasing intraoperative bleeding. Ischemic pain caused by a tourniquet is intense and happens quickly after its inflation. To make tourniquet pain tolerable, traditional upper limb surgery is usually accompanied by intravenous sedation or general anesthesia provided by an anesthesiology team. The anesthesiologist, respiratory therapist, extra intraoperative nurse, and postanesthetic care nurses and their equipment are all very expensive.⁶ In addition, general anesthesia or sedation usually means that the surgery must happen in the main operating room environment, which is also a much more expensive location than a minor procedure room.

WALANT eliminates the tourniquet.⁷ The only 2 medications given to patients are lidocaine to numb the intraoperative pain and epinephrine to provide tourniquet-free hemostasis and intraoperative visibility. No tourniquet means no sedation. No sedation means a tremendous decrease in the cost of surgery. As of November 9, 2024, there are 74 publications since 2015 showing cost reductions with WALANT when searching the words “WALANT cost” on PubMed.⁸ For example, one of the most recent of those publications in 2024 shows that in a US hospital, monitored anesthesia care carpal tunnel surgery is 35% more costly to the facility than WALANT carpal tunnel surgery.⁹ Cost is one of the many reasons the use of WALANT is exploding, with 343 publications listed on PubMed since 2013.¹⁰ The term WALANT was first invented and used on July 15, 2011, by Dr. Jerry Rubin, a Florida hand and plastic surgeon.

2) Minimally Painful Tumescant Local Anesthesia to Numb Large Parts of the Body to Eliminate Sedation

The second major cost reducer is minimally painful tumescant local anesthesia. This is a recent rapidly expanding method of injecting large volumes of local anesthetic fluid over large parts of the body in an almost painless fashion. All the patient feels for pain is the first needle poke of a small 30G needle, and nothing more. Patients can now be very comfortable while surgeons inject local anesthesia and perform complex operations on the face, trunk, and extremities without the assistance of sedation and all its costs. Long bone fracture fixation, major facial reconstruction, mastectomy, hernia repair, shoulder disarticulation, forearm tendon transfers, below knee amputation, and all hand, wrist, foot, and ankle surgery are examples of what can now be totally comfortably performed without pain and without the requirement of an anesthesiology team.¹¹ Eliminating sedation from these procedures liberates anesthesiologists to be more available for those cases that actually need general anesthesia.

Takeaways

Question: How can we increase access to surgery to help alleviate poverty in Africa?

Findings: Traditional sedation surgery in the main operating room is unaffordable and inaccessible for many Africans. WALANT, minimally painful tumescant local anesthesia, and evidence-based sterility are helping Africans stop sedation and move some surgery out of the main operating room to minor procedure rooms with no significant increase in infection rates. Since 2020, WALANT has begun in 75 hospitals in 8 East African countries to decrease costs and increase access.

Meaning: Stopping sedation and moving surgery out of the main operating room is improving access to help alleviate poverty in Africa.

All of the above procedures can be performed with extremely safe doses of 7 mg/kg of lidocaine with epinephrine as described earlier. We never exceed the 7 mg/kg limit even though we know higher doses are safe. This avoids unnecessary monitoring.¹² When we need large volumes, such as 200 mL in the first patient in Video 1, we add 150 mL of saline to 50 mL of 1% lidocaine with 1:100,000 epinephrine. (See Video 1 [online], which displays 2 wide-awake patients in Canada with no anesthesiology team. Patient 1: Scalp graft in a minor procedure room after burn injury. Patient 2: palliative cancer excision and graft in the main operating theater, with severe shortness of breath. Sedation would not have been as safe as pure local anesthesia.)

The wide-awake approach is not only much less expensive, but it eliminates all the risks of sedation such as nausea, vomiting, aspiration pneumonia, venous thromboembolism, and malignant hyperthermia.

A PubMed search of the words “WALANT safety” on November 9, 2024, produced 80 publications since 2015, which show that WALANT surgery is safe.¹³ This included a publication¹⁴ that showed that anticoagulants do not need to be stopped for WALANT surgery. This increases safety in patients who need their anticoagulants to decrease cardiac and cerebral catastrophic event risk. Wide-awake surgery can be performed in the main operating theater for a major decrease in cost (see Video 1 [online]). WALANT surgery can also be performed in a minor procedure room outside of the main operating room environment with either field sterility or full sterility for an even greater decrease in cost, as shown in Video 2. (See Video 2 [online], which displays wide-awake cancer excision by Mohs and skin grafting to the forehead; both operations were performed in minor procedure rooms in Canada with no significant increase in infection rates and much lower costs.)

3) Moving Surgery to Minor Procedure Rooms With No Significant Increase in Infection Rates

The third disruptive major advance in surgery is also a massive cost reducer. It is the advent of evidence-based sterility.^{15,16} This is the study of the rate of surgical site infections resulting from differing levels of sterility. It is different from traditional sterility, which is based on maximally sterilizing the air and all contents of the main operating room



Fig. 1. Fracture hardware removal with WALANT in the main operating room in Zanzibar Tanzania the day after an all-day international speaker WALANT webinar for the surgeons and staff of the Mnazi Mmoja Hospital.

for all operations with the hope that fewer germs in the room might decrease the infection rate. In fact, for many soft tissue operations and K-wire insertions for hand fractures, we now know that field sterility in minor procedure rooms with no special ventilation, no gowns, no surgical hats, and no floor washing between clean cases has the same surgical site infection rate as the main operating room with increased air changes, full gowning, draping, and floor washing between each case.^{16–20} Moving surgical procedures to minor procedure rooms greatly reduces costs and solid waste.²¹

IMPACT OF WALANT, MINIMALLY PAINFUL TUMESCENT LOCAL ANESTHESIA, AND EVIDENCE-BASED STERILITY ON SURGICAL ACCESS IN EAST AFRICA

In 2012, minimally painful tumescent pure local anesthesia with no need for an anesthesiology team was used to repair cleft lips in Malawi in 32 older children and adult patients.²² The average patient felt pain only 1.6 times during the entire lip and nasal injection process. This included the first sting of the first 27G needle insertion. The procedures were performed in a minor procedure room without sedation outside of the main operating room, making this surgery even more affordable.

In January 2020, the first African 2-day course on minimally painful tumescent local anesthesia for WALANT surgery with field sterility in minor procedure rooms was held in Nairobi, Kenya, with 52 College of Surgeons of East Central and South Africa residents and surgeons from 18 cities/towns in Kenya. This led to several hospitals rapidly adopting the technique in Kenya, as had previously been done in Ghana.²³ (See Video 3 [online], which displays wide-awake distal radius fracture fixation by Dr. Ankit Dave, an orthopedic surgeon in Nairobi, Kenya, in 2020.)

Over the next 4 years, more than 25 webinars with surgeons from Kenya, Tanzania, Ethiopia, Sudan, Mozambique, Nigeria, and Egypt popularized the affordable approach to surgery in these countries. Many of the webinars were all-day presentations that included North American, Asian, European, and African lecturing surgeons and live local anesthesia demonstrations (See Fig. 1).

In 2023, a 3-day WALANT field sterility course with live surgical demonstrations was held in Mombasa, Kenya. It was attended by 30 surgeons from Ethiopia, Uganda, Kenya, Tanzania, Malawi, Zambia, Burundi, Zimbabwe, Rwanda, and Ghana. The teaching faculty included surgeons from Kenya, Tanzania, Malaysia, England, the United States, and Canada.

As a result of these efforts, as well as many local presentations in East African countries, WALANT surgery has begun in at least 75 hospitals in 8 countries in East Africa to provide safer, more affordable surgery. (See table, Supplemental Digital Content 1, which displays a list of 75 hospitals in 8 countries in East Africa that have started using WALANT since 2020, <http://links.lww.com/PRSGO/D886>.)

COST SAVINGS WITH WALANT IN SURGERY BEING PERFORMED WITH PURELY TUMESCENT LOCAL ANESTHESIA IN EAST AFRICA

A representative snapshot of the cost savings of WALANT surgery is illustrated in Figure 2, which shows a cost reduction of 16.5 million Kenyan shillings (US \$128,000) in 15 hospitals in parts of their first 3 years of WALANT use since 2020. (See table, Supplemental Digital Content 2, which displays WALANT case logs and economic data for April–June 2024 in 4 hospitals in Kenya, <http://links.lww.com/PRSGO/D887>.)

Most of the procedures shown in Figure 2 and Supplemental Digital Content 2 are relatively minor surgical procedures (Supplemental Digital Content 2, <http://links.lww.com/PRSGO/D887>). This is typical for hospitals just beginning their WALANT in minor procedure room experience. This is also how we began in Canada more than 40 years ago with mostly skin cancer excisions and minor hand surgery.²⁴ In Canada, we have now evolved to routine performance of larger procedures such as forehead flap cancer reconstruction, cubital tunnel releases, and hand fracture operative reduction and internal fixation.²⁵ Each hospital will increase surgical complexities at their comfort level in East Africa as we have in Canada.

We estimate that WALANT adoption enables the following savings to go to the pockets of the poor patients in Kenya every year at the following public hospitals: (1) Mombasa Coast General Teaching and Referral Hospital, 36 million Kenyan shillings; (2) Bomet Longisa County Referral Hospital, 5 million Kenyan shillings; (3) Kiambu Level 4 Hospital, 2 million Kenyan shillings; (4) Kisumu Jaramogi Oginga Odinga Teaching and Referral Hospital, 2 million shillings; and (5) Bungoma Teaching and Referral Hospital, 1.5 million Kenyan shillings. We estimate the savings going to the poor patients are 100 million Kenyan shillings per year in the private Karen Hospital.

WALANT INCREASES ACCESS TO SURGERY TO HELP REDUCE POVERTY IN EAST AFRICA

We have demonstrated that surgery is much less expensive in Kenya with WALANT in the main operating

Hospital	Month	No. Of Cases	Avg. Walant Cost Per Case	Total Walant Cost	Avg. Theatre Cost Per Case	Total Theatre Cost	Savings Per Case	Total Saving
Kakamega	APR-JUNE-2024	6					9450/-	56,700 in 3 months
Kilifi	FEB-JULY-2024	122	1750/-	213,500	8500-MAJOR CASE, 4000-MINOR CASE with additional admission, medication, misc costs = 15,000-20,000/-	2,074,000 (17,000*122)	15,250/-	1,860,500 in 6 months
Kisii	APR-JUNE-2024	32	2200/-	70,400	12,000/-	384,000	9800/-	313,600 in 3 months
Mama Lucy	MAY-2022-MAY-2023	73	3000/-	219,000	6,600/- + additional charges-10,000=16,600	1,211,800	13600/-	992,800 in 12 months
Meru	JAN, FEB, MAY, JUNE-2024	73	3000/-	219,000	20,200/-	1,474,600	17200/-	1,255,600 in 4 months
Dr. Mustafa Khanbhai	2021-2024	109	1574/-	171,566	3300/- excludes surgeons fee, admission fee, medication and misc. costs.	360,000	1308/-	188,434/-
Longisa	APR-JULY-2024	113	5000/-	565,000	10000/-	1,130,000	5000/-	565,000/- in 4 months
Mombasa	JAN-JULY-2024	147	4000/-	588,000	10,000/-	1,470,000	6000/-	882,000/- in 7 months
Nakuru	APR-JUNE-2024	21	5450/-	114,450	10,000/-	210,000	4550/-	128,700/- in 3 months
Litein	APR-JUNE-2024	78	7867/-	613,626	10,000/-	780,000	2133/-	166,400/- in 3 months
Karen, Joorth, Bungoma, Coast General	JAN-2021-MAY-2022	590	44,060/-	25,995,400	58,000/-	34,220,000	13,000/-	8,224,600/- in 16 months
Mbagathi	MAY-JULY-2024	137	1500/-	205,500	15,000/-	2,055,000	13,500/-	1,849,500 IN 3 MONTHS
Total		1364 cases						16,483,844/- savings by 15 hospitals

Fig. 2. WALANT cost savings in 15 hospitals in Kenyan shillings.

theater by eliminating the costs of unnecessary sedation. WALANT field sterility surgery in minor procedure rooms is even less expensive without the costs of unnecessary

main operating room full sterility for many operations. These 2 changes increase access to surgery as it is more affordable and reduce poverty by making surgery less debt

crippling. In addition, moving smaller procedures out of the main operating theater to minor procedure rooms frees up more main operating room time and more general anesthesia time, allowing patients increased access to more major operations. Increased access time to procedures such as total knee replacement enables patients to get back to work to help eliminate poverty. (See Video 4 [online], which shows a summary message of this article by Professor Pankaj Jani, past president of the College of Surgeons of East, Central, and South Africa.)

CONCLUSIONS AND FUTURE DIRECTIONS

The traditional surgical model had all surgery done in the main operating room with tourniquet, sedation, general anesthesia, and full operating room sterility. This model is beginning to be replaced with WALANT surgery, minimally painful tumescent local anesthesia, and evidence-based sterility in minor procedure rooms all over the world but is needed most in low-income and middle-income countries such as those in East Africa where traditional surgery is unaffordable and perpetuates poverty. Research in the areas of surgical cost, sedation-free minimally painful tumescent local anesthesia, and evidence-based sterility surgery is just beginning in East Africa. Expanding research and clinical applications of these principles will continue to improve access to surgery to help alleviate poverty.

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DISCLOSURES

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