Disruptive Innovative Engineering: Designing Surgery for the Developing World

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“What matters most in life?”

Gallup Institute Opinion Poll

1. Job
2. Education
3. Good Health
4. Freedom
5. Religion
6. Good standard of living
7. Happy family life
8. Living in a country without war, violence, or corruption

1999: 50,000 people, 60 countries
“What right have a poor people who lack drinking water, sanitation, and primary health care to aspire to high-technology surgery or even to deserve it?”

“Surgery: the Neglected Stepchild of Public Health”

10/90 Gap

- 10% of the world’s population receives 90% of its surgical resources.
- The greatest burden of surgical disease is borne by those who are least able to do so, who are disadvantaged by poverty and conflict.

Review of a Canadian forum on international surgery: the Bethune Round Table
Can J Surg. Vol. 48 No. 6 December 2005
Epidemiologic Transition in Disease

- Developing communities: move from primarily communicable diseases to noncommunicable diseases.
- Increasing death and morbidity from chronic diseases, cancer, and injury.
90% of the products and services that have been designed and engineered benefit only 10% of the world’s populations
Global Volume of Surgery

234.2 million surgical procedures worldwide

Surgical Procedures/100,000

$ (US) / person/healthcare/year

Business markets in rural areas previously thought to be unattractive financially are proving to be a realistic source for economic growth both locally and abroad.
Surgery for Resource Poor Areas

Sustainable Solutions

- Engineering
- Medicine
- Social
- Business
- Legal