Overcoming Barriers in Delivering Care to Pediatric Burn Patients in an Adult Urban Level 1 Trauma Teaching Hospital

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Objective:
Upon completion of the lecture, attendees should be better prepared to:
  • Recognize resources available within their own systems to expand the knowledge base of caring for the pediatric population

Abstract:
Grady Memorial Hospital is one of the largest health systems in the United States. Grady's Burn Center is the 2nd busiest burn center in a teaching hospital in the country. It is comprised of 23 intensive and intermediate care beds, as well as an outpatient clinic. The Burn Center’s patient population is approximately 30% pediatric in both the inpatient and outpatient setting. Within Grady Memorial Hospital, the Burn Center is the only unit that accepts pediatric patients, other than the Neonatal Intensive Care Unit, and has no age limitations on admissions.

In surveying Grady Burn Center nurses and resident physicians, several areas were identified as barriers to providing safe care for pediatric patients in an adult hospital setting. The acquisition of appropriate pediatric specific supplies was often a challenge. A heightened anxiety level for all areas of care when caring for our smallest and most critical patients was noted. The design of the hospital, patient rooms and family rooms offer little for a kid friendly aesthetic. A centralized education department offered little pediatric specific education to nursing staff. The nurses voiced a need for a better avenue for educating pediatric patients' parents. It was also found that there was limited pediatric based training for surgical residents rotating through the unit.

Since the survey, several efforts have led to a more collaborative multidisciplinary pediatric centered team approach to improve pediatric care. A Child Life Specialist was hired in a full time position. The unit staff nurses implemented a nurse driven unit based pediatric committee. This committee creates and executes education with assistance from the burn specific nurse educator. An open dialogue was created with the nearest Atlanta area pediatric hospital. Educational opportunities have been held in a reciprocal manner. A core group of strong pediatric nurses were trained as PALS instructors and in turn teach classes for the unit staff. The unit received a Capital grant and Starlight Foundation donation that will be used to specifically help with needs for the pediatric population. The local burn foundation has had a steady and greater presence on the unit to disseminate resources that are available.

Through the changes and enhancements already in place the nurses are surveying at a greater comfort level for delivering quality care to the pediatric population and their families. Educational opportunities continue to be created and offered for all disciplines.

Disclosure: Celeste Adan, RN - No Relevant Financial Relationships to Disclose
Ginny Figel RN, MSN, CNL - No Relevant Financial Relationships to Disclose
Glass Paned Fireplace Injuries: Which Children Are at Risk, and How Do We Prevent These Injuries?

Objective:
Upon completion of the lecture, attendees should be better prepared to:
▪ Describe the potential for contact burns from glass paned gas fireplaces
▪ Recognize the need for physical safety guards as a method for mitigation of injury
▪ Realize the importance of preventative care in the content of burn injuries to toddlers and children

Introduction: Glass paned gas fireplaces are popular in modern homes especially in regions with more severe winter weather, and generally considered to be a safe alternative to woodburning fireplaces. Due to a lack of direct convection, however, the glass panes of these fireplaces can be deceivingly hotter than they appear, thereby posing a risk for contact burns, particularly to children (1). It has been reported that up to 90% involve hand injuries (2) and, unsurprisingly, are geographically dependent (3). Though these patients do not typically require hospitalization, we sought to characterize the nature of injuries seen due to glass paned fireplaces at a tertiary metropolitan Burn Center in Western NY. We identify several risk factors, and discuss from a preventative sciences perspective how these injuries might be avoided.

Methods: We searched our Burn registry for all cases that contained the terms “glass” and “fireplace” between 2011 and 2015. This search yielded 33 fireplace related injuries of which we excluded 3 for which the etiology of injury did not include a gas fireplace.

Results: Of the 30 included patient cases, mean age was 2.25 years old, 67% of cases involved males, and 83% of patients were white. No patients were taken to the ICU or put on a ventilator, and the mean length of stay was 1.23 days. The average second degree BSA was 0.70%, third degree BSA was 0.13%, and average TBSA was 0.71%. 16 cases included information about insurance coverage, of which 12.5% were on Medicaid while 37.5% were privately insured. Only one patient had any noted neurological comorbidity, Down Syndrome.

Conclusion: Whereas the incidence of glass paned fireplace injuries is small, and both the mean length of stay and associated morbidity is limited, these cases almost always involve young children and are eminently preventable. We discuss various mechanisms of preventive care which can be employed in order to prevent these injuries in this vulnerable population, focusing on the education of parents of toddlers within the context of general fire and home safety. Furthermore, we believe that that simple measures such as utilization of safety guards in households with children within the identified susceptible age group, or those with cognitive impairments, may mitigate this problem almost entirely.

Applicability to Practice: Fire and home safety should be stressed to the parents of toddlers, and cognitively impaired children. Whereas glass paned fireplaces are generally very safe, they can be deceptively hot, and the use of physical safety guards may mitigate the risk of injury.

References:

Disclosure: Imran Punekar, MD - No Relevant Financial Relationships to Disclose
### ACT Study Database: Yours for the Asking

**Friday, November 4**
**8:15 – 8:30 am**

**Author and Co-authors:**

Reg Richard, MS, PT<sup>1</sup>; W. Scott Dewey, PT, CHT<sup>1</sup>; James H. Holmes IV, MD<sup>2</sup>

<sup>1</sup>United States Army Institute of Surgical Research, Fort Sam Houston, TX; <sup>2</sup>Wake Forest Baptist Medical Burn Center, Winston-Salem, NC

**Objective:**

Upon completion of the lecture, attendees should be better prepared to:

- Understand the ACT Study database contents
- Access the ACT database for their use,
- Recognize the potential research projects exist within the database.

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**Abstract:**

Introduction: In 2008, the DoD awarded to the ABA a grant to conduct a study titled Burn patient acuity demographics, scar contractures and rehabilitation time related to burn scar contractures subsequently referred to as the ACT study. Data collection ceased in December 2013. Since the conclusion of data collection, only the participating ACT facilities had sole access to the database for research and reporting purposes. As of October 2016, the ACT database became available through the ABA to other individuals interested in querying the database for research. The purpose of this presentation is to reveal and explain the contents of the ACT database and explore potential topics for future research reporting.

Methods: The ACT was a prospective, observational, quasirandomized, multicenter study that investigated the rehabilitation outcome of patients treated at 13 ABA verified burn centers nationwide. The primary aim of the ACT was to relate the presence or absence of burn scar contractures (BSC) to amount of rehabilitation time patients received during their acute hospitalization. Range of motion (ROM) measurements were recorded at the time of hospital discharge. ROM was based on cutaneous functional unit (CFU) burn location as outputted by the Surface Area Graphic Evaluation (SAGE) body mapping program specifically modified for ACT study purposes. Data was collected on seven electronic Case Report Forms (CRFs) using the Velos system supported by the Data Coordinating Center at the University of California-Davis. The ACT database was established to investigate a multitude of factors that may play a role in physical outcome of patients with burn injury.

Results: The ACT CRFs contained ~4100 data point choices for selection to document and describe acute hospitalization course of 307 adult patients with burn injury. Sample contents of specific CRFs included:

1. Admission – patient demographic information, preand concomitant physical and medical conditions, including the need and location of escharotomy/fasciotomy and burn wound including burn severity description of depth and percent as determined by SAGE;
2. Daily CRF 1 completed for each day of hospitalization includes level of consciousness, intensive care stay and/or ventilator use, mobility status, treatment for edema, presence/location of exposed tendons/joints, and the amount of time spent undergoing rehabilitation;
3. Daily CRF 2 collected information specific to splint use and wearing time in 15 minute increments;
4. Skin graft CRF – recorded dates of skin grafting (SG), body area SG, depth burn wound skin grafted and wound bed grafted upon, type of SG used including skin substitute along with SG thickness and mesh ratio if applicable, and donor site location;
5. Discharge (D/C) CRF 1 – contains data on patient pain tolerance and rehab compliance, details of heterotopic ossification, neuropathy, thromboembolic prophylaxis/occurrence, anabolic steroid use, hand/lower extremity strength measurements, amputations, and BSC specific to the face, hands, or toes;
6. D/C CRF 2 Torso/Extremity ROM measurements with qualifiers; and 7) D/C CRF 3 – Hand/Finger ROM measurements with qualifiers.
Conclusion: The ACT database contains a plethora of information that is now available for widespread access. The presentation will explain the thought process behind the ACT database, preliminary results to date, and offer ideas on future explorations and interactions of the database that could be pursued going forward.

Disclosure:

**Reg Richard** - No Relevant Financial Relationships to Disclose

**W Scott Dewey** - No Relevant Financial Relationships to Disclose

**James H Holmes** – Stock: Abbott Labs; AbbVie; Eli Lilly; RegenMed Therapeutics; PermeaDerm
## Decreasing Burn Length of Stay

**Author and Co-authors:**
Leonel Fleurimond, BSN; Sherrina Stewart MSN, RN; Howard Smith, MD; Susan Smith, FNP, ACNP-BC, PhD(c); Lillian Aguirre, DNP, CNS, CCRN, CCNS
Orlando Regional Burn Center, Orlando FL

**Objective:**
Upon completion of the lecture, attendees should be better prepared to:
• Realize the effects of the conversion of intravenous analgesics to oral route
• Discuss patient outcomes related to effective transition from intravenous to oral narcotic analgesia
• Identify practice changes that lead to decreased length of stay of the burn patient
• Consider music therapy during burn dressing changes as an important adjunct in multimodal pain management

**Abstract:**
Introduction: According to The National Burn Repository (2015), average length of stay (LOS) for burn patients is 8.6 days. In January of 2015, the average LOS for burn patients in the Trauma StepDown Unit (TSU) at Orlando Regional Medical Center (ORMC) was 13.1 days, significantly above the national average. Efficacy of pain management in conjunction with music therapy, in particular, has been shown to positively impact timely discharge.

Methods:
• Literature review with the search terms: burn*s, patient*s, pain, pain management, hospital stay, discharge, therapy, music, nonpharmacologic therapy
• Retrospective analysis of the Diagnostic Related Group (DRGs) for the Burn Trauma StepDown Unit (TSU)
• Comparison of CMS Geometric Mean Length of Stay (GMLOS) benchmark reports to TSU’s LOS for DRGs 928, 929, 934.

Practice Change:
• Revision of burn pain management regimen with changes to IV analgesics and anxiolytics and transition to oral therapies as early as clinically appropriate in the hospital course
• Limiting midazolam administration in the noncritically ill patients to the initial debridement dressing change, follow by oral administration of lorazepam, as needed for anxiolysis to facilitate wound care
• Strictly limited bed debridement to those patients deemed too ill for shower debridement
• Incorporated music therapy for initial debridement and subsequent dressing changes
• Communication of changes and discussion of observed responses with ancillary staff and unit nurses through daily huddles

Results
• During 2015, 77% of burn patients at ORMC sustained ≤10% TBSA burns
• The average GMLOS for DRGs 929 (5.7 days), 934 (4.1 days) and 935 (3.3 days) compared to the national average of 8.6 days
• Outlier: An increase in the GMLOS of DRG 928 was noted in the month of July for patients sustaining >10% TBSA

Conclusions
• As expected, Large complex burns with complications and comorbidities require more IV analgesia and experience an extended LOS
• Incorporating multimodal, adjunctive therapies, such as music therapy, provided diversion from dressing change discomfort, decreasing the need for IV analgesics and anxiolytics
• Having patients shower with the initial debridement supports patient participation early in the
burn care process, promoting independence and initiating important education for discharge planning
• Successful discharge depends on effective coordination of all members of burn team

Disclosure:
Leonel Fleurimond  -  No Relevant Financial Relationships to Disclose
Sherrina Stewart  -  No Relevant Financial Relationships to Disclose
Howard Smith  -  No Relevant Financial Relationships to Disclose
Susan Smith  -  No Relevant Financial Relationships to Disclose
Lillian Aguirre  -  No Relevant Financial Relationships to Disclose
High Fidelity Simulation During Real Time Clinical Care is Feasible and Safe

Maria L. Serio-Melvin, MSN, RN, CNS-BC, CCRN; Sarah J. Murray, PhD(c), MSN, RN; Sena R. Veazey, MS; Craig Fenrich, BS; Jose’ Salinas, PhD; Greg Rule, MS; Christopher Nemeth, PhD; Jeremy C. Pamplin, MD
United States Army Institute of Surgical Research, Ft. Sam Houston, TX

Objectives:
Upon completion of the lecture, attendees should be better prepared to:
▪ Identify the feasibility of highfidelity simulation in a real clinical environment
▪ Evaluate ways highfidelity simulation can be applied to clinical education and research
▪ Understand ways to use highfidelity simulation during the real clinical environment safely

BACKGROUND: Simulation has been used for decades in health training to teach necessary skills to clinicians in laboratories, without introducing risk to live patients in the actual care environment. However, performing in a laboratory reduces the simulation realism or fidelity, as clinicians must suspend disbelief and perform in an environment that does not reflect their actual work domain. We developed a novel health IT program, the Cooperative Communication System (CCS), designed to improve team communication. The system pulls electronic medical record (EMR) data and presents it in a more useful manner so that users can find the most salient information faster, thereby assisting with decision making and pattern recognition. Phase 3 of our study was to conduct a validation assessment of the CCS; we required a simulated ICU environment that accurately reflected patient care. We describe the process of designing a simulated patient care environment within a real patient care setting to conduct a research study to test a novel health IT software using highfidelity with actual clinicians.

METHODS: This is an IRB approved, prospective, mixed methods, crossover design study to test the CCS. A patient room in the burn intensive care unit (BICU) with a simulated patient was dedicated to the study. We consented staff participants who did not have real patient care duties to only care for the simulated patient each day, to avoid distractions and risk of harm to an actual patient. We used two care teams consisting of a bedside nurse, resident, and attending physician, who participated in two simulated (SIM) patientcare scenarios (scenario 1 patient with 85% burn and scenario #2 with TENS). Other members of the care team (therapists, charge nurses, consultants, etc.) were played by the research team. The “patient” was an 80 kilogram, male, high fidelity, SimMan3G™ simulation manikin with realistic features including audible heart/lung/bowel/verbal sounds, palpable pulses, and reactive pupils. In order to create the most realistic scenario, the “patient” was given simulated wounds and covered in dressings reflecting the typical burn patient, including wetdowns. The manikin had physical tubes, central lines, and drains that were connected to the patient in the correct anatomical places with hidden reservoirs that contained the appropriate simulated body fluid (bile, emesis, blood, urine) that could be aspirated or drained by gravity. Vital signs were displayed on a similar monitor that is used in the actual BICU, and were changed in response to participant actions through manual manipulation. For additional realism, the research team created artificial bags of IV medication, connected a foley catheter to a urimeter, and placed the patient on a ventilator. In addition to the room set up, the team created hard charts, patient labels, ID, allergy, and fall risk bands, and created “family member” information. The study was conducted over a 3day period for each team with orientation to the SIM environment on day 1, followed by 2 days of SIM scenarios. The SIM took place in an actual patient room in the BICU. The SIM scenarios began with shift report/resident handoff, then multidisciplinary rounds, and ended when each team came to a final decision point that was predetermined by the research team. When the simulation was concluded at the end of the day, we conducted an after action review to interview each participant. We collected both
qualitative and quantitative data to measure the realism of the SIM. We used video and note taking throughout the duration of the SIM and during the after action review interview along with a Likert-like survey questionnaire.

RESULTS:
This study required a large research team (n=15) that consisted of note taker/observers (n=3), a clinical simulation team (n=5), and an IT support team (n=7). We had two care teams, each with 3 participants (n=6), RN=2, Attending=2, Resident=2) that participated in 2 scenarios, each over 1 day lasting approximately 6 hours each. Qualitative interview data revealed that the realism of the simulation was related to conducting the study in the real patient care environment with real clinicians, and this enhanced their ability to suspend disbelief and become fully engaged in the scenario. Overall, the participants all believed that they experienced the most realistic SIM of their careers. In an interview, a 13-year experienced simulation expert concluded that this was the most advanced and realistic simulation within their experience. The residents reported that they learned more during their 2 days of SIM than they would have learned working for 2 days in the BICU caring for real patients. One reason for this may have been the compressed timeline and working directly with the attending physician; having a patient decompensate in a rapid fashion provided the residents with an experience of managing a patient with more autonomy and direct communication with the attending physician, than would be expected at their level. The nurses appreciated hearing what the residents and attending physicians were thinking as they were making clinical decisions. All participants stated that they worked well as a team and attributed much of that to the fact that they worked together during their normal duties. Everyone thought that having the SIM in the actual clinical environment enhanced the realism of the simulation.

CONCLUSION:
We demonstrated that simulation conducted in the real patient care environment can offer health IT research a way to reduce risk and increase fidelity while still allowing data points to be collected. The environment and dedicated care team added an additional layer of realism that a simulation laboratory cannot match because the BICU room is fully immersed within a familiar clinical environment and with familiar people. Lastly, no real patients were at risk during the SIM proving that conducting research on an active patient unit is feasible for future studies.

References and Resources

Disclosure:

Maria L. Serio-Melvin - No Relevant Financial Relationships to Disclose
Sarah J. Murray - No Relevant Financial Relationships to Disclose
Sena R. Veazey - No Relevant Financial Relationships to Disclose
Craig Fenrich - No Relevant Financial Relationships to Disclose
Jose’ Salinas - No Relevant Financial Relationships to Disclose
Greg Rule - No Relevant Financial Relationships to Disclose
Christopher Nemeth - No Relevant Financial Relationships to Disclose
Jeremy C. Pamplin, MD - No Relevant Financial Relationships to Disclose
**Advanced Burn Operative Management - Results from a Multidisciplinary Needs Assessment**

**Friday, November 4**
9:00 - 9:15 am

**Author and Co-authors:**
Jeffrey E. Carter, MD\(^1\); James H. Holmes, IV, MD\(^1\); Paul Inclan, BS\(^1\); Michael Hulme, PhD\(^1\); C. Wayne Cruse, MD\(^2\)
\(^1\)Wake Forest Baptist Medical Burn Center, Winston-Salem, NC; \(^2\)University of South Florida, Tampa, FL

**Objectives:**
Upon completion of the lecture, attendees should be better prepared to:
- Recognize the value of advanced burn training and consider participating in future courses or surveys

**Abstract:**
Introduction: Burn care in America represents a highly specialized, multidisciplinary approach to a diverse patient population encompassing pediatrics to geriatrics and equally diverse severity of disease. Historically burn care has primarily occurred under the guidance of a general or plastic surgeon however evolving demands in residency education has forced the Residency Review Committee of the Accreditation Council of Graduate Medical Education to eliminate formal burn exposure. Similarly the American Association for the Surgery of Trauma does not require burn exposure in the Acute Care Surgeon fellowship curriculum. This substantial reduction in surgeon exposure to burn injury assessment, resuscitation, and surgery will have a deleterious effect on burn provider training and raises many workforce concerns especially in disaster management and operative management. This project seeks to evaluate providers’ confidence and proficiency in providing burn care, thereby allowing the creation of a need driven curriculum to improve burn provider competency and comfort level.

Methods: Previous successful studies involving the development of medical curriculum utilize a sixstep approach which recognizes that an efficient and effective curriculum can only be developed if the target learner’s current competencies and weaknesses are first identified. We conducted a crosssectional study measuring provider confidence and competence in providing care and identifying specific areas warranting further training. The research survey was designed using REDCap software. Survey questions vary depending on role in healthcare (eg Provider, nurse, burn survivor, other) in order to gain a 360degree assessment of provider. Subjects did not receive direct compensation for participating in survey. Survey can be accessed at: https://redcap.tsi.wfubmc.edu/redcap/surveys/?s=HM37DLYFY9

Results: (work in progress with results ready by Southern Meeting)
Our results demonstrate that providers and staff learning deficits deferred and that an effective curriculum will require key components that extended beyond the operating room for successful management of complex burn patients.

Conclusions: Efficient and effective curricula for developing burn providers can be developed from burn provider survey analysis. We aim to use this data to develop an advanced burn care course for providers new to burns or wishing to extend their current skill set.

**Disclosure:**
Jeffrey Carter, MD – Stock: PermeaDerm; Advisory Panel: Acelity
Speaker: Integra Lifescience
Paul Inclan – No Relevant Financial Relationships to Disclose
Michael Hulme – No Relevant Financial Relationships to Disclose
James H. Holmes, IV, MD - Stock: Abbott Labs; AbbVie; Eli Lilly; RegenMed Therapeutics; PermeaDerm
ABA President’s Address
The American Burn Association—Responding to Opportunities and Threats

Friday, November 4
9:15 - 9:45 am

Author and Co-authors:
Michael D. Peck, MD, ScD, FACS
President, American Burn Association
Associate Medical Director
Arizona Burn Center
Phoenix, Arizona

Objectives:
Upon completion of the lecture, attendees should be better prepared to:
• Describe the programs managed by the ABA
• Understand how these programs developed historically to meet challenges to members of the ABA
• Analyze new opportunities and develop new programs as needed

Abstract:
The American Burn Association is dedicated to improving the lives of everyone affected by burn injury through patient care, education, research, prevention, rehabilitation, and advocacy. The ABA has a multidisciplinary approach to optimize the care of the burn patient, and its past, present, and future initiatives embody that approach. This presentation will describe each of the missions of the ABA, how they have developed, what they are doing now, and where they are likely to go in the future. It will describe how to become actively involved in the organization and the benefits to be derived personally and professionally as well as for your regional, national and international betterment. Through the efforts of the ABA and its membership, the past and present challenges to burn care from clinical care to disaster management can be addressed.

Disclosure:
Michael D. Peck – No Relevant Financial Relationships to Disclose