Need Surgery?

- 5 billion people lack access to safe, affordable surgical and anesthesia care.
- In LMIC, 9 of 10 people can’t access surgical care.
- 30% of global burden of disease.
- 11% DALY lost due to untreated surgical conditions

Debas et al, DCP-2, 2006
WHO Global Initiative for Emergency and Essential Surgical Care (GIEESC), 2020
Need Plastic Surgery?

- 1 plastic surgeon for 10 million people in Zambia
- 3 for 27 million people in Uganda
- 6 for 22 million people in Ghana

Holler JT et al, Barriers to Performing Soft Tissue Reconstruction Procedures among Orthopedic Surgeons in Low- and Middle-income Countries: Results of a Surgical Skills Training Course

*Plast Reconstr Surg Glob Open* 2019
The Mayo International Health Program: Building Better Doctors

Stephen P. Merry, MD, MPH, DTM&H
Chair, Mayo International Health Program
Education Representative, Mayo Clinic Abroad
Assistant Professor of Family Medicine
Mayo Clinic, Rochester
Mayo Clinic Abroad

- “Sustainability and Capacity Building”
- Allied health scholarships
  - Accompany consultants
  - Facilitate surgical and medical teams
  - Teach!
- Small Grants Program
  - Resource consultants doing CME
  - Fund global health education at Mayo Clinic
Why Be Involved in Global Health?

• To reduce global health disparities.
  • Health is a right.
  • Profound inequities, injustice.
  • Compassion invoked by suffering.
  • Ethical obligation to address the inequities.
Social Justice Response

• The allocation of world resources is not just.

• Health care, medical education, and research collaboration are gifts we can give.

• What we can do is significant.
“Any doctor who has worked in a developing country will not easily forget the widespread and pathetic evidence of surgical neglect in the villages. Huge hernias and hydroceles, unsightly lumps on the faces of women and children, and the compound fractures infested with maggots bear testimony to the failure of so many countries to provide even a basic level of surgical care for their people”

Samiran Nundy, All India Institute of Medical Sciences

Essential Surgery

- Alma Ata 1978
  - Health For All By 2000
    - Health is a human right
    - Health is essential for social and economic development
    - Primary, community-based, health care is the key
  - Surgery seen as too individual, expensive, complex to include in primary care.
- The “neglected stepchild of public health…”

Farmer & Kim, WJS, 2008
Why Be Involved in Educating LMIC Physicians and Surgeons?

- Maldistribution of Physicians and Surgeons:

Surgical Diseases:

The Other Neglected Tropical Diseases
Imagine living 17 years like this.
Anesthesia

**Mayo Anesthesia**

- MAC (19%)
- Local (20%)
- Regional (7%)
- Combined Regional & General (3%)
- Other (<1%)
- General (70%)

**Africa Anesthesia**

- Ketamine (63%)
- Local (20%)
- Spinal (10%)
- Other (7%)
- General (70%)

David Byers, MD, late Mayo Clinic Rochester Anesthesiologist and Macha Hospital, Zambia; personal communication
“Patients should be treated as close to their homes as possible in the smallest, cheapest, most humbly staffed, and most simply equipped unit that is capable of looking after them adequately.”

Maurice King, Medical Care in Developing Countries, Makerere, 1966
Status Quo

- 60-90% of surgery in sub-Saharan Africa done by
  - non-surgeon physicians
  - non-physician technicians (CO, PA, scrub tech).
- Most countries training generalists and surgical technicians in essential surgery
- Proven outcomes in multiple reports.
WHO Global Initiative for Emergency and Essential Surgical Care

Timely access to surgical care saves lives and prevents disability.

- injuries, violence, disasters
- pregnancy-related complications
- congenital anomalies
- cancer
- diabetic complications
- infection

Surgical and Anaesthesia Services

Emergency and Essential Surgical Care Programme
Ensuring the safety and efficacy of clinical procedures in anaesthesia, surgery, orthopaedics and obstetrics
Primary Surgery, Vol I & II
11.6 Gastrastomy (Stamm)

If a patient's oesophagus is obstructed, he cannot swallow food, he starves. He cannot swallow, so he dies from his mouth. You can feed him through an opening in his stomach, but this will not help him to swallow his saliva. This is the symptom, that there is little to be gained by prolonging his life merely to endure it. There is thus an indication for doing a gastrastomy for inoperable carcinomas of the oesophagus or pharynx. The possible indications for it are given below. For many of them a gastrectomy is an alternative.

GASTROSTOMY

INDICATIONS

(1) Stricture of a patient's oesophagus following corrosive poisoning, prior to referral for reconstruction. (2) Malignant stricture of his oesophagus or gastro-oesophageal junction, with no signs of advanced disease, and when you plan to insert a Collison tube. (3) Operable oesophageal carcinoma to build him up before referring him for resection. (4) Diseases of his pharynx or larynx which make swallowing impossible, but which can be cured (for example, rhinopharyngeal abscesses or perforation from a fish bone). (5) Temporary postoperative drainage of his stomach, when a nasogastric tube is impractical. (6) Inoperable carcinoma of the oesophagus is seldom considered a suitable indication, see above and Section 32.34.

METHOD. Under local or general anaesthesia make a small upper cervical incision which will exclude the patient's vertebrae, and draw them apart. You will probably find that his neck remain obstructed, and that what you see in his great omental or transverse colon. Pull this down, and deliver the upper part of his stomach into the wound.

CAUTION: Check that you really have found his stomach, and not his transverse colon by mistake.

Make a small stab wound beside the median incision and use a haemostat to pull a 10 or 15 Ch Foley catheter through it. Make the gastrostomy high on the anterior wall of his stomach, if they don't improve, and he may decide for 2 weeks. Correct the excessive fluid intake with antacids (11.5). If this is not to the point, or he does not improve, give him his parenteral fluids. His stomach is almost certain to open eventually.

11.7 Elective surgery for chronic duodenal ulcer

If a patient has 'peptic ulcer disease', you can usually treat him by medical treatment with diet and antacids, and by persuading him to abandon alcohol and cigarettes. Unfortunately, you are unlikely to be able to give him the expensive H2 receptor antagonists, cinidamine or ranitidine, because he cannot afford them. If, despite generous medical treatment fails, the ulcer will still persist, he may help a poor patient to be operated. If he has uncontrollable pain and dyspepsia, or if his quality of life has been spoilt by the pain by taking painkillers, pain, heartburn, and indigestion, do not regard and gastroenterostomy or pyloroplasty (11.4), as an elective procedure, especially if he is older and has atypical symptoms. He may have a gastric ulcer, with its higher pathology, complications and recurrence. Don't wait until he has a severe bleed or the overwhelming vomiting of pyloric obstruction. You will not have an endoscope, and may not be able to operate on him, so you will only be able to confirm the diagnosis at laparotomy.

The absolute indications for operation are: (1) perforation, (2) a continuing or recurrent haemorrhage, (3) pyloric stenosis, (4) suspicion of carcinoma—if he is fit enough. Otherwise, he

![Fig. 11.7 GASTROSTOMY, A, the incision, B, the patient's stomach passed through the abdominal wall, C, the incision in his stomach, D, the catheter introduced, E, the purse-string sutures, F, how his stomach wall is invaginated.](image-url)
Cost-Effective

- Cost/DALY Averted: US $33-38
  (In low-cost district hospitals)

- On par with many preventive measures in sub-Saharan Africa and South Asia.
  - Vitamin A distribution ($9/DALY averted)
  - Acute lower respiratory infection detection and home treatment ($20/DALY averted)
  - Measles immunization ($30/DALY averted)

DCP2, 2006
McCord & Chowdhury, IJGO, 2003
Surgical Task Shifting/Sharing

- Surgery by generalist physicians and technicians.
- Learn from task shifting in HIV/AIDS
  - Define the limits
  - Ensure adequate training and supervision
  - Provide adequate recognition / remuneration
  - Use simplified tools and guidelines
  - Ensure engagement with regulatory bodies

Chu et al. PLoS Medicine 2009
Surgical Task Shifting/Sharing Or Train More Surgeons?

“most of the surgery is presently being done by generalists with no surgical qualifications, without anesthesiology support and under difficult conditions... This situation will not change rapidly if the “cornerstone to improving surgical care in rural Africa” is the training of general surgeons in 5-year surgical residencies.
Safe

• MSF report:
  • If trained generalist or tech performs surgery with basic supplies, electricity, clean water, sterilization and anesthetics…
  • Then you can keep the operative mortality low

## Surgical Task Shifting (or Sharing)

<table>
<thead>
<tr>
<th>Health Cadre</th>
<th>Level of Care</th>
<th>Procedures Performed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgeon+anesthesiologist</td>
<td>Tertiary hospital</td>
<td>Neurosurgery; Thoracic surgery; Vascular surgery; Complex orthopedic surgery; Endocrine surgery; Reconstructive surgery; Critical care</td>
</tr>
<tr>
<td>General doctor/non-physician clinician with surgical skills+nurse anesthetist</td>
<td>District hospital</td>
<td>Incision and drainage of abscess; Wound debridement; Acute burn care; Skin graft; Circumcision; Hernia repair; Dilation and curettage; Manual placenta extraction; Cesarean section; Exploratory laparotomy for ectopic pregnancy or ovarian torsion; Hysterectomy; Appendectomy; Bowel resection; Stoma creation; Cholecystectomy; Splenectomy; Repair of perforated gastro-duodenal ulcer; Limb amputation; Thoracostomy; Closed fracture reduction; Skeletal traction</td>
</tr>
<tr>
<td>Community health worker</td>
<td>Primary health center</td>
<td>Pre-hospital transport of trauma victims; Basic wound care management; Referral of surgical disease</td>
</tr>
</tbody>
</table>

What Family Docs should be able to do

doi:10.1371/journal.pmed.1000078.t001
Steve’s Surgeries 2003

- 143 C-Sections
- 127 Herniorrhaphies
  - 83 inguinal
  - 12 femoral
  - 15 ventral abdominal
- 87 Exploratory Laparotomies
  - 63 enterorrhaphy typhoid perforation
  - 8 bowel resections
  - 3 cholecystectomies for typhoid cholecystitis
  - 3 appendectomies
  - 1 huge pancreatic pseudocyst (5 L)
  - 1 huge amebic liver abscess
  - 1 ileocolonic intussusception
  - 1 small bowel volvulus
  - 1 metastatic gastric CA
  - 1 hepatoma
  - 2 non-perf’d typhoid
- 26 Ortho cases
  - 11 sequestrectomies (osteo)
  - 6 BKA/AKA
  - 3 forefoot amputation
  - 2 finger amputations
  - 4 ORIF tib-fib
  - Lots of pins&traction or plastering of femur and forearm
- 63 GYN Surgery
  - 35 Hysterectomies
  - 11 ovarian cystectomies
  - 6 ruptured ectopics
  - 2 metastatic ovarian CA
  - 3 VVF (assist)
  - 14 D&C
- 34 Urologic
  - 13 suprapubic prostatectomies
  - 3 orchiopexy
  - 18 hydrocelectomies
- Innumerable I&D’s (Pus Dr.)
  - Pyomyositis, Deep space hand infection
GOAL:

“...sustainable programs run by local medical personnel...best achieved by creating opportunities for education and training of local professional caregivers as a major part of every team trip. Establishing lasting relationships .... increases the possibility of ongoing educational programs and enables local medical independence. Financial support for the operations provided by local surgeons may be necessary to allow local caregivers to provide the care for poor patients.”

Focus on the development of sustainable systems and general care

HORIZONTAL AIMS

Chung K, Let’s Reconstruct Global Surgery, PRS Global Open 2017
What Can ACAPS Members Do?

• Resource LMIC training programs
  • Education, Practice, Research

• Educate nationals
  • General, ENT & Ortho Surgeons
  • Medical officers, surgical techs training with surgeons

• Longitudinal relationships
  • Teach…at one LMIC hospital…return regularly
SMART Course Example

- Surgical management and reconstructive training (SMART) course
- 2-day lower extremity rotational flap course
- Trained 64 Ortho Surg in 2 days in 2016 and 2017 in Bhutan Nepal\(^1\)
- Trained 150 in Tanzania and San Francisco\(^2\)

\(^1\)Challa et al, J Orthop Trauma, 2018.
\(^2\)Holler JT et al, Plast Reconstr Surg Glob Open 2019
Advocate for Essential Surgery

- Essential Surgery is now part of primary health care.
- Support efforts to task shift and normalize Essential Surgery by techs & generalists.
- Include discussion of Essential Surgery in surgical curriculum development.
- Affirm Essential Surgery in policy discussions with MOH, med. school deans, global health leaders.
Additional Resources

- WHO: **Global Initiative for Emergency and Essential Surgical Care** (GIEEESC)
- Tool kit
Additional Resources

  • Trains non-surgeons in essential surgery (trauma management, OB, hernias, osteo).
  • Expect more integration with Bellagio and GIEESC in future.
Additional Resources

• "Primary Surgery" (Volume 1, Non-Trauma; Volume 2, Trauma — Maurice King, et al.; recently updated by a European consortium, available on line)

• "Surgical Care at the District Hospital" (textbook of essential surgery for primary care physicians — World Health Organization, 2003; )
Final Question

What advice and/or guidance would the surgeons on the panel give to the boots-on-the-ground non-surgeons providing the bulk of the care in Africa?
Final Question

What advice and/or guidance would the boots-on-the-ground non-surgeons providing the bulk of the care in Africa give to the surgeons on the panel and in the audience?
Questions & Discussion
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