

# ***National Surgical, Obstetric, and Anesthesia Planning Intervention Toolkit***

A Resource from the Program in Global Surgery and Social Change, Harvard Medical School

**Domain: Improving the skills and quality of care of surgical and anesthesia providers (specialist and non-specialist) specifically in Bellwether procedures and anesthesia.**

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## Brief Synopsis

While there is extensive literature regarding the necessity of surgeon and anesthesia training and calling for improvement in globally accredited training interventions in LMICs, there is very little evidence of the impact of these interventions.

Interventions that have been explored in LMICs can be grouped into the following categories:

1. Practical intensive/short-term training programs
2. Practical mentoring/specialty curricula for specific surgical skills
3. Specialty surgical training centers that offer either of the above training options

## Guidelines

1. The two major accrediting organizations in surgery across Africa are the West African College of Surgeons (WACS)<sup>1</sup> and the College of surgeons of East, Central, and Southern Africa (COSECSA),<sup>2</sup> and both include Anesthesia in the college.
  - a. WACS and COSECSA have strict requirements for becoming a fellow of the College: 5 years of specialty surgical training at an accredited teaching hospital and original logbooks; Basic Surgical Skills course and Health Management and Ethics courses at accredited surgical centers, and the primary, secondary, and final examinations administered by the respective Colleges.<sup>3-4</sup>
  - b. Requirements to become a college-accredited training hospital include presence of consultant specialists, sufficient surgical volume as determined by the College, outpatient clinics, pathology/bacteriology/clinical chemistry/hematology/blood transfusion and radiology services, and a commitment to training.<sup>5</sup>
2. Guidelines regarding who can perform surgical procedures and the level of training required to perform those procedures are country-specific. Individual countries also have differing regulations regarding the training of non-physicians and task sharing in surgery.

## Interventions:

*PRACTICAL INTENSIVE TRAINING PROGRAMS FOR SURGEY, OBSTETRICS, AND ANESTHESIA*

## 1. Basic Surgical Skills Course (BSSC)

### References:

1. Thomas, W., *The Basic Surgical Skills course: A 10-year success story*. *The Bulletin of the Royal College of Surgeons of England*, 2007. 89(3): p. 90-91.
2. Ezeome, E.R., et al., *Surgical training in resource-limited countries: moving from the body to the bench – experiences from the basic surgical skills workshop in Enugu, Nigeria*. *Tropical Doctor*, 2009. 39(2): p. 93-97.
3. Taché, S., et al., *Addressing gaps in surgical skills training by means of low-cost simulation at Muhimbili University in Tanzania*. *Human Resources for Health*, 2009. 7(1): p. 64.

Web link: <http://www.internationalsurgery.org.uk/>

Type: The Association of Surgeons of Great Britain and Ireland (ASGBI) partner with African hospitals, NGO's, and medical schools to offer the Basic Surgical Skills Course

Intervention description:

The BSSC is a two-day, standardized basic surgical training in England and has now become a required course for fellows of WACS and COSECSA, and has been taught in-country throughout the continent. The course covers gowning/gloving, instrument handling, sutures, bowel anastomosis, vascular repair, tendon repair, and plastering. There is also a laparoscopic component offered that is not usually taught in low-resource settings.

Outcome: Pre- and post-course skills, confidence, and feedback from participants is usually collected and has shown positive results.

Organization: Association of Surgeons of Great Britain and Ireland (ASGBI)

Cost: Usually offered free to participants, unless it is through a specialty surgical training center.

Considerations: No impact research has yet been conducted beyond student satisfaction.

Participants may incur travel and lodging costs to participate in the course. The course requires a large amount of equipment, instruments, and suture (expired), which has been/can be donated by Johnson&Johnson but can also be logistically difficult to manage. The course uses some video examples/teaching, and the videos and course manual are only available in English.

Additional information: A similar course with regards to content, developed by the medical school of Muhimbili University in Tanzania and based on the surgical skills requirements in the curriculum of the Canadian Network for International Surgery, showed positive results as well through objective structured clinical examinations and self-perceived performance surveys.<sup>3</sup>

## 2. Safer Anesthesia From Education (SAFE) Obstetric and SAFE Pediatric anesthesia courses

### References:

1. Livingston, P., et al., *Safer obstetric anesthesia through education and mentorship: a model for knowledge translation in Rwanda*.

2. **Enright, A., K. Grady, and F. Evans, *A New Approach to Teaching Obstetric Anaesthesia in Low-Resource Areas. Journal of Obstetrics and Gynaecology Canada. 37(10): p. 880-884.***

Web link: <https://www.aagbi.org/international/safer-anaesthesia-from-education>

Type: 3-day intensive, practical teaching for anesthesia and critical care of children, obstetric patients, and newborns.

Intervention description:

Taught in countries across Africa through NGO and hospital partnerships, the SAFE courses are open to both physician and nurse anesthetists, and often obstetricians and midwives; participants are taught anesthesia specifically for children or pregnant women, critical care and management of obstetric emergencies and newborn resuscitation.

Outcome: The course uses pre- and post-course skills and knowledge measures to show immediate impact.

Organization: The course was developed by the Association of Anesthetists of Great Britain and Ireland (AAGBI) and is run by various organizations affiliated with them.

Cost: Usually free to participants, the course is generally funded by the AAGBI or the NGO partner who is implementing the course.

Considerations: No published long-term impact studies. Participants may be required to travel to course location. Manual is available in English and French.

### 3. Primary Trauma Care (PTC) course

#### References:

1. **Wilkinson, D. and R. McDougall, *Primary Trauma Care. Anaesthesia, 2007. 62: p. 61-64.***
2. **Amiri, H., et al., *Two-day primary trauma care workshop: early and late evaluation of knowledge and practice. European Journal of Emergency Medicine, 2013. 20(2): p. 130-132.***

Web link: <https://www.primarytraumacare.org/>

Type: Two-day course for anesthetists, surgeons, and others focused on stabilization of the surgical patient immediately after trauma.

Intervention description:

The two-day PTC course has run in over 70 countries and extensively through COSECSA and WACS. The course focuses on systematic assessment, stabilization, and transport of trauma patients and life-saving surgical interventions including surgical airway and chest tube insertion.

Outcome: Participants complete pre- and post-course skills, knowledge, and confidence assessments and these results are publicly available.

Organization: Primary Trauma Care foundation

Cost: Free to participants, courses sponsored by various organizations and NGO's

Considerations: The course is intended for low-resource environments and can be done with very little equipment and/or paperwork.

### *PRACTICAL MENTORING/SPECIALTY CURRICULA FOR SPECIFIC SURGICAL SKILLS*

1. MSF training of GP's for surgery, and non-physician anesthetists

#### **References:**

1. **Sohier, N., L. Fréjacques, and R. Gagnayre, *Design and implementation of a training programme for general practitioners in emergency surgery and obstetrics in precarious situations in Ethiopia.* Annals of The Royal College of Surgeons of England, 1999. 81(6): p. 367-375.**
2. **Rosseel, P., et al., *Ten Years of Experience Training Non-Physician Anesthesia Providers in Haiti.* World Journal of Surgery, 2010. 34(3): p. 453-458.**

Web link: <http://www.doctorswithoutborders.org/our-work/how-we-work>

Type: Médecins Sans Frontiers (MSF/Doctors Without Borders) has trained non-specialist physicians and nurses in surgery and anesthesia for emergency situations.

Intervention description:

MSF physician teams mentor and teach host country physicians and nurses in-country, including critical surgical and anesthesia care over two to three years.

Outcome: Seemingly positive evaluations available published by MSF, for both surgeon and anesthesia training

Organization: MSF

Cost: Free to most participants

Considerations: No long term impact research available. Participants may need to travel to training location.

2. Pan African Academy of Christian Surgeons (PAACS) resident training program

#### **References:**

1. **Pollock, J.D., et al., *Is it Possible to Train Surgeons for Rural Africa? A Report of a Successful International Program.* World Journal of Surgery, 2011. 35(3): p. 493-499.**
2. **PAACS. *PAACS training curriculum.* Available from: <https://www.paacs.net/involved/training-curriculum/>.**

Web link: <https://www.paacs.net/>

Type: A five-year residency program for students in SSA; can specialize in general surgery, pediatric surgery, or orthopedic surgery.

Intervention description:

Students are required to participate in and complete religious activities and training alongside surgical mentorship in nine PAACS partnership hospitals in Tanzania, Gabon, Niger, Egypt, Kenya, Malawi, Cameroon and Ethiopia. Often students are required to commit to working in a rural area or within their home country after completing training to lessen the impact of the 'brain drain'.

Outcome: Rigorous standardization and improving the base requirements of graduation over the last several years has led to a high-level surgical mentorship program. Upon graduation students take the COSECSA fellows examination. In 2012, the first group of PAACS fellows all passed this examination and in recent years PAACS Fellows have achieved the highest marks.<sup>2</sup>

Organization: PAACS

Cost: Dependent on student and financial situation; often free for participating students from low-income countries.

Considerations: No long-term impact research found. Participants need to travel to training location which may not be in their country of residence/origin.

### 3. Clinical Officer Surgical Training in Africa (COST)

**Reference: Mahoney, C; Fleck, F. *Meeting the need for surgery*. Bulletin of the World Health Organization 2016; Available from: <http://www.who.int/bulletin/volumes/94/3/16-020316.pdf>.**

Web link: <http://www.costafrica.eu/>

Type: A collaborative training program for non-specialists to augment the workforce of practitioners offering critical surgical procedures in rural areas.

Intervention description:

Currently developing and evaluating scalability of a clinical officer surgical training program in Malawi and Zambia. Project design includes development of a Bsc in surgery training program followed by a 12- to 18-month practical training internship in select hospitals.

Outcome: It looks like a great program; unfortunately, further information about the outcomes or the current progress of the program are difficult to locate, perhaps the results have not yet been published.

Organization: funded by the EU and developed in collaboration with Malawi and Zambia medical schools with support from the Royal College of Surgeons in Ireland.

Cost: Free to participants

Considerations: Research and results not yet available.

#### 4. Enhancing Human Resources and use of Appropriate Technologies for Maternal and Perinatal Survival in Sub-Saharan Africa (The ETATMBA project)

##### References:

1. Ellard, D., et al., *The impact of training non-physician clinicians in Malawi on maternal and perinatal mortality: a cluster randomised controlled evaluation of the enhancing training and appropriate technologies for mothers and babies in Africa (ETATMBA) project*. BMC pregnancy and childbirth, 2012. 12(1): p. 116.
2. Ellard, D.R., et al., *Can training in advanced clinical skills in obstetrics, neonatal care and leadership, of non-physician clinicians in Malawi impact on clinical services improvements (the ETATMBA project): a process evaluation*. BMJ open, 2014. 4(8): p. e005751.
3. Ellard, D.R., et al., *Can training non-physician clinicians/associate clinicians (NPCs/ACs) in emergency obstetric, neonatal care and clinical leadership make a difference to practice and help towards reductions in maternal and neonatal mortality in rural Tanzania? The ETATMBA project*. BMJ open, 2016. 6(2): p. e008999.
4. Warwick, U.o. ETATMBA Project training in Tanzania; Available from: <http://www2.warwick.ac.uk/fac/med/about/global/etatmba/training/tanzania/>.

Web link: <http://www2.warwick.ac.uk/fac/med/about/global/etatmba/>

Type: Training of non-physician in emergency obstetric care in Malawi and Tanzania

Intervention description:

The in-depth course was offered in Tanzania over three months followed by a one-month practical internship, in Malawi in separate modules over several months; the participants then returned to their rural health centers. Curriculum was developed with the aim of reducing maternal and infant mortality, and participants increase their skills in management of obstetric emergencies including obstructed labor and hemorrhage, cesarean section delivery, and neonatal emergencies. Course content is available online.<sup>4</sup>

Outcome: A two-year monitoring of nationwide maternal mortality rates showed no significant change; however, the organization highlights the numerous external factors also contributing to this number including lack of supplies and difficulty in patient transport.

Organization: Developed by the University of Warwick Medical School in collaboration with the medical schools of Tanzania and Malawi.

Cost: Cost information unavailable

Considerations: This program was well designed in terms of pre-and post-intervention data collection and the primary outcome was maternal mortality rates, which unfortunately weren't affected.

#### *SPECIALTY SURGICAL TRAINING CENTERS THAT OFFER EITHER OF THE ABOVE TRAINING OPTIONS*

1. Medical and Surgical Skills Institute of Ghana (MSSI)

**Reference: MSSSI. *MSSSI Course Details. 2010*; Available from: <http://mssighana.webnode.com/news/visitors-notice/>.**

Web link: <https://www.facs.org/~media/files/publications/bulletin/2010/jacobs0610.ashx>

Type: Specialty surgical training center

Intervention description:

Participants from across the region come to the center for specialized skills training in surgical skills, anesthesia, and nursing. MSSSI is an approved training delivery platform for WACS and offers American Academy of Surgery certified courses. The courses are generally less than a week long and take place at the surgical training center in Accra. MSSSI uses a train-the-trainer model for many courses, teaching instructors at the surgical center in Accra to then teach in rural areas to health providers unable to afford the transportation and course fees at the Accra location.

Outcome: Most outcomes measured by student satisfaction which is very high. MSSSI recently conducted an impact assessment showing benefit in the teaching model but it has not been published as of August 2017.

Organization: MSSSI, funded by J&J and partnered with WACS

Cost: Dependent on course and applicant; participants who can afford to pay are expected to pay. Basic Surgical Skills Course \$100, Advanced Trauma Operative Management course \$1500, Key skills in laparoscopic surgery course \$250 (costs from 2010)<sup>1</sup>

Considerations: No published evaluation data as of August 2017. Courses can be expensive and most are only offered in English. Participants would need travel and lodging at the center in Accra.

## 2. Surgical Skills Training Center in South Africa

**Web link: <https://www.surgicalskills.co.za/>**

Type: Specialty surgical training center

Intervention description:

Participants from across southern Africa visit the center for specialized surgical training, including BSSC, anesthesia and nursing courses. They also make teaching available free of charge on their website.

Outcome: No evaluation information available on their website.

Organization: Located at the University of Cape Town, supported by the European Academy of Gynecological Surgery

Cost: Dependent on the course and applicant, most participants must pay tuition. A one-day laparoscopic suture course costs ~\$150 for residents and \$230 for consultants.

Considerations: No evaluation or long-term impact research available. Courses can be expensive and participants need to travel to the training site.

## Additional Resources:

Online program – part-time two-year Masters in General Surgery – offered through the Royal College of Surgeons of Edinburgh, intended for trainees in general surgery - <http://www.chm.rcsed.ac.uk/>

Surgical training outside of the Bellwether procedures:

Fundamentals of Laparoscopic Surgery program taught in Africa, three day course<sup>6</sup>

Plastic surgery training through short- and long-term missions<sup>7</sup>

Recommendations for head and neck surgical subspecialty training in Africa<sup>8</sup>

Mission-based surgical mentoring impact at 12-18 months post-training<sup>9</sup>

A model of long-term anesthesia mentoring showed promise in Kenya<sup>10</sup>

## References:

1. WACS. *West African College of Surgeons*. Available from: <http://www.wacsoac.org/>.
2. COSECSA. *The College of Surgeons of East, Central, and Southern Africa*. Available from: <http://www.cosecsa.org/>.
3. *WACS Fellow requirements*. Available from: <http://www.wacsoac.org/index.php/examinations/examination-forms>.
4. *COSECSA Fellows requirements*. Available from: <http://www.cosecsa.org/members-fellows/fellowship>.
5. COSECSA. *COSECSA Criteria for Training Posts*. Available from: <http://www.cosecsa.org/sites/default/files/Criteria-for-Training-Posts-2009.pdf>.
6. Okrainec, A., L. Smith, and G. Azzie, *Surgical simulation in Africa: the feasibility and impact of a 3-day fundamentals of laparoscopic surgery course*. *Surgical Endoscopy*, 2009. **23**(11): p. 2493.
7. Corlew, S. and V.Y. Fan, *A model for building capacity in international plastic surgery: ReSurge International*. *Annals of plastic surgery*, 2011. **67**(6): p. 568-570.
8. Fagan, J.J., et al., *Head and neck surgical subspecialty training in Africa: Sustainable models to improve cancer care in developing countries*. *Head and Neck*, 2017. **39**(3): p. 605-611.
9. White, M. and K. Close, *Lasting impact: insights from a surgical mission-based mentoring training programme in the Republic of Congo*. *BMJ Global Health*, 2016. **1**(3): p. e000102-e000102.
10. Newton, M. and P. Bird, *Impact of Parallel Anesthesia and Surgical Provider Training in Sub-Saharan Africa: A Model for a Resource-poor Setting*. *World Journal of Surgery*, 2010. **34**(3): p. 445-452.