Management of the Burn Patient

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Learning Objectives

- Describe ambulatory management of burn patients
- Use the “rule of nines” to estimate total body surface area of the burn
- Describe partial and full thickness burn wounds
- List ABA criteria for patient transfer to a specialty burn center
- Discuss the management of SJS/TEM
American Burn Association Transfer Criteria

- Burn > 10% TBSA
- Burns > 5% full thickness
- Burns complicated by inhalation injury,
- Significant associated injury or co-morbidity
- Burns of hands, face, feet, perineum, major joints
- Electrical/chemical injuries

ABA Advance Burn Life Support (ABLS) course

Flowchart:

- Annual Burn Injuries 1,000,000/yr
  - ED visits 450,000
    - Hospitalization 45,000
      - ABA Criteria for Referral to a Burn Center
        - Yes 25,000 Burn Center
        - No 20,000 admissions
  - Outpatient care 505,000
  - Deaths 3500
Annual Burn Injuries
1,000,000/yr

Deaths
3500

ED visits
450,000

Hospitalization
45,000

Outpatient care
505,000

ABA Criteria for Referral
to a Burn Center

Yes
25,000
Burn Center

No
20,000
admissions

Severity
Total Body Surface Area
Rule of Nines
### Severity Total Body Surface Area

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<th>Severity</th>
<th>Total Body Surface Area</th>
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**Baby Rule of Nines**

![Baby Rule of Nines Diagram](image)

**Patient’s whole hand approx. 1.5% BSA**

![Patient’s whole hand](image)
Severity
Total Body Surface Area

Patient’s whole hand approx. 1.5% BSA

Palm of patient’s hand to their body-approx. 1% BSA

Severity-Depth

Demling et al, Burnurgery.org
Partial thickness: First Degree

Epidermis only
- Pink or red
- Painful

Heals in few days, injured epithelial cells peel

Severity
Depth - 2nd Degree Burn

- appearance
  - reddened
  - blisters
  - open tissue

- sensation
  - painful
  - diminished discrimination between sharp & dull stimulus
# Think child Abuse

![Image of burns](image-url)

## Severity

**Depth - 3rd Degree Burn**

- Entire epidermis and dermis
- White, gray
- Dry, leathery
- No hair
- Absent capillary refill
- Less pain
- Small area heals by epithelial ingrowth
- Large areas require surgical skin grafts
### Severity

**Depth - 3rd Degree Burn**

- Entire epidermis and dermis
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### Outpatient care

- **505,000**

#### Wound care

- **Elevation**
- **Well applied dressing**

#### Pain management

- **Topical only**

#### Antibiotics

- **7-10 days Remove long wear**

#### Follow-up

- **Moisturizing cream**

#### SSD

- **At least daily dressing change**

#### Long wear Ag³

#### Facial Burns
Facial Burns

Facial Burns
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Facial Burns

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Example
Long wear Ag\textsuperscript{+} Products

Most Commonly Used
Acticoat
Aquacel\textsuperscript{AG}
Mepilex\textsuperscript{Ag}
Chemical Injury

Treatment

Get chemical off of the tissue
if dry chemical brush off 1st
Flush with *copious* amounts of water 20-30 minutes
P.P.E.’s to ensure safety of healthcare provides
Patient with Chemical Burn

Full thickness injury from chemicals in the home

Hydrofluoric Acid

Tissue damage & great pain
Hydrofluoric Acid binds with Calcium
Treatment
Topical mixture of calcium gluconate & K-Y
Sub-dermal inject calcium gluconate (ER)
Intra-arterial infusion of calcium gluconate
(Burn Center)
Wound Care

FOR PATIENTS BEING TRANSFERRED:

- Cover the wound with dry clean sheets / towels / blankets - need not be sterile
- KEEP THE PATIENT WARM

Steven Johnson Syndrome (SJS) / Toxic Epidermal Necrolysis (TEN) Continuum

STANDARD OF CARE IS MANAGEMENT IN A BURN CENTER

McGee, 1998, Palmieri 2002,
Methods

- Retrospective chart review
  - SJS/TEN patients

- Two Timeframes
  - (2004-2008)
  - (2009)

- Burn Center established
  - February, 2006

Results

- Causative agents:
  - Bactrim
  - Other antibiotics
  - Anticonvulsants

- Services: N=24 (04-08)  N=16 ('09)
  - Burn service  8  7
  - Other services 16  9

- Age (average)
  - 53.1 years (‘04-’08)
  - 47.3 years (‘09)
SJS - TEN Patients

Best Practice Recommendation
Mortality overall 32%

Epidermal Detachment
- Burn Service: 17%
- Other Services: 33%
- Overall: 20%

Mortality
- Burn Service: 49%
- Other Services: 23%
- Overall: 23%

p = 0.022
p = N.S.

‘09 Mortality: Burn 0%; Other 11%; Overall 6%

ICU Length of Stay
(Average)

Days
18
16
14
12
10
8
6
4
2
0

Burn Service
Other Services

2009
2004-2008

2009
2004-2008

p = 0.029 (‘04-’08)
### Quality Measures: SCORTEN Score

- Severity-of-illness score
- Predict mortality of TEN patient
- Obtain first 24 hours of admission
- 7 independent risk factors:
  1. Age > 40
  2. Malignancy
  3. Epidermal Separation > 10%
  4. Heart rate > 120 BPM
  5. BUN > 28 mg/dL
  6. Serum glucose > 252 mg/dL
  7. Serum bicarbonate < 20 mEq/L

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<thead>
<tr>
<th>Number of Risk Factors</th>
<th>Mortality</th>
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<tr>
<td>0 - 1</td>
<td>3.2%</td>
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<tr>
<td>2</td>
<td>12.1%</td>
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<tr>
<td>3</td>
<td>35.3%</td>
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<tr>
<td>4</td>
<td>58.3%</td>
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<tr>
<td>5</td>
<td>90.0%</td>
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### Conclusions

- Early referral to Burn Center was re-confirmed
  - Burn Center patients had greater epidermal detachment, but no difference in mortality, and shorter ICU stays

- Education of other services about early referral to Burn Center
  - Comprehensive supportive intensive care
  - Excellent wound care
  - Increased patient survival
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<th>OSUMC Burn Resources</th>
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<tr>
<td>OSU Burn Center 614-293-2876 (BURN)</td>
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<tr>
<td>Burn Center administrative office</td>
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<tr>
<td>614-293-5710</td>
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<tr>
<td>Burn Unit 614-293-8744</td>
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<tr>
<td>Emergency Department</td>
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<tr>
<td>614-293-8333</td>
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<td>Children’s Hospital (under 16 years of age)</td>
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