

# Arthur E. Guedel Memorial Anesthesia Center

## Global Anesthesia Initiatives: Are We Closer to Bridging the Healthcare Gap in Africa?

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In 2006 the World Health Organization published Disease Control Priorities in Developing Countries, a 1,400-page document which first identified the Global Burden of Surgical Disease as one of the greatest challenges to healthcare in the 21st century. Its authors projected that the burden of surgical diseases would eclipse that of HIV, TB and Malaria combined within 20 years. The publication brings to light some of the existing disparities between global healthcare needs and available workforce. With a profound and continuing lack of workforce in anesthesia, surgery and perioperative specialties, reducing the burden of surgical conditions remains a long way off. In spite of a number of global healthcare initiatives, both past and present, the problem of a shortfall of anesthetic care remains especially acute. Capacity building and workforce expansion in anesthesia are needed as an integral part of tackling the burden of surgical disease.



**African Operating Room.**  
Note the absence of monitors, oxygen, and the anesthesia practitioner.

The global shortage of healthcare workers is estimated to be at 4.2 million, with approximately one million needed in sub Saharan Africa alone. This is particularly poignant considering that Africa bears 25 percent of the global burden of disease with only 2 percent of the world's healthcare workforce. For surgical disease, the numbers of healthcare workers in anesthesia and perioperative care are estimated to be similarly depressing, although good data derived from research is limited. The problem goes far beyond a shortage of anesthesiologists alone, and includes inadequate nursing and surgical staffing, as well as a generally neglected healthcare infrastructure.

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Currently in Uganda (population 30 million) there are 14 physician anesthesiologists, 12 of whom work in government hospitals. In contrast, the USA has an estimated 70,000 anesthesia practitioners, divided fairly evenly between physician anesthesiologists and nurse anesthetists. Working in various combinations and independently, they perform 54 million anesthetics each year on a population of approximately 306 million.

In Uganda, training positions in post-graduate programs are unfilled yearly because of profound difficulty in recruiting and funding trainees. Despite 47 potential positions in anesthesia training positions countrywide, there are presently only 10 residents. The annual cost of training for one surgeon or anesthesiologist in Uganda is approximately \$3,500, ten times the annual family income in Uganda. Half of this is for tuition alone, the residents having to pay the university to allow them to enter specialist training, which is considered a post-graduate degree.

The anesthesia workforce problem is not unique to Uganda. In neighboring Kenya (population 32 million), only 13 of a total of 120 anesthesiologists work in public hospitals. The rest are mostly in private practice in the capital, Nairobi, with very few serving rural areas. The problem is even more severe at Kenyatta National Hospital, the national referral center and teaching hospital where there are a few hundred surgeons and only nine anesthesiologists. The situation is similar in rural Kenya, with just one anesthesiologist for 13 surgeons.

In spite of existing training programs, the issue remains that most low and middle-income countries do not have financial resources to mount a successful program to recruit, train and maintain the workforce in a sustainable manner. Historically Africa has based its education system on a western model, ironically making the ability to retain the workforce even harder as doctors are well qualified to work elsewhere and migrate to better paid jobs, either working for international research organizations within their home country or abroad. Of 600 doctors trained in Zambia since independence, only 60 still practice in country. One estimate of healthcare providers in Malawi suggested that there were more doctors from Malawi working in the city of Manchester in the United Kingdom than there are in the entire country Malawi at this time. This internal and external "brain-drain" makes it even harder to effect sustainable changes.

One estimate suggests that 1,000 more anesthetic personnel are needed just to work within the existing infrastructure in each country in sub-Saharan Africa alone. In an attempt to alleviate the problem, several low and middle-income countries including Uganda and Kenya have engaged in a program of utilizing

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trained “anesthetic officers” (with about 300 practicing in each of these countries). Equally successful programs have been implemented worldwide. These officers undertake a limited amount of training (usually 18 months after high school graduation) to enable them to perform basic anesthesia care. The aim is to alleviate workforce deficiencies from a lack of physician practitioners. As qualifications for these “officers” are not internationally recognized, they are much less likely to leave their home country than physicians. Despite the success of some of these programs, all are faced with problems related to a lack of physician anesthesiologists to provide sufficient initial training, maintenance of skills and oversight.

With persistent anesthesia and surgical workforce shortages, many countries have relied heavily on outreach missions organized by overseas non-governmental organizations (NGOs) or charitable organizations to facilitate anesthesia and surgical procedures. For many years, teams of anesthesia and surgical practitioners have traveled to many of the world’s low and middle-income countries. These programs hoped to bridge the gap between surgical need and local workforce and infrastructural deficiencies. In the absence of other healthcare provisions, it can be argued that such outreach programs are an effective way to tackle this surgical need at this time. However, this should not preclude provisions for long-term sustainability. Based on volunteerism, outreach missions often have problems recruiting appropriate staff to work in a resource poor environment as well as those motivated to teach and instruct local practitioners. While many of these programs have been highly productive and provided effective interventions, they have made little measurable impact on the workforce deficit or the public health burden of surgical disease as a whole. Few conditions can be effectively treated in this manner, as only those conditions that are chronic and amenable to ambulatory or short-stay surgery are usually tackled. As a result, they are unable to alleviate the greater burden of acute trauma, obstetric and perinatal emergencies which represent over 50 percent of the burden of surgical disease. This compares to all congenital abnormalities combined (of which cleft palate and club foot are a fraction) which represent less than 6 percent of the global burden of surgical disease. Outreach programs tend to focus on available expertise or perceived need and not necessarily goals that reflect the surgical burden or unmet need in the host country. This may be combined with pressure from donors for a clearly defined “before and after” effect to achieve publicity goals needed to generate further support.

One identifiable problem with many outreach programs has been that, until relatively recently, only a minority has been actively engaged in effective teaching of local practitioners and in enabling workforce expansion, thus directly

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addressing the sustainability of this type of intervention. Visiting groups often have limited interactions with existing healthcare infrastructure and practitioners. Equally few have addressed local capacity and infrastructural deficiencies and often travel with almost complete operating room facilities, which return home when they do and therefore do little to alleviate the lack of capacity in the host country.

In recent years, increasing oversight and accountability of these groups has led some to actively address patient safety and outcomes and revisit some of their fundamental principals. By paying more attention to the educational and infrastructural needs of local healthcare providers, it has become possible to create an almost entirely self-sustaining program, no longer dependent on visiting teams for support. This model has proven to be a highly cost-effective and efficient strategy and will ultimately have a more sustainable and measurable effect on decompressing the burden of surgical disease.

Anesthesiologists and other perioperative healthcare workers in low and middle-income countries are very poorly paid. In many sub-Saharan African countries, engineers are paid more than doctors, and nurses command about 50 percent of the salary of teachers. A recent study by McKinsey Consultants across Sub Saharan Africa suggested that the solution was “capital intensive and time-consuming: Even if the funds materialized, about 600 additional medical and nursing schools and more than two decades would be needed to close the gap.”

**Equipment Graveyard:** Warehouse at Mulago Hospital in Uganda filled with unusable, incompatible, inappropriate or surplus donations.



Incentives are important but do not need to be monetary. The work of Global Partners in Anesthesia in Uganda has shown that anesthesia practitioners, trainees and allied healthcare workers place a very high value on collaborative efforts aimed at education and improving the workplace and learning environment. Academic and teaching collaborations with visiting faculty from abroad and continuing support by correspondence have had a profoundly beneficial effect on the motivation and morale of the whole workforce. These simple interventions have been shown to help recruit, as well as retain, specialist trainees. Retention of these specialists remains a significant hurdle and is one that will be achieved only when the working environment is attractive enough to facilitate it.

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Another major issue and barrier to recruitment and retention is the poor working environment, resulting in a limited appeal of healthcare jobs, especially in the public sector in Africa. A fundamental lack of infrastructure compounds the workforce issues. A recent study looking at capacity and equipment for the safe delivery of anesthesia in Uganda (i.e., appropriate resuscitation, basic monitoring and oxygen) indicated that only 23 percent reported having a safe environment for adults, only 13 percent were considered safe for children, and less than 6 percent are safe for cesarean section.

An important part of solving infrastructural problems are appropriate donations of essential medical equipment combined with a mechanism for sustainable repair and support. However, many recipients often find it hard to turn down inappropriate donations (which may be unusable due to a lack of replacement parts or consumables or may not work at all). As a result, stockpiles of vast amounts of unusable equipment are common with little hope of it even being utilized. Equipment donations need to combine both the charitable mission of the donors and also an unmet need in the host country. The WHO has produced a lengthy document on this subject, advising on appropriate equipment donations. However, many organizations are not even aware that this kind of guidance exists. Ultimately, the disposal of any redundant equipment is a major economic as well as ecological problem.

The global workforce crisis in anesthesia is an important problem in need of urgent attention. Few solutions to date have been successful in changing the *status quo*. Future interventions need to combine local capacity building with collaborative efforts to develop the anesthesia workforce. A sound physician-anesthesiologist base is an essential requirement for appropriate oversight and education. The training, utilization and support of anesthetic officers are key parts of any expansion process. To be effective, any solution should pay attention to specific unmet needs and must be based on locally driven goals and ideals.

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