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**The 13th Bethune Round Table
Conference on International Surgery**

**Vancouver, BC
May 10–11, 2013**

Abstracts

The 13th Bethune Round Table, Conference on International Surgery

The 13th Bethune Round Table was hosted in Vancouver, BC, May 10–11, 2013, by the Branch for International Surgery, University of British Columbia and the Canadian Network for International Surgery. The annual international meeting, which is devoted to surgical care in underserved regions of the world, attracted 150 participants engaged in global surgery.

Seven keynote presenters, 27 podium presentations, and 11 poster presentations explored how surgical care initiatives can be better integrated into the health services at the national level. To focus the discussion, presentations were clustered around 4 sub-themes that examined the implications of this theme for academic institutions/partnerships, for nongovernmental organizations, for underserved populations including aboriginal communities and for the private sector. More than 50% of the presenters were from resource-limited settings globally.

Thirteen countries were represented including Nepal, Indonesia, Haiti, Rwanda, Tanzania, The Gambia, Uganda, India, Ethiopia, Nigeria, Canada and the United States.

Conference Chair, Brian Westerberg, MD

Emergency and essential surgical care at the national health level in low-resource settings. *M.N. Cherian,* M.K. Singh.†* From the *Emergency and Essential Surgical Care Program, Health Systems and Innovation, World Health Organization (WHO), Switzerland, and the †Virginia Commonwealth University School of Medicine and Harvard Kennedy School, Boston, Mass., USA

Integrating emergency and surgical care initiatives in low-resource settings is a critical and growing need to address pregnancy-related complications and injuries from road accidents, burns, and falls particularly among the aging population, which significantly contribute to death and disability. Health systems in low and middle-income countries (LMICs) are further strained during disasters when communities' acute needs add to the existing burden of obstetrical and other surgical conditions. Surgically treatable blindness, diabetes-related wound care and amputations, tropical diseases like buruli ulcer and filariasis (hydrocele), and female genital mutilation also require safe surgical care.

Access to clinical safety protocols to protect health workers and patients from HIV and infections, functional equipment, and medicines are vital to improving emergency surgical, obstetric, trauma, and anaesthesia service delivery.

The World Health Organization (WHO) Emergency and Essential Surgical Care (EESC) program (www.who.int/surgery) developed an Integrated Management for Emergency and Essential Surgical Care toolkit to guide policy, research for evidence-based planning (WHO EESC Situation Analysis Tool and Global Database), training programs (emergency and trauma care), and monitoring and evaluation. Making surgical care a political priority within primary health care and universal health coverage in LMICs requires organizing multidisciplinary stakeholders including policy-makers, health providers, and media toward investment in research and sustainable EESC services.

The WHO Global Initiative for Emergency and Essential Surgical Care was established to facilitate collaborations and partnerships with health ministries, academia, nongovernment organizations, professional societies, and local and international experts to support surgical care systems in LMICs. Integrating surgical care initiatives in national health plans in LMICs requires political commitment.

Integration of surgical care in Rwanda's health care system. *V. Rusanganwa.* From the Ministry of Health, Kigali, Rwanda

Following the 1994 genocide, the socioeconomic fabric of the population as well as health infrastructure were destroyed. The government of Rwanda focused on rebuilding the lives of the people — the most critical resource for the country. This led to the introduction of reforms in health systems strengthening, including addressing the issue of human resources for health (HRH).

Encouraging trends have been noted from 2000 to 2010; specifically, the overall mortality rate declined by 50% in Rwanda. There has also been a decline of 85.3% for malaria, 78.4% for HIV/AIDS, 77.1% for tuberculosis, 70.4% for the child mortality rate and 60% for the maternal mortality ratio.

However, with 0.5 surgeons per 100 000 population, and a health worker density of 0.84 per 1000 population, Rwanda has recognized the negative socioeconomic impact of this critical shortage of health care workers and is committed to overcoming it. The government is also committed to strengthening medical education with committed partnerships based on national priorities.

Insufficient personnel in the World Health Organization's HRH categories (especially qualified surgeons and anesthesiologists) and insufficient health infrastructure are still major challenges. There are only 1.2 operating rooms (ORs) per 100 000 population. Furthermore, despite 82.5% of major surgical procedures taking place at the district hospitals, only 81.5% of district hospitals have ORs.

Tackling surgical disease in resource-limited countries such as Rwanda is a substantial task. Rwanda is committed to contributing to its improvement. Even if most of the surgical problems are not communicable, they constitute a serious public health risk in developing countries and need particular attention and involvement of the global health community.

Career satisfaction and work-social balance amongst surgical trainees in Nigeria. *E.A. Ameh, T.T. Sholadoye, P.M. Mshelbwala.* From the Ahmadu Bello University Teaching Hospital, Zaria, Nigeria

Background: Surgical training is stressful, but the stressors and their impact on trainees' career satisfaction in low and

middle income countries are often ignored. **Methods:** A cross-sectional survey of surgical trainees in Nigeria was performed, looking at multiple workplace factors. **Results:** There were 124 participants, with 116 (93.5%) males and 8 (6.5%) females, and a median age of 33. The majority were registrars (95.2%) and the rest were senior registrars (4.8%). One hundred and twenty (96%) trainees were dissatisfied with long work hours and the heavy workload, 98 (79%) felt frustrated by limited resources in their hospitals and 79 (63.7%) were unhappy with the level of efficiency in their workplace. Thirty-seven (29.8%) felt physically unsafe at their workplace. Fifty-six (45.2%) trainees were distressed by lack of participation in decisions affecting their work, 96 (77.4%) felt a clear role in decisions relating to patient care was lacking and 107 (86.3%) felt overwhelmed by adverse patient outcomes. Eighty-two (66.1%) trainees were dissatisfied with their remuneration and 89 (71.8%) felt there was no opportunity for recognition of excellence and hard work. Sixty-three (50.8%) trainees reported no time to socially connect and 68 (54.8%) were unable to balance work-life responsibilities. Despite the challenges, 101 (81.5%) trainees would still choose surgery as a speciality. Suggestions for improvement in the work environment included: better mentoring, increased remuneration and workload reduction. **Conclusion:** Surgical trainees in this setting experience important psychological and social stresses. Appropriate psychological and counselling support should be included in LMIC surgical training programmes.

The role of international short-term volunteers in surgical care initiatives: the Gambian experience. A. Jah,* G. Fowlis,† S. Jah,‡ J. Just.§ From the *University of The Gambia Brikama, The Gambia, †BMI Cavell Hospital, Enfield, UK, ‡Royal Victoria Teaching Hospital, Banjul, The Gambia, and the § Royal Inland Hospital, Kamloops, BC

Background: The Gambia is one of the smallest countries in mainland Africa, situated at the “Mouth of Africa” and is among the poorest in the world. The one medical school in the country is over ten years old and hence there is a dearth of medical doctors and specialists. Although there are numerous local and international medical non-governmental organizations, only a few are focused on surgical care. Surgical services are basic and are available mainly in the one teaching hospital, Edward Francis Small Teaching Hospital. One other hospital, Serekunda Hospital, is equipped with two functional theatres but lacks surgical staff. In addition to the Royal Victoria Teaching Hospital (RVTH), this centre is often used by short-term visiting foreign surgeons providing charitable services. **Methods:** This is a descriptive situational analysis of surgical care in The Gambia and the role of international missions. Theatre records of the hospitals were used to extract data on surgeries performed routinely and during visits. **Results:** The number of surgeries done is three times greater during visits than during routine work in the main theatre (at RVTH, 176 v. 59 in 39 days). The surgeries performed by the visiting surgeons are often more complex and some may not have been possible in the country without their presence. **Conclusion:** Visiting surgeons provide much needed service including provision of surgical equipment and consumables. Their presence also offers an opportunity to train local staff to provide more efficient and better quality care.

Capacity of emergency and essential surgical care in Haiti. T. Tran,* M. Saint-Fort,† M.D. Jose,‡ J. Henry,‡ J. Pierre Pierre,† R.A. Gosselin.§ From the * University of California-Haiti Initiative, San Francisco, CA, USA, †Hospital de l'Université d'État d'Haiti, Port-au-Prince, Haiti, ‡Université Notre Dame d'Haiti, Port-au-Prince, Haiti, and the §University of California, San Francisco, San Francisco, Calif., USA

Background: This study provides the first comprehensive, nationwide evidence base for capacity of emergency and essential surgical care (EESC) in Haiti. **Methods:** From April to October 2012, 43 medical directors of the largest health facilities submitted data using a World Health Organization-developed survey, which assessed each facility's 1) infrastructure, 2) human resources, 3) interventions provided and 4) material resources available relevant to provision of EESC. Bivariate analysis was used to compare individual elements among stratifications. **Results:** There are deficiencies in all four categories. Infrastructural deficits include blood banks (28% availability) and oxygen concentrators (54% facilities have uninterrupted). A total of 69% of facilities employ at least one fulltime surgeon, and only 6% facilities employ surgical technicians. Only 33% facilities have at least one anesthesiologist. Eighty-nine percent of the facilities offer general, trauma, and obstetrical surgery; however, basic subspecialty interventions are largely inaccessible: cataract surgery (26%), cleft lip/cleft palate (33%), open treatment of fractures (49%), or neonatal surgery (53%). Comparing public ($n = 18$) to private/nongovernmental organization ($n = 25$), there is stark contrast in capacity. For infrastructure, less public facilities have uninterrupted electricity and functional anesthesia machines. Public facilities employ lower proportion of fulltime surgeons (18% v. 55%) and anesthesiologists (15% v. 33%). Eight of 35 interventions and 60 of 67 items are less available at public facilities. All findings were significant ($p < 0.05$). **Conclusion:** To meet deficiencies, the Haitian government can increase funding material resources management, repairing of infrastructure, and training human resources, especially nurse anesthetists and surgical technicians.

Nutritional status and short-term outcome among children presenting with surgical conditions to Mulago Hospital, Kampala. P. Kisa,* R. Ssentongo,* J. Sekabira,* E. Mupere,† P. Mbaka.‡ From the *Mulago National Referral Hospital, Kampala, Uganda, †Makerere University, Kampala, Uganda, and the ‡UN-WFP, Kampala, Uganda

Background: The acute stress due to surgical conditions results in varying degrees of hyper metabolism manifesting as protein-energy malnutrition (PEM). This, together with pre-existing PEM adversely affects morbidity and mortality of patients with surgical disease. Children are at the highest risk because they are the most likely to have pre-existing PEM and have the highest rate of hypermetabolism. This study describes and documents nutritional status and the short-term outcome of children with surgical conditions admitted at Mulago Hospital (MH) in Kampala, Uganda. **Methods:** We reviewed the data of children aged 12 years and under, admitted to MH for treatment. The data that was reviewed included: patient demographics, symptom history, and nutritional assessment. Clinical data was reviewed until the

end point of either discharge, abscondment, death or until 21 days from admission. Patients were classified into nonmalnourished and malnourished groups. Short-term outcomes were documented and compared between the malnourished and the non-malnourished groups. **Results:** Of the 236 patients studied, 30.4% were acutely malnourished with an alarming 23.2% had severe acute malnutrition compared to 12% and 4% in general paediatrics. Nutritional status affected patient outcome significantly but not length of stay. Burn injured patients had the highest rate of worsening nutritional status during the follow up period. **Conclusion:** This study showed a high rate of PEM and significant association between nutritional status and short-term clinical outcomes among children presenting with surgical conditions to MH in Uganda. Aggressive nutritional screening should be employed and therapeutic and supplementary nutrition undertaken in this at risk population of surgical patients.

A resource planning analysis of district hospital surgical services in the Democratic Republic of Congo. *M. Sion,* D. Rajan,† L. Noel,‡ R. Schmitt,‡ J.P. Lokonga,§ J. Bulakali,¶ G. Fry,¶ M. Mossoko,¶ D. Kwete,¶ M. Cherian.‡* From the *Thomas Jefferson University, Philadelphia, Pa., USA, †World Health Organization (WHO) Health Policy, Development and Services, Geneva, Switzerland, ‡WHO, Geneva, Switzerland, §WHO Country Office, Kinshasa, Democratic Republic of Congo, and the ¶Ministry of Health, Kinshasa, Democratic Republic of Congo

Background: Emerging evidence proves surgery is low-cost and essential in low-income countries. Here, we add an example from the Democratic Republic of Congo (DRC). Utilizing 2 tools, the World Health Organization (WHO)'s integrated Healthcare Technology Package (iHTP) resource planning tool in conjunction with the WHO Emergency and Essential Surgical Care Situational Analysis (EESC-SA) tool, we show that support for surgical services is appropriate resource allocation. **Methods:** We compiled data in the DRC for contribution to iHTP. Utilizing DRC's Health Systems Strengthening Strategy-defined norms, a theoretical normative hospital (NH) database was created in iHTP, permitting intervention cost calculations. Direct observation data from Demba and Kabare hospitals, paired with EESC-SA of 10 district hospitals gives a snapshot assessment of cost and surgical capabilities permitting comprehensive analysis. **Results:** The NH total operating budget was calculated to be \$US11.86 per inhabitant annually. For surgical services, it was \$US2.17, which represented 33.3% of the total patient volume. At Demba and Kabare, total operating budget was \$US0.31 and \$US3.40 per inhabitant annually, the surgical operating budget is 24.2% and 20.2% of total budget, and the proportion of surgical services is 9% and 3.33% of all services. EESC-SA shows that most district hospitals are comparable to Demba and Kabare. An average of 29% of life-saving interventions cannot be performed with such deficiencies. **Conclusion:** NH computes a rational resource allocation model from which other hospitals can be compared; surgical need can be inferred from its utilization rate. The low surgical volume at Demba and Kabare proves such needs are not met, and NH provides reasonable budgetary guidelines.

Surgical care initiatives in resource restricted countries.

I.W. Crandon. From the University of the West Indies, Kingston, Jamaica

Background: The University of the West Indies offers surgical training to 16 territories in the Caribbean islands, which comprise of small, rural populations separated by great distances. Challenges include issues with communication, terrain and transportation difficulties and an unfavourable surgeon density and availability. Global and regional resource restrictions have resulted in challenges in meeting the mandate on surgical education and service delivery against a background of increased enrolment. **Methods:** Increased income generation and the establishment of partnerships have been essential in increasing education and service delivery as well as in maintenance of quality and standards. These partnerships have involved other universities and departments, drug and surgical supply companies, business, national and international agencies as well as individuals. **Results:** Local training programs have resulted in improved surgeon/population ratio, greater access, a wider range of treatments, technological advancement, new centres for training and research, international exchange of medical staff and reduced cost to patients, hospitals and the region. Standards are maintained by a rigid system of accreditation for courses, sites, and the university itself. **Conclusion:** More work is necessary in working with policymakers to identify the disease burden and to establish national and regional goals and manpower requirements. Academic institutions in resource challenged countries must design local training systems that suit their needs, set research based priorities, seek out partnerships locally and internationally, seek out resources with and without government, take the initiative in forging closer relationships with policymakers and influence policy whenever possible. Quality assurance is crucial at every stage.

Building sustainable academic partnerships in surgery and international health: the University of North Carolina-Kamuzu Central Hospital (UNC-KCH) experience. *L. Boschini,* B. Cairns,* A. Charles,* M. Kiser,* J. Samuel,* A. Muyco,† C. Shores,* A. Tyson,* C. Varela,† J. Qureshi.** From the *University of North Carolina, Chapel Hill, NC, USA, and the †Kamuzu Central Hospital, Lilongwe, Malawi

Background: In 2008, the Departments of Surgery at the University of North Carolina (UNC) and Kamuzu Central Hospital (KCH) in Lilongwe, Malawi began a formal partnership. The goals were to: 1) decrease the surgical workforce shortage and 2) decrease the burden of surgical disease in Malawi. **Methods:** We evaluate our UNC-KCH surgery partnership five years after its formation. **Results:** The initial focus of the partnership was to provide clinical service by UNC faculty and seek input from KCH surgeons regarding local needs. From this needs assessment a trauma registry was developed which now has over 50 000 entries. Further assessment identified education and training as a priority. In conjunction with Norway, UNC helped implement a surgical training program at KCH for Malawian doctors. To date there are 10 residents and the first group graduates next year. Successful graduates will become Fellows of the College of Surgeons of East Central and South Africa. The partnership has also led to 13 peer-reviewed/indexed publications and creation of a

KCH burns unit. Other key partners included UNC Departments (Infectious Disease and Public Health), and Malawian organizations and stakeholders (Ministry of Health, Road Traffic Safety Council). **Conclusion:** In our UNC-KCH partnership, we have adhered to the components of low-middle income (LMIC)-developed country academic partnerships (*World J Surg* 34:456–465), namely, relationships built on trust and respect, mutual learning with context-content balance, reliance on advocates, local training superseding visitor training, collaborative research, adapting to local needs through dialogue and partnership, multidisciplinary strategies, and an Oslerian approach embracing clinical service, training and research.

Compliance of a private hospital system with national health care goals. F. Halim. From the Siloam Hospital Corporation, Tangerang City, Indonesia

Background: Private hospitals abound in low- and middle-income countries to provide high quality health care to the upper classes. Their primary purpose is to generate profit. Consequently it is unusual for private institutions to focus on care for the rural, poor or marginalized. Siloam Hospital Corporation in Indonesia is a private hospital system, which has entered into agreement with the government of Indonesia to provide care for the poor. **Methods:** Siloam established a new hospital with emphasis on care to the disadvantaged in the Western Java Region. Low income patients have access to the public health care system through their primary health care insurance, which can subsidize care. In collaboration with the Ministry of Health, both inpatient and outpatient services, continuity of care and a financial management system were developed. **Results:** Experience of the first eight months has shown that this health care delivery model is feasible, and that community acceptance is high. This meets some of the Ministry's goals for health care for the poor. Numerous challenges have arisen, including increased disease complexity and advanced disease state at presentation in patients from the low socio-economic group, complex management issues under the present arrangement and financial sustainability of providing care without significant subsidization. Furthermore, health care providers face ethical challenges, necessitating discussion of appropriate level of care provision and consideration of revised guidelines for care. **Conclusion:** Providing quality health care to the poor poses significant challenges, including financial and ethical issues in the context of a private health care institution in a low and/or middle-income country setting.

Evaluation of international partnerships for child surgery in sub-Saharan Africa. S.O. Ekenze, O.O. Onumaegbu. From the University of Nigeria Teaching Hospital, Enugu, Nigeria

Background: Despite the increasing recognition of the importance of childhood surgical diseases in developing countries, disparity still exists in surgical care between this setting and developed countries. Several international initiatives have been undertaken in the past decades to address the disparity. This study evaluates the impact of these programs in child surgery in sub-Saharan Africa. **Methods:** Review of electronic databases MEDLINE and African Index Medicus on international partnerships for child

surgery in sub-Saharan Africa was undertaken. **Results:** Four types of international initiatives were identified and consist of periodic medical missions; partnership between foreign medical institutions or charities and local institutions; international health electives by surgical trainees; and training of individual surgeons from developing countries in foreign institutions through scholarship programs. The factors that prompted the initiatives may differ between sub-Saharan African countries, but the common goal remains to improve surgical standard of care. The results of these efforts were variable, but sustainability and self-reliance of host nations were limited. Sociocultural factors, dearth of facilities, and lack of local governments' commitment were the main impediments to effective local development or transfer of modern protocols of surgical management and improvement of paediatric surgical care at the host community level. **Conclusion:** There may be the need to augment current efforts with better understanding of the sociocultural dynamics and local politics of the host nation, and improve host nation involvement and commitment. This may engender development of locally controlled viable services and sustainable high level of care.

Ethical challenges in international surgical education: key topics to consider when integrating surgical initiatives within national health care priorities. K.L. Howe,*† M.A. Bernstein.* From the *University of Toronto, Toronto, Ont., and †McMaster University, Hamilton, Ont.

Background: Surgical disease represents a large health care burden in resource-poor settings, a priority that is now formally recognized by the World Health Organization (WHO). International surgical education missions are gaining momentum and have been undertaken by numerous stakeholders including individuals and academic institutions. While ethical dilemmas are routinely faced during the design and delivery of this work, discussion has been sporadic and in the context of specific missions. Consequently, we are missing a broader and national/international evaluation of these issues. Here we have chosen to systematically categorize ethical issues confronted while teaching and operating in a developing country into two broad categories: venue (i.e., host)- and visitor-related. **Methods:** For each identified category, topics within follow an ordinal sequence that one might use when designing a surgical education mission. Illustrative examples are provided as well as the ethical principles involved. **Results:** Discussion is based upon diverse ethical challenges for which there is limited literature, including location selection, unmet needs at home, role of sponsors, and personal gain. Moreover, we address the implications of ethical issues on academic institutions and partnerships as they expand programs aimed at international surgical education. **Conclusion:** In addition to candid dialogue and a solutions-focused approach, we have outlined an "ethical checklist" for international surgical education, akin to the WHO surgical safety checklist. We hope this will serve as a framework for the design of surgical missions that avoids ethical pitfalls and might help guide international surgical education initiatives across health services globally.

Recognizing the need for additional knowledge and expertise for perioperative nurses in low income countries. A. Hiebert. From the Canadian Network for International Surgery, Vancouver, BC

Background: In Ethiopia, physicians and surgeons have some access to educational support and skills training. Other members of the perioperative team have not had similar opportunities. There is no formal training to prepare operating room nurses and continuing education is virtually unknown. The perioperative environment is one where skilled teamwork is essential for safe patient care. A Canadian perioperative nurse educator with Canadian Network for International Surgery created a 2-day perioperative workshop using the outline presented by the World Health Organization Surgical Safety Checklist (SSCL). Since the 2009 pilot project in Ethiopia, the Safe Surgery Saves Lives (nursing) course has been taught in African hospitals eight times. **Methods:** The perioperative nurse educators first observe and gather information about local perioperative practice issues. The two-day course is then taught to perioperative nurses, nurse anesthetists and anesthesiologists. Included are lectures, case studies, interactive presentations and skill sessions. The instructors follow the course with two days of coaching in the operating rooms, assisting the participants to put their new knowledge into practice. **Results:** Immediate practice changes were observed during the follow-up coaching days including use of the SSCL and skill improvement. A 4-month follow-up evaluation indicated continued practice changes, improved communication and increased patient safety. **Conclusion:** The 2 days of coaching played a significant role in practice change. Upon return visits, the operating rooms that did not receive postcourse coaching had very little practice change whereas the site with coaching had significant practice change. Postcourse coaching is now a regular part of the course delivery.

Quality improvement through interdisciplinary collaboration: the University of Nigeria Teaching Hospital experience. *V.O. Ajuzieogu, A.O. Adaobi, S.O. Ekenze, H.A. Ezike, J. Achi.* From the University of Nigeria, Enugu, Nigeria

Background: Neonatal anesthesia and surgery is a high-risk procedure in Nigeria. In order to improve on poor results, a collaborative group was formed 5 years ago. The aim of this study was to audit our results in the management of neonates who present for emergency surgeries in the 5 years before and 5 years after the collaboration. **Methods:** This was a retrospective study of neonates who had surgery in University of Nigeria Teaching Hospital over a 10-year period. Data was obtained from the case notes and anesthetic charts. We analyzed primary diagnosis, quality of care, preoperative preparation, delays, case cancellations, communication, pain management, and outcome. **Results:** All our patients studied were neonates. In the precollaboration period, poor quality care was noted in 82% of cases as against 20% during collaboration. The preoperative preparations were poor with 75% case cancellations in the precollaborative period as against very good preoperative preparations and a 10% case collation in the latter period. Anaesthetists and nurses were involved in postoperative pain management in the latter period, which had 9% mortality. In the precollaborative period, surgeons only managed postoperative pain, and had 80% mortality. **Conclusion:** Teamwork, collaboration between hospital management, and local community has led to better understanding of duties, cheaper cost for patients, and more importantly, and better patient survival. This model can be prescribed in other specialties of our health care system.

Barriers to and drivers of orthopaedic surgery research in East Africa: a qualitative analysis of interviews. *I. Elliott,* D.B. Sonshine,** S. Akhavan,** A.A.S. Shantz,* A. Caldwell,** R.A. Gosselin,† R.R. Coughlin.‡* From the *Institute for Global Orthopaedics and Traumatology, San Francisco, Calif., USA, †University of California, San Francisco, Calif., USA, ‡University of California, Berkeley, Calif., USA, and the § Weill Cornell Medical College, New York, NY, USA

Background: The burden of musculoskeletal disease in low- and middle-income countries (LMICs) remains poorly documented and has gained little attention from the global health community. Little is known regarding the barriers to and drivers of orthopedic surgery research in these resource poor settings. We sought to identify these barriers and drivers for orthopedic surgeon faculty in East Africa. **Methods:** Semistructured interviews were conducted with 25 orthopedic surgeon faculty at 4 academic medical centers in Ethiopia, Kenya, Tanzania and Uganda. A qualitative content analysis of the interviews was conducted using methods based in grounded theory. Interview analysis was conducted until saturation, or when no new themes emerged ($n = 21$). **Results:** Twenty-three barriers to and 21 drivers of orthopedic surgery research were identified and quantified ($n = 1688$ and $n = 1729$, respectively). Resource, research process and institutional domains were identified to categorize the barriers ($n = 7$, $n = 5$ and $n = 7$, respectively) and drivers ($n = 7$, $n = 8$ and $n = 6$, respectively). Resource-based barriers (46%) were more often discussed by interview subjects at least once compared to research process (26%) and institutional barriers (28%). Drivers of research discussed at least once were proportionally similar across the three domains. Some themes, such as the institutional review board ethics, technology and literature access, occurred with similar frequency as both barriers and drivers. **Conclusion:** Further investigation into these identified resource, research process and institutional barriers to and drivers of orthopedic surgery research in East Africa will help inform research capacity building efforts in future partnerships with orthopaedic surgeons in LMICs.

Decreasing disparities in marginalized populations: one Canadian's perspective. *N.R. Caron.* From the University of British Columbia Department of Surgery, Northern Medical Program, University of British Columbia School of Population and Public Health, Johns Hopkins University Bloomberg School of Public Health Center for American Indian Health, USA, and the University of Northern British Columbia; Prince George, BC

Health disparities in Canada's rural, northern and Aboriginal populations are well known among their advocates and stakeholders. These advocates and stakeholders share goals to decrease these disparities. Yet, disparities persist despite the goals of decreasing the inequities these marginalized populations endure. Their perspective may not be reflected in the targets set for them by others. This presentation calls for surgeons to rethink the adequacy, accuracy, and fairness of health care targets, including those in the surgical spectrum.

Decreasing disparities, such as access to surgical services or outcomes from surgical care is considered by many to be a valid, reputable goal. Is this adequate for a high-income country with a

universal health care system? Achieving this goal would infer that gaps are acceptable.

Eliminating the gaps (i.e., equality) often fails to consider the moving goalposts health care goals demonstrate. All Canadians strive for improved health care, so the status quo of the privileged, because it is constantly shifting, may be an *inaccurate* goal. The greater the progress of the majority, the faster they migrate from status quo, the established target set for marginalized peoples.

Even if equality is achieved, fairness calls into question whether one group's limits should be the ceiling of another group's capacity. Equality implies that marginalized peoples can have equal health care, similar health status, and identical health outcomes; but not *better*.

To address these questions of Canada's health goals, we must ensure marginalized voices hold a central role in setting the goals and how they are articulated.

Integrating FIRST[®] into clinical officer training in Tanzania, R. Fairfull Smith,* B. McCoy,† R. Lett.† From the *University of Ottawa, Ottawa, Ont., and the †Canadian Network for International Surgery, Vancouver, BC

Background: Training nonphysicians is a national strategy for providing health care to rural communities in Tanzania. The first encounter for most patients is with clinical officers (COs) who must evaluate, treat and, if necessary, transfer patients to a higher level of care. Clinical officers do not receive training in the evaluation and treatment of obstetric and surgical problems. To address this need, the Canadian Network for International Surgery developed the Fundamental Interventions, Referral and Safe Transfer (FIRST[®]) course. **Methods:** FIRST[®] was implemented at 3 CO training centres in Tanzania in 2012. Pre-course questionnaires asked about previous experience and comfort levels in performing skills taught in FIRST[®]. The Postcourse questionnaire asked about perception of comfort in performing the skills after taking the course. **Results:** Pre- and postcourse skills questionnaires were completed by 129 third-year students (average age of 30 years, 72% were male). Before the course, 60% of students declared little or no experience with the skills and only 33% felt comfortable with all 15 skills. Post-course results showed comfort level in performing skills increased from 33% to 89% ($p < 0.001$). **Conclusion:** FIRST[®] was introduced to CO students in 3 districts in Tanzania. The results show that students had a lack of prior experience with skills and that self-reported levels of confidence in performing the skills markedly increased with the course. FIRST[®] meets a clear need in the CO's education. As they will play an important role in health care delivery in Tanzania, the course should be introduced into all nonphysician training school curricula.

The Haiti Breast Cancer Initiative (HBCI): Initial Findings and Analysis of Barriers-to-Care Delaying Patient Presentation. K. Sharma, A. Costas,**† R. Damuse,[§] J. Hamiltong Pierre,[§] J. Pyda,**†¶ C.T. Ong,**† L.N. Shulman,** J.G. Meara.**† From the *Children's Hospital, Boston, Mass., USA, †Program in Global Surgery and Social Change, Harvard Medical School, Boston, Mass., USA, ‡Duke University, Durham, NC, USA, §Clinique Bon Sauveur, Zanmi Lasante Cange, Haiti, ¶University of Tennessee, Knoxville, Tenn., USA, and **Brigham and Women's Hospital, Boston, Mass., USA**

Background: In Haiti, breast cancer patients present at such advanced stages that even modern therapies offer modest survival benefit. Identifying the personal, sociocultural, and economic barriers to care delaying patient presentation is crucial to controlling disease. **Methods:** Patients presenting to the Hôpital Bon Sauveur in Cange were prospectively accrued. Delay was defined as 12 weeks or longer from initial sign/symptom discovery to provider presentation, as durations greater than this cutoff correlate with reduced survival. A matched case control analysis with multivariate logistic regression was used to identify factors predicting delay. **Results:** From a total of 123 patients accrued, 90 (73%) reported symptom presentation duration and form the basis of this study: 52 patients presented within 12 weeks of symptoms, while 38 patients waited longer than 12 weeks. On logistic regression, lower education status (OR = 5.6, $p = 0.03$), failure to initially recognize mass as important, (OR = 13.0, $p < 0.01$), and fear of treatment cost (OR = 8.3, $p = 0.03$) were shown to independently predict delayed patient presentation. **Conclusion:** To reduce stage at presentation, future interventions must educate patients in the recognition of initial breast cancer signs and symptoms and address cost concerns by providing care free of charge and/or advertising that existing care is already free.

Telehealth in surgical capacity building: collaborative graduate medical education between the University of Virginia and Rwanda. R. Landouald,* R. Petroze,† J. Ngenzi,‡ C. Lewis,† K. Rheuban,† P. Kyamanywa,* J.F. Calland,† G. Ntakiyiruta.* From the *National University of Rwanda, Kigali, Rwanda, †University of Virginia, Charlottesville, Va., USA, and the ‡Kigali Health Institute, Kigali, Rwanda

Background: Rwanda is a low-income East African nation with 40-fold fewer surgeons than internationally recommended minimums. The surgical postgraduate training program at the National University of Rwanda (NUR) has engaged in several North-South academic partnerships to improve surgical training. As one of the priorities of Rwanda's development agenda is the integration of information technology, NUR and the University of Virginia (UVA) have developed a complementary telehealth educational program. We aim to describe and demonstrate the feasibility and utility of these teleconferences as an adjunct for building collaboration and surgical capacity. **Methods:** Teleconference sessions are conducted monthly between residents and faculty at NUR and UVA as a part of the dedicated academic day. A surgical resident from each program presents a clinical case or research topic. All participants discuss the relevant issues raised, specifically highlighting any cross-cultural differences in management and presentation. Evaluation forms are completed immediately post-session and were descriptively analyzed. **Results:** Six teleconferences took place between May 2012 and October 2012 with 133 participants. Evaluations demonstrated that 83% of participants were satisfied with the quality of the video link, 89% found the topic interesting, and concurred they will think differently about similar cases in the future. Overall, 95% of participants recommended that the program continue. Teleconference sessions in February and March 2013 will be recorded for video demonstration. **Conclusion:** Telehealth is a feasible and mutually beneficial tool to complement surgical education and North-South collaboration. Further research is needed to evaluate

whether telehealth programs have a tangible impact in building surgical capacity.

Integrating surgical care initiatives in Uganda's national health care priorities. E.P. Batiibwe. From the Soroti Regional Referral Hospital, Soroti, Uganda

Background: Several health documents such as National Health Policy and the five-year Health Sector Strategic Plans (HSSP) were created to support the National Development Plan of the government of Uganda. These documents are almost silent about Surgical Care Initiatives (SCIs). We analyzed the integration of cost-effective SCIs in national health priorities, and implementation at health care facilities. **Methods:** We used mixed methods, including literature reviews, interviews with surgeons, public health care facility nurses and managers, and analyzed national and health care facility records for use of SCIs, and outcomes. **Results:** Surgical Care Initiatives have not been clearly integrated into national health care policies of Uganda. While the safe surgery checklist was mentioned in HSSP, a categorization of the quality projects in Uganda since 2010 reveals none specific for surgery, yet 14.8% of all admissions are surgical conditions, and have an average length of stay (7.4 days) which is higher than most non-surgical diagnoses. Of these, 3.2% get postoperative complications. The SCIs are mainly limited to increasing surgical access through camps and surgeries done mainly by donors. Seventy-six percent of the hospitals had at least one camp over the past ten years. Surgical checklists have yet to be implemented in all public hospitals in Uganda. None of the surgeons or health facility managers who were interviewed could affirm current use of the surgical checklist. **Conclusion:** Surgical services must become a national health priority. Partnerships must support SCIs that document surgical outcomes. Surgical Care Initiatives, such as a safe surgical checklist, can improve the quality and outcomes from surgery.

A study in Rwandan burn injuries: defining disease burden and financial implications of delayed surgical care. D. Carroll,* V. Muhirwa,† J. F. Calland,* R. Petroze,* J.C. Byiringiro.‡ From the *University of Virginia, Charlottesville, Va., USA, †Centre Hospitalier Universitaire, Kigali, Rwanda, and the ‡National University of Rwanda, Kigali, Rwanda

Background: Burn injuries pose a persistent threat to global public health. Low- and middle-income countries bear the heaviest burn disease onus, representing over 95% of fatal thermal injuries globally. This study seeks to define the basic demographics of burn care in Rwanda, and to examine the possible connection between delay in treatment and excess morbidity and expense. **Methods:** The trauma registries at Rwanda's 2 primary teaching hospitals were queried for burn injuries arriving between Apr. 1, 2011, and Mar. 31, 2012. Descriptive analysis was conducted. Data points assessed included demographics, injury source/severity, timing of debridement, length of hospital stay (LOS), infection rates (IR), and basic outcomes. Economic and cost analyses were carried out using recent hospital cost estimates from the World Health Organization. **Results:** Injuries primarily affected children of under 5 years, and thermal burns (flame/fluids) were the most common mechanism of injury. Serious wound infections occurred in 24% of patients, and length of stay for major burns (> 20% total body surface area, $n = 18$) averaged 68 days.

Basic hotel and nursing expenses were estimated at more than \$282.60/month (international dollars). This resulted in a total expenditure of at least \$11 530.08 in expenses and an overall utilization of 1224 bed days. Initial transport delays were associated with extended LOS and IR. **Conclusion:** Thermal injuries in Rwanda are responsible for substantial morbidity, mortality, disability and expense. The care of these injured patients should be prioritized in ongoing public health efforts by developing specialized centers, training programs, triage algorithms, and treatment protocols.

"Treat & Train": a novel program delivering specialist care to rural patients in Tanzania while increasing surgical training capacity. R.E. Stafford,†‡§¶ C. Mguta,‡ C. Mtani,‡ C. Morrison,**†† Sr. M.J. Voeten,‡ A. Chandika,† V. Ervin,* S. Justus.* From the *Touch Foundation, New York, NY, USA, †Bugando Medical Center, Mwanza, Tanzania; ‡Sengerema Designated District Hospital, Sengerema, Tanzania, §University of North Carolina, Chapel Hill, NC, USA and the **Baylor College of Medicine, Houston, Tex., USA**

Background: Tanzania Ministry of Health and Social Welfare (MOHSW) strategic plan aims are: 1) to reduce morbidity and mortality by providing quality health care and 2) to train/increase number of health staff. A partnership between Touch Foundation, Bugando Medical Centre (BMC), Sengerema District Hospital (SDDH) and an assistant medical officer (AMO) program was designed to enhance access to surgical and obstetric care and provide AMO clinical training at SDDH. **Methods:** In October 2012, new student rotations in surgery and obstetrics began at SDDH, a rural hospital that provides surgical and obstetric care with 10 000 deliveries and 5000 surgical cases/year and no posted specialists. Faculty includes rotating BMC surgical and obstetric specialists, 1 full-time U.S. surgeon, 2 medical officers and an AMO at SDDH. Faculty attend morning report, lead didactics and teaching rounds and participate in patient care. **Results:** Twenty-nine students have received training in operative obstetrics from visiting CNIS teams. The first 19 students have done 157 supervised C-sections. Over 400 general surgery cases have been done by surgical faculty with students participating in cases such as laparotomy, prostatectomy, hernia and orthopedic repair. Student and faculty feedback indicates satisfaction with the educational experience at SDDH. **Conclusion:** Tanzanians lack access to specialist health care in rural areas. Partnership programs can scale up healthcare worker education while decreasing student to faculty ratios and providing specialist care to underserved rural populations in fulfillment of MOHSW policy aims. Training in a rural environment may have an effect on recruitment and retention of healthcare workers in rural areas.

Integrating surgical care initiatives with national health care priorities. G.N. Rao. From the L V Prasad Eye Institute, Hyderabad, India

Blindness is a major public health problem globally. Cataract disease is the leading cause of blindness and can be controlled by surgical correction effectively in a cost effective manner. Various organizations around the world have developed innovative approaches for the delivery of surgical care for cataract.

At the L V Prasad Eye Institute, surgical care is accomplished through its pyramidal model of delivery system from primary to

advanced tertiary care which focuses on both volume and quality. In addition, training of ophthalmologists in enhancing their skills, from all over the world, is a significant component. Outcomes and other forms of evaluative research are also essential components of this surgical care program.

Surgical skills are not enough: a mixed methods needs assessment in North Gondar, Ethiopia. *D. Jenkin,* R. Lett.†* From the *University of British Columbia, Vancouver, BC, and the †Canadian Network for International Surgery, Vancouver, BC

Background: The shortage of skilled surgical providers in Sub-Saharan Africa is reaching crisis level. In response, Ethiopia has set out plans to expand surgical capacity to the district hospital through a surgical health officer program. The Canadian Network for International Surgery has been teaching surgical skills in Ethiopia for 15 years; however, there has not been an assessment of translated service delivery, nor of ongoing barriers to care. This study aims to assess the status of surgical infrastructure, providers and education in the North Gondar zone. Subobjectives are to assess the perceived value of structured surgical training courses and identify ongoing barriers to emergency surgery. **Methods:** This mixed-methods study employed semistructured interviews with surgical providers, a review of operative records, an infrastructure needs assessment and questionnaires distributed to medical trainees. **Results:** Emergency surgery was only performed at Gondar University Hospital, with a met need for caesarean section of only 15%. There was a severe shortage of both hospitals and care providers in the zone, although each hospital was staffed with several physicians trained in basic surgical procedures. A lack of consumable emergency equipment was cited as the greatest barrier to delivering emergency care at the district level. **Conclusion:** A lack of coordinated supply management, a severe lack of hospitals and the threat of professional isolation present several barriers to surgery and threaten the success of the planned expansion. Engagement of and advocacy on behalf of care providers in district hospitals may help ensure appropriate equipment is available for them to provide basic surgical care.

Injury experience in Tanzania: need for intervention. *R. Boniface,** L. Museru,** V. Munthali,*† R. Lett.‡* From the *Muhimbili Orthopaedic Institute, Dar es Salaam, Tanzania, †Injury Control Centre, Tanzania, ‡Muhimbili University of Health and Allied Sciences, Dar es Salaam, Tanzania, and the §Canadian Network for International Surgery, Vancouver, BC

Background: Injuries have been recognized as a major public health problem in both developed and developing countries and much of this burden is due to road traffic accidents. This study aimed at determining distribution of injuries and factors associated with mortality in six hospitals of Tanzania mainland. **Methods:** A cross-sectional study of patients who sustained injuries and were seen at the casualty departments of six hospitals in Tanzania mainland between November 2011 and December 2012. **Results:** Of the 9316 injury patients seen, 72% were males. More than half were between 18–45 years (54.9%). Traffic crashes were the leading cause of injuries and accounted for 47.5% of all injuries. Long bone fractures accounted for 49.2%, and injuries were severe in

5%, as determined with the Kampala Trauma Score II (KTS II). A majority of 66.7% were admitted and 2.4% died at the scene of the casualty. Factors associated with mortality were low KTS II score (OR 2.3, 95% CI 1.25–6.52, $p = 0.01$), unemployment (OR 1.62, 95% CI 1.62–5.26, $p = 0.009$), ambulance use to hospital (OR 1.59, 95% CI 1.23–4.57, $p = 0.004$) and sustaining a head injury (OR 2.63, 95% CI 1.20–5.55, $p = 0.007$). **Conclusion:** Injuries in Tanzania are an important public health problem, predominantly in adult males, and are mostly attributable to traffic accidents. It is likely that patients with serious injuries die before they access hospitals due to lack of prehospital care. It is therefore important to reinforce preventive measures and focus attention on prehospital emergency services and systems.

Global fellowship training programs for corneal transplantation in the developing world. *P. Dubord,* M. Chamberlain.†* From the *University of British Columbia, Vancouver, BC, and †Sightlife International, Seattle, Wash., USA

Background: Over 46 million people are blind in the developing world. Corneal disease affects approximately 25% of this population. Roughly 10 million people would benefit from corneal transplantation. For current needs to be met, the shortage of surgeons needs to be addressed, and one million transplants should be done annually (in contrast to 40 000 in 2012). **Methods:** In 1992 the Canadian nongovernmental organization (NGO) Eyesight International (ESI) launched an educational initiative in corneal transplantation and eye banking. Over 200 fellows have been trained, and eye banks have also been developed. From one example alone, the LV Prasad Eyebank, the number of transplants has increased from 25 in 1990, to over 2100 in 2012. Eyesight International also partnered with an American NGO (Sightlife) to develop comprehensive fellowship programs, skill transfer courses and educational modules. Sightlife's mission is to "serve as a global leader and partner to eliminate corneal blindness." **Results:** Sightlife and ESI's programs have been so successful that a relative surplus of corneal tissue developed due to a shortage of fellowship trained surgeons. This shortage exists in the developing world, including India. To expand the surgical capacity for corneal transplantation, SightLife further launched a global education initiative to develop a curriculum for fellowship training as a next step. This initiative involved collaboration with national and international organizations. **Conclusion:** Strategies to expand educational programs and scaling up of existing fellowship and residency education programs in the developing world have a positive impact. Furthermore, these initiatives will potentially have an impact on other institutions tasked with surgical training.

Safer Anesthesia from Education (SAFE): the SAFE obstetrical anesthesia course and anesthesia practice network for Rwanda. *P. Livingston,* F. Evans,† J. Sargeant,* I. Nshinyumuremyi,‡ P.R. Banguti,‡ G. Nyirigira,‡ S. Amani.‡* From the *Dalhousie University, Halifax, NS., †Emory University, Atlanta, Ga., USA and the ‡National University of Rwanda, Kigali, Rwanda

Background: Maternal mortality remains unacceptably high in Rwanda. Qualified anesthesia providers are vital to a team response to maternal emergencies. The Safer Anesthesia from

Education (SAFE) obstetric anesthesia course, an internationally based education initiative, has been adapted to the Rwandan context to improve maternal care. **Methods:** The SAFE obstetrical anesthesia course was held in January 2013 in Rwanda. Ninety anesthesia providers from 20 district hospitals in Rwanda participated in the course. Twenty-six additional anesthesia providers trained to be trainers, ensuring local sustainability of the course. Teamwork and collaboration were strongly emphasized; safety can only be assured by building safe teams. Active experiential teaching methods were used by discussion, hands-on skills teaching, and simulated scenarios with role-play. During the course, the APN was introduced as participants were divided into geo-

graphic clusters and, along with their mentors, they developed "commitment to change" plans. Mentors will visit participants at 3 and 6 months following the course to support continued practice improvement. **Results:** Pre- and postcourse tests of knowledge and skill were conducted with initial data showing improvement after the course. Evaluations and commitment to change forms show a new appreciation for the role of teams in safe obstetric anesthesia care. **Conclusion:** The implementation of the SAFE obstetrical anesthesia course and the anesthesia practice network are an example of the ongoing collaborative efforts to decrease maternal mortality by improving anesthetic care in Rwanda.