

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 perioperative care providers and ancillary staff supporting surgery.

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Brief Synopsis

There is a very small body of evidence around interventions to support ancillary perioperative workforce training and development. Ancillary perioperative staff includes operating room nursing, sterilization technicians, ultrasound, and biomedical technicians. While many organizations explore the need for further training in these support services for surgery, there is little evidence of impact from interventions.

Guidelines

1. Centers for Disease Control guidelines on surgical instrument sterilization: <https://www.cdc.gov/infectioncontrol/guidelines/disinfection/cleaning.html>
2. International Committee of the Red Cross sterilization guidelines: <https://www.icrc.org/eng/assets/files/publications/icrc-002-4218.pdf>
3. Association of periOperative Registered Nurses surgical instrument cleaning guidelines: https://www.aorn.org/websitedata/cearticle/pdf_file/CEA15517-0001.pdf
4. Association of periOperative Registered Nurses standards of perioperative nursing: https://www.aorn.org/-/media/aorn/guidelines/aorn-standards/ii-01_standards_2015.pdf
5. World Health Organization guide on the role of Biomedical Engineers: http://www.who.int/medical_devices/publications/hr_med_dev_bio-engineers/en/

Interventions

1. Sterile Processing Education Charitable Trust (SPECT) training programs for sterile processing technicians

Web link: <http://www.spectrust.org/>

Type: Training for sterile processing technicians

Intervention description:

Internationally certified sterile processing technicians/educators offer sterile processing technicians 20-40 hours of classroom instruction on microbiology, infection control, cleaning,

decontamination, disinfection, and packaging and storage of sterilized instruments. Classroom instruction is followed by individualized hands-on mentoring and further training in the workplaces of the trainees. SPECT has also developed a [pressure-cooker sterilizing machine](#) for low-resource environments.

Outcome: SPECT is currently working on evaluation tools and reporting; no published impact measurements as of August 2017.

Organization: SPECT, in partnership with ASSIST and Mercy Ships

Cost: Free for participants, training is sponsored by grants and the Canadian government

Considerations: Some projects are in rural areas and hospitals while some other projects require participant travel to the training site. No published results.

2. Ernest Cook Ultrasound Research and Education Institute (ECUREI) training programs for diagnostic ultrasound and radiology

References:

1. Kawooya, M.G., *Training for Rural Radiology and Imaging in Sub-Saharan Africa: Addressing the Mismatch Between Services and Population*. *Journal of Clinical Imaging Science*, 2012. 2: p. 37.
2. Nathan, R., et al., *Screening Obstetric Ultrasound Training for a Five-Country Cluster Randomized Controlled Trial*. *Ultrasound quarterly*, 2014. 30(4): p. 262-266.
3. Kawooya, M.G., et al., *Evaluation of US Training for the Past 6 Years at ECUREI, the World Federation for Ultrasound in Medicine and Biology (WFUMB) Centre of Excellence, Kampala, Uganda*. *Academic Radiology*, 2010. 17(3): p. 392-398.

Web link: <http://ecurei.com/>

Type: Institution-level

Intervention Description:

Institute for diagnostic radiology and biomedical engineering at Mengo Hospital in Kampala, Uganda, offers training to practitioners from across Africa.

Intervention description: Diploma-level training programs in ultrasound and x-ray film interpretation, with 76% of graduates still in their home hospitals and practicing ultrasound for two years after the training.¹ The Radiological Society of North America sponsored some train the trainers' courses. Another paper outlines a ten-day training course for non-physician healthcare workers to perform screening obstetric ultrasound.² Training has been accredited by the Ugandan National Council for Higher Education.

Outcome: There is a published evaluation of the train-the-trainer program that presents final examination scores, however there was no pre-test score to show increase of knowledge³.

Organization: Research projects in collaboration with the University of Washington and University of Vermont, facilitated by the World Federation of Ultrasound in Medicine and Biology, original courses sponsored by the Radiological Society of North America

Cost: The tuition page of the website was down as of 6 September 2017.

Considerations: Biannual intakes in March and August; participants must travel to Mengo Hospital training site. Provision of equipment is not included in the educational program.

3. Imaging the World (ITW) ultrasound provision and training of healthcare workers in diagnostic ultrasound and radiology

References:

1. Ross, A.B., et al., *A Low-Cost Ultrasound Program Leads to Increased Antenatal Clinic Visits and Attended Deliveries at a Health Care Clinic in Rural Uganda*. PLOS ONE, 2013. 8(10): p. e78450.
2. Ross, A.B., et al., *Ancillary benefits of antenatal ultrasound: an association between the introduction of a low-cost ultrasound program and an increase in the numbers of women receiving recommended antenatal treatments*. BMC pregnancy and childbirth, 2014. 14(1): p. 424.
3. *Imaging the World - About*. Available from: <http://imagingtheworld.org/about/>.
4. *ITW. Partners*. Available from: <http://imagingtheworld.org/partners/>.

Web link: <http://imagingtheworld.org/>

Type: Provision of equipment and training

Intervention description:

This ultrasound machine was created for a low-resource environment, and ITW provides comprehensive training of local healthcare workers on its use and maintenance. This project has been implemented in 8 sites in rural Uganda including provision of the equipment and training.

Outcome: Demonstrated increase in antenatal clinic visits and attended deliveries at a rural health center in Uganda,¹ and since that initial research, they have shown a 70% increase in prenatal visits in health centers participating in this program.³

Organization: Imaging the World Africa

Cost: Supported by donations from the Bill and Melinda Gates foundation, Grand Challenges, Canada, Philips healthcare, and several other partners.⁴

Considerations: Research limited by lack of control group/site; current prospective study going on evaluating whether the program plays a role in reducing neonatal and maternal morbidity and mortality.

4. MedAid International biomedical equipment provision, maintenance and repair training of engineers

Web link: <http://www.medaid.co.uk/>

Type: Equipment provision and training

Intervention description:

MedAid can provide refurbished equipment built for challenging environments, and will develop installation-specific training programs for biomedical engineers on equipment maintenance and repair. They offer both theoretical training and practical hands-on mentoring for participants.

Outcome: Renovated operating rooms and trained staff; however, no evaluation data is available as of August 2017.

Organization: Medical Aid International

Cost: They use refurbished equipment and volunteer trainers to keep costs down, but equipment an installation costs must be covered by the receiving institution or a third-party funder; dependent on the equipment and extent of the project.

Considerations: Installations can be expensive.

5. Assist International biomedical engineering technician training

References:

1. Assist, *2015 Annual Report. 2015.*
2. International, A. *Biomedical Engineering Technician Training. Available from: <https://www.assistinternational.org/biomedical-engineering-technician-training/>.*

Web link: <https://www.assistinternational.org/biomedical-engineering-technician-training/>

Type: Training of technicians to maintain and repair surgical equipment

Intervention description:

Biomedical engineers and technicians focus on repairing and maintaining existing equipment using available resources. The training program involves coaching and mentoring of technicians and tailored curriculum for different countries and educational partners. Duke University is currently evaluating impact.

Outcome: The training programs have been introduced in Honduras, Rwanda, Ghana, Cambodia, and Nigeria. One website indicates successes have been well documented including improvements in problem resolution and reduction in equipment downtime, but published data was not found; it's mentioned that Duke is currently evaluating the impact of the program.²

Organization: Assist International, in partnership with Engineering World Health and Duke University

Cost: Unknown/not listed

Considerations: No evaluation or impact research available

6. ReSurge visiting educator program

References:

1. 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.*

2. **ReSurge. 2016 Annual Report. 2017; Available from:**
[http://www.resurge.org/graphics/PDFs/2016 annual report.pdf](http://www.resurge.org/graphics/PDFs/2016%20annual%20report.pdf).

Web link: http://www.resurge.org/impacting_the_world/story_visiting_educator_program.cfm

Type: Short-term mission training programs for perioperative staff

Intervention description:

Week-long workshops include classroom teaching with lectures as well as observation and participation in the surgical mission in the operating room, for plastic and reconstructive surgery perioperative staff including anesthesia, nursing, physical therapy and hand therapy.

Outcome: No evaluation information found. Annual report on program outcomes does not refer to training impact.²

Organization: ReSurge International

Cost: ReSurge volunteers pay a flat \$350 fee to participate in the educator program. Several funding partners fund the remaining costs of the visiting educator teams, and participants attend for free. Additional financial information is not available.

Considerations: No evaluation or impact research found.