

## **International Outreach Program, American Burn Association (ABA), Children's Burn Foundation (CBF) June 4-27, 2011**

### **St. Francis Hospital, Katete, Zambia, June 4-20, 2011**

Team members: Barbara Latenser, MD, FACS; Becky Jallo-Knorrek, RN, BSN; Jennette Maier, RN, BSN University of Iowa Burn Treatment Center (BTC), Iowa City, IA. Jason Heard, University of Iowa Undergraduate.

Background: St. Francis Hospital (SFH) in Katete is a 360 bed district mission hospital in the Eastern Province of Zambia. The immediate service area has a population of 250,000. Although there is a district hospital in Chipata, SFH functions as the primary district hospital for the Eastern Province and provides primary and secondary medical care to a geographical area with a population of 1.4 million. The surgical wards admit ~80 burn patients annually. Burns are typically seasonal and occur primarily due to cooking (scalds) and/or open fires in the home (flame). Burns of > 20% total body surface area (TBSA) are life threatening. Scald burns related to cooking and flame burns due to open fires are the primary cause of burns. In winter (June-August), the incidence of burns increases due to open fires used for warmth. Burns in patients with epilepsy are usually deep with a significant TBSA. Zambians will not help a seizing victim who falls into the fire because of the belief that epileptics are possessed by demons or evil spirits. Significant delays in seeking medical treatment are common. Patients often turn to the African bush doctor for treatment which may include tattoos, herbal remedies, prayers, or spells.

SFH is managed by the African Anglican and Catholic dioceses and features a two year nursing college and medical volunteer opportunities including an elective for medical students from abroad. The Executive Director is Shelagh Parkinson, MD, who has been at SFH since 1998. The hospital administrator is Ian Parkinson. The chief surgeon is Mike Currie, MD, who has been at SFH since November 2009. Mrs. Seya, RN, director of nursing services, is on leave for 6 months. Mrs. Xoliswa Silanda, chief nursing tutor, has been at SFH at least 16 yrs. She was revising the nursing curriculum during the last burns team visit. Mr. Rodwell Banda, senior anesthetist, has been at SFH since 1988. Dr. Parkinson, Dr. Currie, and Mr. Rodwell Banda, have shown enthusiastic support for the burns training and education provided through this program. Prior trips resulted in planning of the men's and women's burn units and subsequent opening of these units. In June 2009, the Zambian Ministry of Health was accused of a fraud scam, resulting in international donors withholding funding. This reduced the government funding for SFH, which relies on funding from the Ministry, by 90% as well as essentially drying up the international donor pool of funds. Ian Parkinson is being replaced as hospital administrator and the Parkinsons leaving SFH in November 2011. The future management team at SFH is not currently known.

### **Program Goals**

1. The primary long term goal for the International Outreach Program at St. Francis Hospital is to globally improve burn care, reduce mortality and morbidity, and progressively move towards a more independently functioning burn service (see Figure 1). Over the next 3-5 years, the program will provide burns education, teaching sustainable, translatable burn care that will prepare the SFH medical staff and improve the functional outcomes of burns of 10-24% TBSA.

2. The other primary goal is to expand burn prevention outreach programs to decrease the incidence of burn injury and death through educational programs in the schools & community businesses in Katete, and provide support to the Fire Brigade Service in Katete.
3. Table 5 contains detailed goals and timetables.

There were four team members. Barbara Latenser served as the team leader. Most of her time was spent in the operating theatre Mo-We-Fr, teaching rounds with the licenciates and staff on Tu-Th-Sa-Su. Lectures were held on Tu and Th afternoons. She also met with the Fire Brigade Service in Katete. Rebecca Jallo-Knorrek and Jennette Maier represented nursing. Both spent hours on burn and surgical ward rounds as well as extensive burn ward demonstrations, speaking with burn ward staff, and learning about barriers to providing care to burn patients. There were 10 hours of lecture and hands-on laboratory teaching 49 students at the School of Nursing. Jason Heard performed burn prevention interventions and data collection for children at 2 elementary schools as well as adults in the community.

**Table 1: Burn/wound patients**

Name Unit	Age	Date of Burn/Injury	Date of Arrival	Burn size	Mechanism of Injury	Dates of Operating Theatre SI=sloughectomy STSG=grafting	Date of Discharge
M.T. Mukasa	4	5/10/2011	5/12/2011	18%	Dress caught fire  3 <sup>rd</sup> degree and infected donor sites	5/13 SI 5/16 SI 5/19STSG 6/13 SI 6/15 SI	
K.Z. Mukasa	1	6/08/2011	6/07/2011	4%	Stepped into fire, full thickness	6/13 STSG 6/15 dsg change	
J.B. Mukasa	36	April 2011?	6/07/2011	4%	Seizure (fits) caught fire	none	6/11/2011
G.B. Mukasa	41	May 2011?	6/06/2011	4%	Seizure (fits) foot caught fire 3 <sup>rd</sup> degree- infected to the bone/joint open	6/08 SI 6/15 SI 6/20 BKA	
M. Z. Mukasa	37	5/21/2011	5/23/2011	12%	Scald, infected wound-abscess, decub AIDS	6/08 SI 6/17 SI	
G. P. Mukasa	3	6/11/2011	6/12/2011	11%	Fall into fire (burning maize) 2 <sup>nd</sup> & 3 <sup>rd</sup> degree	6/13 SI, escharotomy 6/15 STSG arm 6/17 STSG hand, torso	

I. Z. Mukasa	10	6/04/2011	6/12/2011	4%	Wound-snake bite Puff Adder	6/13 SI 6/15 SI 6/17 STSG	
L.N. Kizito	19	3 weeks ago	6/10/2011	4%	Wound-Injured leg with sharp hoe	6/13 SI 6/15 SI 6/17 STSG	
M. Z. Kizito	5	6/14/2011	6/15/2011	8% 2 <sup>nd</sup> degree	Hot water scald	none	
A.S. Kizito	50	Mar 2011?	6/14/2011	1%	Fungating heel tumor, presume melanoma	06/15 excise 06/17 STSG	06/20

**Medical staff:** Daily ward rounds cover 50-70 surgical patients (including the burn patients), and clinic on Tu-Th has 40-50 patients each time. Power goes out daily, rendering the OR equipment useless. There were 2 Padgett dermatomes present but nonfunctional that we brought back to the US for repair. We brought one donated dermatome and blades and used this equipment throughout our stay. The electrocautery works intermittently. Most skin meshing is performed by hand on a small wooden cutting board. There is no blood, and most patients are quite anemic from malaria, HIV/AIDS, and malnutrition. Using tourniquets and topical epinephrine in the saline for excised areas and donor sites were new tricks for the medical staff as was using tape to secure skin grafts in place. Skin grafts have typically been done 1-4 months post injury, on granulation tissue, with very poor results. The skin grafts performed while we were there all had 90-100% graft take. Keeping donor sites clean to promote healing was a new concept. OR debridement led to rapid donor site healing in one patient who had previously failed to heal donor sites after >1 month. Debriding all the granulation tissue and daily wound care to keep the ever present pseudomonas at bay was a key part of our success, since topical antimicrobials are not reliably available.

Surgical audit was conducted once while we were there. The 2 burn patients who died were aged 2 ½ years and 3 years old with medium sized burns. Foley catheters are not used and urine outputs are not measured. Topical antimicrobials were not used but both children were placed on IV antibiotics at the time of admission. The crux of the discussion was about IV antibiotics vs early surgical excision and topical antimicrobials. Most licensiates & physicians believe that IV antibiotics, saline to keep the wound moist, waiting for robust granulation tissue, and then grafting the wound is appropriate acute burn care management. Both children died at the end of the resuscitation period, most likely from burn shock, but the local consensus was sepsis. Other complications are not recorded or tracked.

**Table 2: Medical lectures**

Date	6/7/2011	6/9/2011	6/14/2011	6/14/2011	6/16/2011
Topic	Intro to Burn Care	Burn Physiology	Impact of burn	OR burn wound	Burn quiz & answers,

			teaching teams at SFH	management	evaluations
Audience	Chainama School for Licensiates SFH	Licensiates, intern, attending surgeon SFH	SFH staff	Licensiates, intern, attending surgeon SFH	Licensiates SFH
Number	7	8	53	9	9

An anonymous evaluation of the effectiveness of the instructor and the course was done at the end of the rotation using the evaluation tool developed by the team (see attachments). The instructor was rated 5/5 on knowledge, lecture topics, and teaching effectiveness. The licensiates took the post-test developed by Jennette, and missed between 1-4 questions (see attachment). There was no pre-test for comparison. All lectures were provided to the licensiates on a CD at the end of the course.

**Nursing staff:** Upon our arrival only the Mukasa (female & pediatric burns) ward had burn patients; the majority of our time on the wards was spent there. We assisted in bathing, wound assessments, dressing changes, staff education, ward barrier assessment, nutritional education, and burn team collaboration in surgical wards rounding. Time was spent with nurses Zeb, Stella, Anna, Chris, Isaac, and Mwsonda on Mukasa ward. The nurses Kanonkela Shindon, Oleepa, and David were on Kizito ward. Nursing students were available most days and also participated. Most days a staff member would be present, but would have to be asked to participate. It was necessary to remind the nursing staff that the purpose of our visit was to provide burn care education and not simply manpower. We were made aware that nursing staff was increased for our visit but that normally two nurses work during the day with up to 45 patients, making quality care of burn patients a steep challenge. There are times when only one nurse must tend to the entire ward. Frequent turnover (averaging six months) of nurses is common. There were only a few remaining nurses that had been present during the August 2009 visit.

**Observation 1:** Cleaning and dressing of burns and wounds was done infrequently, using only normal saline. The physicians often took patients to operating theater for dressing changes. Dressings often went at least four days between changing. The nurses did not change the first post-operative dressing regardless of what procedure was done, and they did not do any dressing change unless specifically ordered. They did not question or assume the role of changing the dressing even if prolonged time passed, the dressing had foul odors, or it was soiled. These observations reflect low autonomy of nursing staff.

**Burn Nursing Intervention 1:** We taught the nurses the importance of daily cleansing and dressing changes. We discussed burn/wound management, burn depth, use of topical medications, donor site care, care of grafts, signs of infection and stages of burn/wound healing.

**Observation 2:** Patients did not bathe or shower on a regular basis. There was no soap available for hand washing at sinks.

**Burn Nursing Intervention 2:** We taught the nurses and bedside nurses the proper technique to bathe the patient and cleanse the burns/wounds, including hand hygiene, use of soap and water, hand sanitizer, use of gloves, and disinfecting the shower area in between patients. It was also recommended to place soap at all of the sinks for improved hand hygiene. The need for hand cleansing between each patient contact was re-emphasized.

**Observation 3:** Pain management showed improvement from the previous trip report. Scheduled paracetamol was given but no additional medication was used for dressing changes. Both nursing staff and the staff surgeon reported that morphine or pethidine were rarely given, even when ordered post-op. A minimum of two hours after anesthesia went by before even paracetamol was administered due to concerns about overmedicating patients.

**Burn Nursing Intervention 3:** Administration of brufen with dressing changes daily was initiated during the visit to introduce the idea of pre-medicating for a dressing change. Anxiety related to pain and daily dressing changes was discussed with multiple staff members. Morphine for dressing changes was ordered for only one patient.

**Observation 4:** A barrier to medication administration by nurses was noted by reviewing the medication sheets and finding short intervals of pain medication order duration. The order duration is limited to seven days, but many pain medications were only ordered for three days, and at the completion of the order the physicians neglected to reorder them, leaving the patients without pain medication. The extended ward rounds by physicians and licentiates and disorganized medication sheets distracted them from the fact that orders were expired. A physician was rarely easily reachable to rewrite an order during times besides rounds. Generally, staff performed dressing changes without pain medication. We discussed this with the physician team and nursing staff and found that it was a frustration for both.

**Burn Nursing Intervention 4:** The ABA/CBF burn team emphasized writing orders for seven days (especially for non opioid analgesia), and reviewing med charts by both nursing and physician upon rounds. Orders need to be consistent and written if nurses are to follow them, as there is frequent alternation between nursing and physician teams. An admission order set was presented, discussed, and approved by both nursing staff (represented by nurse Shindon) and physician staff. It is necessary that nurses plan out their days so that they can do dressings and baths after morning rounds. The orders for nutrition and topical medications have to be sent to the pharmacy in the early morning.

Discussion with chief nurses revealed a desire for nursing guidelines to ensure consistency with rotating staff and nursing students. Jennette and Becky designed guidelines (see attached guidelines) that were hung in both burns wards to standardize pain medication, bathing, topical medication needs, and wound care. Several nursing staff requested the lectures prepared for SFH nursing students and requested additional burn nursing lectures during the August 2011 CBF visit. The lecture handouts were given to the Mukasa and Kizito wards in the form of CDs and handouts. Computer access is a challenge for most SFH staff.

**Nutrition:** Nutrition access, orders, needs, and education were addressed. We evaluated nutrition in the burn wards. Currently, patients receive 3 meals a day: porridge with groundnuts (locally grown peanuts) for breakfast, rape, nshima, and beans for lunch and dinner. We met with Grace, the current nutritionist of one year. It is uncertain whether there will be any more Plumpy Nut as the province distributes the WHO donations, and the hospital has no control over ordering amounts. SFH received 10 boxes on June 16, 2011, but they had been waiting for quite some time and were not told if/when further shipments would arrive. Plumpy Nut is primarily reserved for malnourished children but the hospital has been out. We explained to Grace about the burn patients' increased nutritional needs; she is aware that the malnourished and burn patients have priority. Plumpy Nut as a food source may not be sustainable. Another supplement, F100, is allowed for all burn patients, including the adults. We were told by nursing staff that it was available and being given. Two days prior to leaving, we discovered that the burn patients had not received F100 all week because the nurses did not have time to collect the orders they had placed. There is not a reliable system in place to collect orders for F100. F100 and Plumpy Nut are distributed from the pharmacy. The pharmacy head, Jeremiah Nyirenda, verified that there were sufficient supplies of F100 for all burn patients. Feedback from staff and observations revealed that surgeon Mike Currie reminds the nursing staff frequently about obtaining Plumpy Nut. He was unaware that the F100 could be ordered for adults. We did try to initiate this in the final week but the burn patients did not receive F100 that week. We encouraged the use of nasogastric tube feedings, but none were used. Bedsiders were educated about good nutrition (protein rich foods) to bring for the burn patients.

**Pharmacy:** We investigated barriers to care between the pharmacy and wards. Topical medications are not stocked on the ward. Orders are dropped off by nursing staff, who then must return later to pick up the order, taking time out of the patient care day. This turned out to be a barrier and frustration for staff. We presented our concerns to the head pharmacist, Mr. Nyirenda. There is adequate room for SSD and neomycin in the medication floor stock for the ward. We pointed out that these are the most important medications for a burn patient, so they must be available. Obtaining medications is a barrier for the nurses, who have to check in at the pharmacy several times a day to see whether the medications are prepared. Mr. Nyirenda agreed and said that the charge nurses can order topical medications and dressings in the stock book and it will be approved by pharmacy. The staff was concerned that they would not be allowed to order the stock themselves, so we assisted them by determining stock amounts in the Mukasa ward and had them collect these from the pharmacy. Follow-up revealed that floor stock was obtained. The staff was very pleased.

A pharmacy inventory revealed minimal topical antimicrobials. SSD is present in 15 gram tubes but there were only 60 tubes. There were only 20 tubes of Neomycin in stock. Aqueous cream, which is prepared at the pharmacy, was out (there was a shortage of paraffin) or in short supply during our visit. When we inquired about future orders of topical antimicrobials, Mr. Nyirenda stated that he was told to order limited stock by the hospital administrator, due to cost. When the issue of topical antibiotics versus systemic antibiotics was discussed during the hospital's surgical audit, several doctors, including the medical director, favored the administration of intravenous antibiotics over topical antimicrobials. We inquired in the pharmacy about the availability of F100 for all the burn patients, regardless of age. We informed Mr. Nyirenda and Dr. Currie that F100 was to be used for adult & pediatric patients.

**Therapy:** Mwape is the current and only physiotherapist for all wards & outpatient clinics. Her time is spent primarily in the surgical wards, with priority given to post-op orthopedic and cerebral palsy patients. She was very receptive to learning splint-making techniques and positioning, and looks forward to receiving training by the August 2011 burns team. She was unaware of positioning specific to burn patients but was given a book designed by a previous CBF burn team. We informed her of the need for early activity such as ambulation, stretching and the encouraging of out-of-bed activity, such as sitting in a chair several times a day.

**Nursing Student Education:** The SFH Nursing School is a competitive two-year program that is highly selective with 600 applicants for 49 slots in each class. There are a limited number of nursing schools in Zambia with many only accepting 20-30 students per term. During the first year, students briefly learn about burn care. Other experience is acquired from encountering burn patients when the students help out on the wards when not in nursing class or clinical rotations. Until now, ABA/CBF teams have not had access to nursing students. Mrs. Xoliswa Silanda is the head of the nursing school. She allowed us 11 hours of lecture time distributed over 4 days. We developed two tools to assist in measuring effectiveness: a burn knowledge assessment tool was created by Jennette, with testing before and after the series of lectures. An instructor course evaluation tool was created by all team members.

**Table 3: Nursing Lectures SFH School of Nursing**

Date	6/09/2011	6/13/2011	6/15/2011	6/17/2011
Hours	2	3	3	3
Lecture topics	Intro to burn Nursing	Early burn management, Fluid Resuscitation,	Infection, Wound management, Pain Treatment	Metabolism and Nutrition, Range of Motion, and Positioning
Labs/assessments	Pre-test: burn knowledge quiz	3 case scenarios using Burn Diagrams and calculating Fluid resuscitation	Wound cleansing techniques, preparation of topicals (including slurry), dressing wounds and including consideration for mobility	Demonstrations of proper positioning and range of motion.  Post-test: burn knowledge quiz.  Instructor and course Evaluation.

Nursing students were receptive and asked good questions after each lecture. We tracked quiz results and noted improvement. Course evaluations showed increased student interest in burn care. Some students requested more lecture time, as well as clinical burn instruction on the ward. Comments reflected an improved knowledge of cleaning, dressing, and therapy skills. Nursing students requested hard copies of the presentations, which were made available through printing at the school. Due to viruses on computers and flash drives, CDs or inexpensive flash drives of presentations are

recommended. The nursing school does have a projector for presentations but there was difficulty in finding compatible computers. Our main contact and resource person was Daka Mboni who was head clinical instructor but he died unexpectedly at the end of our visit. A replacement contact at the nursing school should be identified, as Mrs. Xoliswa Silanda may be unavailable.

### **Katete Fire Service**

June 10, 2011 Barbara Latenser met with the Council Secretary, Grayson Lankhata, in Katete prior to meeting with the Fire Service. The red WWII vintage tanker truck labeled "Chipata Fire Service" was staffed by Mr. Binwell Kumwenda, the officer in charge of the fire brigade and Fire Inspector. Accompanying him were Jimmy Malamula, the firefighter, and Hezzy Nyambose, the driver. There are 7 all total, but 4 are currently off at elections. Mr. Binwell invited me in to see the building, and apologized for no chairs as they were getting it cleaned "floor mopping" this week. Jimmy is leaving for 3 months to attend the National Fire Service Training School, PO Box 80489, Kabwe, Zambia, so he will have some training. I didn't ask if Hezzy or Binwell had any formal training. There is a mess with a small wood stove but no refrigerator (there is no electricity or running water in the building) or other means to cook. There is a small office with a desk, and 2 other rooms that will be used for a sleeping quarters and a dispatch/reception type area.

Mr. Kumwende has no computer or email address but can be reached at 0975 993021, his mobile. His address for mail is: Katete District Council, PO Box 55023, Katete, Zm. There is a toll free fire number, 993, but right now it rings in Chipata (90 km away), and the fire service drives one hour to Katete when activated. Mr Kumwende is getting this to ring in Katete, and has also requested a land line in his office and believes it will be coming soon. The fire service is available 0740-1700 M-F but he has his cell phone available 24 hours, so if there is a fire, someone calls him, as they are on standby 24/7. There is a minimum crew of 3, so they would all go to a fire if called.

When a fire call comes, they drive the truck (it took about 10 minutes to start it when we tried) to the location and first, establish a safe perimeter, make sure there are no live wires, then check for life, then try to extinguish the blaze. The truck can carry 1700 liters of water when full, but usually carries 1500 liters. There are no fire hydrants in the entire province of Katete. Once the fire is extinguished, or burned out, Mr. Kumwende is in charge of investigating the cause of the fire.

Another duty is to do community education (sensitization) programs. Right now, he is trying to education the community about fire prevention. He has made contact with some places but has not heard back from them. He thinks it is important to get into the schools but has not yet done that. In this community of 10,000 people, there were 6 fire turnouts between August-December 2010. Most of the time, the fire service is not notified until something is fully ablaze, or they are not ever notified. One of his duties is to do fire certifications for public buildings. I did not ask what training he has to certify a building is safe, but he investigates new construction for public buildings and makes sure that no flammable materials have been used. Many of the structures in the villages have a dirt floor and thatch roof. Another job is to enforce fire regulations but it is unclear how that is done, or if there are penalties for noncompliance. Mr. Kumwende is trying to teach a fire party, where workers within a certain premises know how to evacuate the premises, activate an alarm, work a fire extinguisher, etc. He doesn't think this happens much, even at SFH.

Currently, when they go to fight a fire, they go in their blue uniforms, which look like short-sleeve scrubs. They do not have helmets, turnout gear, boots, SCBA, gloves, or anything to protect them against fire or chemicals. Mr. Kumwende is worried that the Great East Road is the point along which everything to and from Mozambique and Malawi enters Zambia, and the overloaded chemical trucks could crash. If they do, there is nothing for them to clean up the spill safely. They are very keen to get flashlights, and the Jaws of Life, for they also respond to road traffic accidents (RTAs), and if it is bad, he said they have a very difficult time getting someone who is trapped out of the car.

For his outreach programs to schools, workshops, and restaurants, Mr Kumwende would like to have a computer and a beamer (LCD) so they can do big group educational programs. He will get permission from the workshops and restaurants, as we have permission from the DEBS (district education board secretary) to go to every school in the district. It will be easy to get this permission again next year. Posters with our message in both English and Nyanja will help, as will simple radio broadcasts aimed at the villages. Radio broadcasts regarding burn prevention will be taken by the August 2011 burn team.

Mr. Kumwende has requested that a team of burn prevention specialists and firefighters stay in Katete for one month. We agreed that we will have a program in June 2012, and Ray Reynolds, IA state fire marshal, will lead this project. He will contact Mr. Kumwende after this team returns to the US. For large amounts of information transfer, Ray will email the council secretary, Grayson Lenkhata, with large information or anything that needs to be printed, keeping in mind that printing capabilities in Katete are limited.

**Burn Prevention Education:** A burn prevention education event and demonstration was done by Jason Heard at assembly for all students at Tikondane Community School. The answers to the research survey completed the day before for grades 4-7 were given to the students. A stop, drop and roll demonstration was done by Jason Heard and 4 student volunteers. This was the first exposure to Stop, Drop, and Roll for students and it was well received. After the assembly Jason, Becky, and Jennette traveled to each classroom to distribute a burn prevention story/coloring book to each student (Attachment 1). The book, written in English and Nyanja, tells the story of two Zambian children that find a magical rabbit that goes back to their village with them to go over burn prevention and other safety strategies. Six hundred fifty students received books and crayons. A similar prevention demonstration was performed at Jersey School near SFH for grades 4-9. Grades 6 and 7 (125 students) received the burn prevention story/coloring book and crayons. Students in grades 4-5 and 8-9 completed the survey and received the burn prevention demonstration but did not receive coloring books (we ran out).

The burn prevention programs were well received at every school and within each classroom. Every educator was eager for the program in their classroom, and all requested a longer program in the future. For future programs, a burn prevention curriculum needs to be designed and implemented across the Katete School District. A research study is planned for June 2012 to determine whether this burn prevention education is retained.

**Research/Burn Prevention Outreach:** A burn prevention research study approved by the University of Iowa Hospitals and Clinics Institutional Review Board (IRB), SFH Ethics Committee, and the Katete District Education Board Secretary (DEBS) was conducted at Tikondane Community School and Jersey School in Katete. The research team was

Janelle Born RN BSN, Jason Heard, Becky Jallo-Knorrek, Barbara Latenser, and Jennette Maier. Five hundred fifty children between the ages of 7-18 completed a 10 question survey pertaining to burn prevention techniques (Attachment 2). The student surveys were easy to collect within the schools using the teachers as intermediary translators. All of the students also spoke some English, and all could read and write in Nyanja or English, but many were bilingual. Simple statistical analysis of the aggregate was used to determine the frequency and percentages of correct and incorrect answers for each question. The students were analyzed after being grouped by age. The students performed well on some questions and poorly on others but a need to for burn prevention intervention is evident. The students received a burn prevention demonstration by Jason Heard; 650 students at Tikondane and 125 students at Jersey School received an English/Nyanja burn prevention story/coloring book and crayons. A reassessment is planned for June 2012 to evaluate knowledge retention.

An adult survey of patient family members and villagers was also performed. Forty people were asked questions pertaining to burn prevention strategies and mechanisms of burn injuries, focusing on prevalence and awareness of seizure (fit) related burns. There were significant barriers to obtaining adult surveys as most spoke no English and very few could read or write in either language. Simple analysis was used on the aggregate to determine frequency and percentages of correct answers; the fill in the blank answers were also analyzed. Adults did well on the surveys, but there is a clear need for burn prevention education within the adult population.

### **University Teaching Hospital, Lusaka, Zambia, June 23-25, 2011**

The team met with surgery department chair James Munthali and Chadwick Ngwisha and toured UTH hospital surgical wards. Approximately 500-700 patients/year are admitted to 5 different burn wards under the management of 5 different surgical teams. Current burn care is dependent upon which team admits the patient. Early surgical intervention is rarely performed. The operating rooms have been closed for renovations for the past 1.5 years, opening 2 months ago. There is minimal surgical equipment available in the operating room. Although burn care antimicrobials are provided by UTH if patients are treated according to the department protocol, the hospital has been out of topical antimicrobial agents for the past 4-5 months, so a patient's family must buy the medication, bring it to the ward, and the nurse will apply/administer the medication. Time was spent with burn service director, Dr. Chadwick Ngwisha learning about future plans for burns service including standardizing admission, surgical, and discharge protocol. Dr. Ngwisha has developed a 3 page data collection tool to be completed by the registrar at discharge. It is not in electronic format and it is unclear who will manage the collected data. We received permission from Drs. Munthali and Ngwisha to move forward with analysis and publication of burn patient data from 2003-2010, prior to Dr. Ngwisha becoming burn director at UTH.

We interviewed surgical/burn ward nurse Melinda about daily routine, cares, nutrition, pain medication, and fluid resuscitation practices. We found that patients receive some resuscitation fluids, given in bolus but not given hourly. Burn patients have burn diagrams sent up with them after admission but are primarily completed at discharge. Patients bathed twice a day with in the tub room. Bedsiders assisted with the afternoon bathing. Dressings consisted most regularly of normal saline with an absorbent pad, which was changed every 3 hours. Postoperative dressings are removed by the surgeon, usually 7 days after surgery. Some patients were given a nasogastric tube but

rarely given F100, usually eggs and milk are put down tube. Plumpy Nut was available but was not routinely ordered.

**Table 4: UTH Lectures**

Date	6/24/2011 (Becky, Jennette)	6/24/2011 (Barbara)
Topic	Burn nursing care, early burn management, infection, wound management; post test	Introduction to burn care
Audience	Nursing students	7 <sup>th</sup> year medical students
Number	151	5

**June 24, 2011 Churches Hospital Association of Zambia (CHAZ):** Barbara Latenser and Jason Heard met with the Chairman of the Board, Dr. Joop Jansen, and the Executive Director, Karen Sichinga. CHAZ is comprised of 40 hospitals throughout the country. The CHAZ board is interested in starting and managing a small private hospital in Lusaka dedicated to burn care and training. This central location within the population center provides the ideal location for a training hospital for all medical students, licensiates, registrars, nursing, and physiotherapy students. A registrar who is currently in her final year of training, Miriam Miambo, has been identified as a person desiring a career in burn care. She resides in Lusaka and is the logical choice for burn center physician in Lusaka. Care would be available to all Zambians. When the Minister of Health was convicted of fraudulent use of funds in 2009, CHAZ was the only organization not found guilty of mishandling funds. Funding for this endeavor will be through grants written jointly by CBF and the CHAZ board. The ABA/CBF teams would continue to support this endeavor with episodic multidisciplinary teaching teams.

**Final Recommendations:**

SFH: The carryover of burn interventions from trip to trip has been challenging, primarily due to the frequent turnover of nursing and medical staff. The nurses taking care of the burn patients have too many patients to provide adequate care. We propose that CBF sponsor two Zambian nurses to be trained specifically for burn nursing. The average nurse salary at SFH is \$200 month. If the sponsored nurses have a top off, they would stay at SFH. They could be trained in America through a month long training program designed to train burn nurses. They would be hosted by burn nurses during their training and would return to SFH and set up organized burn nursing. They would be responsible for caring for burn patients only and improving the quality of burn care and thereby decreasing burn mortality. They would be responsible for maintaining records on burn statistics at SFH consistent with WHO guidelines. As incentive, after certain milestones of time worked, they would be sponsored for travel to burn conferences. The anticipated change in leadership at SFH may lead to changes within the hospital. The teams should continue plans for the next year as outlined above.

UTH: Miriam Miambo should be financed to complete a 6 month burn fellowship with Shobha Chamania, Chief of the Burn Unit, Choithram Hospital and Research Center, Indore, India. She will then be ready to head up the burn unit in Lusaka under the

CHAZ/CBF auspices. The nurses will be trained the same as those for SFH above. The grant for the burn unit in Lusaka should be written by CBF/CHAZ and submitted by the end of 2011.

General: A short, up-to-date handbook on burns in low and middle income countries is needed. The June 2011 nursing team will write this by the end of 2011. Publication costs should be grant supported through the CBF.

<b>Table 5 Detailed Goals &amp; Objectives with Timetable</b>				
Goal	Time Frame	Status	Project Description	In charge
Build 6 bed burns wards on Mukasa and Kizito	2008	Complete	6 bed burn wards with heaters, sinks, hydrotherapy, and mosquito nets	SFH administration
Acquire initial epidemiologic burn data	2002-2009	Complete	IRB/SFH Director approved study. Published January 2011. Peak incidence ages 2-5 yrs. Mortality rate >50% for burns >20% TBSA. No impact on outcomes with teaching teams.	Latenser
Assess early impact of multidisciplinary burn teaching teams	2007-2009	Published Jan 2011	Completed burn diagrams and analgesic use ↑, p=0.05. Trends in antimicrobial use, early excision and grafting, and use of fluid resuscitation.	Latenser
Assess ongoing impact of multidisciplinary burn teaching teams	2012	Perform on site analysis in June 2012	Reassess topics reviewed in 2009.	ABA/CBF/SFH teams
Correctly calculate and perform fluid resuscitation when appropriate	2009-present	On going	-Posters in Kizito and Mukasa developed by August 2009 team. -Didactic, direct patient care, and lab experience for RN's, nursing students, and licensiates. -Preprinted orders by Aug 2011 team.	ABA/CBF teams
Correctly complete burn diagram on all admitted burn patients	2007-present	On going	50% completion 2007-2009. Reassess June 2012.	ABA/CBF teams through IRB/SFH Director approved study
Reduce morbidity for all admitted burns	2007-present	On going	Correct wound size and depth evaluation on admission, topical antimicrobials, appropriate pain	SFH burn care team/administration

			medication, early consult with physio, splinting and positioning, early excision & grafting when appropriate. -Reassess in June 2012.	
Reduce mortality rate for all admitted burns	2007-present	On going	Appropriate resuscitation, topical antimicrobials, nutritional supplementation when appropriate, use of blood transfusions where appropriate, early excision and grafting. -Reassess in June 2012.	SFH burn care team/administration
Improve knowledge of wound care/infection control	2007-present	On going	-Daily dressing changes with antimicrobials. -Daily linen change for every patient. -Disinfect shower between patients.	SFH burn care team/administration
Perform early burn wound excision & grafting	2007-present	Jan 2011 publication showed no increase in surgical intervention.	Goal of having every patient requiring surgical intervention done by HD 5. -Reassess in June 2012.	SFH team
Perform appropriate pain management	2007-present	Jan 2011 publication showed increase in analgesic use but 10% of pts never received pain meds.	Medical staff writes and nurses administer pain medication. -Preprinted order sheets Aug 2011 team. -Reassess in June 2012.	SFH team
Prevent post-burn contractures	August 2011	On going	-Reprint and display splinting posters in Musaka, Kizito, and OPD as developed by the June 2009 team. -Teach PT how to make splints Aug	SFH/ABA/CBF teams

			2011.	
Improve knowledge of nutritional requirements in burn patients	2007-present	On going	-Monitor availability of Plumpy Nut and F100. -Appropriate nutritional supp in pre printed orders.	SFH administration
Improve hand hygiene practices by hospital staff and visitors	2007-present	On going	-Soap available at each sink in the burn center. Encourage staff to use them. -Post signs about hand hygiene in Kizito and Mukasa near each sink. -Provide individual bottles of hand sanitizer to all SFH staff.	SFH medical/nursing administration
Dedicated long-term attending surgeon presence	2007-present	On going	Mike Currie here through Nov 2011. Another surgeon arriving for up to 3 years. Mike Currie may return long term in 2012.	SFH administration
Two dedicated Zambian burn nurses	June 2011	Pending	Assess practicality of having one burn nurse in charge of each of the burns units. Top up provided by CBF.	SFH and CBF administration
Educational module for nurses working in Mukasa and Kizito	June 2011	Pending	Nurses working in Mukasa and Kizito have opportunity to attend 2 week lecture course on burns as provided to nursing students.	SFH nursing administration/ABA/CBF teaching teams
Improved availability of essential burn care supplies	June 2011	Pending	Weekly inventory of stock in OT, Mukasa, and Kizito to assure that supplies from pharmacy are available in advance.	SFH administration
Address psychological impact of burn injury on patients	June 2011	Pending	Assess psychological impact of burn injuries at SFH. Long term goal for psych counseling.	ABA/CBF research team
Assess continued impact of multidisciplinary teaching teams	June 2012	Pending	Retrospective chart review 2009-2012 by June 2012	ABA/CBF research team

Compile minimal database set for burns consistent with WHO	August 2011	Pending	The dedicated burn nurses would perform this job on a monthly basis and submit data to Zambia site director from ABA/CBF.	SFH dedicated burn nurses/ ABA/CBF teams
Burn care manual for low income countries	June 2011	Pending	Printed manual available for all areas where internet access is not readily available. Goal is printed burn manual for low income countries by Jan 2012.	Latenser/Maier/Jallo-Knorrek/Logsetty/Dylewski
Assess burn prevention knowledge in Katete	June 2011	On going	1 <sup>st</sup> questionnaire & intervention completed June 2011. Submit to 2011 MW burn meeting and 2012 ABA meetings.	Heard/Latenser
Teach burn prevention to school age students in Katete	June 2011	On going	1 <sup>st</sup> questionnaire & intervention completed June 2011. Submit to 2011 MW burn meeting and 2012 ABA meetings. Reassess knowledge retention in June 2012. Consider puppets for school programs.	Heard/Latenser
Teach burn prevention to adults in Katete	June 2012	Pending	Ray Reynolds & Steve Knorrek develop & teach program. Develop radio program for broadcast by Aug 2011.	Reynolds/Knorrek/Quinn/Kemalyan
Assess fire service capabilities in Katete district	June 2012	Pending	Contact made with Katete Fire Brigade June 2011. -Ray Reynolds & Steve Knorrek develop & teach program.	Reynolds/Knorrek
Enhance fire service capabilities in Katete district	June 2012	Pending	Contact made with Katete Fire Brigade June 2011 by Barbara Latenser. -Ray Reynolds & Steve Knorrek develop & teach program.	Kemalyan/Reynolds/Knorrek
Develop centralized teaching center for training burn care professionals throughout	June 2009	On going	Barbara Latenser, Jason Heard met with Joop Jansen, CHAZ board chair, Karen Sichinga, CHAZ exec director in Lusaka June 2011. Potential sites	Latenser/Quinn/Dylewski/CBF/ ABA/Kemalyan

Zambia.			<p>explored, CHAZ board supports mgmt of burn hospital &amp; partnership with ABA/CBF.</p> <p>-Grant application for developing same submit Jan 2012.</p>	
Improve burn care at UTH as demonstrated by decreased morbidity and mortality.	June 2009	On going	<p>Support UTH burn care centralized approach via single approach, enhanced surgical capability, uniform documentation, education.</p>	ABA/CBF/UTH
Assess burn care at UTH 2003-2010	June 2010	On going	<p>Evaluate available data from UTH monthly surgical audits.</p> <p>-Compare pre/post ABA/CBF education programs.</p> <p>-Assess impact of burn service director on burn care at UTH since spring 2010.</p>	Maimbo/Jovic/Latenser/Edwards