

# **International Outreach Program**

## **Assessment Site Visit**

### **CMC Ludhiana, India**

**January 10 – 23, 2009**

#### **Partnership:**

American Burn Association  
Children's Burn Foundation  
Health Volunteers Overseas  
Christian Medical College, Ludhiana, India

#### **Team:**

Timothy C. Keenan, RN, University of California Davis Medical Center  
Barbara A. Latenser, MD; University of Iowa Burn Center  
Sam K. Yohannan, PT, NewYork-Presbyterian Hospital/Weill Cornell Medical Center

#### **Background**

Christian Medical Center (CMC) Ludhiana Hospital in Punjab, India is a 455 bed tertiary care hospital in northern India 150 km from Pakistan and 325 km from Delhi. The hospital, established in 1894, states its primary mission is to educate and train Christian men and women as healthcare professionals. The hospital's immediate service area has a population of approximately 3 million people. The immediate area is also serviced by a Civil Hospital (strictly charity care), numerous small private fee-for-service hospitals, and several corporate hospitals focusing care on the newer parts of the city.

CMC is surrounded by a rural belt in a radius of more than 60 miles interspersed with small towns and villages. Beginning in 2003, they began providing rural health care and education through clinics and medical camps. The hospital's Burn Research Unit receives approximately 200 inpatient burn admissions annually. All major burns are encountered in the Casualty Department and taken immediately to the Burn Resuscitation Room there. Primary and secondary treatment is performed in that location prior to admission to either the 6 bed burn ICU or the 8 bed minor burn ward. Patients requiring ventilatory support are transferred to the Surgical ICU. Burns to children and adults are primarily due to flame. Dowry burns to young women from acid or flame are a routine occurrence, as are industrial related burns. Patients with significant TBSA burns often survive but they experience prolonged hospitalization, significant morbidity, and significant out of pocket expenses.

CMC Ludhiana was identified as a suitable ABA/CBF/HVO Site for burns upon referral by Dr. Jacob Chacko from CMC Vellore. CMC Ludhiana staff is a dedicated group of healthcare providers committed to providing burn care to their local population. Using the pre/post test developed for the CMC Vellore site, the current team administered the pre-test to plastic surgery residents and staff, burn unit nursing staff, and staff physiotherapists. All the medical and physio staff returned the pre-tests. The average score on the pretest for physicians was 83.7% correct

answers. The average pre-test score for physio staff was 48.3%. The nurses did not return any pretests and no pretests were administered during the site visit. The Hospital Director, Professor A. B. Thomas, Professor Vijay Obed, and Associate Professor Ajanayanthi Mala of the Department of Plastic Surgery showed enthusiastic support for the burns training and education provided by the International Outreach Program. The visiting medical team was invited to speak at the college of nursing, college of physiotherapy, and to the resident and staff components of the burn unit. The visiting medical team taught didactic lectures and demonstrated surgical techniques as well as provided hands on teaching in the burn unit. During the second part of the mission, the team participated, on behalf of the ABA/CBF/HVO, in the 7<sup>th</sup> Asia Pacific Burn Congress in Delhi, India. The portions of the Congress relating to the CMC Ludhiana Site Visit will be discussed at the end of this report.

### **Program Mission**

The goals of the January 2009 CMC Ludhiana visit include:

- Further evaluate the state of current burn care & rehabilitation
- Discuss with the CMC staff long term goals in the areas of:
  - Medical care
  - Surgical procedures
  - Nursing care
  - Physiotherapy

Prior to reviewing the results of the mission, it is useful to have some basic reference points for the healthcare environment in which CMC operates.

- Poverty is an overlying commonality. Patients are provided medical care based upon their ability to pay, and may be referred back to the civil hospital (government hospital) if they have insufficient financial resources.
- Patients may be illiterate.
- Private hospitals are available in Ludhiana for those who can afford them. The lowest strata are the civil hospitals that provide free care. CMC is one of the best hospitals in Ludhiana but competes for fee-for-service patients in the corporate/private sector. Civil hospitals lack the resources needed to care for burn patients and therefore any surgical intervention is nonexistent.
- It is not unusual for the power at the hospital to go out on a daily basis. The operating theater does continue to work during power outages but electronic tools including the electrocautery and ventilator are nonfunctioning during power failures.
- Dowry burning remains an epidemic for the middle and lower socioeconomic class women, including acid burns. Land disputes have also resulted in significant numbers of burns to males and children peripherally involved in these conflicts.
- Delays in seeking medical treatment at CMC are common as patients turn to untrained health care providers for treatment which may include months of nonoperative care.

### **2009 Mission**

The 2009 mission occurred January 10-22, 2009 with 6 days of burns education occurring at CMC Hospital and 3 days of participation in the 7<sup>th</sup> Asia Pacific Burns Congress in Delhi. The 2009 medical mission was helmed by Dr. Barbara Latenser, MD, FACS, of the University of Iowa Burn Center who provided didactic lectures and demonstrations to surgical and medical staff as well as interactive demonstrations during the operating theater. UC Davis staff member Tim Keenan, RN, accompanied Dr. Latenser to provide lectures to burn staff, the college of nursing, and the Casualty Department nurses. In addition, he provided hands-on education in the burn research unit. Sam Yohannan, PT at Weill Cornell Burn Center, provided didactic lectures for staff, third year students, and fourth year intern physiotherapists. Hands on clinical demonstrations were also performed with staff physiotherapists and their interns.

Equipment delivered:

- 10 Burn Care textbooks by Dr. Mani Mani textbooks delivered to Vijay Obed
- Samples of thermoplastics delivered to physio department
- Burn Procedure & Rehabilitation Guidelines delivered to Dr. Benjamin
- Splinting manual delivered to Dr. Benjamin
- Toys and Play-doh delivered to the physio department and patients on the women's surgical ward and the BRU
- A burn care guidelines manual delivered to Sister Agnes
- Nursing Clinical Instructor given Family Resources & newsletter from Phoenix Society
- PowerPoint Nursing lecture basic burn nursing given to Casualty Dept EMT instructor and College of nursing.

### **Current Care in the Burn Research Unit (BRU)**

The 6 bed burn research unit is under the direction of the department of plastic surgery. Burns comprise approximately a third of the clinical practice of the two plastic surgeons who coordinate the care of the 6 bed ICU and any overflow burn patients on the 8 bed burn ward that is housed in a remote location (is the BRU also remote/how far from each other?). Patients requiring ventilatory support are treated in the surgical ICU. Their care is under the purview of the intensivists. Outpatient burns and follow-up appointments are handled in the burn clinic which is held every Wednesday. Master Samuel is the nurse manager for the BRU as well as the female surgical ward. The BRU is staffed by 2 assistant managers, 8 nurses, and 7 burn techs. The hospital's physiotherapy department is comprised of 10 physios (PT) and 1 occupational therapist (OT). Their only interaction with burn patients is dependent upon a physician's prescription and rarely happens. Nutritional assessment and management is done by the nursing staff. Use of Lund Browder diagram is not routine.

### **Physician care**

The residents arrive before 0700 daily and evaluate their patients. The attending(s) round with the residents before dividing the workload of OR, clinic, or writing patient notes. Wound rounds are attended by the entire team. Operating room cases are plentiful. The most senior resident takes the lead position in a case and if a more senior resident scrubs in, the junior resident moves to an assistant role. Level of attending supervision varies with the complexity of the case and the level of the resident. The most complex cases are done by the staff with resident assist.

## **Nursing care in the BRU**

The assistant nurse manager arrives at 0700 daily. She reviews the nursing record for each patient and ensures that all ordered patient cares have been completed. The entire burn team then joins the staff of the female surgical unit in a 15” morning prayer session. After the night shift gives a nursing report, the 3-4 day techs begin preparing dressing carts while the assistant nurse manager and the 2 staff nurses make bedside rounds.

Dressing changes are routinely done in the patient’s bed and are primarily done by the techs. Pain medication, if administered, is given at the end of the dressing change. Nurses spend the remainder of the day providing IV antibiotics and doing charting. The techs see to the daily hygiene of the patients.

## **Physio care in the BRU**

Once prescribed by the physician, the physio will do a general assessment and treatment only if time permits. The clinical workload throughout the hospital precludes having a dedicated burn therapist whose presence is more than perfunctory. There is one physiatrist for the hospital but he does not interact with in-patient burn patients. Positioning and splinting is primarily the duty and function of the burn techs who have no formal training in any patient care modality. Post operative splinting is provided by the surgeons who have limited time and training.

## **Resuscitation**

The residents and staff use dextrose and water for acute burn resuscitation. Fluid management is administered by central line inserted at the time of admission and kept in place until the time of discharge. Fluids are given by bolus and modifications loosely based upon urine output and blood pressure. Full thickness circumferential extremity burns are treated by fasciotomy at the time of admission. Systemic antibiotics are also started at the time of admission and continued ad infinitum.

## **Temperature management**

There is no attempt at warming the patient or the environment in either Casualty Department or Operating Theater. Fluids are administered without warmers, and Bair huggers are rarely utilized. The BRU is warmer than the rest of the hospital (which is unheated) but felt cooler than optimal for burn patients. There is no heating system available for the hydrotherapy room.

## **Infection control**

Access to the BRU is tightly controlled through the changing rooms. Health care providers wear hats, masks, scrubs, and communal flip flops to enter the unit. Hand washing is irrelevant and there is one centrally located staff-designated sink. A communal towel is provided for hand drying. Bandages are removed using sterile gloves, and all products touching the patient are sterile, including the bed linen. Wound care involves beta dine dabbed on the wounds, SSD

applied to the patient, followed by bulky cotton dressings. Patients do receive a bath weekly but that does not include shampooing the hair.

### **Nutrition**

Patients are required to be weighed weekly but we did not see evidence of monitoring. Nutritional laboratory studies are not performed. Enteral nutrition is not routinely used in patients with significant burns, but TPN (CVN) is fairly common practice. Meals are provided by the hospital but are low in protein. Vitamins B, C, and folate are routinely provided in IV form. Families are encouraged to provide high protein food and there is an attempt at daily calorie counts. Calorie needs are routinely underestimated based upon current burn care in developed countries. Clinical malnutrition and hypoproteinemia contribute to generalized edema and markedly decreased activity tolerance, even in young patients.

### **Pain management**

When provided, pain management is delayed and inadequate. There is opportunity for conscious sedation but both processes are physician dependent. Pharmacodynamic understanding in the burn patient is limited in all disciplines.

### **Wound care**

Wound care begins on admission and is then performed daily by burn techs until surgical intervention. Nurses and physicians have little direct involvement in wound care. Post-operative wound care is suspended until the first dressing change, usually post-operative day #5. Early surgical intervention is not practiced. Eschar is allowed to separate and only then are wounds deemed ready for skin grafting. Stretching, positioning, therapeutic exercise, and functional mobility are not part of the daily dressing change routine. There is little attempt made to educate or involve the patient/family regarding post-discharge management.

### **Burn supplies & care**

Upon admission, the nursing staff estimates the cost of the dressing materials that will be needed for the entire hospital stay. Based upon the daily needs, an auxiliary nurse procures the dressings from central sterilizing. Physio is based upon a fee-for-service system, and splinting is outsourced and must be paid in advance. Medical care may be provided at no or much reduced costs at the discretion of the surgeon. Patients unable to pay for their cares are discharged to the civil hospital.

### **Psychosocial support**

There is a wall-mounted television in each room and patients are encouraged to watch TV. There is no daily schedule for the patients, and they are not encouraged to leave their room, sit in a chair, or participate in any activity throughout the day. Burn techs are empathetic towards patients' well-being and do spend significant non-dressing care time talking with patients and providing emotional support. Otherwise, there is no attention from the medical or nursing

perspective, to the patient's mental health. There are no reintegration programs, and out-patient follow up is erratic. Nonaccidental burns are common to the middle and lower classes. Although there is acknowledgement that this is problematic, there is little in place to help the patient or their family.

### **Education Provided**

All the medical and physio staff returned the pre-tests. The average score on the pretest for physicians was 83.7% correct answers. The average pre-test score for physio staff was 48.3%. The nurses did not return any pretests and no posttests were administered during the site visit.

The American medical team provided burns education in acute burn management, abdominal compartment syndrome, resuscitation, wound care, physiotherapy, positioning and splinting, and surgical procedures through a combination of didactic lectures, demonstrations and hands on guidance. The schedule of formal lectures is provided below.

### **Hospital-wide Guest Lecture**

01.17.09 250 in attendance. Topic: Acute Burn Management (BAL)

### **Lectures for Physicians**

01.14.09 7 in attendance: plastic surgery residents, staff. Topic: Quality Burn Care (BAL, TCK, SKY)

01.14.09 9 in attendance: plastic surgery residents, staff. Topic: Abdominal Compartment Syndrome (BAL)

### **Lectures for Nurses**

01.15.09 14 in attendance: burn unit nursing staff. Topic: Basic Burn Care (TCK)

01.15.09 160 in attendance: college of nursing students & faculty. Topic: Burn Nursing Care (TCK)

01.16.09 17 in attendance: casualty dept nurses. Topic: Burn Care for Paramedics & Casualty Room (TCK)

### **Lectures for Physios**

01.15.09 15 in attendance: college of physio faculty & CMC staff. Topic: Post Burn Rehabilitation (SKY)

01.16.09 45 in attendance: graduate/post-graduate physio students. Topic: Post Burn Rehabilitation (SKY)

### **Hands-on Teaching/Demonstrations**

01.13.09 Operating theatre: observation (BAL)

01.15.09 Operating theatre: participation/teaching (BAL)

01.13.09 BRU dressing changes: observation (TCK)

01.14.09 BRU dressing change/range of motion participation/teaching (TCK)

01.15.09 BRU dressing change/range of motion/psychosocial participation/teaching (TCK)

01.13.09 Burn ward observation & teaching positioning/splinting/mobility: (SKY)

01.14.09 Burn ward positioning/splinting/mobility teaching: (SKY)

## Opportunities

- Physician staff is enthusiastic about the mission and hopeful for change while recognizing barriers.
- Nursing staff & nursing students' outlook is very traditional/passive. No protocols exist for nursing care. BRU nurses rotate approximately every 3 months; there is no dedicated BRU nurses/team. Nurse Manager and assistant managers demonstrate compassion and dedication to patients and hospital mission, and open to new ideas. Staff nurses are, however, eager to advance their skills and develop greater autonomy.
- Burn Technicians lack up to date training but are eager to learn new techniques, and new technicians are being trained up to replace many who are soon to retire. Development of Burn Tech training in collaboration with medical, nursing and physiotherapy staff would greatly improve patient outcomes and reduce morbidity. Protocols could be developed by the medical officer, Division of Plastic Surgery and nursing staff to enhance communication and reduce redundancy. Clinical instructors are eager to enhance their nursing practice and become more involved in addressing the psychosocial needs of the patients and families.
- Casualty nurses are also eager to develop their skills in burn resuscitation, and receiving up-to-date training as EMTs through CMC-L instructor from UK.
- The physiotherapists have a good understanding of burn rehabilitation; however, they rarely have the opportunity to apply it clinically. They are understaffed and support the entire hospital. The director had co-pioneered the utilization of tenured burn techs to implement physio care to post-burn rehabilitation; however, they do not possess the level of knowledge deemed to be autonomous in evaluation, treatment, and goal-setting. Pulleys previously on the wall and bed trapezes have been stored away. Splinting materials designated to the burn unit are non-existent and expensively outsourced. Written patient/patient family education is absent. Future recommendations include bringing a heat gun, hacksaw and exploring inexpensive onsite materials for splinting, such as PVC piping. Also, providing illustrated education materials to be posted in the rooms would be beneficial.
- Equipment:
  - Surgical equipment: rusted, broken. Site needs a new dermatome and mesher
  - Educational tools: any burn textbooks (acute medical/surgical/nursing/physio or rehab) needed for all burn team members. -Patient education materials absent.

## Next Steps

There are many opportunities for education. Long term goals for the site can include:

- Goal 1: *To establish up to date written burn care protocols.*
  - Objectives:

- Emphasize team approach to treatment
- Use up to date resuscitation techniques
- Early nutrition assessment and intervention
- Coordinate dressing changes with pain management and physio
- Set pain management protocols
- Discontinue use of IV antibiotics
- Discontinue routine use of central lines
- Implement early excision and grafting for full thickness burn wounds
- Discharge planning

Goal 2: *To integrate physical therapy rehabilitation into the burn care protocol*

Goal 3: *To provide education for the development of dedicated burn nursing staff*

Goal 4: *To provide formal education for burn technicians*

Goal 5: *To assist in the development of a burns database*

Goal 6: *To assist in the development of appropriate teaching tools for family and patients*

Goal 7: *Provide psychosocial and burn prevention information to burn staff for consideration of program development*

The CMC Ludhiana site has requested return visits as often as we are able. The 3 team member approach seems to be appropriate for this site but a burn prevention specialist could play a significant role in the future. Peak burn season is during the winter months and future site visits should avoid the humid summer months when temperatures exceed 48°C. The ideal length of time for future site visits is 2-3 weeks. Communication with the site can be marked by delays from Ludhiana as email is not as routinely used as in the US. However, arrangements once made proved the site is clearly set up to accommodate international visitors.

Further measurement and evaluation of the site's progress will occur during subsequent missions. Data for evaluation will be collected by a variety of methods including observations, selective interviews, pre and post tests and surveys.

The following deliverables were identified as immediate needs of the site:

- A quarterly newsletter should be sent to maintain communication throughout the year and reinforce burn management principles.
- Burn unit policies and procedures could be formatted into usable tools for the burn care team. Posters and flipcharts could be used in the Casualty Department.
- Assistance with fostering relationships and procuring donations of much needed dermatome, skin mesher, textbooks, and thermoplastic materials.
- Compilation of a minimal database set for burn, consistent with World Health Organization guidelines.

**7<sup>th</sup> Asia Pacific Burns Congress, Delhi January 18 – 20, 2009**

The US team attended the Asia Pacific conference in Delhi on behalf of the American Burn Association, Children's Burn Foundation and Health Volunteers Overseas. Dr. Barbara Latenser moderated sessions as part of the team's participation. New contacts developed as a result of the conference included invitations for assessment of sites in Pakistan, Bangladesh and throughout India as well as:

- Monira Rahman and Acid Survivors Foundation, Bangladesh
- Fiona Procter, OT and Interburns
- Scott Corlew, MD and Interburns
- David Mackie, MD and ISBI

The schedule of the attended events by the team included:

- 01.17.09 Faculty dinner (BAL)
- 01.18.09 Meeting with Monira Rahman & Fiona Procter, ASF
- 01.19.09 Research presentations (BAL)
- 01.19.09 Moderate sessions (TCK, SKY)
- 01.20.09 Research presentations (poster TCK, SKY)