Dermatology Pearls Part I: Spotlight on Rashes

Janet Tcheung, MD, FAAD
Objectives

• Provide a framework to describe cutaneous findings
• Recognize and diagnose common cutaneous conditions and diseases for inpatient/outpatient settings
• Provide first line treatments of common skin diseases
Roadmap

- Skin structure and function
- Dermatologic Descriptors
- Rashes
  - Drug (DRESS, AGEP, SJS, Morbilliform)
  - Infection (Bacteria, HSV, VZV, Fungal)
  - Infestations (Scabies, Bed bugs)
- Topical Steroid Primer
Function of Skin

• Physical barrier: protects against physical, chemical, and microbial insults
• Immunologic barrier: senses and responds to pathogens
• Temperature regulation
• Protection from radiation: melanin provides shield against UV radiation
• Nerve sensation
Skin Structure

- Epidermis
- Dermis
- Subcutaneous tissue
Epidermis

• **Stratum corneum**
  – Major physical barrier
  – Takes 4 weeks for cells to migrate from basal cell layer to top of stratum corneum where they are shed

• **Granulosum**
  – Helps form “cement” that holds together stratum corneum cells

• **Spinosum**

• **Basal Cell Layer**
  – “Stem cells” of the epidermis
  – Undifferentiated proliferating cells
Epidermis

- Stratum corneum
- Stratum granulosum (granular cell layer)
- Stratum spinosum (spiny layer)
- Stratum basale (basal cell layer)
Other Cellular Components

• Melanocytes
  – Pigment producing cells
  – Located in basal cell layer

• Langerhans Cells
  – Tissue macrophage
  – Serves as immunologic barrier of skin
Dermatologic descriptors

• Primary Lesions
• Secondary Lesions
The 12 Medical Specialty Stereotypes

**ORTHOPEDICS:** The meatheads
Ugh! New knee no fit!
Why no hammer harder, you?
Me hammer hard already! Need me bigger mallet!
**Dude!**

**NEUROLOGY:** The armchair intellectual
...For you see, with the onset of diasemia, an insidious hemispheric syndrome, and diminished sensation to the contralateral body, we can isolate this stroke to the posterior circulation, specifically a lateral medullary infarct. What can you do about it now?

**NEUROSURGERY:** Workaholic Egomaniacs
Come on, people! Let's get the patient in the room! Am I the only person who does work around here?

**FAMILY MEDICINE:** Hippy Dippy Country doctor
Now, I could give you some antibiotics for that skin infection, or I could make you a pot of tea.

**PSYCHIATRY:** The fake doctor
Can't you see that all of the patients depression stems from his latent sexual attraction to his childhood au pair?

**FAMILY MEDICINE:** Grumpy doc
His what?

**PSYCHIATRY:** The fake doctor
Yeah, but I think he's also pretty depressed about his diabetes being under poor control.

**DERMATOLOGY:** Glamazon.com
Impetigo contagiosa is a superficial, intraepidermal, unilocular vesicopustular infection.

**OB-GYN:** Overworked bitch Goddess
OK, now... PUSH! PUSH! PUSH!

**DERMATOLOGY:** Glamazon.com
Let me scrape off some of the pus and send it for culture to be sure.

**OB-GYN:** Overworked bitch Goddess
For Chris's sake, what the hell is wrong with you? I've been awake for 72 hours and even I can push harder. What do you want me to cut you? Because I did it!

**RADIOLOGY:** Rich in the dark
Sound of counting bones and dollars

**PEDiatrics:** If Patch Adams and Mister Rogers mated.
Hey kids, who's ready for their shots? Or as I like to call them, 'pointy kisses.'

**INTERNAL MEDICINE:** Works.
...well, given that his GFR is down to 10 and his BUN is up at 58 on the latest set of labs, I'm not going to mention his creatinine of 2.1. We're not interested in the fact that his blood pressure is 106/68. I wish all my patients had things up to 2.1. Not to mention his creatinine of 2.1 with an ESR of 226. Today, you see, this guy's pretty sick. How much coffee have you had today?

6.3 cups.
DERMATOLOGY: Glamazon.com

Knows lots of adjectives

Impetigo contagiosa is a superficial, intra-epidermal, unilocular vesicopustular infection.

Let me scrape off some of the pus and send it for culture to be sure.

diamond the size of a chicklet
	nice hair

designer clothes

high heels
PRIMARY LESIONS
Primary Lesions: Flat

• Macule:
  - < 5mm
  - Flat area / Nonpalpable
  - Color altered

• Patch
  - > 5mm
  - “Large macule”
  - Color altered
Primary Lesions: Raised

• Papule
  – < 5mm
  – Solid raised lesion

• Plaque
  – > 5mm
  – Palpable, elevated
Primary Lesions: Nodule

- Firm
- Thicker
- Deeper
Primary Lesions: Fluid filled

- **Vesicle**
  - < 5mm
  - Raised, clear, fluid-filled

- **Bulla**
  - > 5mm
  - Raised, clear fluid-filled
Primary Lesions: Nonblanching

Petechiae
- Bleeding from capillaries
- Pinpoint red, brown, purple macules

Purpura
- Extravasation of blood into tissue
- 4-10mm
SECONDARY LESIONS

SHE IS A RAISIN... CAN YOU SAY “BOTOX”?
Secondary Lesions: Excoriations

Excavations dug into skin by scratching
Secondary Lesions: Lichinification

Roughening of skin with accentuation of skin markings
Secondary Lesions: Scale

Flakes of stratum corneum
Secondary Lesions: Crust

- Rough surface c/w dried serum, blood, bacteria, and cellular debris
Secondary Lesions: Ulcer

Loss of epidermis and dermis
I'm going to the dermatologist for a weird rash on my ankle. But I really just want to talk about wrinkles.
Rash Differential

• Drug (DRESS, AGEP, SJS, Morbilliform)
• Infection (viral, fungal, bacterial)
• Infestations (Scabies, Bed bugs)
• Inflammatory (Contact, Eczema)
• Cancer (CTCL)
Helpful Questions to Ask

- Symptoms: itchy vs tender/painful
- New drugs
- Contacts with rash (Scabies, Bed bugs)
- Where did it start before progressing
  - Drug: trunk and spread centrifugally
  - Arthropod assault/bed bugs: exposed skin
- ROS: fever, joint pain, dysphagia, sore throat, cough, dysuria, stinging eyes
  - Drug rash
  - Infection (viral exanthem, HSV/VZV)
DRUG RASH
Epidemiology

- Incidence: 0.1% to 1%
- WHO: 2% of all drug rashes ‘serious’
  - Results in death
  - Requires hospitalization
  - Prolongs hospitalization
  - Persistent disability / incapacity
  - Life-threatening
## Drug Rashes

<table>
<thead>
<tr>
<th>Dangerous</th>
<th>Benign</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRESS</td>
<td>Morbilliform</td>
</tr>
<tr>
<td>AGEP</td>
<td></td>
</tr>
<tr>
<td>SJS / TEN</td>
<td></td>
</tr>
</tbody>
</table>
Case

• 47 yo, otherwise healthy, male admitted for osteomyelitis
• Patient had traumatic injury of right femur leading to compound fracture s/p MVA
• Multiple surgeries complicated by infection
• + Staph aureus
• TMP-SMX x 22 days
TBSA: 80% + LAD
What is your next step in management?

A. Obtain a shave biopsy
B. Topical triamcinolone 0.1% cream
C. Obtain labs to further work-up (CBC, CMP)
D. Essential oils to help soothe the rash
E. Stop the offending medication
F. Both A and E
G. Both C and E
DRESS

• Drug Reaction with Eosinophilia and Systemic Symptoms
• Severe drug-induced reaction
• Delayed onset: 2-6 weeks after initiation
• Mortality Rate: 10-20% (liver failure)
### Table 2 Classification of Published DRESS Cases According to the RegiSCAR’s Score\(^\text{11}\)

<table>
<thead>
<tr>
<th>Drugs</th>
<th>No case n = 13 (8%)</th>
<th>Possible n = 35 (20%)</th>
<th>Probable n = 77 (45%)</th>
<th>Definite n = 47 (27%)</th>
<th>Nb of Cases n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abacavir(^\text{12-16})</td>
<td>4</td>
<td>1</td>
<td></td>
<td>5 (3)</td>
<td></td>
</tr>
<tr>
<td>Allopurinol(^\text{17-29})</td>
<td>1</td>
<td>6</td>
<td>8</td>
<td>4 (11)</td>
<td></td>
</tr>
<tr>
<td>Amoxicillin plus clavulanic acid(^\text{30})</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1 (0.6)</td>
<td></td>
</tr>
<tr>
<td>Amisulprim(^\text{31,32})</td>
<td>2</td>
<td></td>
<td>2</td>
<td>2 (1)</td>
<td></td>
</tr>
<tr>
<td>Atorvastatin(^\text{33})</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1 (0.6)</td>
<td></td>
</tr>
<tr>
<td>Aspirin(^\text{34})</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1 (0.6)</td>
<td></td>
</tr>
<tr>
<td>Captopril(^\text{6})</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1 (0.6)</td>
<td></td>
</tr>
<tr>
<td>Carbatrazepine(^\text{6,2})</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1 (0.6)</td>
<td></td>
</tr>
<tr>
<td>Cefadroxil(^\text{2})</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1 (0.6)</td>
<td></td>
</tr>
<tr>
<td>Celecoxib(^\text{6})</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1 (0.6)</td>
<td></td>
</tr>
<tr>
<td>Chlorambucil(^\text{56})</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1 (0.6)</td>
<td></td>
</tr>
<tr>
<td>Clonazepam(^\text{67})</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1 (0.6)</td>
<td></td>
</tr>
<tr>
<td>Clopidogrel(^\text{68})</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1 (0.6)</td>
<td></td>
</tr>
<tr>
<td>Codeline phosphates(^\text{69})</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1 (0.6)</td>
<td></td>
</tr>
<tr>
<td>Cotrimoxazole/ci(^\text{70})</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1 (0.6)</td>
<td></td>
</tr>
<tr>
<td>Cyanamide(^\text{71})</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1 (0.6)</td>
<td></td>
</tr>
<tr>
<td>Dapsone(^\text{72-75})</td>
<td>4</td>
<td></td>
<td>1</td>
<td>1 (0.6)</td>
<td></td>
</tr>
<tr>
<td>Diaphenylsulfone(^\text{76})</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1 (0.6)</td>
<td></td>
</tr>
<tr>
<td>Efalizumab(^\text{77})</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1 (0.6)</td>
<td></td>
</tr>
<tr>
<td>Esomeprazole(^\text{78})</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1 (0.6)</td>
<td></td>
</tr>
<tr>
<td>Hydroxychloroquine(^\text{79})</td>
<td>2</td>
<td></td>
<td>2</td>
<td>2 (1)</td>
<td></td>
</tr>
<tr>
<td>Ibruprofen(^\text{80,81})</td>
<td>2</td>
<td></td>
<td>2</td>
<td>1 (0.6)</td>
<td></td>
</tr>
<tr>
<td>Imatinib(^\text{82})</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1 (0.6)</td>
<td></td>
</tr>
<tr>
<td>Lamotrigine(^\text{52,83})</td>
<td>10</td>
<td></td>
<td>10</td>
<td>(6)</td>
<td></td>
</tr>
<tr>
<td>Mexiletine(^\text{24,91-92})</td>
<td>5</td>
<td></td>
<td>5</td>
<td>(3)</td>
<td></td>
</tr>
<tr>
<td>Minocycline(^\text{69-98})</td>
<td>3</td>
<td></td>
<td>3</td>
<td>(2)</td>
<td></td>
</tr>
<tr>
<td>Nevirapine(^\text{99-102})</td>
<td>8</td>
<td></td>
<td>8</td>
<td>(5)</td>
<td></td>
</tr>
<tr>
<td>Olanzapine(^\text{103})</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1 (0.6)</td>
<td></td>
</tr>
<tr>
<td>Oxcarbazepine(^\text{105})</td>
<td>3</td>
<td></td>
<td>3</td>
<td>(2)</td>
<td></td>
</tr>
<tr>
<td>Phenoxybutazone(^\text{106})</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1 (0.6)</td>
<td></td>
</tr>
<tr>
<td>Phenobarbital(^\text{107})</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1 (0.6)</td>
<td></td>
</tr>
<tr>
<td>Phenytoin(^\text{24,91-92})</td>
<td>7</td>
<td></td>
<td>7</td>
<td>(4)</td>
<td></td>
</tr>
<tr>
<td>Quinine and thia(^\text{108})</td>
<td>2</td>
<td></td>
<td>2</td>
<td>(1)</td>
<td></td>
</tr>
<tr>
<td>Saxazosulfapyridine(^\text{109})</td>
<td>2</td>
<td></td>
<td>2</td>
<td>(1)</td>
<td></td>
</tr>
<tr>
<td>Sodium meglumine(^\text{110})</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1 (0.6)</td>
<td></td>
</tr>
<tr>
<td>Sodium vaptrocept(^\text{110})</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1 (0.6)</td>
<td></td>
</tr>
<tr>
<td>Spironolactone(^\text{111})</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1 (0.6)</td>
<td></td>
</tr>
<tr>
<td>Steptomyacin(^\text{112})</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1 (0.6)</td>
<td></td>
</tr>
<tr>
<td>Sisomicin(^\text{113})</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1 (0.6)</td>
<td></td>
</tr>
<tr>
<td>Sulfadiazine(^\text{114,115-118,135})</td>
<td>10</td>
<td></td>
<td>10</td>
<td>(6)</td>
<td></td>
</tr>
<tr>
<td>Sulfamethoxazole(^\text{14,136})</td>
<td>2</td>
<td></td>
<td>2</td>
<td>(1)</td>
<td></td>
</tr>
<tr>
<td>Trbeneside(^\text{13})</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1 (0.6)</td>
<td></td>
</tr>
<tr>
<td>Vancomycin(^\text{137-140})</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1 (0.6)</td>
<td></td>
</tr>
<tr>
<td>Zonisamide(^\text{18})</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1 (0.6)</td>
<td></td>
</tr>
</tbody>
</table>

**DRESS** = Drug Reaction with Eosinophilia and Systemic Symptom.
DRESS: Diagnostic Criteria

• Rash, nonspecific

And 3 / 4 criteria

• Liver involvement
  (AST/ALT elevated 9-10x)

• Hypereosinophilia

• Lymphadenopathy

• Fever > 38
DRESS: Treatment

- Discontinuation of causative drug
- Corticosteroids
Acute Generalized Exanthematous Pustulosis (AGEP)

• Pustular drug rash with high fever

• Rash:
  – Pustules, numerous
  – Distribution: face, skin folds → disseminate in hours
  – Symptoms: burning, pruritus
  – 50% also with facial and hand edema, purpura, vesicles, bullae, EM-like lesions, mucous membrane involvement
Case

- 42 yo F with recent diagnosis of unclear autoimmune disease
- Presented with rash that started 5-6 days prior to presentation
- Areas involved:
  - Neck folds
  - Chest
  - Abdomen
  - Upper arms
  - Scalp
  - Thighs
- Symptoms: itching and burning
- 2 weeks prior to presentation: started hydroxychloroquine
- ROS:
  - Fever at rash onset but now resolved
  - Myalgia
  - Arthritis
What is your diagnosis?

A. Follicultis
B. Erythema Multiforme
C. Stevens-Johnson Syndrome
D. Acute Generalized Exanthemeatous Pustulosis
E. Drug Reaction with Eosiniophilia and Systemic Symptoms
AGEP

- Acute Generalized Exanthematous Pustulosis
- Pustular drug rash with high fever
- Acute extensive formation of sterile pustules
- Locations: folds or face
- Systemic signs/symptoms:
  - Fever
  - Burning or itching
  - **Hand and facial edema**
  - Lab abnormalities:
    - Leukocytosis
    - Elevated neutrophil count
    - Elevated liver enzymes
    - Mild eosinophilia
    - Transient renal failure
- Typically resolves in <15 days
Median time between initiation of drug and AGEP:

Antibiotics: 1 day

Other: 11 days
AGEP

Most common drugs: antibiotics, calcium channel blockers, antimalarials
Treatment

- Stop offending drug
- Corticosteroids
- Antipyretics
Case

- 52 yo female admitted for CNS toxoplasmosis
- Dermatology consulted due to spreading rash
- 1 day duration
- Started on pyrimethamine and sulfadiazine x 3 days
- ROS: + sore throat, fatigue, myalgia
What is your diagnosis?

A. SJS/TEN
B. Morbilliform Drug Rash
C. Psoriasiform Drug Rash
D. Sun burn
E. Eczema
SJS / TEN

- Stevens-Johnson and Toxic Epidermal Necrolysis
- Rare, acute and life-threatening
- Involves mucosa and skin
- Extensive keratinocyte cell death leading to separation of dermal-epidermal junction
- Time course: 7-21 days
- May begin as benign appearing dermatosis and rapidly progress

Bologna, Dermatology 2008
SJS/TEN

• Mortality rate:
  – TEN: 25-50% (16% in children)
  – SJS: ~ 5% (0% in children)

• Most of cases ➔ drugs

• Most common drugs:
  – Antibiotics
  – NSAIDs
  – Anticonvulsants
SJS/TEN: Symptoms

• Initial: fever, stinging eyes, dysphagia
  – May precede rash

• Mucosal involvement:
  – Erythema and erosions
  – Buccal, ocular, genital mucosae
  – Respiratory tract epithelium: 24% with TEN
  – GI
SJS/TEN

• Tender rash appears on trunk then spread
• Morphology of skin rash
  – First lesions are erythematous, dusky red, or purpuric macules that coalesce
    • +Nikolsky sign: detachment of epidermis from dermis when exerting tangential lateral pressure
  – Red macular lesions take on a characteristic gray hue
  – Necrotic epidermis then detaches from dermis and fluid fills the space between epidermis and dermis giving rise to flaccid blisters
  – “Wet cigarette” paper appearance of skin when pulled away → large areas of raw bleeding dermis ‘scalding’
SJS/TEN

- Tender rash appears on trunk then spread
- Erythematous macules
- Dusky/gray
- Epidermal and dermal detachment
- Flaccid Blisters
- Sloughing of skin
- Raw “scalded” bleeding dermis

Bolognia, Dermatology 2008
Nikolsky Sign

• Detachment of epidermis from dermis when exerting tangential lateral pressure
TEN: Factors a/w Poor Outcome

- Increasing age
- Extent of epidermal detachment
- Number of medications
- Elevated: serum urea, creatinine, glucose
- Depression of Blood Count: neutropenia, lymphopenia, thrombocytopenia
SJS/TEN: Complications

- Fluid and Electrolyte Imbalance
- Secondary infection (sepsis)
- Skin: dyspigmentation, scarring, genitalia w/adhesions, loss of nails without regrowth
- Eye: blindness, corneal scarring, symplepharon, synechiae, ectropian, entropian
- Lung: brochiolitis, bronchiectasis, obstructive d/o
- GI: oral pain, esophageal strictures
- Renal Insufficiency
- Urethral adhesions, erosions, strictures
SJS/TEN: Treatment

• Early identification and withdrawal of offending drug
  – Prompt withdrawal reduces risk of death by 30% per day
• Skin: Dermatology consult, daily wound care
• Eyes: Ophthalmology consult, ointments/drops
• GI: Nutrition support/NG tube, magic mouth wash, petroleum jelly for lips
• GU: Urine catheter to prevent urethral strictures
• Treatment controversial: corticosteroids (1-2mg/kg/day), IVIG, cyclosporine, thalidamide, plasmapheresis

Garcia-Doval, Arch Dermatol, 2000
Zimmerman n, JAMA Dermatolol 2017
Magic Mouth Wash

• Compound of 3 different ingredients
• Ingredients may vary
  – 1 part Viscous lidocaine 2%
  – 1 part Maalox
  – 1 part Diphenhydramine 12.5mg/5ml elixir
• Swish and spit / swallow 1-2 teaspoons q6h
# Time to Rash Onset after Drug Ingestion

<table>
<thead>
<tr>
<th>Rash</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRESS</td>
<td>2-6 WEEKS</td>
</tr>
<tr>
<td>AGEP</td>
<td>HOURS-2DAYS</td>
</tr>
<tr>
<td>SJS / TEN</td>
<td>7-21 DAYS</td>
</tr>
<tr>
<td>MORBILLIFORM</td>
<td>7-21 DAYS</td>
</tr>
</tbody>
</table>

**Diagram:**
- **Start Drug**
- 7 days
- 14 days
- 21 days
- **AGEP**
- **Dress**
- **SJS / TEN**
- **Morbilliform**
Take Home Points: serious drug rash

- Early dermatology consult
- Facial edema $\rightarrow$ AGEP
- Marked peripheral blood eosinophilia $\rightarrow$ DRESS
- Mucous membrane lesions $\rightarrow$ SJS/TEN
- Painful lesions $\rightarrow$ SJS/TEN
- Dusky lesions $\rightarrow$ SJS/TEN
Take Home Points: serious drug rash

- Early dermatology consult
- Facial edema
  - AGEP
- Eosinophilia + organ involvement
  - DRESS
- Mucous membrane lesions
  - SJS/TEN
- Painful lesions
  - SJS/TEN
- Dusky lesions
  - SJS/TEN
## Drug Rashes

<table>
<thead>
<tr>
<th>Dangerous</th>
<th>Benign</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRESS</td>
<td>Morbilliform</td>
</tr>
<tr>
<td>AGEP</td>
<td></td>
</tr>
<tr>
<td>SJS / TEN</td>
<td></td>
</tr>
</tbody>
</table>
MORBILLIFORM DRUG RASHES

- Most common drug rash (>90%)
- Described as morbilliform / exanthenmatous: “maculopapular”
- Lesions begin as:
  - Erythematous macules → papules
  - Start on trunk → extremities
  - Symmetric distribution
- Symptoms: pruritus, low grade fever

Revuz and Valeyrie-Allanore, Dermatology, 2008
Treatment

• Discontinue offending agent (if possible)
• ‘Treating through’
  – Close monitoring
  – Desensitization
• Topical cortisteroids
• Antihistamines
INFECTIONS AND INFESTATIONS

“Scratch yourself a couple of times and call me in the morning.”
MIRM

• **Mycoplasma pneumoniae-induced** Rash and Mucositis

• Other names:
  – Atypical Stevens-Johnson
  – Fuch’s syndrome
  – Mycoplasma pneumoniae-associated mucositis

• Proposed reclassification of these cases

• 25% extrapulmonary complications

• Mean age: 11.9 +/- 8.8 years

• Male predominance
Cutaneous Involvement

- Sparse 61 (47%)
- Absent 42 (34%)
- Moderate 24 (19%)
MIRM: Mucosal Involvement

- Ocular lesions
- Oral lesions, esophageal involvement
- Genital, anal
MIRM : Rash

- Cutaneous lesions: pleomorphic
- Majority with full recovery (~80%)
- 8% of patients with recurrence
MIRM: Treatment

- Antibiotics
- Pain management
- Oral care
- Ophthalmology consult
- Hydration / nutrition support
- Corticosteroid
- IVIG
- Plasmapheresis
Magic Mouth Wash

• Compound of 3 different ingredients
• Ingredients may vary
  – 1 part Viscous lidocaine 2%
  – 1 part Maalox
  – 1 part Diphenhydramine 12.5mg/5ml elixir
• Swish and spit / swallow 1-2 teaspoons q6h
Case

- 37 yo woman in the ER for rash on lips and extremities
- Reports itching on arms, tenderness to lips
- Has had difficulty eating due to lip involvement
- Rash preceded by cold sores
Which virus is most commonly associated with this rash?

A. HSV
B. Coxsackie A16
C. EBV
D. CMV
E. Influenza
Erythema Multiforme

• Acute, self limited, but potentially recurrent dz
• Rash: abrupt onset of papular “target” lesions, majority appearing within 24 hours
• Target lesions favor acrofacial sites
• Minor: little/no mucosal lesions, no systemic sx
• Major: severe mucosal involvement + systemic features
• Most common precipitating factor: HSV
• Does not progress to TEN

Yacoub, Clin Mol Allergy. 2016
Erythema Multiforme Continued

• Mucosal Lesions
  – Vesiculobullous and rapidly develop into painful erosions
  – Buccal mucosa, lips, ocular, genital mucosae

• Systemic Symptoms (EM Major)
  – Fever
  – Fatigue
  – Arthralgias with joint swelling
Treatment

• Supportive care
  – Petroleum jelly to erosions
  – Oral antihistamines to relieve burning/stinging of skin

• Severe EM
  – Systemic corticosteroids 0.5-1mg/kg/day
  – Pulse methylprednisolone 1mg/kg/day x 3 days

• HSV-associated EM, recurrent
  – Prophylaxis for 6+ months
  – Oral acyclovir 10mg/kg/day
  – Valacyclovir 500-1000mg/day
  – Famciclovir 250mg BID
Varicella Zoster Virus

• HSV3
• Chickenpox (varicella)
• >90% of infections seen in <10 yo
• Transmitted via inhalation of infected air droplets (airborne isolation) or direct contact
• Rash: *lesions in different stages of development*
  – Erythematous macules → vesicles with rim of red “dew drops on a rose petal” → papules that rupture → crust
  – Pruritic
Diagnosis and Treatment

• Diagnosis: clinical exam, PCR, viral cx, direct fluorescent antibody

• Immunocompetent kids/adolescents: no tx needed, supportive care
  – No aspirin → Reye’s Syndrome

• Immunocompetent/compromised adults: antiviral, supportive care
Breakthrough varicella

• Varicella among those vaccinated
• Most are mild
• Severe cases involved disseminated VZV with other organs involved
  – Literature review yielded <60 cases
  – >31 million doses distributed annually worldwide
  – Bottom line: RARE!
• Oka strain vs wild-type
Herpes Zoster (Shingles)

- Reactivation of varicella virus
- Latent in sensory dorsal ganglion nerves
- Triggers: trauma, irradiation, immunosuppression
- Prodrome: pain, tenderness, paresthesia, pruritus, tingling
Zoster: Rash

- Grouped vesicles on an erythematous base within dermatome → crusts
- Typically involves 1 dermatome, unilaterally
Schematic demarcation of dermatomes shown as distinct segments. There is actually considerable overlap between any two adjacent dermatomes.
Complications

- Increase with increasing age
- Postherpetic neuralgia
- Secondary bacterial infections
- Scarring
- Ophthalmic zoster
- Ramsey-Hunt syndrome: reactivation of VZV in geniculate ganglion → vesicles of ear canal, tongue, hard palate, acute facial nerve paralysis, loss of taste in anterior 2/3 of tongue
- Meningoencephalitis
- Motor paralysis
- Pneumonitis
- Hepatitis

Immunocompromised

- Unusual clinical presentations
- Persistent crusted verrucous lesions
- Postherpetic hyperhidrosis
- Disseminated disease (>20 vesicles outside primary or adjacent dermatome)
- Visceral involvement
Shingles Diagnosis

- Clinical exam
- Viral Culture
- Direct immunofluorescence assay
- PCR

- To obtain adequate sample: rub the base of the vesicle

Treatment

• Goal: accelerate healing, limit severity and duration of acute and chronic pain, reduce complications, reduce risk of dissemination (immunocompromised)

• Best to treat <72, but some benefit even after

• Acyclovir 800mg q4h (5xdaily) 7-10days

• Valacyclovir 1g TID x 7 days

• Famciclovir 500mg TID x 7 days

Postherpetic Neuralgia

• Pain that persists more than 30 days after the onset of the rash or after cutaneous healing
• Incidence and duration directly correlated with patient’s age
• Symptoms within affected dermatome:
  – Sensory abnormalities
  – Neuropathic pain
  – Allodynia: any stimuli (light touch) perceived as pain
• Lasts months to years
Treatments: Postherpetic Neuralgia

- May need a combination of medications
- Gabapentin 300mg PO daily and titrate slowly to daily dose of 3600mg (divided in 3 doses) over 4 weeks
- Topical steroids
- Capsaicin 0.025-0.074% cream TID
- Lidocaine 5% patch applied to painful sites, up to 3 patches at a time for max 12 hours

Herpes Zoster: Take Home Points

• More common in advancing age and immunocompromised
• Ophthalmology referral for involvement around eyes or nose
• To diagnose: swab base of lesions (vigorously)
Case

- 82 yo female with severely itchy rash affecting most of her body
- Rash involves trunk, extremities, and groin
- Itching is rated at 10/10, leading to insomnia
- Social: lives in nursing home, roommate itchy
What treatment would you recommend?

A. Oral prednisone
B. Topical diphenhydramine and calamine lotion
C. Topical permethrin
D. Moisturize skin with petroleum jelly
E. Hydroxyzine orally
Scabies

- Mite: Sarcoptes scabiei var. hominis
- Entire life cycle: human epidermis
- Can survive for a week in the environment
- Transmission: close personal contact, fomites
- Incubation before sx develop: 2-6 weeks
Scabies: Rash

- Rash:
  - Papules
  - Nodules
  - Vesicles
  - Excoriations
  - Eczematous dermatitis

- Pathognomonic Sign: Burrow

- Severely itchy!

Burrow: Tunnel that female mite excavates while laying eggs
Finger web spaces
Axillae
Waistline
Genitalia
Wrist
Crusted Scabies

- Immunocompromised
  - Elderly
  - Mental impairment
  - HIV
  - Transplant
- 1000’s of mites on skin surface
- Minimal pruritus
- Highly contagious
Diagnosis and Treatment

• Diagnosis
  – Clinical exam
  – Scabies prep
  – Dermatoscopic exam
  – Biopsy

• Treatment:
  – Permethrin 5% cream
    • Leave on overnight, wash off in AM, repeat in one week (for nymphs)
    • 2mo-5yo: treat head to toe
  – PO Ivermectin (Crusted Scabies)
  – Vacuum, wash all clothing in hot water, bag unwashables for 14 days
  – Treat close contacts
Take Home Points: Scabies

- Use distribution of rash to help with diagnosis
  - Finger webspaces, wrists, axillae, waist, genitalia
- Adults: neck down involvement
- Children and Crusted Scabies: all over
- Treat if high pretest probability
Case

• 28 yo female with itchy rash
• Started 6 weeks ago
• New sites continue to crop up
• Denies going outside and uses insect repellent when she does
What would you recommend?

A. Pest control with careful examination of mattress seams.
B. Oral ivermectin
C. Insect repellent with greater % DEET.
D. Oral prednisone
E. Both A and B
F. Both B and E
Bedbugs

- Cimex lectularius
- Blood-sucking human parasites
- Oval-shaped, flat, reddish brown, ~5mm
- Feed at night
- Hide in seams of mattresses, furniture, luggage, holes in wall, pipes, gutters
Bedbugs

• Rash: papular urticaria, urticaria, bullae, papules
• Exposed skin
• “Breakfast, lunch, and dinner”
Treatment

• Mattress covers
• Professional Exterminator: Pesticides / heat treatment
• Permethrin treated clothing
• Cover up
• Topical steroid and antihistamines for itching rash
Topical Corticosteroid Primer

• Effectiveness depends on diffusion through stratum corneum

• Percutaneous absorption depends on:
  – Active ingredient
  – Concentration
  – Vehicle
  – Skin location
Vehicle

- More occlusive, better penetration
- Solutions/sprays/aerosols: ingredients dissolved in alcoholic vehicles
- Lotions: suspensions of powder in water
- Creams: semisolid emulsions of oil in water
- Ointments: emulsions of water droplets suspended in oil
Topical Corticosteroid Primer: Location

• Thicker stratum corneum ➔ lower absorption

• Mucosal skin
• Eyelids
• Face/Skin folds
• Trunk/extremities
• Palm/soles
Volume to be Dispensed

• Common prescribing error
• Take into consideration:
  – Size of area to be treated
  – Frequency of application
  – Time between appointments or before predicted clearing of rash
  – $$
• 1 grams covers ~10x10cm
• 1 application:
  – Face 2g
  – Arm 3g
  – Leg 4g
  – Whole body: 30g
General Guidelines

• Become familiar w/1 per potency class
• Remember potency also depends on vehicle!
  – Sprays, solutions, gels: hairy areas
  – Creams: thinner plaques, rubs in well
  – Ointments: lichenified, thicker plaques
<table>
<thead>
<tr>
<th>Strength</th>
<th>Topical Steroid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lowest</td>
<td>Hydrocortisone 1%</td>
</tr>
<tr>
<td>Low</td>
<td>Hydrocortisone 2.5%</td>
</tr>
<tr>
<td>Medium</td>
<td>Triamcinolone 0.1%</td>
</tr>
<tr>
<td>High</td>
<td>Fluocinonide 0.05%</td>
</tr>
</tbody>
</table>
Side Effects

- Atrophy (thinning of skin)
- Striae (stretch marks)
- Hypopigmentation
- Acne
- Enhanced fungal infections
- Retarded wound healing
- Contact dermatitis
- Glaucoma, cataracts
- Systemic Side Effects: adrenal suppression, cushing’s syndrome, growth retardation
Take Home Points

- Take vehicle/location into account
- Prescribe enough
- Become familiar with 1 per potency class
- Use least potent that is still effective
- “Stop when smooth and flat”
References

- medskin.co.uk
- dermnetnz.org
- Aad.org
- Emedicine.medscape.com
- Pcds.org/uk
- Pcds.org/uk
• J.tcheung@gmail.com  Questions?