UGANDA SUSTAINABLE

USTOP

TRAUMA ORTHOPAEDIC PROGRAM

Trip Report | April 5 - 19, 2013

a place of mind
THE UNIVERSITY OF BRITISH COLUMBIA

Contents

Personnel

Regina Colistro, physiotherapist
Alicia Green, nurse
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Genelle Leifso, nurse
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Nathan O'Hara, coordinator
Dr. Marie-Eve Pelletier, orthopaedic resident
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Dr. Adam Sidky, orthopaedic surgeon
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USTOP would also like to thank Dr. Tito Beyeza and the entire staff at Mulago Hospital, Dr. Rodney Mugurua our GPAS/USTOP scholar, Ms. Harriet Nambooze from the CNIS Skills Lab and Ms. Monica Kabagambe for all of her hard work to ensure this trip was a success.

Trip Schedule

April 2013

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2	3	4	5 Perioperative Nursing Course	6 Perioperative Nursing Course
7 Basic Bioskills Course	8 OR (Casualty, Ward 7)	9 OR (Casualty) Hospital Rounds	10 OR (Casualty, Ward 7)	11 OR (Casualty, Ward 7)	12 Sterile Processing Workshop Outpatient Clinic OR (Casualty)	13 Advanced Bioskills Course
14	15 OR (Casualty, Ward 7)	16 OR (Casualty) Hospital Rounds	17 OR (Casualty, Ward 7)	18 OR (Casualty, Ward 7)	19 Outpatient Clinic	20

Courses

CNIS Safe Surgery Saves Lives - Perioperative Nursing Course

Date: April 5 & 6, 2013
Location: CNIS Surgical Skills Lab, Mulago Hospital
Attendance:

- 16 (female), 2 (male)
- 16 perioperative nurses, 2 scrub technicians
- perioperative nursing experience: from one month (2) to more than 20 years (3)

Sterilization Seminar

Date: April 12 & 16, 2013
Location: CNIS Surgical Skills Lab, Mulago Hospital
Attendance:

Infection Control Head Nurse, theatre nurses (Main, Ward 7, Casualty, Eye, Gyne, UCI), ward nurses, sterile processing personnel (Total = 20)

Courses cont'd

Orthopaedic Bioskills Course - Basic

Date: April 7, 2013
Location: CNIS Surgical Skills Lab, Mulago Hospital
Attendance: orthopaedic residents (years I, II), OR nurses
Topics:
LECTURE Surgical reduction techniques: Respecting bone
LECTURE Spectrum of stability
LECTURE Screw design and Function
PRACTICAL EXERCISE – Screws – introduction of drills and screws
-postion screws
-cortical lag screws
-cancellous lag screws
LECTURE Plate design and function
PRACTICAL EXERCISE – Plates
-Lag screw with Neutralization plate, large fragment
-Dynamic compression plate, small fragment
-Buttress Plate, large fragment

Orthopaedic Bioskills Course - Advanced

Date: April 13, 2013
Location: CNIS Surgical Skills Lab, Mulago Hospital
Attendance: orthopaedic residents (years III, IV), OR nurses
Topics:
LECTURE Surgical Safety Checklist
LECTURE Principles of Intramedullary Nailing
LECTURE Intramedullary Nailing of Proximal Femur Fractures
LECTURE Intramedullary Nailing of Femoral Shaft Fractures
LECTURE Intramedullary Nailing of the Tibia
PRACTICAL EXERCISE – DEMO – Tibial nailing
PELVIC RING FRACTURES
LECTURE Classification of Pelvic ring Fractures
LECTURE Radiology of Pelvic Ring Fractures
PRACTICAL EXERCISE
-Exfix pelvis
-iliac crest and supra-acetabular pin techniques
-ORIF
-Symphysis Pubis
ACETABULAR FRACTURES
LECTURE Classification of Acetabular Fractures
LECTURE Radiology of Acetabular Fractures
LECTURE Indications for Surgical Treatment of Acetabular Fractures

Closed Gloving and Gowning

Date: April 11, 2013
Location: Library, Orthopaedics Department, Mulago Hospital
Attendance: orthopaedic residents

Lectures

Morning Orthopaedic Teaching Sessions

Attendance: orthopaedic residents

Physiotherapy Education

In Service Training

Attendance: physiotherapy staff
Topic: neurological motor and sensory assessment and documentation

Half Day Seminar

Attendance: physiotherapy students
Topic: physiotherapy treatment of trauma patients (orthopaedic and spinal cord injuries)

Lecture

Attendance: orthopaedic residents
Topic: neurological assessment and classification of spinal cord injuries, using the international standards (ASIA- American Spinal Injuries Association)

Clinical Training

USTOP participated in a variety of cases with the staff and trainees at Mulago Hospital. Some of these cases included:

- Three week old capitellum fracture in a child
- Pipken 2 with posterior acetabular lip fracture
- Two year old ankle fracture dislocation
- Removal of femoral hardware
- Patellar tension band wiring
- Dislocating unipolar
- Tibial nailing
- External fixating
- Unipolar

Prosthesis

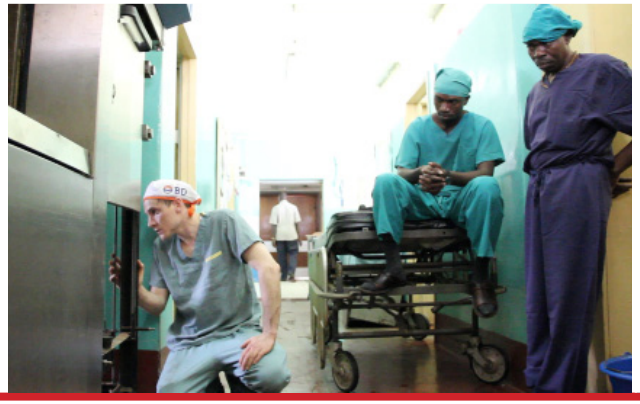
The visit marked the start of a new collaboration between USTOP, Mulago Hospital Rehabilitation and the Ellen Meadows Foundation to supply and fit LN-4 hand prostheses. The need for a program involving low cost, practical hand prostheses was established following the trip last year. The Ellen Forbes Foundation agreed to provide LN-4 hand prostheses for USTOP to transport. Appropriate training was provided to the Mulago staff to ensure a proper fit for the patients. The prostheses were provided to the patients at no-cost and replacements willl be available as the prosthesis eventually wears down.

During the visit two upper extremity amputee patients were fit with LN-4 prosthetic hands. These patients were injured last year when we were in Uganda. The two patients, one a mother of several children, who was attacked with a machete and lost both her arms, and the second, an 11 year old girl who lost both her arms in a motorcycle taxi accident, were keen to have the prosthesis. It was incredible to see that the first thing both patients did with their new prosthesis was write their name.

Another bilateral arm amputee patient, theresult of a machete attack, came to the hospital during our time in Uganda. She will be fit in a few weeks time by one of the Mulago Occupational Therapists .

The remaining LN-4's (a total of 13) that we brought with the team will be stored in the OT department in a secured area. The plan is that future assessments and fittings of prospective appropriate patients will be done by one of the two Ugandan occupational therapists. The OT's will ensure the prostheses are supplied free of charge and will collect the necessary information required by the Ellen Meadows Foundation. Support will be provided by the USTOP therapist on an ongoing basis. The USTOP therapist will maintain the link between the Mulago OT's and the Ellen Meadows Foundation, and ensure and maintain the flow of information required for the ongoing supply of the LN-4' prosthesis.

Sterile Processing



The involvement of sterile processing personnel has become a large component of USTOP. This trip we were fortunate to have Craig Haubrich from Getinge Canada Ltd on the team. Craig worked with Samantha Shone, a Medical Device Reprocessing Coordinator at Vancouver General Hospital, and technicians at Mulago Hospital to evaluate and service many of the autoclaves at Mulago Hospital. The purpose was not only to improve the function of the machines but to look for redesign options to address mechanical performance of the machines and the systematic delivery of reprocessing services at the hospital.

Infrastructure Support

One of the highlights of this trip was the discovery of the talent and expertise of the technicians of the Mulago Orthopedic Workshop. These talented gentlemen were able to make many items of equipment needed at the hospital , for the orthopedic and spine wards, specifically two wheelchairs, wheelchair cushions for pressure relief, replacement pins for cervical tongs, and a table for the Operating Theatre. These items were designed at the hospital, specific to the need, and made in within a few days, for relatively minimal cost.

Drill Cover Design

USTOP has partnered with two Engineering graduate students, Lawrence Buchan and Marianne Black, to develop a resterilizable cover to enable surgeons to use commercially available drills in the operating room. The design has tremendous potential in a low resource setting and is currently under going a second phase of testing.

Low Cost Sterilizer

USTOP has partnered with six undergraduate engineering students to develop a autoclave prototype for low resource environments. The initial design has passed rigorous testing at the University of British Columbia Engineering labs. Plans for further testing in Uganda are underway.

USTOP Video

Video is available at:
http://www.youtube.com/watch?v=0yFsMVrxEGA&feature=youtu.be

This video documents the April 2013 trip providing insight from Canadian and Ugandan partners on what USTOP has been able to achieve and what challenges still remain.

Recommendations

Clinical Care

Consistent use of the Safe Surgery Checklist. While the Checklist was posted on the walls of some theatres, there was little evidence that the Checklist was being put into practice in a consistent manner. We observed that the circulating nurse is not always present to do the Checklist with the surgeon and anesthetist. These nurses are preoccupied with instruments or readying supplies. The nurses must also value the Checklist as a patient safety initiative and ensure that they are able to participate when the surgeon and anesthetist are there to do it. Using the Checklist will increase communication and teamwork and provides a forum whereby patient concerns as well as breaks in sterile technique can be identified and addressed. Leadership on the part of the surgeons is critical.

Basic handwashing. Washing one's hands before and after direct patient care is an important strategy in decreasing hospital acquired infection. Access to soap and water is important, as is the length of time (15 to 20 seconds) that this activity should take. For example, soap and water was not always available in the OR staff toilet. Nor were there nail cleaners at the scrub sinks. Since the 2012 course, Ward 7 had a box of nail cleaners on the cart with other anesthetic supplies. Betadine soap was now available at all the scrub sinks.

Patient identification bands. It is not unheard of to have two patients with the same name in the hospital, and patient identification in these situations comes from the patient and the patient's family. Once the patient is anesthetized and unconscious there is significant potential for error. This seems like a systems process which could be improved and potentially decrease risk to patient safety (i.e. wrong patient). Patient identification should include name, birth date, chart number, sex, and allergy status The use of plaster/adhesive tape (a commonly available product) on which this information was written was observed for some patients in Ward 7 and Main theatres.

Surgical site marking. This should be instituted for patients having surgeries on a right or left side (i.e. paired organs, limbs). Marking must be done by the surgeon or designated surgical resident. It must not be delegated to the nurse or anesthetist.

Pulse oximetry. Pulse oximetry is available (there are two) but not routinely used in the Casualty Theatre. On one occasion as the "before induction" portion of the checklist was being competed, the sat reading was 71. Obviously this was not accurate. It is important that the pulse oximeter is "functional"; an accurate baseline is needed so that any deterioration in patient status can be recognized.

Surgical team members wear cloth masks. The barrier protection of these masks is inadequate for both the patient and the healthcare providers because they allow larger particles to pass through the barrier. Some team members wore paper masks but these were also worn for the whole day. Masks should be changed after each case; however, this solution costs money. Another problem identified is that the masks are not worn correctly. Masks should cover both the nose and the mouth. We observed that the masks are often positioned below the nose, which is an incorrect practice.

Surgical scrub. Working in a variety of surgical settings, it is apparent that some review of surgical scrub procedure could benefit all members of the surgical team. There are no clocks above the scrub sinks, nor did the perioperative nurses in the course know the "stroke" method of scrubbing. Some surgeons and residents were observed to be very cavalier in their approach to the surgical scrub. And so, the correct scrub procedure should be reviewed and monitored for compliance. It is also common practice for some surgical staff to wear wedding rings while scrubbing and consequently during the surgical procedure. Best practice is to scrub with all jewelry removed from the hands as the literature reports that there can be 10x the bacteria under rings - even when washing with soap and water.

Closed gloving. All scrubbed personnel should use this method, rather than the "open gloving" technique. Those who attended the course have been taught this method, and the nurses we were able to "coach" were all successful in applying this skill. In addition, this practice should be taught to the surgical residents who often work without the assistance of a scrub nurse to gown and glove them. We did teach this skill to a group of the orthopedic residents during a morning teaching session. This knowledge should be disseminated throughout the surgical community.

Antibiotic prophylaxis. The participants were challenged to consider the surgeries for which prophylactic antibiotics are most beneficial. Of course, antibiotic prophylaxis is only beneficial if everything else (aseptic/sterile technique) is done right. Many of the medications used are supplied from India and China and the anesthetists said there was no guarantee that the stated dosage was actually in the medication vials.

Surgical count. The practice of the surgical count could be improved. Although counts were done for some surgeries in Ward 7, the nurses weren't counting together. Ward 7 was using a count sheet but Main and Casualty were not. Casualty stated they were unable to obtain stationary because of a shortage. Ideally, an e-copy of a count sheet should be provided to the theatres so the document can be adapted to meet the needs of their OR (e.g. names of supplies and instruments). It is recommended that the Checklist and Count sheet be printed on opposite sides of the same page. The count of sponges is even more important in this practice environment, given that they are not using radiopaque sponges.

Specimens. We observed specimens being thrown into the garbage at the end of the case during clean up even though they were identified as specimens during the case. A specimen retrieved from the garbage may be adequate for pathology but definitely not for C&S. Containers were not present in the theatre for receiving the specimens.

Instrument maintenance and repair. In reviewing some of the instrument sets, it was noted that some instruments were very "stiff". This may be due to the cleaning process currently being practiced. There was no awareness of "instrument milk" for instrument lubrication. Instruments needing repair are often returned to the sets instead of being inspected for repair or usability. Cautery pencils are also recycled even though they have failed to work during that the particular case.

Decontamination of instruments. There appears to be great concern around the preliminary reduction of viral load, however this will not be successful if "bioburden" remains intact on the instruments. Rather than first immersing instruments in the Jik (bleach) solution, tissue and other "bioburden" should be removed by washing the instruments in the detergent solution (an enzymatic cleaner would be even better). Then deal with remaining viral contamination by immersion in the bleach solution and a final rinse in water. Standardization of practice (e.g. how long

should the instruments be soaked in Jik, washing of asculap instrument pans) needs to be developed and supplies for cleaning instruments/ items with a lumen made available.
This process was discussed with Ward 7 Theatre nurses in February 2012, and it resulted in a change in practice there, which continues. While some nurses in the Casualty and Main Theatre also received this education, it was apparent that there had been no attempt to share knowledge on the correct method of decontaminating instruments because no staff there were using the correct process.
The nurses should be wearing personal protective equipment (including a waterproof apron, as well as masks, protective eyewear, and gloves) while involved in the decontamination and disinfection process. This was observed in Ward 7 and it appeared that this equipment was available in the Main theatre, although we didn't observe those nurses during the decontamination process.

Personal protective equipment (PPE). In addition, personal protective equipment should be available for the scrub nurse during surgery. Many of the surgical gowns are not impervious. If they become wet, then there is contamination of the surgical field. While the USTOP team brought many donated gowns with them, consistent use of PPE is a best practice that should be available to all perioperative personnel who are at risk. The scrub nurses in Ward 7 Theatre wore plastic aprons under their sterile gown. Eye protection left behind by the USTOP team in February 2012 was used by very few of the personnel in the operating theatres (even by surgeons when the patient was known to be sero positive).

Sharps safety. Neutral zone was used for the scalpel at least some of the time in the Casualty Theatre and more frequently (although not consistently) in the Ward 7 Theatre. When prompted, there was an awareness of correct practice. Used needles were often seen loose on the Mayo Tray or back table – a dangerous practice for both the nurse and patient. It was suggested that an extra pot/bowl could be included in the set so that needles are confined and not laying loose.
Perioperative personnel commonly use scalpel blades for many non-surgical purposes (e.g. opening IV fluid bottles, cutting plaster/tape). We observed that these used blades are left on various surfaces, not disposed of properly (e.g. sharps mixed with other waste), and pose a risk to other individuals. Slicing open the IV bottles to use for irrigation is not good practice – the outer edge is contaminated resulting in the irrigation fluid being dispensed to the surgical field also becoming contaminated.

Recovery Room care. Post anesthesia care is less than optimal, especially in the Casualty Theatre. Their previous small postop area has changed to a ramped entrance to the Trauma Resuscitation space. And so, post-operative Casualty Theatre patients are now left to recover in the hallway, usually unattended and with no monitoring equipment. A family member may be present for the children. Ward 7 patients also recovered in the hallway but here a nurse was present for some of the time as she was also in charge of receiving patients to the unit among many other duties. There was one blood pressure unit on the wall but no other monitoring equipment. The patients in the Main Theatre actually were recovered in a recovery room staffed by a nurse.

Skills Training

The advanced bioskills course was well received. Suggestions for future course topics include tension band wiring, patella fracture management, dynamic hip screw, surgical management of shoulder injuries and arthroplasty.

Sterile Processing

As the hospital's autoclave have unreliable capacity, it is recommended that investment and support is made in the machines which currently operate at the highest standard. A centralization of equipment and personnel would provide an economic of scale to enable faster reprocessing times leading to a higher overall case volume for the hospital.

Other recommendations to augment to sterile supply include:

- specific pack for one patient
- correct packing materials
- surgeons planning a day ahead for instrumentation they need
- providing specialized training to non-nursing personnel so that nurses can look after patients
- using chemical integrators consistently (the purchasing department was visited and informed of the product required)
- initiating biological testing of autoclaves
- regular monitoring and preventative maintenance of the autoclaves
- establishment of an Infection Control Committee to oversee and be accountable for sterile processing. This Committee should include senior management so that there is authority for implementation of recommended improvements.

Rehabiliation Services

Support rehabilitation education to the Mulago Physiotherapy Department, the Makerere School of Physiotherapy and trainees at the Makarere Department of Orthopaedics to optimize early physiotherapy care to reduce later on disability, in a resource limited setting.

Assist the Physiotherapy Deparment to advocate for more rehabilitation staff. Mulago Hospital has over 2000 in-patients at any given moment. There are 15 Physiotherapists and 3 Occupational Therapists to provide rehab service. As a result, many trauma patients are discharged, without having seen a physiotherapist. Many of the resulting deformities and disability could be prevented. Many patients subsequently turn up in the out patient physiotherapy department, which again is not large enough to accommodate the large volume of patients.

Maintain responsibility for the LN-4 prosthesis project at Mulago Hospital, serving at the link between the Eileen Forbes Foundation in California and the Occupational Therapists at Mulago Hospital to ensure fitting of appropriate patients, collection of information for the Foundation, thus ensuring a continued supply of LN-4's to Mulago.

Infrastructure Support

Continue the link with the Orthopedic Workshop, and to encourage the use of locally made therapy and acute care equipment, which ultimately is more available, less expensive and more sustainable.

Thank you

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