Surgery in developing countries

• Is surgery a cost-effective public health intervention?

• Should surgery be considered an aspect of primary health care?

• Are surgical pathologies rare compared to infectious diseases?
World Map
Global Burden of Disease
Physicians Working
Maternal Mortality
America =

500 surgeons / per million people\(^5\)

- In Africa - 1 surgeon (any type) / million
  - Rural = WORSE
  - Malawi – 1 OB/GYN and 2 GS / 2.5 million\(^2\)
  - Mozambique - 12 OB/GYNs / 15 million people\(^3\)
  - Neurosurgeons
    - 1 per 9 million people (most areas)
    - Eleven countries (46 million) = no neurosurgeons\(^4\)

- 2-3 billion people lack basic surgical care\(^1\)
“Surgery may be thought of as the neglected stepchild of global public health.”

- March 2008
Esophageal Cancer

5 Most common malignancies diagnosed from January 1999 - August 2007
Unique to Kenya

Parker et al. Disease of the Esophagus 2009
References


SEMS
Self-Expanding Metal Stents

Beijing Rui Chang Medical Technology Development Co.

Esophageal stent placement without fluoroscopy.
Gastrointestinal Endoscopy. White et al. March 2001
• Median Survival
  – SEMS 250 days (8.4 mo)
  – 10 European and North American series
    • Range 49-186 days
  – Non-randomised case-control study (n=72)
    • Chemotherapy + Radiation - 11 months
    • SEMS – 4mo
  – Other reported palliative modalities
    • Photodynamic therapy - 4.8mo
    • Laser therapy – 4.1-4.6mo
    • Single-dose brachytherapy – 4.9-7.9mo
• Dysphagia scores
  – Still alive 90% - improved (mean score 1.0)
  – At time of death - 77% improved, 20% no change, 3% worse (mean 1.8)
Complications

- Perforation 1.9%
  - 37 (in 1950 dilations)
  - 4 Died within 30 days
  - 1 underwent surgery
  - Remaining stented
    - Median survival 283 days

- Procedure related mortality
  - 0.3%

**Table 2: Procedure-related complications**

<table>
<thead>
<tr>
<th>Early complications</th>
<th>Number of complications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perforation</td>
<td>34*</td>
</tr>
<tr>
<td>Bleeding</td>
<td>7</td>
</tr>
<tr>
<td>Severe chest pain</td>
<td>10</td>
</tr>
<tr>
<td>Death</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Late complications†</th>
<th>Number of complications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overgrowth or obstruction</td>
<td>55</td>
</tr>
<tr>
<td>Migration</td>
<td>3</td>
</tr>
<tr>
<td>Tracheo-oesophageal fistula after SEMS placement</td>
<td>8</td>
</tr>
</tbody>
</table>

SEMSt=self-expanding metal stent. 10 patients had both an early and late complication. *37 perforations occurred in the 1950 patients undergoing endoscopic dilation of an oesophageal tumour during the study period, 34 of whom were treated with SEMS placement. Overall perforation frequency was 1.9%. †Occurring in 62 of 334 patients with long-term follow-up; four patients had obstruction or overgrowth twice.

Expandable Stents for Iatrogenic Perforation of Esophageal Malignancies
White et al. J Gastro Surg 2003
Surgery in developing countries

• MYTH #1: Surgery is not a cost-effective public health intervention

• MYTH #2: Surgery is not an aspect of primary health care

• MYTH #3: Surgical issues are rare compared to infectious diseases
MYTH #1: Surgery is not a cost-effective public health intervention

"Basic surgical services can be highly cost-effective – even on par with widely accepted preventive health care such as immunization for measles and tetanus."

Copenhagen Convention
- Air pollution, Conflicts, Diseases, Education, Global Warming, Malnutrition and Hunger, Sanitation and Water, Subsidies and Trade Barriers, Terrorism, Women and Development
- Top 30 priorities: Improving surgical capacity - district hospital
• Cost per DALY of emergency obstetric care - rural hospital in Bangladesh
  – $10.93/DALY averted

• For all surgical care services provided at hospital in Sierra Leone
  – $32.78/DALY averted

• Other primary interventions
  – Vitamin A distribution - $9/DALY averted
  – Acute lower respiratory infection detection & treatment - $20/DALY averted
  – Measles immunization - $30/DALY averted

• Cost-effectiveness of 40 health interventions
  – included three surgical conditions
  – severe trauma, appendicitis, and hernia

• Cost / Life Years Saved (LYS)

• Results
  – appendectomy - $36/LYS,
  – Hernia - $74/LYS
  – Severe Trauma - $233/LYS

• In contrast
  – medical treatment for...
    • Diarrhea $74/LYS
    • Malaria $84/LYS.
MYTH#2: Surgery is not an aspect of primary health care

- 1978 - Alma-Ata Declaration on Primary Health Care
  - “Prevention and control of locally endemic diseases; appropriate treatment of common diseases and injuries”
MYTH#3: Surgical issues are rare compared to infectious diseases

Figure 27: Ten leading causes of burden of disease, world, 2004 and 2030

<table>
<thead>
<tr>
<th>Disease or injury</th>
<th>2004 As % of total DALYs</th>
<th>Rank</th>
<th>2030 Rank</th>
<th>Disease or injury</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower respiratory infections</td>
<td>6.2</td>
<td>1</td>
<td>1</td>
<td>Unipolar depressive disorders</td>
</tr>
<tr>
<td>Diarrhoeal diseases</td>
<td>4.8</td>
<td>2</td>
<td>2</td>
<td>Ischaemic heart disease</td>
</tr>
<tr>
<td>Unipolar depressive disorders</td>
<td>4.3</td>
<td>3</td>
<td>3</td>
<td>Road traffic accidents</td>
</tr>
<tr>
<td>Ischaemic heart disease</td>
<td>4.1</td>
<td>4</td>
<td>4</td>
<td>Cerebrovascular disease</td>
</tr>
<tr>
<td>HIV/AIDS</td>
<td>3.8</td>
<td>5</td>
<td>5</td>
<td>COPD</td>
</tr>
<tr>
<td>Cerebrovascular disease</td>
<td>3.1</td>
<td>6</td>
<td>6</td>
<td>Lower respiratory infections</td>
</tr>
<tr>
<td>Prematurity and low birth weight</td>
<td>2.9</td>
<td>7</td>
<td>7</td>
<td>Hearing loss, adult onset</td>
</tr>
<tr>
<td>Birth asphyxia and birth trauma</td>
<td>2.7</td>
<td>8</td>
<td>8</td>
<td>Refractive errors</td>
</tr>
<tr>
<td>Road traffic accidents</td>
<td><strong>2.7</strong></td>
<td><strong>9</strong></td>
<td><strong>3</strong></td>
<td>HIV/AIDS</td>
</tr>
<tr>
<td>Neorenatal infections and other</td>
<td>2.7</td>
<td>10</td>
<td>10</td>
<td>Diabetes mellitus</td>
</tr>
<tr>
<td>COPD</td>
<td>2.0</td>
<td>13</td>
<td>11</td>
<td>Neonatal infections and other</td>
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<tr>
<td>Refractive errors</td>
<td>1.8</td>
<td>14</td>
<td>12</td>
<td>Prematurity and low birth weight</td>
</tr>
<tr>
<td>Hearing loss, adult onset</td>
<td>1.8</td>
<td>15</td>
<td>15</td>
<td>Birth asphyxia and birth trauma</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>1.3</td>
<td>19</td>
<td>18</td>
<td>Diarrhoeal diseases</td>
</tr>
</tbody>
</table>
The Political Economy of Emergency and Essential Surgery in Global Health

- **Organizational:**
  - Coordinate stakeholders
  - Expertise in policy and global public health (e.g. global health tracks during/after residency)

- **Symbolic**
  - Reframe EES as an essential component of primary health care
  - Use media for EES issues (e.g. maternal health and injury epidemic)

- **Economic**
  - Promote national health insurance schemes and novel mechanisms of sustainable funding

- **Research**
  - Expand collaborative research partnerships

- **Political**
  - Influence policy makers to promote the EES agenda.
Expanding Options

• Twinning / Collaboration

• Public private partnerships (PPPs)
  • Integral for WHO / UNICEF

• Funding
  — Unprecedented money available in global health
  — Philanthrocapitalism
  • Gates foundation
    — $37.1 billion
    — Min $1.5 billion / yr
    — $2.6 billion 2010
    — $25 billion since inception