Volatility and Complexity in Burn Injury Claims

Speakers:
Kevin Fleming, President, Paradigm Management Services
Dr. Michael Peck, MD, ScD, FACS, Arizona Burn Center & Paradigm Medical Director
Welcome

Thank you for joining us for our 2010 webinar series. Replays of past webinars are available for viewing at www.paradigmcorp.com/webinars.

- Volatility and Complexity in Burn Injury Claims
- Drug Management and Narcotics Abuse in Workers Compensation
- Multiple Issues with Multiple Traumas
- What Employers Should Know About Complex Cases
First a few housekeeping points:

- Slides will advance automatically
- Question & Answer period at end
- You may submit questions at any time
  - Click the “Q&A” button in the upper right
  - Type a question into the lower section of the Q&A panel that appears
  - Ask All Panelists and be sure to click “Send”
  - If we cannot answer during the session, we will e-mail you
- Replay will be available – look for our e-mail
- When the webinar ends, a short survey will pop up
  - There will be a CCMC section which must be completed to receive continuing education credits
- If you experience computer broadcast audio problems, please use the dial in number posted in the Chat panel on the right
Incidence of Burn Injuries

Each year there are approximately 600,000 burn injuries in the US. While most are relatively mild, 60,000 require hospitalization and 5,000 a year result in death.

Distribution of Burn Incidence by Percent of Total Body Surface Area (TBSA)

Today's discussion focuses on the most severe classes of burns (as defined by degree, location, and total body surface area).

Source: American Burn Association, National Burn Repository, 2009
Severe burns are among the most complex injuries that a person can experience.

- **Fire/Flame**: 40%
- **Scald**: 30%
- **Non Contact**: 11%
- **Contact with hot object**: 9%
- **Electrical**: 4%
- **Chemical**: 3%
- **Other**: 4%

**Burns Definition:** Damage to the skin or other organic tissue caused by thermal or acute trauma.

Source: American Burn Association, National Burn Repository, 2009
A single injury can cost a payor millions of dollars, some as much as $10 million for a single case if complications occur.

Burn Medical and Financial Volatility

The average medical expenses are high, but if complications emerge, the costs can be astronomical.

Source: Paradigm mean values for medical costs years 2002-2008 adjusted for inflation (methodology likely understates risk exposure)
* Complexity is a Paradigm Management Services proprietary scale assigned after a multivariate analysis containing more than 800 variables. Level 1: Minimal treatment, 2: Routine treatment, 3: Low-intensity treatment, 4: High-intensity treatment, 5: Severe, 6: Extremely severe.
With us today is Dr. Michael Peck, MD, ScD, FACS from the Arizona Burn Center and a long-time Paradigm Medical Director.

Dr. Peck is currently the Director of Ambulatory and Outreach Programs for the Arizona Burn Center.

Prior to this position, Dr. Peck spent 11 years as Medical Director of the North Carolina Jaycee Burn Center and was a Professor of Surgery at the University of North Carolina at Chapel Hill.
Burn Categorization

Burns are classified according to the depth of tissue injury. Severe burns often have a mixture of damage levels.

- **1st Degree (Partial-Thickness)**
  - Epidermis

- **2nd Degree (Partial-Thickness)**
  - Epidermis
  - Dermis

- **3rd Degree (Full-Thickness)**
  - Epidermis
  - Dermis
  - Subcutaneous Tissue

- **4th Degree (Full-Thickness)**
  - Epidermis
  - Dermis
  - Subcutaneous Tissue
  - Muscle
Burn Categorization

These pictures show the appearance of the different levels of burn damage.

- **First Degree** – Superficial
- **Second Degree** – Partial Thickness
- **Third Degree** – Full Thickness
- **Fourth Degree** – Full Thickness
Burn Healing

- Wounds heal by **scar contracture**
- Must fight this from day one

**Key surgical treatments:**

- **Escharotomy**: Incisions through eschar to release constricting tissue
- **Debridement**: Removal of loose, devitalized, necrotic and contaminated tissue
- **Excision**: Incisions through deep dermis to open tissue and prepare for covering
- **Grafting**: Surgical close of wounds with harvested or synthetic skin

- Appropriate care may require **multiple treatment modalities**, each with varying sequencing
Surviving Burn Injuries

With most burns the risk of death occurs well after the initial injury.

- Few patients die within the first 48 hours
  - Severe respiratory failure from smoke inhalation injury
  - Very large (>80% body surface) burns

- Most deaths occur after 2-3 weeks as a result of septic shock
  - Immune system compromised by burns

Mortality Rate

<table>
<thead>
<tr>
<th>% Total Body Surface Area</th>
<th>Mortality Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>90+</td>
<td>80%</td>
</tr>
<tr>
<td>80 to 90</td>
<td>69%</td>
</tr>
<tr>
<td>70 to 80</td>
<td>57%</td>
</tr>
<tr>
<td>60 to 70</td>
<td>43%</td>
</tr>
<tr>
<td>50 to 60</td>
<td>36%</td>
</tr>
<tr>
<td>40 to 50</td>
<td>24%</td>
</tr>
<tr>
<td>30 to 40</td>
<td>16%</td>
</tr>
<tr>
<td>20 to 30</td>
<td>8%</td>
</tr>
<tr>
<td>10 to 20</td>
<td>3%</td>
</tr>
<tr>
<td>0 to 10</td>
<td>1%</td>
</tr>
</tbody>
</table>

Source: American Burn Association, National Burn Repository, 2009
Immediate Intervention

The most immediate things to tend to include breathing, early excision and infection prevention.

- Prompt attention to intubation, ventilator support, and fluid resuscitation
- Early excision and grafting of the burns
- Appropriate nutritional support
- Attention to prevention, recognition, and treatment of infections
With smoke inhalation injuries, there are a number of key factors to consider.

- Carbon monoxide poisoning
- Injury above or below the glottis
- Supra-Glottic inhalation injury
  - Thermal injury
  - Edema threatens airway patency
  - Injury below the vocal cords is not thermal
  - Injury below the cords is from toxicants in smoke
- Diagnosis
  - History of being burned in a close space
  - Facial burns
  - Respiratory distress
  - Bronchoscopy not necessary in ER; used in ICU for prognostic, diagnostic, and (sometimes) therapeutic reasons
Body tissues have high resistance to current flow
- Least resistance from nerves and muscles
- Most resistance from tendons, ligaments, and especially bone, where electrical energy is converted to heat; wrist and ankle often deeply injured

Electrical injuries impact multiple systems and damage can evolve over time
- Heart: Cardiac arrest, anoxic brain damage, and cardiac arrhythmias
- Kidney: Kidney failure caused by myoglobin from damaged muscle tissue
- Nerves: Brain, spinal cord, peripheral nerves, altered thinking processes, sometimes many months later
- Eyes: Cataracts months or years after injury
- Programmed cell death
- Narrowing and obstruction of blood vessels
Case Study

It is not uncommon for a patient to need multiple operations and re-grafting procedures.

**Situation:** 25 year old man (1.8 m² body surface area), otherwise healthy, sustains third degree burns over 75% (13,500 cm²) of his body after falling into a vat of sodium hydroxide.

<table>
<thead>
<tr>
<th>Day</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Life flight to ER</td>
</tr>
<tr>
<td>2</td>
<td>First OR visit for Excision &amp; Allograft on Hands &amp; Arms (≈15% TBSA)</td>
</tr>
<tr>
<td>3</td>
<td>Third OR visit for Excision &amp; Allograft on Back and Buttocks (≈15% TBSA)</td>
</tr>
<tr>
<td>4</td>
<td>Second OR visit for Excision and Allograft on Chest &amp; Abdomen (≈15% TBSA)</td>
</tr>
<tr>
<td>5</td>
<td>Fourth OR visit for Excision and Allograft on Legs and Feet (≈30% TBSA)</td>
</tr>
<tr>
<td>6</td>
<td>Fifth OR visit for Inspection</td>
</tr>
<tr>
<td>7</td>
<td>Sixth OR visit for Inspection and replacement of all allografts</td>
</tr>
<tr>
<td>8</td>
<td>Seventh OR Visit for repeat lower back allografting</td>
</tr>
<tr>
<td>9</td>
<td>Eighth OR Visit for repeat abdomen and thigh allografting</td>
</tr>
<tr>
<td>10</td>
<td>Ninth OR Visit for repeat leg and foot allografting</td>
</tr>
<tr>
<td>16</td>
<td>Tenth and Final OR visit of Acute Phase of Care for additional leg and foot allografting</td>
</tr>
</tbody>
</table>

- Necrosis on hands results in re-excision and allografting
- Repeat excision and allografting on back and chest
- Rejected arm and abdomen allograft replaced
- Repeat excision and allografting on areas of chest and abdomen
- New allograft applied to arms, and split thickness allograft to hands using skin harvested from upper arms
- Repeat excision and allografting on back using skin from buttocks

Dr. Michael Peck, MD, ScD, FACS

© 2010 Paradigm Management Services, LLC All rights reserved
Poll #1: Hospital Stay

What is the average length of hospital stay for a patient with a 75% TBSA burn injury?

A. 31 days  
B. 54 days  
C. 76 days  
D. 93 days

Source: American Burn Association, National Burn Repository, 2009
Poll #2: Hospital Cost

What is the average cost of hospital stay for a patient with a 75% TBSA burn injury?

A. $302,000
B. $443,000
C. $597,000
D. $741,000

Source: American Burn Association, National Burn Repository, 2009
Complications are common, so patients need 18-36 months of meticulous evaluation and correction of fluid/electrolyte, metabolic, cardiopulmonary, homeostatic and infectious derangements.

Frequency and Cost of Top 10 Clinically Relevant Complications

- Disfigurement/scarring/contracture: $28–135, 66%
- Psychological complications: $16–75, 57%
- Fragile skin/skin breakdown: $38–107, 55%
- Infection (pneumonia, sepsis, other): $58–120, 35%
- Delayed wound healing/skin graft failure: $37–110, 32%
- Chronic pain: $14–80, 29%
- Wound infection: $44–132, 27%
- Inhalation injury: $58–112, 19%
- Heterotopic ossification: $32–117, 17%
- Acute Respiratory Distress Syndrome (ARDS): $58–226, 14%
- Cataract/corneal injury: $18–68, 13%

% Incidence of complications among severely injured burn victims

Additional expense due to complication ($000)

Source: Paradigm case experience/data extract
Getting the Best Outcomes

A process involving Systematic Care Management \(^{SM}\) can greatly improve the outcome/success of the patient's recovery.

- **Medical experts**: oversight/coordination by skilled burn physician and onsite nurse case manager
- **Top providers**: burn center with multidisciplinary approach to burn care:
  - MDs
  - Burn RNs
  - Physical Therapist
  - Occupational Therapist
  - Nutritionist
  - Psychologist
- **Infrastructure**: relevant data, standards, and outcome planning and guarantees
Physical Management Issues

In the weeks that follow a burn there are a number of key issues that need to be monitored closely.

Key Issues:

- Respiratory Dysfunction
- Malnutrition
- Neuropathies
- Hypertrophic Scarring
- Amputations
- Decreased Strength and Endurance
- Altered Sensation and Function Of Skin
Psychological Management Issues

With severe burn injuries, there are also a number of psychological issues that need to be managed and mitigated.

Key Issues:

- Substance abuse
- Anxiety disorders
- Chronic pain syndromes
- Altered self-image
- Depression
- Post-traumatic stress syndrome
Using Systematic Care Management℠ we are able to achieve outcomes far above those within the general industry.

**Burn Injury Outcomes**

<table>
<thead>
<tr>
<th></th>
<th>Industry Benchmark¹</th>
<th>Paradigm</th>
<th>Industry Benchmark¹</th>
<th>Paradigm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release to Return to Work</td>
<td>30%</td>
<td>64%</td>
<td>15%</td>
<td>55%</td>
</tr>
<tr>
<td>Returned to Work Full Duty</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Based on an independent comparison by Milliman, the nation’s leading actuarial and consulting firm, to their proprietary database of similar WC claims; Return to Work timing based on attending physician’s judgment (not Paradigm’s)
We hope you will join us for future webinars and leave knowing the following.

- **Burn are among the most complex and costly types of injuries**
- **Burn care is highly involved and fraught with complications**
- **Constant monitoring and sequential interventions are necessary for recovery**
- **Paradigm has successfully proven the value of the models during the past 20 years**
Question and Answer Session

Please submit your questions for our panelists in the Q&A window on the right.

Today’s speakers:

Kevin Fleming
President
Paradigm Management Services

Dr. Michael Peck, MD, ScD, FACS
Director of Ambulatory and Outreach Programs, Arizona Burn Center
and Paradigm Medical Director

Reminder: If you experience computer broadcast audio problems, please use the following dial-in number:

Toll Free 866-699-3239
Passcode 663 351 016 # #