Objectives

- Describe various pediatric complex wound and skin conditions.
- Identify the root causes of complex wound and skin conditions and critical impact on body systems and complications.
- Describe the treatments for complex wound and skin conditions.
**Congenital Hairy Nevus**

- Type of mole present at birth
- Often pale at birth; darken and grow with the child
- Can have regular or uneven borders
- Most are benign, but they do have potential to become malignant
Port Wine Stain

- A birthmark that looks like red wine was spilled on the skin
- Most commonly found on the face, neck, scalp and arms
- Treated with V Beam laser over 12 month period
### Traumatic Injuries

- Scar revision
- Dog bites
- Lawnmower injuries
- Treadmill injuries
- Road rash
Sheet Autograft

A strip of donor site is taken and transferred without alteration to the excised burn area.

**Advantages:**
- more durable than mesh grafts
- better cosmetic results
- contracts less than mesh grafts

**Disadvantages:**
- blood or bacteria may collect under the graft causing graft loss.
Donor skin is fed through the Tanner mesher which can expand the skin from 1.5 to 9 times its original size. The larger the expansion, the greater the scarring.

Advantages:
- less donor sites are needed
- allows passage of exudate through the interstices.

Disadvantage:
- mesh pattern visible

**Mesh Autograft**
Scar Management

Guidelines for Using Compression Therapy

- <10 days to heal = no compression
- 10-14 days to heal = monitor for compression
- > 21 days to heal = compression
**Dog Bites**

- 74% of attacks are by Pit Bulls and Rottweilers
- 1,000 per day requiring medical treatment
- 27,000 reconstructive surgeries per year
- 5th highest reason children seek ED treatment
- 61% of deaths are in children under the age of 4

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**Case Study**

- 6 year old female attacked by family dog on June 4th 2013
- Transferred to Cincinnati on June 5th via air transport
  - Awake and alert
  - No airways issues
  - Pain managed IV pain medication
  - Complex lacerations of face and scalp
June 5th taken to the operating room for initial debridement and wound cleansing.

Area of necrosis noted to wound flap on the right side needing demarcation.

Returned to OR on June 7th for application of split thickness skin graft.

Left side of scalp had an area of complete degloving. The area was cleansed, shaved and dressed awaiting grafting.

Post Autografting day 5

Autografting day 20
Traumatic alopecia, 300ml scalp expander placed on March 24th 2014

3 months after expansion
**Hidradenitis Suppurativa**

A chronic, relapsing, inflammatory disease that originates in the apocrine sweat glands and involves the adjacent skin and subcutaneous tissues, resulting in abscesses, fistulae, & fibrosis

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**Etiology**

- Depilatories, deodorants, shaving
- Smoking: effect on glandular function
- Obesity
- Genetic tendency to acne

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**Areas Involved**

- Axillae 65-75%
- Inguinal, perineum & scrotum 20-25%
- Breast 5-7%
- Multiple sites 25-65%
### Recurrence

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Recurrence Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antibiotics</td>
<td>100%</td>
</tr>
<tr>
<td>Incision &amp; drainage</td>
<td>83%</td>
</tr>
<tr>
<td>Excision only</td>
<td>50%</td>
</tr>
<tr>
<td>Excision &amp; 1º closure</td>
<td>30%</td>
</tr>
<tr>
<td>Excision &amp; grafting</td>
<td>13%</td>
</tr>
</tbody>
</table>

### Axillary HS: Skin Grafting
Exfoliative and necrotizing diseases

- Necrotizing fasciitis
- Staphylococcal scalded skin syndrome (SSSS)
- Erythema multiforme (EM)
  - Minor
  - Major
- Stevens-Johnson syndrome (SJS)
- Toxic epidermal necrolysis (TEN)
**Case study**

- 6 week old male who presented at 8 days old with fever, emesis, erythema to his back
- Rapidly decompensated requiring:
  - Intubation
  - Pressors
  - ECMO
  - CVVHD

**Case study**

- Diagnosis viral sepsis
- Back was debrided, cultured positive for MRSA
- Attempted to graft twice, both failed
- Transferred to Shriners Hospital post one month

**Necrotizing Fasciitis**

- Image of a newborn baby
Day five autograft

Case study

- 5 week old male presents with fever. Septic work up included a lumbar puncture
- Sever erythema at puncture site and respiratory distress developed over the next 24 hours
- Admitted to the ICU. Intubated and taken to the OR for surgical debridement of the site
Case study

- Started on antibiotics
- Wound culture positive for MRSA
- Diagnosis necrotizing fasciitis
- Treated with a negative pressure dressing for 2 weeks
- Autografting attempted and failed
- Transferred to Shriners Hospital

One month post debridement

Two weeks post autografting
Two years post autografting

Tissue expansion
Staphylococcal scalded skin syndrome (SSSS)

- AKA Ritter von Ritterchein
- Most common in children under 5
- Exfoliative toxin produced by staph aureus
- Common sites mouth, nose, throat, umbilicus
- Two types
  - Localized
  - Generalized

Diagnosis and treatment

- Presentation
  - History of Infection
  - Fever/malaise
  - Rash
- Treatment
  - Antibiotics
  - Hydration
  - Wound care as needed

Case study

- 12/30/2016
  - 11 month old presents with perioral rash
  - Diagnosis: impetigo
  - Antibiotic started: murpirocin
  - Sent home
12/31/2016

- Presents to ED
- Skin slough
- IV inserted
- Clindamycin
- Began clindamycin
- Foley inserted
- Silver impregnated dressing

1/4/2017

- Wounds healed
- Good oral intake
- IV discontinued
- Foley removed

<table>
<thead>
<tr>
<th>Erythema Multiforme</th>
<th>Stevens-Johnson Syndrome</th>
<th>Toxic Epidermal Necrolysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>History</td>
<td>Fever/malaise/cough</td>
<td>Fever/malaise</td>
</tr>
<tr>
<td>Mucosal Involvement</td>
<td>Minor: no involvement</td>
<td>Yes</td>
</tr>
<tr>
<td>Skin slough</td>
<td>Target shaped lesions</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Major: lesions slough &lt; 10%</td>
<td>&gt; 30% TBSA</td>
</tr>
<tr>
<td>Duration</td>
<td>1-4 weeks, Recurrence</td>
<td>1-6 weeks</td>
</tr>
<tr>
<td></td>
<td>expected</td>
<td>1-6 weeks</td>
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<tr>
<td>Mortality</td>
<td>&gt; 5%</td>
<td>0-40%</td>
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<td></td>
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<td>25-80%</td>
</tr>
<tr>
<td>Cause</td>
<td>Most cases bacterial/viral</td>
<td>Rem to foreign agent</td>
</tr>
<tr>
<td></td>
<td>55% cases caused by HSV</td>
<td>Drugs implicated 77-94% of cases</td>
</tr>
</tbody>
</table>
### Common Drugs

**Mnemonic: SOAPS**
- Sulfonamides
- Oral hypoglycemic
- Anticonvulsants/Antibiotics
- Penicillin/phenytoin
- nSaids

### Case Study

**Erythema Multiforme**
- Diagnosed 12/22 with pneumonia
  - Treatment amoxicillin
  - Albuterol inhaler
  - Cultures pending
- ED visit 12/24 for mouth ulceration
  - Hx of pneumonia 3 month prior with rash
  - Admitted to OSH for observation
  - Within 24 hours rapidly developing rash and eye involvement

2 weeks after onset
Treatment

- Wound care
- Enteral feeds due to oral lesions
- Foley catheter due to penile ulcerations
- Eye lubricants for protection
- Anxiety and pain control

3 weeks after onset
5 weeks after onset

2 months after onset

Case Study

Stevens-Johnson syndrome

- 5 year old treated with amoxicillin, Augmentin and Zithromax for prolonged URI.

- Presented to ED 20 days after treatment began. Presented with neck swelling and facial rash. Prescribed rocephin. Discharged home.

- Presented to ED 24 hours later with increased neck swelling, drooling and blisters in the mouth
Admitted to the hospital
Electively intubated
Foley and nasogastric tube placed
Approximately 10% TBSA involvement
Transferred to Shriners Hospital

Extubated 2 days after admission. No further progression of skin involvement mostly confined to his mouth.
Discharged on day 7
**Case Study**

Toxic epidermal necrolysis

- 15 year old with history of seizure disorder. Lamictal increased one week prior to development of symptoms.
- Blisters developed in the mouth, rapidly developed widespread rash
- Transferred to Cincinnati 2 days after onset.

Electively intubated

Enteral feeds

Positive Nikolsky sign

Approximately 10% TBSA involvement

Amniotic membrane lens placed to both eyes
Minimal wound care.

10 days after onset.
Tracheotomy placed on day 8 due to copious bloody secretions.
Approximately 50% TBSA.
Allograft placed on largest open areas.

20 days after onset.
Eyes and oral mucosa continue to be an issue.
One year post onset