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Work-related operating theatre accidents among surgical residents in Addis Ababa, Ethiopia. ***A. Bekele, B. Kotisso, S. Shiferaw*. From Addis Ababa University and Black Lion Hospital, Addis Ababa, Ethiopia.**

Purpose: With the human immunodeficiency virus (HIV) epidemic and infections with hepatitis B, C and D, occupational exposures is a cause of concern to all health care workers, especially those working in the operating theatre in low-income countries. **Methods:** A cross-sectional study was conducted to investigate the prevalence and context of all work-related accidents that occurred involving contamination with blood and blood products among surgical residents at the Black Lion Hospital, a specialized teaching and referral hospital in Addis Ababa, Ethiopia. Data were collected from all 36 surgical residents who were at different stages of their specialty training in 2006/07. **Results:** Thirty-two (88.9%) of the residents were male, 17 (47.2%) were in their third and fourth years, and the rest (19, 52.8%) were in their first and second years of training. Of the 36 respondents, 28 (77.8%) had sustained a needle-stick injury in the operating theatre at least twice during their residency (range 2–10 times). For 13 (36.1%), the accidents involved a high-risk patient at least once. A cut with a sharp object, contact of blood to unprotected skin and a splash of blood to the eyes and face were reported by 11 (30.6%), 27 (75%) and 27 (75%) of the respondents, respectively. Information concerning the most recent occupational injury in the operating theatre revealed that 31 (86.1%) of the residents had sustained work-related accidents in the 6 months preceding the survey, 8 (25.8%) of which involved a high-risk patient. All 8 (100%) of the recent high-risk injuries and 22 (95.6%) of the non–high risk injuries were not reported to the hospital's employee health service. The most frequently cited reasons for not reporting included: "The occupational health service doesn't exist" or "I don't know if it exists in the hospital" for 15 (50%), among others. **Conclusion:** Overall, the present study revealed that work-related accidents among surgical trainees constitute a substantial risk of acquiring and transmitting blood-borne infections, which calls for well-targeted educational and other preventive measures in the teaching hospital.

Traditional bone setter and orthopedic fracture care: reasons for preference in a Southern Nigerian community. ***T.E. Nottidge,* E.M. Essien, T.O. Alonge.†* From the *University of Uyo Teaching Hospital, Uyo, and the †University of Ibadan Teaching Hospital, Ibadan, Nigeria.**

Purpose: The general perception in Uyo, the capital city of Akwa-Ibom state, is that the populace prefers traditional bone setter (TBS) care over orthopedic specialist care. This study aimed to ascertain the attitude of the population toward TBS and orthopedic fracture care and to identify some of the reasons for preferences, thus providing a basis for improving orthodox fracture care and increasing its acceptability by the user population. **Methods:** This study was carried out on 2 populations: one in the general outpatient department (GOP) of the University of Uyo Teaching Hospital and the other in the Uyo community, using a self-administered, pretested questionnaire. The required sample size was determined to be 24 for both populations, using the StatCalc domain of Epi Info 3.4.1. However, 95 respondents were recruited into the GOP arm and 150 into the community group. **Results:** Sixty percent of our hospital clients indicated they would opt for hospital care if they sustained a fracture. In the community, 64% preferred TBS treatment for a fracture, whereas 36% preferred hospital care for the same problem. When both sets of data were combined, 134 people (54.7%) preferred TBS care. There was a positive correlation between preference for hospital care and the highest level of education achieved. People in the community indicated that fear of limb amputation was their main reason for preferring TBS care if they or a relation sustained a fracture. Both groups agreed that the time to see an orthodox doctor was longer and that hospital care was more expensive. **Conclusion:** This study shows a definite preference for TBS care in Uyo owing to the fear of limb amputation, the long time to see the doctor, a presumed high cost of orthodox care and a lack of formal education. Religious concerns and the duration of care were not important determinants. Reducing the wait time for seeing a doctor and the immediate cost of orthopedic care and improving the patient–doctor relationship and public education about the processes of medical care (especially to allay the fear of an amputation) would help increase the proportion of the Uyo populace who access and benefit from orthodox fracture care. **Significance:** The Uyo populace still prefers traditional bone setter care for treatment of a fracture. To save the lives and limbs of fracture victims, appropriate enlightenment to allay the fear of an amputation and thus increase the patronage of orthodox care by the Uyo populace is required.

Urology development in Africa. ***M. Labib*. Chairman of the Education and Scientific Committee of the College of Surgeons of East, Central and Southern Africa (COSECSA), and professor of urology, Zambia.**

Urology in Zambia, 1996. Zambia is a southern African country with a population of 12 million. In 1996, there was 1 local urologist in the whole country. Most operations were performed through open surgery as there was minimal use of endoscopic techniques in urology. As well, the volume of cases versus supplies

in the urology department was unsustainable. **Plans for the future, 1996.** We wanted to build the infrastructure in urology (i.e., equipment, links with other reputable urological associations, etc.). We also wished to train postgraduates in general surgery in the proper management of common urology cases and try to encourage them to specialize in urology. The development of a program course (M MED degree) was also planned. **Plans accomplished by 2008.** There is now an accredited M MED Urology program that was started in 2006. We have also established proper links with the British Association of Urology Surgeons (BAUS), the Societé Internationale d'Urologie (SIU) and the European Association of Urology (EAU). Every year, BAUS organizes workshops in Zambia (since 2001) and donates endoscopy equipment regularly. The SIU and EAU donated a brand-new video stalk through Olympus. The following procedures have increased as indicated since 1996:

1. transurethral resection of the prostate, from 0 to 79
2. optic urethrotomy, from 0 to 126
3. transurethral ethanol ablation of the prostate, from 0 to 75
4. bladder neck incision, from 0 to 18

Further developments in urology. There are now 2 more residents who have joined the program and 2 doctors who have applied to join next year. The College of Surgeons of East, Central and Southern Africa (COSECSA) is a college with 9 participating African countries (Ethiopia, Kenya, Tanzania, Uganda, Malawi, Mozambique, Rwanda, Zambia and Zimbabwe) and about 35 urologists serving about 250 million people. A Fellowship in Urology in COSECSA was started in 2008. Two students from Zambia have already passed the fellowship examination. Another 4 are expected to take the exam next year (2 from Uganda and 2 from Kenya). **Plans for the future.** We hope to introduce laparoscopy into operations in urology very soon. We also hope to start an outreach urology service to rural areas.

Upper gastrointestinal endoscopy by clinical officers at a central hospital in Malawi. ***T.J. Wilhelm,* M. Malunga,* D. Chiwewe,* B. Mwatibu,* H. Mothes,* G. Kaehler.†*** **From the Departments of Surgery, *Zomba Central Hospital, Zomba, Malawi, and †Klinikum Mannheim, University of Heidelberg, Germany.**

Purpose: Gastrointestinal (GI) endoscopy is rarely performed in Malawi, particularly in the public health sector. Even where endoscopy equipment is available, the lack of doctors and equipment maintenance hamper continuous service provision. An endoscopy unit was set up at Zomba Central Hospital in 2001 within the context of a long-term cooperative agreement between the governments of Malawi and Germany, which provides specialists for health care and capacity building. Since medical doctors are scarce, clinical officers (COs) — nonphysician clinicians with 4 years of formal training — were instructed in upper GI endoscopy. The aim of this study was to evaluate the feasibility of upper GI endoscopy performed by COs and to evaluate the endoscopic findings. **Methods:** Prospectively recorded data on patient sex, age and chief complaint, qualification of the endoscopist, endoscopic findings, interventions and recommendations were retrospectively analyzed using SPSS 12.0. The study period was from January 2002 to October 2008. **Results:** A total of 1361 upper GI endoscopies were performed: 881 (65%) by COs alone, 142 (10%) by COs assisted by surgeons and 338 (25%) by surgeons. Common practice involved local anesthesia with Xylocaine spray without analgesic sedation. Only 16 procedures (1.2%) could not be completed because patients did not tolerate the endoscope. Overall, 307 procedures (22.6%) revealed normal findings. The most frequent pathology was suspected cancer of the esophagus, which is endemic in Malawi (n = 396, 29.1% of all procedures), followed by gastritis (n = 142, 10.4%) and esophageal candidiasis (n = 124, 9.1%). We performed 44 endoscopic interventions (stenting, dilatation, ethanol infiltration). The failure rate and distribution of findings of COs and surgeons were similar. **Conclusion and Significance:** This study demonstrates that COs can safely perform upper GI endoscopy. International cooperation can successfully provide training, supervision and technical assistance. The endoscopic findings in this large series re-emphasize the high prevalence of cancer of the esophagus and the need for tools for palliation.

Sustaining academic surgery in resource-limited settings. ***E.A. Ameh.*** **From the Department of Surgery, Ahmadu Bello University, Zaria, Nigeria.**

Background: Most surgical training and progress depends to a large extent on academic surgery. Although academic surgery faces difficult challenges in developing countries, not much attention has been given to developing strategies to sustain academic surgery in resource-limited settings. **Purpose:** To review the academic retention of surgeons completing formal surgical training, as well as interest in surgical training and future academic surgery among preregistration interns in a developing country with limited resources. **Methods:** The residency training program in Nigeria was established in 1971. We reviewed the volume of surgeons trained at the Ahmadu Bello University Teaching Hospital, Zaria (1 of 4 of the oldest and largest teaching hospitals in Nigeria) and their involvement in academic surgery after completion of training. A pilot survey was also carried out among preregistration interns to determine their interest in taking up training in surgery, as well as their interest in subsequent academic surgery. **Results:** A total of 53 residents were trained during the period 1971–2008. Of these, 33 (62.3%) remain in academic surgery: 24 in the same department and 9 at other institutions. Nine (17%) have migrated abroad, and 11 (20.8%) are in nonacademic positions within the country. Of the 33 in academic positions, only 8 (24.2%) are in senior faculty positions and 13 (39.3%) were recruited as junior-level academic staff and went through surgical training while maintaining their junior academic posts; none of the 13 migrated abroad. Of the 9 abroad, 5 left in the period 1981–1990 (a period of severe economic difficulty in Nigeria) and 4 in the period 1991–2000. Since 2000, no surgeon trained in the centre has migrated abroad. All 9 that migrated abroad would have been in senior positions had they remained in academics in Nigeria and were productive. In a survey of 68 preregistration interns, only 23 (34.3%) would want to take up training in surgery, and none showed much interest in academic surgery. Although the number of academic surgeons continues to remain low, intake into the medical school and residency training continues to rise. Interest in academic surgery by most practicing surgeons in Nigeria is greatly limited by poor job satisfaction and concerns about financial security. Most academic surgeons feel isolated from colleagues in other parts of the world. **Conclusion:** Improvements in the economy and recruiting medical graduates

into very junior academic posts while they are in surgical training appear to help in retaining trained surgeons in academics. Efforts need to be made to mentor medical students and interns to help in their future choice of training in surgery and taking up academic surgery. Various efforts of the international community of surgeons and surgical associations should help overcome the isolation felt by academic surgeons in Nigeria. **Significance:** This report provides insight into some of the challenges of academic surgery in Nigeria and similar settings, and suggests ways of sustaining academic surgery in these settings.

e-Learning in postgraduate surgical training: an African pilot. *M. Labib,* S.W. Ogendo,† T. Rushdy,‡ F. Walsh,‡ S. Tierney.‡* *Chairman of the Education and Scientific Committee of the College of Surgeons of East, Central and Southern Africa (COSECSA), and professor of urology, Zambia, †Secretary General, COSECSA, and cardiac surgeon, Kenya, and from the ‡Surgical Training Unit, Royal College of Surgeons in Ireland (RCSI), Dublin, Ireland.

Purpose: Appropriately designed e-learning programs may allow more efficient use of consultant teaching time. Using funding from Irish Aid, we piloted these existing e-learning tools in a sub-Saharan African country (Zambia) where low specialist numbers and limited consultant time for teaching severely limit expansion of surgical training programs. **Methods:** Eight MMed trainees preparing for the membership examination (College of Surgeons of East, Central and Southern Africa) in the University of Zambia Department of Surgery, Lusaka, acted as the study group, and 4 from elsewhere served as controls. Each trainee was supplied with BeST (an e-learning basic knowledge course) on a hand-held computer, and weekly online case-based discussions were arranged using the RCSI School for Surgeons platform. **Results:** Structured feedback after an initial 8 cases previously developed for Irish trainees identified trainee preference for local cases and faculty involvement. Eight cases appropriate to the health care context of the region developed by local faculty members were used subsequently. Student feedback on both BeST and School for Surgeons was positive. Among the key issues identified were the need for case material to be local and the involvement of regional faculty. The average participation score in School for Surgeons in the initial phase was 62.5%, which is comparable to the early experience among Irish trainees, for whom participation is mandatory. Eight of 8 trainees in the pilot group were subsequently successful in the MCS exams versus 3 of 4 trainees who were not included. **Conclusion:** Appropriately adapted e-learning programs may be an effective adjunct in surgical training programs in developing countries. This pilot will be expanded to include higher surgical trainees (in Zambia) and a number of other countries in the region in 2009.

The use of the internet and web-conferencing software to facilitate postgraduate surgical training in Guyana. *R. Sukhraj,* C. Martin,* M. Rambaran,* B.H. Cameron,† B. Ostrow.†* From the Georgetown Public Hospital Corporation, Georgetown, Guyana, and the †Canadian Association of General Surgeons, International Surgery Committee.

Purpose: In an effort to address the shortage of trained surgeons, the University of Guyana started a local postgraduate diploma in surgery program in 2006. The course is delivered as 16 modules, alternating between Guyanese and visiting Canadian faculty. In an effort to increase participant exposure to overseas faculty, Internet-based teaching sessions are also conducted on a regular basis. This paper seeks to review our experience with these web-based tutorials. **Methods:** Experience with all Internet-based educational sessions conducted from July 2006 to April 2009 was reviewed, including VOIP/phone, Skype and Elluminate web-conferencing. The quality of audio, video and internet connection, limitations and overall quality of the sessions were assessed. A questionnaire was administered to all participants to garner their views on the use of this method of teaching. **Results:** Twenty-eight Internet-based education sessions were attempted, with 26 completed and 2 failures for technical reasons, resulting in almost 50 contact hours. Three sessions were scheduled using VOIP/phone (all successful), 4 using Skype (1 failure) and 21 using Elluminate (2 failures: 1 was salvaged using Skype). Faculty and residents from up to 6 sites at once participated in the Elluminate sessions. The format involved a PowerPoint presentation with moderated questions and discussion. Faculty made 12 of the presentations, and residents presented 14 times. The consensus among participants was that these sessions were valuable and educational, and that they contributed substantially to the training of the residents. Sixty-one percent of the participants felt they learned just as much during these sessions as they did during traditional face-to-face interactions. Some of the limitations encountered included weather affecting satellite internet, low bandwidth, sound feedback and audio delay. The overall quality of the sessions improved as participants became more familiar with the technology. **Conclusion:** Didactic and interactive sessions are an important part of surgical residency training, but delivery of these sessions in Guyana can be quite challenging, with limited local faculty and residents being posted to outlying areas. The use of web-conferencing can be as educationally effective as traditional face-to-face sessions. Web-conferencing allows people to participate without having to travel to a central location, as long as they have a good internet connection. Web-conferencing is a valuable teaching tool and has contributed considerably to the training of surgical residents in Guyana. **Significance:** With wider availability of the internet in the developing world, web-conferencing software can be used to supplement surgical education and build partnerships between surgical training programs.

Do foreign physicians understand lectures? *R.J. Cusimano,* Q. Fu,† P. Han.†* From the *Division of Cardiac Surgery, University of Toronto, Toronto, Ont., and †Xinxiang Medical University, Xinxiang City, China.

Purpose: Lecturing in a country where the speaker does not speak the native language may limit the translation of knowledge. In order to determine whether physicians in China understood lectures presented in English, we devised a pre- and postlecture test to determine if the audience grasped the concepts presented. **Methods:** A test examining understanding of vascular suture techniques was administered to a group of students, residents and staff surgeons in Xinxiang, China (Henan province). A lecture was then delivered in English, with occasional translation by a member in the audience when the need arose (audience driven). A

clinical skills laboratory was then set up. Two hours later, the test was readministered. **Results:** Seventeen people, ranging from a medical student to the head of the department, wrote the exam. Eleven people completed both the pre- and postlecture exams. Eight questions were asked on the exam. The average prelecture score was 1.9 (SD 1.9, range 0–6). The average postlecture score was 7.6 (SD 1.0, range 5–8) ($p < 0.0001$). All scores improved. **Conclusion:** Concepts delivered in a language other than the native language of the audience can be understood and retained. There are enough language experts in the audience to ensure that all concepts are translated. **Significance:** Speakers delivering lectures in countries with a different native language than their own can be confident that the concepts delivered are understood by the audience.

Open reduction and internal fixation of fractures in the Third World: Myth or reality? *A.O. Ifesanya,* T.O. Alonge.† From the *Department of Orthopaedics and Trauma, University College Hospital, and the †Department of Surgery, College of Medicine, University of Ibadan, Ibadan. Nigeria.*

Purpose: It is often assumed that operative orthopedic interventions involving the use of implants are risky in developing countries. The reasons are not far-fetched; these include infection of the hardware, which can be disastrous, as well as the perception that the technical know-how may not be available. The AO methods of open reduction and internal fixation have been employed in our centre for about 13 years. This study aimed to evaluate the outcome of open reduction and internal fixation of fractures at our centre with a view to determining whether operative treatment of fractures should be an option in our environment or not. **Methods:** We carried out a retrospective review of all cases of open reduction and internal fixation done at the University College Hospital (UCH), Ibadan, Nigeria, between September 1995 and December 2006. The type of fracture, indications for surgery, technique of fixation as well as outcome measures like time to union and complications were recorded. **Results:** A total of 494 bones that were treated operatively (in 419 patients) were available for review. The femoral shaft was the site of fracture in 125 cases (25.3%), the supracondylar region of the humerus in 45 cases (9.1%), the humeral shaft in 42 (8.5%), the radius and ulna in 38 (7.7%) and 36 (7.3%) cases, respectively, the tibial shaft in 34 (6.9%) and the ankle in 28 (5.7%). The mean age of patients was 35.1 years (peak 31–40, range 1–100 yr), with a male:female ratio of 1.4:1. Sixty-seven percent percent of cases were due to road traffic injuries, and 77% were open fractures. Antibiotics were administered for an average of 30.6 days. Average admission and follow-up periods were 50.8 days and 12.7 months, respectively. Plate osteosynthesis was employed in 319 cases (64.5%), followed by k-wires (13%), intramedullary devices (9.1%), interfragmentary screws (5.7%), tension band wires (3.2%) and various combinations of these in 4.5% of cases. Average time to union was 4.4 months. There was a 22.5% complication rate, which included contiguous joint stiffness in 8.9%, chronic osteomyelitis in 3.8%, loosening and failure of the implant in 2.8% and superficial wound infection in 1.2%. **Conclusion:** Despite the wider surgical exposure that occurs during plate osteosynthesis owing to a lack of facilities for closed nailing at our centre, the success rate is acceptable. The incidence of joint stiffness calls for attention to postoperative rehabilitation. The chronic infective complications found in this study are comparable to results from other centres around the world. **Significance:** Our study shows that open reduction and internal fixation is an option to consider in treating fractures and nonunions in the Third World if the required precautions are observed. It has also pointed out areas where further interventions to improve patient outcomes are required.

Multiple levels of delay in treatment of children with hydrocephalus in Addis Ababa, Ethiopia. *L. Luketic,* A. Belah,† M. Derbrew,† A. Howard,* S. Woodrow. From the Faculties of Medicine, *University of Toronto, Toronto, Ont., and †Addis Ababa University, Addis Ababa, Ethiopia.**

Purpose: Hydrocephalus is a serious impairment that affects between 1 and 3 infants per thousand in many parts of the world, often leading to death or severe life-threatening disabilities. From the limited data that exist, it appears that in African countries, the typical hydrocephalus patient presents to a clinic or hospital in a delayed fashion, usually between the ages of 6 months and 1 year, when many of the complications are irreversible. To understand more about this condition, both in terms of presentation and possible delays in treatment, we decided to investigate hydrocephalus in Ethiopia. **Methods:** A retrospective chart review of all pediatric neurosurgery patients that presented in the year 2007 was conducted. Four specific time frames were investigated: (A) the time between the onset of symptoms and presentation to local health facility, (B) the time from local health facility referral to presentation at specialized hospital, (C) the time from presentation at a specialized hospital to presentation at a neurosurgical clinic and (D) the time between presentation at a neurosurgical clinic and surgery. **Results:** Over 1 year, approximately 100 children presented with hydrocephalus to the specialized hospital in Addis Ababa. The most delayed time frames where (A) and (D). Only one-third of the patients who were deemed to require urgent surgery received treatment, and of these patients, the average wait time was 110 days. **Conclusion:** Patients with hydrocephalus in Ethiopia present very late in the course of their disease. Once they are referred to publicly-funded, specialized hospitals with a neurosurgical clinic and are assessed to require surgery, they are put on an excessively long wait list. **Significance:** With multiple levels of delay in seeking and receiving medical treatment for patients with hydrocephalus, it is important to target each level separately to decrease the overall time that patients must wait for adequate treatment.

Sixty-second screening identifies persons at risk for diabetic foot ulcers. *B. Ostrow,* R. Gary Sibbald,† K. Woo,† M. Rambaran;‡ for the Guyana Diabetic Foot Team*. From the *Office of International Surgery, University of Toronto, the †Women's College Hospital, Toronto, Ont., and the ‡Georgetown Public Hospital Corporation, Georgetown, Guyana.

Purpose: To develop and apply a low-tech tool to screen patient risk of developing diabetic foot ulcers in a resource-poor setting. **Methods:** A 60-second screening tool was developed to identify

high-risk status on the basis of history, examination of the foot for lesions or deformity, monofilament loss of protective sensation and the absence of a dorsalis pulse. The tool was applied at a weekly medical diabetic clinic at Georgetown Public Hospital Corporation, Guyana's only referral and teaching hospital. The clinic has a population base of more than 2000 patients. The team identified high-risk patients who were referred to the Diabetic Foot Centre (DFC) for further assessment and education for preventative foot care and footwear practices. **Results:** An audit of the first 1000 patients screened found the following: 70% of the screened population was female, 40% of the total screened population was at high risk, 13% had previous ulcers, 5% had previous amputation, 8.5% had an absent foot pulse and 7.7% had an active ulcer. The tool profiled the frequencies of risk factors in the population. High-risk patients referred to the DFC formed a cohort to determine the effects on ulcer prevention of patient education and follow-up concerning foot care and the wearing of appropriate footwear. **Conclusion:** Screening the population for high-risk status reduces workload and focuses preventative practices. It also identifies unrecognized ulcers at an early stage. **Significance:** Screening and patient education to change behaviours are the keys to preventing diabetic foot ulcers. The 60-second tool is being adopted by the Ministry of Health in Guyana.

Motorcycle road traffic injuries in Southern Nigeria: the small motorcycle as a prevention strategy. *T.E. Nottidge, US Ekanem, S.O. Ogunlade, N.E. Ngim, E.S. Mkpouto-Obong ES.*

Purpose: The most common mode of public transportation in Uyo is by motorcycle. There are 2 sizes of motorcycle in common use: the big one (the Qlink or Skygo model, made in China) and the small one (the C90, made in China). This study was carried out to determine if there is a lower risk of sustaining serious road traffic injuries (RTIs severe enough to be brought to the hospital) attributable to using a small motorcycle. **Methods:** Motorcycle RTI victims admitted at the accident and emergency department of the University of Uyo Teaching Hospital were reviewed over a 15-month period, and data on the size of motorcycle involved were collated, in addition to demographic data. Three community visual surveys of the proportion of small to large motorcycles were also conducted. **Results:** A total of 131 RTI cases were reviewed over 15 months. The visual surveys of motorcycles in Uyo revealed that the mean proportion of small to large motorcycles was 38 to 62, a ratio of 1:1.6. Eighty-three (63.3%) of the 131 RTIs involved motorcycles: 74 of these involved large motorcycles. In 4 cases, data on motorcycle size were not obtained, and these were excluded from the study. Data analysis was done with StatCalc, an internet software, using the χ^2 test for goodness of fit, with statistical significance set at $p \geq 0.05$ ($df = 1$, $\chi^2 = 22.94$, $p < 0.001$). Thus there is a significant relation between motorcycle size and the occurrence of an RTI severe enough to be brought to hospital, with reduced risk of such an RTI attributable to the smaller motorcycle. **Conclusion:** The risk of sustaining a motorcycle RTI severe enough to be brought to the hospital can be reduced by using a smaller motorcycle. A study designed to determine whether the overall risk of motorcycle RTI is reduced by using a small motorcycle in an unregulated environment is justified. **Significance:** Awka-Ibom state has the twin problems of high motorcycle RTI and high poverty indices, in an unregulated environment, in which standard rules of the road that might help to reduce the rate of motorcycle RTI are difficult to enforce. The government of this state could take a bold step to reduce a serious problem by replacing large motorcycles with small ones, while continuing efforts to ensure safe practices on the road.

International collaboration in Guyana to reduce amputations in persons with diabetes. *R.G. Sibbald,* K. Woo,* B. Ostrow,† M. Rambaran;‡ for the Guyana Diabetic Foot Team*. From the *Women's College Hospital and the †Office of International Surgery, University of Toronto, Toronto, Ont., and the ‡Georgetown Public Hospital Corporation, Georgetown, Guyana.

Purpose: This project created an interprofessional, patient-centred clinic in Guyana, South America, to prevent and treat diabetic foot ulcers and reduce amputations. **Methods:** A longitudinal, evidence-based educational intervention was designed to: apply effective primary and secondary educational strategies from the Cochrane and other systematic reviews to translate knowledge into practice, adapt evidence-based guidelines from the Registered Nurses' Association of Ontario and related best practice recommendations of the Canadian Association of Wound Care to a resource-poor setting and (3) identify and empower key opinion leaders with a collaborative practice model. **Results:** The interprofessional Diabetic Foot Centre was opened at the Georgetown Public Hospital Corporation in July 2008. Working collaboratively, 4 teams of doctors, nurses and rehabilitation specialists were trained and mentored by a Canadian team modelling interprofessional collaboration. A total 30 participants were trained in 2 training visits (20 trainees attended both). The physician and nurse team used the Wound Bed Preparation Paradigm to assess and treat the patient as a whole, as well as focusing specifically on vascular supply, infection and local wound status. Plantar pressure redistribution was taught by a Canadian chiropodist to a variety of Guyanese physiotherapists and technicians. Teams rotated in the clinic working in a collaborative model with context-specific enablers who acted as quick reference guides to translate new knowledge into practice. The new knowledge was reinforced with practice reflection through daily seminars. To develop leadership skills and a greater theoretical framework for education methodology, wound care practices and health care systems, 4 key opinion leaders and the project coordinator were enrolled in the International Interprofessional Wound Care Course from the University of Toronto. This course consists of two 4-day residential weekends of interprofessional education separated by 8 months of self study modules and a selective that relates the material from the course to day-to-day practice. This multiple intervention model has facilitated knowledge, skills and attitude change to diabetic foot practice as well as developing collaborative patient care skills to improve patient outcomes. A survey of trainees will assess their reflections on personal growth and changed practice. **Conclusion:** Sustainable local capacity can be developed by modelling and adapting best practices using primary and secondary (enabling and reinforcing) educational strategies in a longitudinal format. **Significance:** Diabetic foot ulcers are a major public health problem in Guyana and elsewhere. They represent the single largest (30%) reason for admission to the surgical wards. There is an opportunity to improve patient outcomes

in persons with high-risk diabetic foot complications through international collaboration.

Surgical education needs assessment: the first step toward establishing collaboration between the University of Toronto and Addis Ababa University. ***M. Blankstein,[*] D.W. Cadotte,[†] C. Pain,[‡] M. Derbew,[§] A. Bekele,[§] S. Dessalegn,[¶] M. Bernstein,[†] A. Howard.[*]***
From the Divisions of *Surgery and †Neurosurgery, Department of Surgery, and the ‡Department of Psychiatry, University of Toronto, Toronto, Ont., and the §Division of General Surgery, Department of Surgery, and the ¶Department of Orthopedic Surgery, Addis Ababa University, Addis Ababa, Ethiopia.

Background: The Toronto–Addis Ababa academic collaboration was established in 2008 to assist the underserviced population of Ethiopia. With a population nearing 80 million cared for by less than 200 surgeons, a significant shortage of surgical care exists. Our goal was to identify the needs of the surgical community, both staff and residents, at Addis Ababa University and to propose specific ways in which the University of Toronto department of surgery might offer assistance through a formal surgical teaching partnership. **Methods:** Two questionnaires were designed: one aimed at the surgical staff and the other at surgical residents of Addis Ababa University. The questionnaires were divided into the following domains: personal demographics, work experience and educational experience. In addition, the staff surgeons were questioned on leadership experience and the residents on core curriculum. The staff surgeons were individually interviewed, and the residents were interviewed in small groups. **Results:** Eighty-five percent of the surgical staff and residents at Addis Ababa University completed the questionnaires. Their responses shed light on the difficulties that both staff and residents face in surgical training and practice in Ethiopia. All staff expressed interest in the collaboration. They highlighted an inadequate degree of subspecialty training to care for the needs of the population. The residents highlighted several domains of their training program that could be improved, namely educational resources, clinical supervision and curriculum development. Other areas identified for improvement included hospital/OR resources and OR management. **Conclusion:** This study demonstrates that by interviewing both surgical staff and residents at a large academic training program in the developing world, specific goals can be outlined to create a partnership in surgical education. Subsequent to the establishment of specific needs, the partner universities can go on to outline explicit goals and objectives that directly meet the requirements of both staff and residents caring for an underserviced population.

Teaching the trainers in simulation-based education for sub-Saharan Africa: initial analysis. ***M. Derbew,[*] N. Byrne,[†] R. Kneebone,[‡] R. Pittini,[†] T. Tajirian,[†] A. Barnet,[‡] F. Bello,[‡] A. Dubrowski[†,§]*** **From *Addis Ababa University, Addis Ababa, Ethiopia, the †Wilson Centre, University of Toronto, Toronto, Ont., the ‡Imperial College London, London, UK, and the §Centre for Research in Nursing Education, University of Toronto, Toronto, Ont.**

Purpose: The goal of a partnership between Addis Ababa University, the University of Toronto and Imperial College London is to develop a sustainable plan for training cohorts of educators capable of developing and evaluating training programs in technical skills related to surgery, gynecology and obstetrics (Ob/Gyn), nursing and midwifery using simulation. In November 2008, a group of individuals representing the 3 partners conducted an extensive environmental scan and stakeholder's analysis to set an agenda for the upcoming 3-year funding period. Three primary objectives during this meeting were: first, to identify current use of simulation resources in the Surgical Simulation Laboratory (SSL, Black Lion Hospital, Faculty of Medicine, Addis Ababa University); second, to identify potential areas for faculty development programs to enable optimal use of the SSL; and third, to develop a plan of faculty development and its implementation. **Methods:** The group met with stakeholders from medicine, surgery, Ob/Gyn, nursing and midwifery, the potential users of the SSL. The group also visited the site and participated in a training session in the facility. **Results:** It was found that the undergraduate medical program and surgical residency use the SSL extensively by following the Essentials of Surgical Skills (ESS) program, self-guided learning opportunities are provided to students at all levels on request, special skills training (including laparoscopic skills training) is offered and that other departments (including Ob/Gyn, nursing and midwifery) have been invited to participate and organize skills training courses. Three significant areas for future development were identified: first, reliable and valid learner assessments; second, more realistic and sophisticated forms of simulation training; and third, inter- and multiprofessional simulated training. **Conclusion:** The collective expertise within the partnership group will be applied to the development of faculty development courses aimed at expanding on skills necessary to plan, implement and assess simulation-based courses offered to the medical students, surgical residents, Ob/Gyn residents, nurses and midwives. **Significance:** With proper implementation, this program will create cohorts of local trainers proficient in using simulation for training of clinical skills. This proficiency will lead to self-sustainable programs with Ethiopian and sub-Saharan appropriate content and methods.

Evaluating the impact of the Essential Surgical Skills (ESS) course in Tanzania. ***S.S. Fung, A. Scheer, K. Chilonga, T.K. Asano, P. Moroz, R. Fairfull-Smith*.** **From the Departments of Surgery, University of Ottawa, Ottawa, Ont., and Tumaini University, Moshi, Tanzania.**

Purpose: The Essential Surgical Skills (ESS) course is a 5-day hands-on workshop implemented by the Canadian Network for International Surgery, where health practitioners from low-income countries learn life-saving surgical and obstetrical interventions. The purpose of this study was to determine the change in subjective comfort level with performing various surgical skills after taking the course. These sessions were held at the Kilimanjaro Christian Medical Centre (KCMC) in Tanzania, Africa. **Methods:** Eighty-one participants from the KCMC Doctor of Medicine or Assistant Medical Officer programs participated in the ESS course, conducted over 3 sessions (August 2008, October 2008, February 2009). They completed self-administered pre- and postcourse questionnaires. The precourse experience, pre- and postcourse comfort levels for the procedures taught in the course were evaluated. **Results:** Sixty-eight precourse and 77 postcourse questionnaires were completed. The comfort level before the

course for all tasks was on average 34.8%. At baseline, participants were comfortable with reading x-rays and scrubbing. There was no significant difference in comfort level pre- and postcourse with managing normal vaginal deliveries, casting/splinting, knot-tying, traction and nasogastric tube placement. For most other tasks, including cardiopulmonary resuscitation, chest tube insertion, urological emergencies, difficult deliveries, laceration repair, laparotomy and bowel anastomosis, there was significant discomfort at baseline. Postcourse, comfort levels increased to an average of 91.6% (a significant difference). All tasks demonstrated substantially increased comfort. The procedures with the largest gains included laparotomy, bowel anastomosis, Foley and filiform catheter insertion, managing shoulder dystocia and venous cutdown. **Conclusion:** The ESS course provides medical trainees with hands-on structured exposure to surgical skills that may not otherwise be experienced during their clinical rotations. The ESS course increased self-reported comfort levels for the independent performance of surgical and obstetrical tasks.

Developing a pediatric tumour database in Nigeria. ***E.A. Ameh,* P.M. Mshelbwala,* G.O. Ogunrinde,† A. Musa,† M.A. Anumah,* A. Gomna,* B.A. Jabo,* C.S. Lukong.**** **From the *Division of Paediatric Surgery, Department of Surgery and †Department of Paediatrics, Ahmadu Bello University Teaching Hospital, Zaria, Nigeria.**

Background: Availability of adequate data and information has helped in providing quality care for children with solid tumours in developed countries, as well as planning of prevention and control strategies. In most of sub-Saharan Africa, however, reliable data on pediatric tumours (including hospital-based data) are not available, and not much attention is given to these tumours. **Purpose:** To develop a hospital-based database for pediatric solid tumours in a large teaching hospital in Nigeria. **Methods:** In January 2000, we started a paper-based pediatric tumour database in our institution using a 32-point, 1-page proforma. The proforma was designed to capture information on demographics, evaluation, hospital care and follow-up. Data were entered by surgical staff. The database (2000–2007) has been reviewed to identify shortcomings and institute modifications. **Results:** In 8 years, a total of 51 children aged 8 days to 12 years with solid tumours have been entered into the database. The tumours included nephroblastoma 25 (49%), teratoma 12 (24%), rhabdomyosarcoma 8 (16%), neuroblastoma 2 (4%), lymphoma 2 (4%) and others 2 (4%). Twenty-one (41%) patients presented late with advanced disease, and this contributed to mortality in 18 (35%) patients. It has been observed that data entry was incomplete in 29 (57%) patients, owing largely to unsupervised entry by surgical trainees. Since not all solid tumours come to our pediatric surgery service (others are treated by pediatricians, radiotherapists and various specialties), it is projected that the database has captured only about 30% of childhood solid tumours. A multidisciplinary pediatric tumour board has now been established, and data entry will be closely supervised. An electronic database has been developed, and we plan to migrate our paper database to the electronic database. Efforts are ongoing to seek international collaboration with the aim of eventually having a web-based database and real-time data entry. **Conclusion:** It is feasible to establish a reliable pediatric tumour database in our setting, but close supervision, appropriate training in database management and multidisciplinary collaboration are necessary for adequate data capture. **Significance:** When fully established, the database should help in planning cancer care as well as resource allocation and cancer control.

A comparison of the Kampala Trauma Score II with the new Injury Severity Score in predicting in-hospital mortality for road traffic injury patients presenting to a regional referral hospital. ***S.M. Mutooro,* E. Mutakooha,* P. Kyamanywa.†*** **From the Committee of the College of Surgeons of East, Central and Southern Africa (COSECSA) and the Departments of Surgery, *Mbarara University of Science and Technology, Mbarara, Uganda, and the †National University of Rwanda, Butare, Rwanda.**

Purpose: Road traffic injuries are of growing public health importance because of their significant contribution to the global burden of disease. The need to predict outcome of injuries has led to the development of injury scores. The Kampala Trauma Score II (KTSII), now recommended for use in resource-poor settings, has not been compared with the "gold standard," the New Injury Severity Score (NISS). We compared the performance, predictive power, sensitivity and specificity in predicting mortality at 2 weeks of the KTSII and NISS in patients involved in road traffic incidents seen on the surgical ward at Mbarara Regional Referral Hospital. **Methods:** This prospective study conducted between June 2005 and August 2006 examined clinical and radiological data of 173 consecutive patients admitted to the emergency surgical ward at Mbarara Regional Referral Hospital with road traffic injuries. Only patients presenting within 24 hours of injury and with 3 or more injuries were recruited in the study. The KTSII and NISS scores were computed for each patient on admission. The primary outcome measure was survival. Receiver operating characteristics (ROC) analysis and logistic regression analysis were used for comparison. **Results:** The KTSII predicted mortality and discharge with an area under the curve (AUC) of 0.87 (NISS AUC 0.89). The KTSII was less accurate (AUC 0.65) than the NISS (AUC 0.83) in predicting long stay in hospital. At a cut-off point of 9 and below, the KTSII had a sensitivity of 87% and a specificity of 81%, whereas the NISS scored 96% and 78.4%, respectively, in predicting mortality. The KTS11 predicted long hospital stay at a cut-off score of 9 and below, with a sensitivity of 87.5% and specificity of 81%. **Conclusion:** The KTSII is as reliable a predictive score and good triage tool as the NISS. The use of the KTSII for trauma management should be further encouraged in resource-poor settings. **Significance:** This study has demonstrated that the KTSII provides reliable objective criterion upon which injured patients can be triaged in emergency care conditions. The KTSII may enhance the use of ambulance services and timely transfer of injured patients. In addition, the KTSII should make documenting the epidemiology of trauma more feasible in resource-poor settings.

Assessment of emergency obstetric and newborn care (EmONC) services in Addis Ababa, Ethiopia. ***B.E. Astil,* M.N. Belatchew,* Y. Berhan.†*** **From the *United States Agency for International Development (USAID) Ethiopia, and the †Addis Continental Institute of Public Health, Addis Ababa, Ethiopia.**

Purpose: Obstetric needs are health problems that necessitate

EmONC services or interventions. The sum of incidence of pathologies (obstetric emergencies and complications) is taken as an indicator of obstetric need. This study identifies gaps and deficits in major obstetric interventions (MOIs) for absolute maternal indications (AMIs) in comparison with existing needs. The purpose is therefore to assess unmet obstetric need (UON) in emergency obstetric services in the hospitals of Addis Ababa. **Methods:** A cross-sectional study was conducted from July to September 2006 on 625 mothers who received MOIs with or without AMIs in 19 hospitals of Addis Ababa, 6 public and 13 private. The data collectors were midwives working in the obstetric units of the hospitals. They were trained on pretested structured formats. Data quality was ensured through continuous supervision. **Results:** A total of 666 MOIs were conducted, most of which were cesarean sections (C/Ss; n = 531, 80.5%). The C/S rate per 100 births was 5.3%. The number of women with AMIs was 367, with the majority having obstructed labour (n = 145, 39.5%) The number of MOIs done without AMIs was 354, with the majority done for previous C/S (n = 143, 40.4%) and fetal distress (n = 127, 35.9%). The odds of undergoing C/S in a private hospital 1.77 (1.09, 2.90) and after daytime admission 1.61 (1.01, 2.57) was significantly higher than in public hospitals and after_night-time admissions. Newborn results showed that 538 (92.4%) were born alive and discharged alive. Some of the mothers (n = 39, 5.4%) had complication after delivery, mainly sepsis and hemorrhage, with 4 resulting in maternal deaths; these all occurred in public hospitals. The average hospital stay was 3.9 and 7.1 days for private and public hospitals, respectively, where the difference of means was statistically significant ($p < 0.001$). Nearly 9 out of 100 births that needed major obstetric intervention in Addis Ababa during the period of data collection (Jul. 17 to Sep. 17, 2006) did not receive it. In other words, the deficit of MOI/AMI per 100 births is 9.46%. **Conclusion:** The UON in Addis Ababa was higher than urban figures of other countries that underwent the UON exercise. The rural situation is expected to be worse than the capital, where better socioeconomic indicators and several health facilities exist. If purely preventive measures are out of favour, the move toward managing maternal health through a hospital network still seems in its infancy. Finally, this study should not remain one more theoretical study, but should pave a way for practical and effective decisions to be taken that will, through advocacy and resource mobilization, allow the country to move out of the poverty of the maternal health services. **Significance:** This study marked a turning point to the understanding of the decision makers at the Ministry of Health on the situation of emergency obstetric services in the country. The Ministry is now conducting a national census on the availability of EmONC services, their location and capacity.

Trauma team training in Guyana. ***C. Prashad, M. Rambaran, S. Amir, B.H. Cameron, R. Lett.*** **From the Georgetown Public Hospital Corporation, Georgetown, Guyana, and the Canadian Network for International Surgery (CNIS).**

Purpose: In 2006, the Trauma Team Training (TTT) course developed by CNIS was introduced in Guyana during a visit by one of the authors (R.L.). A total of 16 Guyanese instructors were trained for 1 day and then supervised while delivering the first course to 25 providers. This paper reviews Guyana's experience delivering the course independently over the past 2 years, and discusses the wider applicability of the TTT course to Guyana and other developing countries. **Methods:** The low-cost 2-day TTT course includes lectures, skills sessions and team exercises, and teaches a multidisciplinary team approach to trauma evaluation and resuscitation. A total of 76 Guyanese health professionals completed the TTT course: 39 physicians, 11 nurses, 22 medex (nonphysician primary care practitioners) and 4 attendants. These included 41 instructors and providers trained initially, and 35 providers trained by the Guyanese instructors in 2 subsequent courses. Pre- and post-test scores were analyzed for these latter 2 training sessions, and course evaluations were reviewed. **Results:** There were 35 participants in the 2 independently-run training sessions: 18 doctors, 16 medex and 1 nurse. The average pretest score was 49% (range 20%–87%), whereas the average post-test score was 68% (range 33%–100%). Overall, 89% of all participants had an improved score at the post-test. The average post-test score for physicians was 85% (range 67%–100%) and for nonphysicians was 51% (range 33%–73%). Evaluation comments were uniformly positive. Sixty course evaluation forms were reviewed, with all the participants agreeing (83% "strongly agreeing") they found the course useful. Remarks by participants described the course as "systematic" while "addressing topics of the utmost importance;" all participants complimented the "interactivity" of the course and noted that "participation was encouraged." When asked what should be considered for future courses, 37% of the participants suggested that more time be allotted to the skill sessions. Course-qualified personnel served as the core of the medical teams for the 2007 World Cup Cricket audiences in Guyana. Medex are able to better manage patients in isolated regions, and nonmedical staff are more willing and able to offer support as part of the trauma team. **Conclusion:** After CNIS trained the original TTT instructors, Guyana has successfully trained 2 more cohorts of health professionals as TTT providers. Trauma management at the main teaching hospital has improved, and more patients are stabilized and transferred appropriately. **Significance:** The TTT course is low cost, can be taught by local instructors and improves trauma care by educating all health professionals involved in treating acutely injured patients.Within Guyana, it has been adopted as a national program with the goal of training all emergency department personnel throughout the country. The course is widely applicable to the rest of the developing world where the trauma epidemic continues and nonphysicians provide much of the primary trauma care.

The impact of yearly minimally invasive surgery (MIS) workshops and ongoing mentorship on MIS in Botswana. ***B. Bakanisi,* A. Bedada,* J. Fourie,† I. Joubert,‡ L. Smith,§ A. Okrainec,§ G. Azzie.§*** **From the *Princess Marina Hospital, Gaborone, Botswana, †Wilmed Park Private Hospital, Klerksdorp, the ‡Linmed Hospital, Johannesburg, South Africa, and the §Department of Surgery, University of Toronto, Toronto, Ont.**

Purpose: To assess the impact of yearly MIS workshops and ongoing mentorship for minimally invasive surgery at Princess Marina Hospital, Gaborone, Botswana, since March 2006. **Methods:** Since 2006, yearly MIS workshops have been held by visiting faculty at Princess Marina Hospital. In parallel,

programs for ongoing mentorship through telephone consultation and formal telesimulation (the latter in order to teach and test the Fundamentals of Laparoscopic Surgery course) have been established. Case log books at the largest health care centre in Botswana were retrospectively analyzed and data collected with regard to total number of cholecystectomies done and operative technique used (open v. laparoscopic), between January 2004 and January 2009. Where available, data were also collected regarding conversions from laparoscopic to open procedures. **Results:** When comparing data before inception of the MIS program (2004–2005) to that after (2006–2009), the percentage of cases attempted via MIS had increased from 32% (15/47) to 85% (80/94) ($p = 0.001$, χ^2 test). From inception of the program in 2006, the percentage of cases attempted with MIS has increased 24% and the percentage of cases completed by MIS has increased 22%. The conversion rate from 2006 to 2009 is 6% (5/80) (Table). **Conclusion:** A thoughtful program designed to address local educational needs regarding MIS can help shift clinical practice in the direction the local governing body desires. This has been the case in Botswana. Moreover, the impression of Batswana, South African and Canadian partners is that there has been significant upskilling among local surgeons and better care provided to their patients. **Significance:** This partnership between surgeons from Botswana, South Africa and Canada demonstrates that a thoughtful program based on local needs and capacities can result in the upskilling of local health care providers. The desire to do minimally invasive surgery was, and is, local: the equipment was already present and being used. The need for upskilling was expressed by local surgeons. The program was established as a multinational partnership (Botswana, South Africa, Canada) to help local surgeons and Ministry of Health officials reach their MIS goals.

Table. Data regarding attempted and completed MIS procedures at Princess Marina Hospital, Gaborone, Botswana

	Cholecystectomies, no.			Conversions (MIS to open), no.	MIS, %	
Year	Total	MIS attempted	Open		Attempted	Completed
2004	37	14	23	NA	38	NA
2005	10	1	9	NA	10	NA
2006	34	24	10	1	71	68
2007	21	19	2	2	90	81
2008	39	37	2	2	95	90

MIS = minimally invasive surgery; NA = data not available.

A 10-country coordinated program of clubfoot training and care: preliminary results. ***N. Penny,*[*] *C. Lavy,*[†] *A. Mayo,*[‡] *J. Morcuende.*[§] **From the *Faculty of Medicine, University of British Columbia, Vancouver, BC, †Oxford University, Oxford, UK, ‡CURE Clubfoot Worldwide, Philadelphia, Pa., and the §Department of Orthopaedics and Rehabilitation, University of Iowa, Iowa City, Iowa.***

Purpose: To report the preliminary findings of a 10-country coordinated capacity building and service delivery program for congenital clubfoot treatment using the Ponseti method. **Methods:** This is a 2-year project aimed at introducing the Ponseti method of clubfoot care into 10 resource-poor countries simultaneously in a coordinated way. It involves collaboration between 2 international disability nongovernmental organizations and the Ponseti International Association from Iowa with national institutions and service delivery projects. A standardized curriculum and training method was used, and standardized protocols for service delivery were implemented. Programs were integrated into national disability strategic plans and Ministry of Health programs as much as possible. **Results:** In the first complete operational year, 61 clinics were operational, 395 professionals practitioners were trained, and 2751 babies were treated. National committees were established. **Conclusion:** A coordinated and standardized methodology using public health principles broadens the reach and scope of clinical services and facilitates prevention of disability in resource-poor countries. **Significance:** Lessons learned from this project may be extrapolated to other disabilities. The concept of moving disability care into the public health domain is enhanced and the possibility of national plans for prevention of disability encouraged.

Effectiveness of a basic prehospital trauma care program for lay first-responders in Kampala, Uganda. ***J. Mabweijano,*[*] *S. Jayaraman,*[†] *M. Lipnick,*[‡] *N. Caldwell,*[†] *J. Miyamoto,*[†] *R. Wangoda,*[*] *C. Mijumbi,*[*] *R. Hsia,*[†] *R. Dicker,*[†] *D. Ozgediz.*[§] **From the *Mulago Hospital and Makerere University, Kampala, Uganda, the †University of California San Francisco, San Francisco, Calif., ‡Brigham and Women's Hospital, Boston, Mass., the §University of Toronto, Toronto, Ont.***

Purpose: In Kampala, Uganda, no formal prehospital emergency system currently exists. We implemented a basic trauma care program for lay people and tested its effectiveness over 6 months. **Methods:** In 2008, we conducted a modified basic first-aid course on trauma for 307 police officers, taxi drivers and local government officials and supplied them with first-aid kits of basic, locally available materials. Cross-sectional surveys at baseline, 3 and 6 months were used to assess their fund of knowledge, frequency of skill and kit use, reasons for not providing aid, perceived utility of the kit and course and self-reported confidence in their skill use. Paired t tests were used for all comparisons. **Results:** At baseline, fund of knowledge tests before and after the training course showed significant improvements ($p < 0.0001$) in test scores in all 5 skill areas: assessing airway, breathing and circulation (ABCs), use of the recovery position, bleeding control, splinting and lifting/moving safely. At 3 and 6 months, there was high knowledge retention with no difference in scores in 4 of 5 areas compared with baseline. Scores on the fifth skill, bleeding control, increased at 3 months (68% v. 84%, $p = 0.0024$, $n = 92$) and 6 months (76% v. 84%, $p = 0.04$, $n = 147$). For skill use, at 3 months, lifting/moving safely decreased (68% v. 32%, $p < 0.0001$, $n = 114$), but confidence in all other skills were unchanged compared with baseline. At 6 months, assessing ABCs and bleeding control increased from baseline (50% v. 64%, $p = 0.0041$, $n = 169$ and 61% v. 74%, $p = 0.0075$, $n = 171$, respecitvely), whereas lifting/moving safely decreased (78% v. 67%, $p = 0.0072$, $n = 171$). Use of the recovery position was evaluated at 3 and 6 months and also increased from 43% to 57% ($p = 0.04$, $n = 82$). Restrictions to providing aid at 6 months owing to lack of knowledge

decreased compared with baseline (3% v. 8%, $p = 0.018$, $n = 179$); however, trainees were less able to stop at the scene of an emergency owing to work (3% v. 13%, $p = 0.0003$, $n = 179$) or travel reasons (2% v. 12%, $p = 0.0006$, $n = 179$). Trainees rated the course and kit highly. Course ratings were 4.6 of 5 and 4.7 of 5 at 3 and 6 months, respectively. Kit ratings were 4.6 of 5 and 4.5 of 5 at the same times. Trainee confidence in providing first-aid for trauma increased from a mean of 3 of 5 at baseline to 4.2 of 5 at 3 months ($n = 124$, $p < 0.0001$) and 3.2 of 5 to 4 of 5 at 6 months ($n = 185$, $p < 0.0001$). **Conclusion:** Lay first-responders in Kampala, Uganda, effectively gained and maintained knowledge of first-aid for trauma for at least 6 months. Trainees found this basic intervention useful and demonstrated a sustained increase in confidence in deploying these new skills during emergencies. **Significance:** Such a training program may be a useful and effective first step toward developing a formal emergency system in Uganda. These lessons could also be useful in other similar settings when no emergency medical systems currently exist.

Management of intussusception in children in a developing country: the role of pneumatic reduction. ***F.A. Abantanga,*†* ***B. Nimako,†*** ***M. Amoah,†*** ***K.P. Yankey.†***
From the *Department of Surgery, School of Medical Sciences, College of Health Sciences, Kwame Nkrumah University of Science and Technology, and the † Directorate of Surgery, Komfo Anokye Teaching Hospital, Kumasi, Ghana.

Purpose: To evaluate the outcome of children with intussusception who were treated in our hospital with air enema reduction of the intussusception. **Methods:** An analysis of children presenting to our hospital from March 2004 to April 2008 with intussusception was done. From this group, the data of a subset of children treated using air enema reduction (AER) or pneumatic reduction (PR) of the intussusception were analyzed. The method involved a nonoperative management of the intussusception using PR and controlling the progress of reduction of the intussusceptum using the escape of air through a nasogastric tube submerged in a kidney dish of water. **Results:** During this period, 44 children received a diagnosis of intussusception. Treatment for 22 was started with an AER of the intussusception after resuscitation, but then 9 were converted to open laparotomy after the AER of the intussusception had failed. Thirteen intussusceptions were successfully reduced using this method. Out of the last group of patients, we did a laparotomy in 2 because we suspected that the intussusceptions were not reduced (it turned out that they were all reduced despite the nonescape of air via the nasogastric tube). We did not give any time limit for attempting AER, i.e., from the start of the clinical symptoms to initiation of PR of the intussusception. The earliest we received a child with intussusception was about 24 hours and the latest was about 6 days after the occurrence of symptoms. There was a perforation in one of the children undergoing PR. All the children who underwent nonoperative management of the intussusception using AER survived. **Conclusion:** All children with intussusception should first undergo attempted PR of the intussusception, and if that fails, a laparotomy should be done. We suggest that this procedure be done in theatre and by a pediatric surgical team if there are no facilities (fluoroscope or ultrasound machine) for monitoring the progress of intussusceptum reduction in the radiology department of the hospital. This method is contraindicated if the child has peritonitis or pneumoperitoneum. **Significance:** This method is ideal for poorly-resourced hospitals where there is no ultrasound machine or a fluoroscope for monitoring the progress of AER but the surgeon is still interested in nonoperative management of intussusceptions.

Experience with glabrous skin of the sole instep in the management of postburn palmodigital contractures in Nigerian children. ***M.K. Chira, J.A. Akindipe.***
From the National Orthopaedic Hospital Igbobi, Lagos, Nigeria.

Purpose: There are enormous challenges to burn prevention in the face of poverty and overcrowding, as happens in the low-income countries of the world. Consequently, the incidence of postburn contractures in the hands of toddlers in Nigeria is high. Keeping children out of harm in small over-crowded homes where cooking is done at ground level is a tough task. We have been challenged with having to release postburn palmodigital flexion contractures in these children. Initially, we resurfaced the releases with partial-thickness skin grafts taken from the thighs, but the colour mismatch of the skin in black populations is significant. The purpose of this report is to show the excellent colour match we have obtained using skin grafts from the sole of the feet to resurface the palms. **Methods:** In the past 10 years, we have operated on 105 children with postburn contractures of the hand. We released the contractures either in a single or multiple-staged fashion. Soft-tissue coverage was established with partial-thickness skin grafts taken from the sole of the foot for colour and texture matching. In this paper, we have done a retrospective review of these cases, and we present our results using pictorial slides. **Results:** In black patients, there is substantial aesthetic superiority of skin from the sole over skin from the thighs in resurfacing palmar contractures. Also, the glabrous skin grafts from the soles were functionally stable even after long-term follow-up. Donor site morbidity is almost nonexistent. The colour match with the palmar skin of the hand, an organ of exposed anatomy, has remained excellent. **Conclusion:** Resurfacing soft-tissue releases of palmar postburn contractures with glabrous skin of the sole instep, even when taken as a partial-thickness skin graft, produces a far superior aesthetic and functionally stable skin cover. **Significance:** The significance of this paper is that recontractures can be prevented and aesthetic outcome improved with the thick, smooth skin of the instep of the sole. Also, donor site morbidity can be eliminated, especially from the thighs of female children who may have aesthetic issues later in life.

Comparison of total versus partial excision in the surgical treatment of earlobe keloids using triamcinolone acetonide as adjunct therapy. ***R.E. Nnabuko.***
From the Plastic Surgery Department, National Orthopaedic Hospital, Enugu, Nigeria.

Purpose: Keloids are abnormal scars that have a high tendency to recur after surgical excision. Presently, 2 main methods of surgical excision are in use: total excision, which involves complete removal of all keloidal tissue, and core or partial excision, which involves incomplete removal of keloidal tissue, leaving behind a narrow

margin at its junction with normal skin. This study aims to show if there are any significant differences between the 2 methods of surgical excision using the earlobe as a model and postoperative triamcinolone acetonide injections as adjunct therapy. All keloids resulted from ear piercing. **Methods:** A total of 165 female patients of all ages with 201 earlobe keloids seen between January 2004 and December 2008 were included in this study. All had their earlobes pierced for earrings and were documented for age, family history of keloids, etiological agent, previous excisions and therapies. The various scar sizes were measured with a ruler and a pair of calipers and documented into 3 categories: small (< 2 cm diameter), moderate (2–4 cm diameter) and large (> 4 cm diameter). A total of 87 mild keloid lesions were treated with total excision, whereas 114 moderate and large lesions were treated with partial excision because it was necessary to reconstruct the earlobe using residual keloidal tissue to avoid cosmetic deformity. All cases were done using local analgesia with 1% lignocaine in an adrenaline solution and had intraoperative triamcinolone wound-edge injections of 10–40 mg/mL. They subsequently had fortnightly injections for varying periods. Follow-up was for a minimum of 1 year. **Results:** Results were assessed on a scale of poor to excellent on the basis of recurrence of the lesion, persistence of symptoms, cosmetic acceptability and adjunct therapy complications. The results from the total excision group were excellent in 37.9%, good in 37.9%, fair in 16.1% and poor in 10.3%, whereas results from the the partial excision group were excellent in 43.9%, good in 29.8%, fair in 16.7% and poor in 9.6%. Comparison, however, showed no statistically significant differences between the 2 methods of excision ($p > 0.05$). **Conclusion:** For small lesions (< 2 cm diameter), total excision is recommended, whereas for larger lesions, partial excision is preferable, as residual keloidal tissue must often be used to reconstruct the deformed earlobe and maintain cosmetic acceptability. In both types of excision, adjunct triamcinolone acetonide therapy is mandatory. The most common adverse effect seen with steroid therapy was skin atrophy. **Significance:** Keloids are a problem of pigmented races and recurrence following excisions are high. Using the earlobe model, our suggestions can be applied to other sites where possible: small defects should be totally excised and closed primarily, whereas with larger lesions, partial excision methods should be adopted.

Experience with post-trauma lower extremity reconstruction in a tertiary Third World hospital. *M.K. Chira, C. Ahachi*. From the National Orthopaedic Hospital Igbobi, Lagos, Nigeria.

Purpose: With the exception of the hand, the leg is perhaps the most exposed segment of the limbs. The tibia is most vulnerable on its anterior aspect, being protected here by skin only. Our hospital is a 400-bed trauma centre in the middle of Lagos, the most populous city in Africa with over 12 million residents. Often, we are called to resurface complex Gustilo type-3 fracture wounds. The absence of microvascular facilities has limited our success. However, with the introduction of the reverse sural neurocutaneous flap (RSNCF) and the saphenous neurocutaneous flap into our armamentarium about 5 years ago, we have recorded substantial success. The purpose of this paper is to share our experiences and results with lower extremity soft-tissue resurfacing, including pictorial prototypes, and to show that with the skilful use of RSNCF, there is very limited indication for the traditional free-flap cover on defects of the lower one-third of the leg. Based on our experiences, we proffer strategies for improved results. **Methods:** In the past 5 years, we have done 35 major post-traumatic resurfacings of the leg. The techniques employed included muscle flaps, Ponten super flaps, cross leg flaps and neurocutaneous flaps. No free flaps were employed. **Results:** Our results showed a flap success rate of over 90%. There was 1 complete flap necrosis using a cross-leg flap. Three sural neurocutaneous flaps had tip necrosis that healed well with dressings. The rest of the flaps healed primarily, with impressive aesthetic results. All flaps have been stable on long-term follow-up. **Conclusion:** The sural neurocutaneous flap is an easy to raise but highly effective tool for defects of the lower one-third of the leg. Its skilful application has virtually eliminated the need for free flaps in these injuries at our hospital. The aesthetic outcome and contour restoration with sural neurocutaneous flaps far exceed those of muscle flaps and peninsular fasciocutaneous flaps. **Significance:** The significance of this paper is that our shared experience and techniques will serve as succour for other surgeons coming from centres without microvascular facilities who have to resurface complex post-trauma defects of the lower-limb.