Acute Dermatologic Emergencies of the Inpatient
Sarah Taylor, MD, FAAD
Eisenhower Army Medical Center

I need a dermatology consult STAT...... Said no one ever
Objectives

- Identify potentially life-threatening dermatologic conditions in the inpatient
- Discuss the most common disease processes which should prompt a dermatology consult
- Discuss management of inpatient dermatologic emergencies
Introduction

- 20% of outpatient primary care visits are for “skin issues”
- In the inpatient setting, both common and potentially life-threatening dermatologic conditions occur
- Quickly identifying manifestations of serious skin disease can significantly reduce morbidity and mortality
When to worry...

- Erythroderma
- Mucous membrane involvement
- Blisters or desquamation
- Rapid purpura
- Skin pain
History is critical!

- Known/underlying dermatologic conditions
  - Atopic derm, psoriasis, etc which can flare
- All prescribed and OTC meds
  - Intermittent drugs very important
- Exposures
  - Travel, pets, other contacts, occupation
- Where did rash start? How did it progress?
- Pruritus vs skin pain
  - Skin pain is ominous
Exam is critical!

- **More is missed by not looking than by not knowing**
- **Distribution**
  - Don’t forget to check mouth, eyes and genitals
- **Morphology**
  - Papules? pustules? blisters?
- **Blanching vs non-blanching**
  - Distinguishes contained vascular inflammation (dilation) vs “leaky” vasculature (vasculitis)
Red flags

- Erythroderma
- Mucous membrane involvement
- Blisters or desquamation
- Rapid purpura
- Skin pain
Erythroderma

- Redness over > 90% of skin surface
- Multiple causes
  - Drug Eruption
  - Toxic Shock syndrome
  - Psoriasis
    - Contact Dermatitis
    - Atopic Dermatitis
    - Cutaneous T cell lymphoma
    - Seborrheic dermatitis
    - Pityriasis rubra pilaris
Erythroderma

- Check for:
  - Fever
  - Systemic Symptoms
  - Rapid progression
  - Multi-organ dysfunction
    - Excess vasodilatation leading to:
      - Hypotension
      - Electrolyte imbalance
      - Congestive heart failure
Erythroderma

- Case:
- 60 yr old male with recent COPD exacerbation, hx of HTN, HLD, and mild psoriasis
- On lisinopril, simvastatin, advair, and given 1 week of oral prednisone for COPD flare
- Develops low-grade fever, shaking chills, diffuse erythema
Q1. Which drug is most likely responsible for the patient’s presentation?

A. Simvastatin
B. Lisinopril
C. Prednisone
D. Advair
Pustular/Erythrodermic Psoriasis

- Occurs when known psoriatics are given oral steroids
  - B-blockers, indomethacin, antimalarials can also cause flare
- Flare with pustules when tapered
- Can be life threatening
  - High cardiac output state
  - Electrolyte issues, elevated ESR
  - Leukocytosis
  - Can affect multiple organ systems

Management:
- Monitor closely
- Cyclosporine (2.5-5mg/kg/day) or Infliximab
  - Quick acting, then transition to other agents long-term
Erythroderma

- Case
- 40 yr old male recent rotator cuff repair
- Develops fever, hypotension, and faint rash on the abdomen
- After hospitalization, widespread erythroderma, decreased urine output, diarrhea, vomiting, and confusion ensue
Toxic Shock Syndrome

- **Fever, hypotension, blanching, sunburn-like rash**
- Menstrual (<5% mortality) and non-menstrual cases (20% mortality):
  - Post-surgical, sinusitis, postpartum, respiratory infection post influenza, etc
- S. aureus exotoxins act as superantigens
  - activate large numbers of T cells, triggering extensive cytokine production (IL1, IL2, TNF, and IFN)
## TSS Diagnostic Criteria

<table>
<thead>
<tr>
<th>Major criteria</th>
<th>Minor criteria (three or more of the following)</th>
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</thead>
<tbody>
<tr>
<td>Fever $&gt;38.8^\circ$C</td>
<td>Gastrointestinal (vomiting or diarrhea)</td>
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<tr>
<td>Erythematous rash; skin desquamation, 1–2 weeks after onset of illness</td>
<td>Central nervous system (disorientated or alterations in consciousness without focal neurological signs when fever and hypotension are absent)</td>
</tr>
<tr>
<td>Hypotension (systolic $&lt;90$mmHg)</td>
<td>Mucus membrane hyperemia</td>
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<td></td>
<td>Muscular (severe myalgia or raised creatine kinase levels at least twice upper limit of normal)</td>
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<tr>
<td></td>
<td>Hepatic (thrombocytopenia, liver function tests twice upper limit of normal)</td>
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<tr>
<td></td>
<td>Renal impairment (urea or creatinine twice upper limit of normal)</td>
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</tbody>
</table>
Toxic Shock Management

- Supportive care
- Check for any foreign bodies—tampons, contraceptive sponges, nasal packing
- Clindamycin + oxacillin or nafcillin, or vancomycin (if MRSA)
Erythroderma

- Case:
  - 52 yr old M with hx gout, hypertension, and hyperlidemia.
    - on enapril for years
    - simvastatin and allopurinol added 4 weeks ago.
  - Presents with pruritic eruption on his face, upper trunk, and upper and lower extremities
  - Fevers prior to rash and facial edema
  - Labs reveal leukocytosis with eosinophilia, elevated BUN/Crt and elevated transaminases
Q2. Which drug should we stop?

A. Enalapril
B. Allopurinol
C. Simvastatin
D. All of the above
**DRESS**

- **Drug Reaction with Eosinophilia and Systemic Symptoms (drug hypersensitivity rxn)**

- **Clinical presentation:**
  - Erythematous morbilliform rash and facial edema
  - Lymphadenopathy - limited or generalized
  - Fever
  - Leukocytosis with eosinophilia and/or atyp lymphs
  - Transaminitis

- **Systemic abnormalities which can affect nearly every organ system**

- **10% mortality**
  - Hepatic necrosis most common
Drug Eruptions

- Simple cutaneous eruptions:
  - Without systemic involvement
  - Exanthematous in appearance, truncal
  - Remove offending drug, pt improves over 7-10 days

- Complex drug eruptions:
  - DRESS
  - Drug Induced Hypersensitivity
  - SJS/TEN
    - Prominent systemic involvement
    - Widespread eruption +/- mucosal surfaces
# Common drugs associated with drug reaction with eosinophilia and systemic symptoms syndrome

<table>
<thead>
<tr>
<th>Drug category</th>
<th>Drug name</th>
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<tbody>
<tr>
<td>Anticonvulsant</td>
<td>Carbamazepine, lamotrigine, phenobarbital, <strong>phenytoin</strong>, valproic acid, and zonisamide</td>
</tr>
<tr>
<td>Antimicrobial</td>
<td>Ampicillin, cefotaxime, dapsone, ethambutol, isoniazid, linezolid, metronidazole, <strong>minocycline</strong>, pyrazinamide, quinine, rifampin, sulphasalazine, streptomycin, <strong>trimethoprim-sulfamethoxazole</strong>, and vancomycin</td>
</tr>
<tr>
<td>Antiviral</td>
<td>Abacavir, nevirapine, and zalcitabine</td>
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<tr>
<td>Antidepressant</td>
<td>Bupropion and fluoxetine</td>
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<tr>
<td>Antihypertensive</td>
<td>Amlodipine and captopril</td>
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<tr>
<td>Biologic</td>
<td>Efalizumab and imatinib</td>
</tr>
<tr>
<td>NSAID</td>
<td><strong>Celecoxib and ibuprofen</strong></td>
</tr>
<tr>
<td>Miscellaneous</td>
<td><strong>Allopurinol</strong>, epoetin alfa, mexiletine, and ranitidine</td>
</tr>
</tbody>
</table>
DRESS Pathogenesis

- Role for HHV-6 reactivation
- Latent period of 2-6 weeks after drug started
- Precise pathogenesis unclear
  - * Drug detoxification problem
- Certain HLA types more pre-disposed to drug reactions with certain drugs
  - Ie, HLA-B5701 allele and abacavir-induced DRESS in Caucasian patients
DRESS management

- Stop offending drug
- Limit any new/unnecessary drugs while in-house
- All organ systems at risk, but certain drugs preferentially target certain systems
Drugs associated with specific internal organ risk in drug reaction with eosinophilia and systemic symptoms syndrome

<table>
<thead>
<tr>
<th>Medication</th>
<th>Clinical abnormality</th>
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<tbody>
<tr>
<td>Allopurinol</td>
<td>Renal</td>
</tr>
<tr>
<td>Ampicillin</td>
<td>Cardiac</td>
</tr>
<tr>
<td>Carbamazepine</td>
<td>Renal</td>
</tr>
<tr>
<td>Dapsone</td>
<td>Hepatic and renal</td>
</tr>
<tr>
<td>Minocycline</td>
<td>Hepatic, pulmonary, and cardiac</td>
</tr>
<tr>
<td>Phenytoin</td>
<td>Hepatic</td>
</tr>
</tbody>
</table>
DRESS management

- Sometimes tough to determine which drug is offender
  - Patch testing and lymphocyte transformation test?
- Life-threatening DRESS
  - PO or IV steroids, 1-2mg/kg and taper over 3-6 months after clinical/lab stabilization
  - Add in topical steroids as well
  - Avoid empiric abx or unnecessary NSAIDS
- DRESS with exfoliation
  - Steroids + care in burn or ICU setting
DRESS long-term

- Most will recover
  - Cutaneous manifestations can take weeks
  - +/- scarring, hyperpigmentation
- Can have life-long systemic damage
- Long-term endocrine effects:
  - Thyroid fxn should be routinely screened for at least 2 years
  - Pancreatic fxn should also be assessed
    - Fulminant Type I DM can develop weeks-months later
Red flags

- Erythroderma
- Mucous membrane involvement
- Blisters or desquamation
- Rapid purpura
- Skin pain
Desquamation/Blisters/Pain

- Need to rapidly evaluate and determine rapid course of action
  - Skin separation and/or skin pain is an ominous sign
- Immediately consider:
  - SJS/TEN
  - Staph scalded skin
  - Severe acute graft vs host disease
  - Acute generalized exanthematous pustulosis
Desquamation/Blisters/Pain

- Case:
- 35 yr old F with recent UTI
- Started on Bactrim
- Dysphagia, eye pain
- Flu-like symptoms
- Skin sloughing/pain
Q3. What is the next best step?

A. Consult dermatology
B. Stop all non-life-sustaining drugs
C. Request a tissue biopsy/frozen section to confirm diagnosis
D. All of the above

A. 0%
B. 10%
C. 0%
D. 90%
Stevens Johnson/Toxic Epidermal Necrolysis

- **Clinical Presentation:**
  - Fever, chills, anorexia prodrome - “flu-like”
  - Morbilliform rash that rapidly evolves to widespread sloughing of skin and mucosa
  - Prominent dysphagia and dysuria
  - Painful eyes and stinging/painful skin

- **1-2 weeks** within initiation of offending drug
  - **As opposed to** DRESS (**2-6 weeks**)

- **Leukopenia**
  - **As opposed to** leukocytosis in DRESS

- “Acute Skin Failure”
  - extensive sloughing of internal and external mucocutaneous membranes
SJS/TEN
Common Drugs implicated in SJS/TEN

- **Sulfa drugs, sulfasalazine**
- **Allopurinol**
- **Tetracyclines (minocycline)**
- **Anticonvulsants**
  - Carbamazepine, lamotrigine, phenytoin, phenobarbital
- **NSAIDS**
- **Nevirapine**
SJS/TEN Pathogenesis

- **Hypersensitivity rxn to drug**
  - Mycoplasma, dengue, CMV and contrast medium also implicated

- **T-cell mediated disease**
  - CD8+ cells as mediate keratinocyte death
  - Soluble Fas ligand, TNFalpha, granzymeB/perforin, & granulysin mediate apoptosis

- **Certain HLA’s increase risk**
  - Patients of East Asian descent (HLAB1502) should have testing prior to carbamazepine therapy
  - All patients (HLA-B5701) before abacavir therapy
  - HLAB5801 (Han Chinest) and allopurinol
SJS/TEN Management

- Early derm consult
  - Frozen section can quickly identify TEN vs other
  - Full thickness epidermal necrosis

- Early ophtho
  - Eyesight preservation paramount

- Early urology

- Manage like burn victim
  - Severe dysfunction of ocular, pulmonary, CV, GI and renal systems

- Up to 30% mortality
  - Sepsis, GI bleeds, PE, MI, pulmonary edema

- 65% 5 yr survival rate
Table 1. SCORTEN Criteria

<table>
<thead>
<tr>
<th>Risk Factors</th>
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<tbody>
<tr>
<td>• Age &gt; 40 years</td>
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<tr>
<td>• Malignancy</td>
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<tr>
<td>• Total body surface area affected &gt; 10%</td>
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<tr>
<td>• Heart rate &gt; 120 beats per minute</td>
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<tr>
<td>• Serum Urea (blood urea nitrogen) &gt; 28 mg/dL</td>
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<tr>
<td>• Serum glucose &gt; 250 mg/dL</td>
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<tr>
<td>• Serum bicarbonate &lt; 20 meq/L</td>
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<table>
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<tr>
<th>Criteria Present</th>
<th>Mortality Rate</th>
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<tbody>
<tr>
<td>0-1</td>
<td>3%</td>
</tr>
<tr>
<td>2</td>
<td>12%</td>
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<tr>
<td>3</td>
<td>35%</td>
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<tr>
<td>4</td>
<td>58%</td>
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<tr>
<td>≥5</td>
<td>90%</td>
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</table>

SCORTEN, SCORe of Toxic Epidermal Necrosis
SJS/TEN management

- Withdraw offending drug/stop unnecessary drugs
  - Major predictor of survival
- Supportive/Burn unit level care
- **NO PROPHYLACTIC ABX!**
  - Sterile handling of patient
    - Optimized wound care
  - Culture-directed abx only
    - Q48 hrs for skin, blood, catheters, urinary, gastric tubes
  - Steroids controversial
  - IVIG– FasL not main mediator- granulysin is
  - Enbrel? Cyclosporine? Success in small case series
Fig 1
SJS/TEN Sequelae

- Cutaneous scarring
- Ocular lesions
- Dental complications
- GU issues- stenosis, adhesions
- Pulmonary disease
Desquamation/Blisters/Pain

- Case:
  - 45 yr old Asian female
  - Facial swelling, fevers, leukocytosis (PMN’s)
  - Takes ranitidine, multivitamin
  - Took naproxen 3 days ago for back pain
Acute Generalized Exanthematous Pustulosis

- **Rapid** onset 2-5 days after drug initiated
- Pinpoint sheets of nonfollicular, sterile pustules on erythematous background
  - Erythema on body folds, face before generalizing
- Mucous membrane common, but usually only 1 surface, non-erosive
- Fever, facial edema, leukocytosis:
  - PMN’s(90%), but occasionally eos
- Self-limiting in 15 days once drug removed
AGEP

- Antibiotics-
  - sulfa, B-lactams, quinolones, TCN’s, Vanc
- NSAIDS
- Hydroxychloroquine
- Terbinafine
- Diltiazem, nifedipine, furosemide
- Allopurinol
- 5% of cases- no trigger identified
  - Likely viral, etc.
AGEP

- Most important to differentiate from DRESS and/or pustular psoriasis flare
- Biopsy helpful!
  - Subcorneal pustules
- Treatment includes stopping drug, topical /po steroids and antihistamines
- * 5% mortality due to secondary infection
- * If relapse/refractory, etanercept and cyclosporine have success
<table>
<thead>
<tr>
<th>Characteristic findings of severe cutaneous drug reactions</th>
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</thead>
<tbody>
<tr>
<td><strong>Onset of eruption</strong></td>
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<tr>
<td>DRESS</td>
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<tr>
<td>2-6 weeks</td>
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<tr>
<th>Duration of eruption (weeks)</th>
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<tbody>
<tr>
<td>Several</td>
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<table>
<thead>
<tr>
<th>Fever</th>
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<thead>
<tr>
<th>Mucocutaneous features</th>
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<tbody>
<tr>
<td><strong>Facial edema</strong>, morbilliform eruption, pustules, exfoliative dermatitis, tense bullae, and possible target lesions</td>
</tr>
<tr>
<td>Bullae, atypical target lesions, and mucocutaneous erosions</td>
</tr>
<tr>
<td><strong>Facial edema</strong>, pustules, tense bullae, possible target lesions, and possible mucosal involvement</td>
</tr>
<tr>
<td>Erythematous plaques and edema affecting &gt;90% of the total skin surface with or without diffuse exfoliation</td>
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<table>
<thead>
<tr>
<th>Histological pattern of skin</th>
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<tbody>
<tr>
<td>Perivascular lymphocytic infiltrate</td>
</tr>
<tr>
<td>Epidermal necrosis</td>
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<tr>
<td>Subcorneal pustules</td>
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<tr>
<td>Nonspecific, unless reflecting Sézary syndrome or other malignancy</td>
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<thead>
<tr>
<th>Lymph node enlargement</th>
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<thead>
<tr>
<th>Lymph node histology</th>
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<tr>
<td>Lymphoid hyperplasia</td>
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<tr>
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<td>–</td>
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<tr>
<td>No, unless reflecting Sézary syndrome or other malignancy</td>
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<tr>
<th>Hepatitis</th>
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<tr>
<th>Other organ involvement</th>
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<tbody>
<tr>
<td>Interstitial nephritis, pneumonitis, myocarditis, and thyroiditis</td>
</tr>
<tr>
<td>Tubular nephritis and tracheobronchial necrosis</td>
</tr>
<tr>
<td>Possible</td>
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<td>Possible</td>
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<table>
<thead>
<tr>
<th>Neutrophils</th>
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<th>Eosinophils</th>
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<tr>
<th>Atypical lymphocytes</th>
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<tr>
<td>+</td>
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<td>–</td>
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<td>+</td>
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<thead>
<tr>
<th>Mortality (%)</th>
</tr>
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<tbody>
<tr>
<td>10</td>
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<tr>
<td>5-35</td>
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<tr>
<td>5</td>
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<tr>
<td>5-15</td>
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Red flags

- Erythroderma
- Mucous membrane involvement
- Blisters or desquamation
- Rapid purpura
- Skin pain
Purpura

- **Purpura:**
  - Extravasation of red cells
- **“Palpable purpura”**
  - Leukocytoclastic vasculitis (LCV)
  - Implies inflammation damaging vessel wall
- **Non-palpable**
  - **Petechiae** - pinpoint (benign to severe)
  - **Macular** - > 1-2 mm
- **Retiform:**
  - “Net-like” purpura
    - Antiphospholipid antibody syndrome
    - Calciphylaxis
Petechiae

- Non-Platelet related:
  - Trauma (valsalva, retching, compression)
  - Scurvy, amyloid, infection

- Platelet-related:
  - ITP, TTP, DIC, HUS
  - NSAIDs
Purpura

- If associated with fever, likely systemic inflammatory process or infection
  - Rocky Mountain Spotted Fever, DIC, Meningococcemia

- Palpable purpura:
  - Idiopathic 45-55%
  - Infection 15-20%
  - Inflammatory 15-20%
  - Medication 10-15%
  - Malignancy < 5%
Calciphylaxis
Rocky Mountain Spotted Fever
Antiphospholipid AB Syndrome
Coumadin Necrosis
Purpura

- Case:
  - 20 yr old asplenic male
  - Fever, chills, myalgias, stiff neck, hypotension
  - Petechiae which have progressed to purpura, and finally, frank bullous hemorrhagic lesions within hours
  - “The sickest he has ever felt”
Q4. What is the most important next step in management?

1. Call dermatology for biopsy
2. Initiate antibiotics
3. Start 1-2mg/kg oral steroids
4. Wait until lumbar puncture performed to initiate antibiotics
Meningococcemia

- Flu-like prodrome
- Angular, gun-metal grey centered purpuric lesions
- Purpura fulminans (in setting of DIC and infxn), shock, amputation, death
- Require prompt care to save life and limb:
  - 30min time to abx
We are more than Botox- but we love that too. 😊

I'm going to the dermatologist for a weird rash on my ankle. But I really just want to talk about wrinkles.
Evaluation

- Please take < 90 seconds to evaluate this session.
- Time permitting, speaker will take questions following evaluation.
- Responses are not displayed and are important in maintaining high quality education.
The overall performance of the speaker:

1. Poor
2. Fair
3. Average
4. Good
5. Excellent
How well were the learning objectives met?

1. Poor
2. Fair
3. Average
4. Good
5. Excellent
Did speaker present a balanced view of therapeutic options?

1. Yes
2. No
3. N/A

100%
How useful will this session be in your practice?

1. Poor
2. Fair
3. Average
4. Good
5. Excellent

[Bar chart showing:
- Poor: 73%
- Fair: 23%
- Average: 5%
- Good: 23%
- Excellent: 0%]
As a result of this program, do you intend to change your patient care?

1. Yes
2. No
Thank you!