Ozarks Dermatology
Inpatient/Outpatient

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I have no financial conflicts of interest.
Objectives

• Recognize the most common forms of skin cancer
• Identify common side effects of topical corticosteroid use
• Recognize cutaneous signs of tick borne illnesses found in this area
• Recognize cutaneous signs of loxoscelism
• Recognize cutaneous signs of select food-associated skin/medical conditions
Case

• Your patient spent a lot of time in the sun over the past many years
• He shows you a spot on his back he has had for a year
• It is asymptomatic
• It has been slowly enlarging
• Occasionally bleeds without pain
Question: What is the most likely diagnosis?

A. Squamous cell carcinoma
B. Brown recluse spider bite
C. Basal cell carcinoma
D. Inflamed keratinous cyst
Non Melanoma Skin Cancer Risk Factors

• Ultraviolet radiation
• Pale skin, freckles, red hair
• Cigarette smoking
• Arsenic, nitrogen mustard, coal tar, ...
• HPV
• Chronic wounds and inflammatory conditions (discoid lupus)
• Genetic conditions (Muir-Torre)
• Immunosuppression
Non Melanoma Skin Cancer

• Over 5 million cases, > 3 million people diagnosed each year
• More cases than all other cancers combined
• 1 in 5 Americans will develop over their lifetime
Actinic Keratosis

Pink, scaly papules

Intraepithelial neoplasia
- “pre-cancer”
Actinic Keratosis

Keratin without underlying tumor
Actinic keratoses

Treatment:
- Liquid nitrogen
- 5-FU
- Photodynamic therapy
- Imiquimod
- Ingenol mebutate
Actinic Cheilitis

- Whitish patches on lower lip
- Risk of progression
- Liquid nitrogen, 5-fluorouracil, laser ablation...
Actinic Cheilitis

Squamous cell carcinoma
Basal Cell Carcinoma

- Most common skin cancer
- Low metastatic potential
- Highly destructive
- Deeply invasive
Basal Cell Carcinoma

Pink
Shiny
Pearly
Telangiectasia
Benign Dermal Nevus

Normal skin tone and texture
Basal Cell Carcinoma

Deeply invasive
Destructive
Squamous Cell Carcinoma In-Situ

More pink substance
(plaque/tumor) than
Ak

Not defined
morphologically by
just keratin

Full thickness
keratinocyte atypia
Squamous Cell Carcinoma

Red nodules

Tender

Crusted, eroded

Metastatic potential
Squamous Cell Carcinoma

Misdiagnosed as cyst occasionally

Beware in elderly

Sun exposed areas
Benign Keratinous Cysts
Squamous Cell Carcinoma

Beware of chronic ulcers or “non-healing” sores
Cutaneous Melanoma

- Risk factors similar to keratinocyte carcinomas
  - Family history
  - Personal history
- Incidence increasing
- Mortality rates stabilized/decreasing
Melanoma Risk Factors

Lentigos
Numerous = 3 x risk

Atypical Nevi and Melanoma
>100 nevi = 10 x risk
>5 atypical nevi = 5 x risk
Melanoma

- Asymmetric
- Irregular Borders
- Irregular Color
- Dynamic
Melanoma
Benign Junctional Nevus (Mole)

- Hyperpigmented macules
- Small
- Sharp Borders
- Homogeneous pigmentation
Benign Compound Nevus
Malignant Melanoma
Acral Melanoma

Look at feet and hands
Most common location in people with darker skin
Advice from internists/general practitioners during routine health care visits helps to reduce sun exposure.

Sun protection advice mediated by the general practitioner: An effective way to achieve long-term change of behaviour and attitudes related to sun exposure?

Magnus Falk¹,²,³ and Henrik Magnusson¹,³
“Isn’t Sun Exposure Good For You?”

HOROSCOPES

Your Horoscope

Libra | Sept. 23 to Oct. 22
You've always said there's nothing a little bit of sun couldn't cure, leading to your eventual death from both diabetes and skin cancer.
Sun Protection

Apply sunscreen 15-20 minutes before sun exposure

Reapply every 2 hours and After swimming/sweating

Don’t use spray on sunscreens

Table 132.5
Guidelines for photoprotection.
SPF, sun protection factor.

GUIDELINES FOR PHOTOPROTECTION

• Avoid direct sun exposure between 10 AM and 4 PM whenever possible
• Seek the shade to shelter you from direct sun exposure
• Wear protective clothing, hats, and sunglasses whenever possible
• Apply sunscreen to all exposed skin when you will be outdoors
• Use a sunscreen with an SPF 30 or greater that is labeled as BROAD SPECTRUM
• Use up to 1 to 2 ounces of sunscreen to cover exposed skin (in an adult)
• Apply the sunscreen 15 minutes before sun exposure
• Use a water resistant sunscreen if you are going to swim or perspire heavily
• Re-apply sunscreen every 2 hours or after swimming or excessive sweating
• Spray sunscreens must be applied liberally to achieve the rated SPF
Spray On Sunscreen (Not My Choice)
The chemicals in sunscreen seep into your bloodstream after just one day, FDA says

Sunscreens enter bloodstream after just one day of use, study says

Sunscreen Found in Bloodstream After One Day, Study Shows
Results strengthen FDA's call for more information on sunscreen safety

How Safe Is Sunscreen?
A recent study on absorption into the bloodstream has caused concern, but you should be more worried about skin cancer.
American Academy of Dermatology comments on recent study on absorption of sunscreen ingredients

ROSEMONT, Ill. (May 6, 2019) — Statement from AAD President George J. Hruza, MD, MBA, FAAD

The study “Effect of Sunscreen Application Under Maximal Use Conditions on Plasma Concentration of Sunscreen Active Ingredients” published in the Journal of the American Medical Association addresses an important question about the potential for certain sunscreen ingredients to be absorbed in the bloodstream. As the study concludes, this is a small, pilot study and more research is needed before it can be determined if the absorption of sunscreen ingredients has any effects on a person’s health. These sunscreen ingredients have been used for several decades without any reported internal side effects in humans. Importantly, the study authors conclude that individuals should not refrain from the use of sunscreen, which the AAD encourages as one component of a comprehensive sun protection plan as sunscreen use has been shown to reduce the risk of skin cancer in a number of scientific studies.

No ill effects in humans

Sunscreen use reduces the risk of skin cancer
American Academy of Dermatology comments on recent study on absorption of sunscreen ingredients

ROSEMONT, ILL. (May 6, 2019) — Statement from AAD President George J. Hruza, MD, MBA, FAAD

Skin cancer is the most common cancer in the United States, and dermatologists see the impact it has on patients’ lives every day. Unprotected exposure to the sun's ultraviolet rays is a major risk factor for skin cancer. The AAD encourages the public to continue to protect themselves from the sun by seeking shade; wearing protective clothing, including a lightweight, long-sleeved shirt, pants, a wide-brimmed hat and sunglasses; and generously applying a broad spectrum, water-resistant sunscreen with an SPF of 30 or higher to exposed skin.

The AAD's sun protection recommendations are based on the existing body of scientific evidence and current FDA regulations and guidelines; these recommendations will continue to evolve as the science develops and the FDA issues new regulations. If you are concerned about the safety of the ingredients in your sunscreen, talk to a board-certified dermatologist to develop a sun protection plan that works for you.
• Zinc oxide and titanium dioxide = GRASE
• PABA and trolamine salicylate = not GRASE
• Additional safety and effectiveness data needed
  Oxybenzone, octinoxate, avobenzone, cinoxate, dioxybenzone, ensulizole, homosalate, meradimate, octisalate, octocrylene, padimate O, sulisobenzone
Sunscreen: Use Titanium/Zinc

• All major brands make “chemical free”, “mineral”… sunscreen
  • Neutrogena, Aveeno, Clinique ...
  • Blue lizard sensitive
You should recommend sunscreen

Sunscreen reduces the risk of skin cancer

Use zinc, titanium based sunscreen spf 30 or higher

Do not use spray – or be careful

No tanning beds
Protect

Avoid

Outdoor Pools
Open mid-May to early September.
• Lakeside Pool is an outdoor pool complex with a 120’ water slide, toddler splash pool and whirlpool
• Tradewinds Pool
• Landshark Pool - located at Landshark Bar & Grill. Swim up bar pool is restricted to ages 21 & up. Lower portion of the pool does not have an age restriction.

Complimentary to all Resort guests.

Tanning Beds
10 Minutes - $4.00
15 Minutes - $6.00
20 Minutes - $8.00
Skin Cancer – Outpatient Considerations

- Recognize clinical presentations
- Treat early for better outcomes (actinic keratosis)
- Prescribe protective measures, safe practices
- Sunscreen is recommended, use zinc/titanium products
- Vitamin D
Case

This patient spent time at the pool and in the lake, drinking alcohol and sunbathing. He used sunscreen. About a day after this party he noticed an odd, red, linear streak which was raised and somewhat blistered. The rash settled down after a few days but it turned dark brown and lingered for weeks.

Note: I see about 5 of these after every spring break
Case
Question: Which of the following is the most likely culprit?

A. Scotch and soda
B. Rum and cola
C. Tequila with lime
D. Vodka with cranberry
Phytophotodermatitis

- Furocoumarins in plants + UVA light
- Redness and blisters a few hours after exposure
- Intense hyperpigmentation lasts for weeks
Phytophotodermatitis

Lemonade
Limeade
Alcoholic drinks with lemon, lime

Also, celery
Grapefruit, parsnip, Parsley...

RISK ACTIVITIES FOR PHYTOPHOTODERMATITIS

<table>
<thead>
<tr>
<th>Risk Activity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cosmetics</td>
<td>Tan promoters or perfumes containing bergamot oil (berlock dermatitis) or a fig leaf decoction</td>
</tr>
<tr>
<td>Fruit and vegetable processing</td>
<td>Canning celery or stocking celery in grocery stores, Making lemonade or limeade, especially if selling it outside, squeezing lime juice for margaritas and other drinks or guacamole</td>
</tr>
<tr>
<td>Gardening</td>
<td>Brushing against Dicranum spp. (“gas plant/burning bush”) (US, Europe, N China) or Ruta (UK)</td>
</tr>
<tr>
<td></td>
<td>Cultivating celery, parsnip or parsley</td>
</tr>
<tr>
<td></td>
<td>Clearing weeds with a “weed wacker” (US) or “string trimmer” (UK)</td>
</tr>
<tr>
<td></td>
<td>Pruning or harvesting figs</td>
</tr>
<tr>
<td></td>
<td>Growing Angelica for herbal medicine (Korea), cake decorating (when candied), tonic and flavoring in wines (esp. Benedictine, US)</td>
</tr>
<tr>
<td>Hiking</td>
<td>Through fields and riverbanks (Heracleum spp.) (Pacific NW, Europe)</td>
</tr>
<tr>
<td></td>
<td>Rolling in meadows</td>
</tr>
<tr>
<td></td>
<td>Hiking in southern California and Baja California (Crepidium dumosum, coast spice bush [Rutaceae])</td>
</tr>
<tr>
<td>Ingestion</td>
<td>Ingestion of massive quantities of psoralens (esp. celery) before UVA tanning</td>
</tr>
<tr>
<td></td>
<td>Ingestion of Chlorella (an alga) (Japan)</td>
</tr>
<tr>
<td>Medications</td>
<td>Excessive exposure to UV radiation after taking or applying psoralens for PUVA</td>
</tr>
<tr>
<td></td>
<td>Application of rue (Ruta spp.) as an insect repellent</td>
</tr>
<tr>
<td>Play</td>
<td>Making peashooters with Heracleum spp.</td>
</tr>
<tr>
<td></td>
<td>Playing among rue bushes or Apiaceae</td>
</tr>
<tr>
<td></td>
<td>Fighting with parsnips/celery</td>
</tr>
<tr>
<td></td>
<td>Wearing leis of Ptelea amicata (Hawaii)</td>
</tr>
</tbody>
</table>

Outpatient Consideration

- Linear, vesiculated, acute, pink, itchy rashes are almost always caused by external exposures as in allergic contact dermatitis (e.g. poison ivy)
- Choose an appropriate topical corticosteroid
Poison Ivy

Linear
Vesiculated
Intensely pruritic
Choose high potency steroid
Topical Steroids

- **High potency** - clobetasol
  - Acute, severely inflamed skin
    - Contact dermatitis, hand dermatitis, bug bites
  - Limit use to two weeks

- **Medium potency** - triamcinalone 0.1%
  - Chronic, moderately inflamed skin
    - Venous stasis dermatitis, chronic eczema

- **Low potency** - hydrocortisone 1% or 2.5%
  - Chronic use, groin, face, axilla
    - Seborrheic dermatitis, intertrigo
Topical Steroid Risks/Side Effects

- Atrophy
- Striae
- Ulceration
- Acne
- Purpura
- Cushing syndrome
- H-P-A axis suppression
Steroid Atrophy
Steroid Ulcer
Steroid Acne

- Stop steroid
- Topical antibiotic
  - Clindamycin, metronidazole, sulfur
- Systemic antibiotic
  - Tetracycline, erythromycin
- Two to three months
Case

- A patient with bug bites did not improve with hydrocortisone.
- She was given triamcinalone to use for two weeks.
- Her condition worsened so she was given fluocinonide (lidex) for 2 weeks but she continued to worsen, developing widespread pink itchy patches everywhere she used the medicine.
Question: What is the most likely reason this patient is not improving?

A. Bug bites worsen with corticosteroids
B. Steroid allergy
C. Steroid is not strong enough
D. Need to give steroid more time to work
Prescribe the steroid of correct potency and dose.

Verify the diagnosis.

If steroid is “not working” or condition worsens then consider steroid allergy.
Case

• She continued to worsen so she was given a medrol dose pack.

• A few days later she presented with a severe and widespread red pruritic rash that covers most of her body.

Question:
Is it possible that p.o. medrol caused worsening of her condition?
Steroid Allergy

- 0.2% - 6% of all cases of delayed type hypersensitivity

- These 2 identify 91% of cases
-5% (16/325) of steroid patch test positive cases

-Oral/i.v. exposure led to severe widespread dermatitis
Corticosteroid Allergy

- **Topical**
  - Contact dermatitis, focal, patchy

- **Systemic**
  - Oral, intravenous, intra-articular, inhaled, nasal
  - Some, but not all cases also type 1 hypersensitivity
  - Onset 24 hours, peak at 72 hours
  - Eczematous
  - Worsening asthma
  - Methylprednisolone, prednisone, hydrocortisone, budesonide ...
Hypersensitivity Reactions to Corticosteroids

Abstract

Hypersensitivity reactions to corticosteroids (CS) are rare in the general population, but they are not uncommon in high-risk groups such as patients who receive repeated doses of CS. Hypersensitivity reactions to steroids are broadly divided into two categories: immediate reactions, typically occurring within 1 h of drug administration, and non-immediate reactions, which manifest more than an hour after drug administration. The latter group is more common. We reviewed the literature using the search terms “hypersensitivity to steroids, adverse effects of steroids, steroid allergy, allergic contact dermatitis, corticosteroid side effects, and type I hypersensitivity” to identify studies or clinical reports of steroid hypersensitivity. We discuss the prevalence, mechanism, presentation, evaluation, and therapeutic options in corticosteroid hypersensitivity reactions. There is a paucity of literature on corticosteroid
Case

Ball into woods...
Case

• 45 year old patient
• Rash
• Mild headache, feels fatigued, a bit achy but otherwise healthy
• Removed this tick 6 days prior to rash
Case: Rash
Question: What is the most likely diagnosis?

A. Lyme disease
B. Southern Tick Associated Rash Illness (STARI)
C. Ehrlichiosis
D. Rocky mountain spotted fever
Southern Tick Associated Rash Illness (STARI)

• Borreia lonestari
• No serologic test
• Amblyomma americanum (lone star tick)
• Erythema migrans –like rash (looks like Lyme disease rash)
• Mild: headache, malaise, fatigue, nausea
• Symptoms resolve with doxycycline
• No long term complications
Lone star ticks have not been shown to transmit *Borrelia burgdorferi*, the cause of Lyme disease. In fact, their saliva has been shown to kill *Borrelia* (Ledin et al., 2005, Zeidner et al., 2009).
Amblyomma americanum
Lone Star Tick - STARI
Ixodes scapularis

Lyme disease
Borrelia burgdorferi
Lyme Disease Maps: Most Recent Year

Map of Lyme disease incidence* categories – United States 2017

Legend
Incidence Category
- Low incidence
- High incidence

Cities DC

Data Table

<table>
<thead>
<tr>
<th>Location</th>
<th>Incidence category</th>
<th>2017 Confirmed</th>
<th>2017 Probable</th>
<th>2017 Incidence</th>
<th>Incidence 3-year avg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missouri</td>
<td>Low incidence</td>
<td>2</td>
<td>10</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Lyme Disease
Lyme Disease

Rash does not distinguish STARI from Lyme disease
Stari
Lyme Disease

In Stari – will see rash but not likely arthralgia, neurologic symptoms or long term sequelae

cdc.gov
## Lyme Disease

<table>
<thead>
<tr>
<th>Major Extracutaneous Features of Lyme Disease</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General</strong></td>
</tr>
<tr>
<td><strong>Eyes</strong></td>
</tr>
<tr>
<td><strong>Neurologic</strong></td>
</tr>
<tr>
<td><strong>Cardiac</strong></td>
</tr>
<tr>
<td><strong>Rheumatologic</strong></td>
</tr>
<tr>
<td><strong>Genitourinary</strong></td>
</tr>
</tbody>
</table>
Study results: Distinctions between STARI and Lyme disease symptoms

In a study that compared physical findings from STARI patients in Missouri with Lyme disease patients in New York (Wormser et al, 2005), several key differences were noted:

- Patients with STARI were more likely to recall a tick bite than were patients with Lyme disease.
- The time period from tick bite to onset of the skin lesion was shorter among patients with STARI (6 days, on average).
- STARI patients with an erythema migrans rash were less likely to have other symptoms than were Lyme disease patients with erythema migrans rash.
- STARI patients were less likely to have multiple skin lesions, had lesions that were smaller in size than Lyme disease patients (6-10 cm for STARI vs. 6-28 cm for Lyme disease), and had lesions that were more circular in shape and with more central clearing.
- After antibiotic treatment, STARI patients recovered more rapidly than did Lyme disease patients.
Outpatient Considerations

• Erythema migrans is seen in both Lyme disease and STARI
• STARI is mild relative to Lyme disease and has no long term sequelae
• Ask about travel history
• Look for ticks and consider tick-borne illnesses
• Treat with doxycycline
Lyme Disease

<table>
<thead>
<tr>
<th>Age Category</th>
<th>Drug</th>
<th>Dosage</th>
<th>Maximum</th>
<th>Duration, Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adults</td>
<td>Doxycycline</td>
<td>100 mg twice per day, orally</td>
<td>N/A</td>
<td>10-21*</td>
</tr>
<tr>
<td></td>
<td>Cefuroxime axetil</td>
<td>500 mg twice per day, orally</td>
<td>N/A</td>
<td>14-21</td>
</tr>
<tr>
<td></td>
<td>Amoxicillin</td>
<td>500 mg three times per day, orally</td>
<td>N/A</td>
<td>14-21</td>
</tr>
<tr>
<td>Children</td>
<td>Amoxicillin</td>
<td>50 mg/kg per day orally, divided into 3 doses</td>
<td>500 mg per dose</td>
<td>14-21</td>
</tr>
<tr>
<td></td>
<td>Doxycycline</td>
<td>4 mg/kg per day orally, divided into 2 doses</td>
<td>100 mg per dose</td>
<td>10-21*</td>
</tr>
<tr>
<td></td>
<td>Cefuroxime axetil</td>
<td>30 mg/kg per day orally, divided into 2 doses</td>
<td>500 mg per dose</td>
<td>14-21</td>
</tr>
</tbody>
</table>

Treat STARI because of uncertainty related to Lyme diagnosis

cdc.gov
Case

- You remove this tick from a patient who has no rash, is otherwise healthy, ros all negative
- Travelled to **high risk area** for Lyme dz
- Tick has been **on for about 5 days**
- She is worried about Lyme disease and wants treatment.
Question: **What is the best course of action?**

A. Remove tick and observe, there is no need to treat
B. Remove tick and treat with doxycycline 100 mg po bid 3 weeks
C. Remove tick and treat with doxycycline 100 mg po bid 1 week
D. Remove tick and treat with doxycycline 200 mg po x 1
Lyme Prophylaxis

Approach to prophylaxis — We agree with the Infectious Diseases Society of America (IDSA) guidelines that recommend antibiotic prophylaxis only in patients who meet all of the following criteria (table 2) [10]:

- Attached tick identified as an adult or nymphal I. scapularis tick (deer tick).
- Tick is estimated to have been attached for ≥36 hours (by degree of engorgement or time of exposure).
- Prophylaxis is begun within 72 hours of tick removal.
- Local rate of infection of ticks with B. burgdorferi is ≥20 percent (these rates of infection have been shown to occur in parts of New England, parts of the mid-Atlantic States, and parts of Minnesota and Wisconsin).
- Doxycycline is not contraindicated. (See "Tetracyclines", section on 'Special populations' and "Tetracyclines", section on 'Adverse reactions'.)

If the patient meets all of these criteria, the recommended dose of doxycycline is 200 mg for adults and 4.4 mg/kg up to a maximum dose of 200 mg in children, given as a single dose. The American Academy of Pediatrics states that in areas of high risk, a single prophylactic dose of doxycycline can be used in children of any age to reduce the risk of acquiring Lyme disease after the bite of an infected I. scapularis tick [21]. However, in young children, the efficacy of this approach and the appropriate regimen have not been established, since doxycycline prophylaxis has not been studied in children <12 years of age and recommendations are extrapolated largely from the adult experience. (See 'Efficacy and rationale' above.)
Tick Removal

Tick removal and testing

Removing a tick  Testing of ticks

If you find a tick attached to your skin, there's no need to panic—the key is to remove the tick as soon as possible. There are several tick removal devices on the market, but a plain set of fine-tipped tweezers work very well.

How to remove a tick
1. Use fine-tipped tweezers to grasp the tick as close to the skin’s surface as possible.
2. Pull upward with steady, even pressure. Don’t twist or jerk the tick; this can cause the mouth parts to break off and remain in the skin. If this happens, remove the mouth-parts with tweezers. If you are unable to remove the mouth easily with clean tweezers, leave it alone and let the skin heal.
3. After removing the tick, thoroughly clean the bite area and your hands with rubbing alcohol or soap and water.
4. Never crush a tick with your fingers. Dispose of a live tick by putting it in alcohol, placing it in a sealed bag/container, wrapping it tightly in tape, or flushing it down the toilet.

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Case

• 30 year old patient
• Fever, malaise, muscle aches, nausea, abdominal pain...
• Rash began on hands and feet faint pink pinpoint spots that
• Darkened and enlarged over the next few days
• She removed this tick from her body....
Case
Case: Headache, Fever and purple macules on feet and hands
Question: What is the most likely diagnosis?

A. Ehrlichiosis
B. Babesiosis
C. STARI
D. Rocky mountain spotted fever
Rocky Mountain Spotted Fever

**Incidence of Rocky Mountain Spotted Fever, by State – United States, 2010**

- **Cases per million**
  - **NN**: 0
  - **0.2–1.5**: Lighter blue
  - **1.5–19**: Darker blue
  - **19–63**: Red

**Comparison of Ixodes scapularis, Amblyomma americanum, and Dermanyssus variabilis, by life stage**

- **Blacklegged tick (Ixodes scapularis)**
  - Adult
  - Female
  - Male
  - Nymph
  - Larva

- **Lone star tick (Amblyomma americanum)**

- **American dog tick (Dermacentor variabilis)**

Bologna Dermatology Text
Rocky Mountain Spotted Fever - Early

Rash begins (2-4 days after onset of fever) with erythematous macules on ankles and wrists…

onset
3-12 days after bite

<50% of cases will have early rash
Rocky Mountain Spotted Fever

Become purpuric after 2-4 days
Rocky Mountain Spotted Fever

90% will eventually have rash ~ 5-6 days into illness
Rocky Mountain Spotted Fever
Rocky Mountain Spotted Fever
Rocky Mountain Spotted Fever

- *Rickettsia rickettsii*
- American dog tick (*Dermacentor variabilis*)
- Erythematous macules (50%) on ankles and wrists ~ 2-4 days after onset of fever/headache
  - Later (day 5-6), widespread purpuric macules (90%)
- Septic vasculitis: fever, headache, malaise, seizures, renal, pulmonary, hepatomegaly
- ~ higher mortality in very young and older patients
- Treatment: doxycycline
Rocky Mountain Spotted Fever

Case Fatality Rate of Spotted Fever Rickettsiosis by Age Group, 2008-2013

Case fatality rate by age-group for spotted fever rickettsioses (including RMSF) in the United States, 2008-2012.
Rocky Mountain Spotted Fever

Signs and Symptoms

- Rocky Mountain spotted fever (RMSF) is the most severe rickettsiosis in the United States.
- RMSF is a rapidly progressive disease and without early administration of doxycycline can be fatal within days.
- Signs and symptoms of RMSF begin 3-12 days after the bite of an infected tick. However, because tick bites are not painful, many people do not remember being bitten.
- Illness generally begins with sudden onset of fever and headache and most people visit a healthcare provider during the first few days of symptoms.

**Early illness (days 1-4)**

- Fever
- Headache
- Gastrointestinal symptoms (nausea, vomiting, anorexia)
- Abdominal pain (may mimic appendicitis or other causes of acute abdominal pain)
- Myalgia
  - Rash (typically occurs 2-4 days after the onset of fever)
  - Edema around the eyes and on the back of hands

**Late illness (day 5 or later)**

- Altered mental status, coma, cerebral edema
- Respiratory compromise (pulmonary edema, acute respiratory distress syndrome)
- Necrosis, often requiring amputation
- Multorgan system damage (CNS, renal failure)

Risk factors for severe illness

- Delayed treatment
- Children < 10 years
- Persons with glucose-6-phosphate dehydrogenase (G6PD) deficiency
Rocky Mountain Spotted Fever

Rash can occur with RMSF, but may start later in illness. Never wait for a rash to begin doxycycline.

Digital necrosis in hand with untreated Rocky Mountain Spotted Fever. Median time to death is only 8 days.
Case – Purpura, Fever and Headache

A college student presented to the emergency room with fever, headache, nausea and vomiting. He was noted to have few pink papules and purple non-blanchable macules on his abdomen, arms and legs. He was sent home with the diagnosis of a viral infection with associated exanthem. He was brought back emergently the next evening with widespread purpura and hypotension. He died the next day.
Acute Meningococcemia

Purpura with dusky Centers

Trunk
Lower extremities
Eyelids
Acute Meningococcemia
Acute Meningococcemia

• Neisseria meningitidis (Gram neg. diplococcus)
• Respiratory transmission, 2-10 day incubation
• 50% - 66% develop a petechial eruption (trunk, lower ext., eyelids)
  • Later, large purpuric patches and ischemic necrosis
• Bacteremia, sepsis, septic vasculitis
  • Fever, meningitis, hypotension, pneumonia, arthritis, pericarditis, myocarditis, disseminated intravascular coagulation
Acute Meningococcemia
Inpatient Considerations – RMSF

• Purpura and Fever
  • Ddx includes: meningococcemia, vasculitis, viral hemorrhagic fevers, disseminated gonococcal infection...

• Treat early

• Look for acral rash, purpura

• Ask about and look for ticks

• Ask about history of hunting, camping, possible exposures etc.

[cdc.gov]

Confirmation of the diagnosis is based on laboratory testing, but antibiotic therapy should not be delayed in a patient with a suggestive clinical presentation. Antibiotics are less likely to prevent fatal outcome from RMSF if started after day 5 of symptoms.
Case

A young woman presented to the emergency room with a purple papule within a pink patch on her leg. She also complained of feeling sick with weakness and nausea. She was admitted to the hospital and found to be anemic and in acute renal failure. She does not remember being bitten, but found this in her sweat pants:
Case: Feels sick, with pink patch and spider
Choose the best answer:

A. She has systemic loxoscelism
B. She is having a hypersensitivity reaction to a wolf spider bite
C. Anemia is not likely associated with the spider bite
D. She should be sent for surgical consultation immediately
Brown Recluse Spider
Brown Recluse Spider
5 Spiders Found at Lake of the Ozarks

October 08, 2015

At Best Pest Control, we've seen all kinds of spiders around the Lake of the Ozarks. Spiders have a knack for slipping into a home and staying hidden. There are several species of spider around the Lake, while most are harmless, some are dangerous and should only be left to pest control experts at Lake of the Ozarks. Let's take a look at some of the spiders found around the Lake area and learn more about them!

3. Wolf Spider

Size: up to 1 inch not including the legs

Another spider that doesn't spin a web to catch its prey! Wolf Spiders run down insects and other spiders at night, often darting through the grass or dirt. The bite of a Wolf Spider hurts, but is otherwise harmless. An interesting fact about wolf spider females is that they carry their young on their back. Once hatched, they stay with mom for weeks until the spiderlings are ready to go off on their own.

4. Brown Recluse

Size: 1/4 inch not including legs

Finally, a spider worth staying away from! The Brown Recluse is commonly found in homes across Missouri, and they love to hide in storage, rarely used drawers, and basements/attics. They tend to avoid human contact, (hence the recluse title) but due to how often we are cohabitants, bites do happen. They are almost never fatal but the venom is dangerous to humans and animals. If you are bitten by a Brown Recluse, seek medical attention immediately.

5. Black Widow
KANSAS CITY, Mo. -- A not so itsy, bitsy spider not found on a waterspout. Instead, doctors removed a brown recluse spider from the ear of Susie Torres.
Brown Recluse Spider Bite

Painless bite, then a purple papule with surrounding erythema 6-12 hours later.
Brown Recluse Spider Bite

Grey-purple discoloration by 48-72 hrs. portends...
Brown Recluse Spider Bite

Ulceration Usually ~ day 7 post-bite.
Brown Recluse Spider Bite
Scar From Brown Recluse Spider
Brown Recluse Spider Bite

• Loxosceles reclusa
• Fiddleback spider
• Closets, attics, under sheets, folded clothing
• Sphingomyelinase D
  • Aggregates platelets, generates leukocyte chemoattractants, causes erythrocyte lysis
• Full thickness skin necrosis (ulceration) is the most common serious reaction
Brown Recluse Spider Bite

- Rarely causes a **systemic reaction**
  - Morbilliform rash, fever, chills, malaise
  - Arthralgias, headache, nausea and vomiting
  - Acute DIC
  - Hemolytic anemia → hemoglobinuria → renal failure
  - Usually appears in first 48 hours after bite

- Necrotic bites are frequently secondarily **infected**

- The majority of bites are clinically inconsequential
Brown Recluse Spider Bite

• Treatment is mostly supportive
• Rest, ice, elevation
• Aspirin
• Tetanus prophylaxis
• Antibiotics for infected wounds
• Corticosteroid for systemic reaction
• No immediate surgical intervention
Necrotic Loxoscelism?
Numerous conditions have been mistaken for a necrotic recluse spider bite (table 2). The most common disorders in the differential diagnosis are presented in this section (table 3).

The following mnemonic (NOT RECLUSE) may assist in differentiating brown recluse spider bites from other skin lesions [34]:

- **N** – Numerous (recluse bites are typically a single focal lesion)
- **O** – Occurrence (recluse bites typically occur in secluded locations in the home such as attic space, garage, or closet rather than outside)
- **T** – Timing (lesions appearing from November to March are much less likely to be caused by recluse spider bites)
- **R** – Red center (recluse bites typically have a pale center)
- **E** – Elevated (recluse bites are flat or sunken)
- **C** – Chronic (lesions presenting longer than several weeks are unlikely to be recluse spider bites)
- **L** – Large (lesions >10 cm are uncommon after a recluse spider bite)
- **U** – Ulcerates too early (<7 days) suggests infection or pyodermagangronosum rather than a recluse spider bite
- **S** – Swollen (except for bites to the face or feet, significant swelling is not typical for recluse spider bites)
- **E** – Exudative (other than bites on eyelids or toes, recluse spider bites are not moist or exudative; frank pus suggests infection)

**PubMed**

NOT RECLUSE-A Mnemonic Device to Avoid False Diagnoses of Brown Recluse Spider Bites.
Stoecker WV, Vetter RS, Dyer JA
JAMA Dermatol. 2017 Feb;

SpiderTok, Rolla, Missouri2Department of Dermatology, University of Missouri Health Sciences Center, Columbia.
28199453
Case

- After a recent fishing trip
- Red, hot, swollen arm/hand
- By 36 hours greyish/black
- Large
- Initially extremely painful
- Then, anesthetic
Case
Necrotizing Fasciitis

- Risk factors
  - Diabetes mellitus
  - Coronary artery disease
  - Peripheral vascular disease
  - Immunosuppression
- Trauma, (no trauma), iv drug use, surgery, varicella, decubitus ulcers
- Group A Strep., polymicrobial
- 20-60% mortality
- Debridement, IV antibiotics
Minor cut leads to flesh-eating infection on Florida man's hand. Black blisters were sign something was very wrong

Ashley May, USA TODAY Published 8:49 a.m. ET April 26, 2019 | Updated 1:44 p.m. ET April 28, 2019

“Black blisters…"

“…prick from fishing hook...”
Flesh-eating bacteria infects Florida man fishing off coast of Palm Harbor in Gulf of Mexico; @NicoleSGrigg shares his story >> bit.ly/2VilZXP
Necrotizing Fasciitis

Red, swollen
Hot, painful
Tender
Then anesthetic

Does not respond to po antibiotics

Grey, black, blistering by 36 hours

Sick/Toxic
Not a spider bite
Case
This patient ate at the restaurant with 2 unrelated colleagues. They all ate the same meal and within 30 minutes they each developed flushing and generalized pruritus. They also complained of a tingling sensation of the lips and throat, headache, and nausea. They have no known food allergies.
# Windrose

## Appetizers

- **Soup du Jour**  
  House made seasonal soup  \(8\)
- **Portabella Ravioli**  
  Ricotta cheese, red pepper coulis, brown butter, local greens  \(11\)
- **Coriander Crusted Tuna**  
  Radish, frisée, micro cilantro, blood orange, soy vinaigrette  \(16\)
- **Mussels Marinieres**  
  Garlic, lemon, duck fat, white wine, parsley, baguette  \(16\)
- **Scallops Saint-Jacques**  
  Onion gravy, champagne, tarragon  \(15\)
- **Maryland Crab Cakes**  
  Cajun remoulade, jalapeno jelly  \(15\)
- **Shrimp & Grits**  
  Candied tomato, chorizo, Creole sauce, grit cake  \(13\)

## Salads

- **Mushroom & Bacon Salad**  
  Roasted Shiitake, goat cheese, dried cranberries, local greens, bacon & apple vinaigrette  \(12\)
- **Grilled Romaine Salad**  
  Tomato, parmesan, anchovy, hearts of Romaine, Caesar dressing  \(10\)
- **Duck Confit Salad**  
  Cured egg yolk, red onion, pear, local greens, blood orange & soy vinaigrette  \(9\)
- **Waldorf Salad**  
  Grape, apple, celery, candied pecan, iceberg wedge, champagne vinaigrette  \(11\)

## Main

- **14 oz. RIBEYE**  
  Mashed potatoes, seasonal vegetables, demi glace  \(38\)
- **8 oz. Filet Mignon**  
  Mashed potatoes, seasonal vegetables, demi glace  \(38\)
- **Duck a l'Orange**  
  Carrot, fingerling potatoes, blood orange  \(30\)
- **Roasted Lamb**  
  Polenta cake, pearl onion, demi glace, herb salad  \(42\)
- **Chicken au Vin**  
  Mashed potatoes, Shiitake mushroom, carrot, red wine, brandy  \(26\)
Question: Which Is The Most Likely Culprit?

A. Portabella mushroom
B. Tuna
C. Chicken
D. Grits
Scombroid Poisoning

- **Tuna,**
  - Mahi mahi, bonito, mackerel...
- **Bacterial histidine decarboxylase turns fish histidine into histamine**
- **Elevated histamine in fish and patient**
  - Allergy testing is negative, tryptase is negative
- **Fish histamine levels > 50mg / 100g fish are potentially toxic**
- **Cooking does not prevent the reaction**
Scombroid Poisoning

- “Sharp”, “metallic”, “peppery” taste to fish
- Onset 2 minutes to 2 hours after eating
- Flushing, urticaria, generalized pruritus
- Headache, dizziness
- Burning/tingling mouth, lips
- Nausea, abdominal pain, diarrhea
- Respiratory distress in severe cases
- Lasts 8-12 hours
- Treat with antihistamines
<table>
<thead>
<tr>
<th>Scombroid fish poisoning</th>
<th>Fish allergy</th>
<th>Bacterial food poisoning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonimmunologic</td>
<td>Type I allergy</td>
<td>Nonimmunologic</td>
</tr>
<tr>
<td>Any age</td>
<td>Peak incidence in adulthood</td>
<td>Any age</td>
</tr>
<tr>
<td>Predominantly erythema</td>
<td>Wheal and flare reaction</td>
<td>Predominantly gi symptoms</td>
</tr>
<tr>
<td>Type I allergy tests negative</td>
<td>Type I allergy tests positive</td>
<td>Type I allergy tests negative</td>
</tr>
<tr>
<td>Bacterial fish contamination</td>
<td>No bacterial contamination</td>
<td>Bacterial fish contamination</td>
</tr>
<tr>
<td>Dark-fleshed fish</td>
<td>Mostly codfish (parvalbumin)</td>
<td>Any fish</td>
</tr>
<tr>
<td>Histamine levels in fish elevated</td>
<td>Histamine levels in fish normal</td>
<td>Histamine levels in fish normal</td>
</tr>
</tbody>
</table>

JAAD July 2011
Whole Foods Market Recalls Tuna Due to Scombroid Food Poisoning

POSTED BY FOOD POISONING ATTORNEY ON APRIL 05, 2010

Whole Foods Market announced the recall of its Whole Catch Yellow fin Tuna Steaks (frozen) with a best by date of Dec 5th, 2010 because of possible elevated levels of histamine that may result in symptoms that generally appear within minutes to an hour after eating the affected fish.

The product, sold in twelve ounce bags with Best by Date: exp 05 DEC 2010 with Lot Code: 483369157A and displays the following UPC code: 0-99482-42078-9

Whole Catch Yellow fin Tuna Steaks (Frozen) 12 oz.

High levels of histamine can produce an allergic reaction called scombroid poisoning when the fish is consumed. The following are the most common symptoms of scombroid poisoning: tingling or burning sensation in the mouth, facial swelling, rash, hives and itchy skin, nausea, vomiting or diarrhea. Scombroid food poisoning is a foodborne illness that results from eating spoiled (decayed) fish.

There have been two reported incidents by consumers. Product was distributed to 28 states plus the District of Columbia including Texas, Oklahoma, Louisiana, Illinois, Indiana, Kansas, Ohio, Wisconsin, Minnesota, Missouri, Michigan, Maryland, Virginia, Pennsylvania, Florida, Alabama, Georgia, Kentucky, South Carolina, Tennessee, North Carolina, Connecticut, Nebraska, New Jersey, New York, Maryland, Rhode Island, Maine and Washington, D.C.
Case
Case

A few hours after eating at the other resort restaurant, this patient noted some mild abdominal discomfort, bloating and flatulence. He later developed intensely pruritic papules and vesicles on the elbows, knees and low back.
SANDWICHES

Served with lattice chips. Substitute French fries, House or Caesar side salad for an additional cost.

FISH SANDWICH

Fresh catch grilled or blackened. Served on a toasted bun with lettuce, tomato and jalapeño tartar sauce

ROASTED TURKEY CLUB

A triple decker club with roasted turkey, smoked bacon, lettuce, tomato, Swiss cheese and signature mayonnaise on country white toast

JERK CHICKEN WRAP

Crisp chicken tenders tossed in jerk sauce, smoked bacon, cheddar & Monterey Jack cheeses, salsa, red onions, shredded lettuce and ranch dressing rolled in a tomato basil tortilla

SHRIMP PO' BOY

New Orleans style breaded shrimp with lettuce, diced tomatoes and a spicy remoulade sauce

PHILLY CHEESESTEAK

Thin sliced ribeye steak mixed with onions, mushrooms and peppers, topped with spicy queso and provolone cheese on a hoagie roll
Question: Which Is The Likely Culprit?

A. Turkey
B. Mayonnaise
C. Shrimp
D. Country white toast
Dermatitis Herpetiformis

- Intensely pruritic vesicles/papules
- Gluten
- Diarrhea rare
- Increased risk of lymphoma
- Thyroid disease
- IgA anti TTG (ppv = 92%)

Treatment
- Gluten free diet
- Dapsone
Dermatitis Herpetiformis

Forearms
Knees
Low back
Posterior neck
Case
This patient broke out in a **bizarre flagellate rash** that occurred about 2 days after he ate at the hotel restaurant. The rash was mildly pruritic but otherwise he was asymptomatic.
## Case

<table>
<thead>
<tr>
<th>Appetizers</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Soup du jour</strong> House made seasonal soup</td>
<td>8</td>
</tr>
<tr>
<td><strong>Portabella Ravioli</strong> Ricotta cheese, red pepper coulis, brown butter, local greens</td>
<td>11</td>
</tr>
<tr>
<td><strong>Grilled Crusted Tuna</strong> Radish, frisée, micro cilantro, blood orange, soy vinaigrette</td>
<td>16</td>
</tr>
<tr>
<td><strong>Mushrooms Matelotes</strong> Cèleri, lemon, duck fat, white wine, parsley, bagna cotta</td>
<td>16</td>
</tr>
<tr>
<td><strong>Scallops Saint-Jacques</strong> Oignon, gravy, champagne, tarragon</td>
<td>15</td>
</tr>
<tr>
<td><strong>Maryland Crab Cakes</strong> Cajun remoulade, jalapeño jelly</td>
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<tbody>
<tr>
<td><strong>Mushroom &amp; Bacon Salad</strong> Roasted Shiitake, gouda cheese, dried cranberries, local greens, bacon &amp; apple vinaigrette</td>
<td>12</td>
</tr>
<tr>
<td><strong>Grilled Romaine Salad</strong> Tomatoes, parmesan, anchovy, hearts of Romaine, Caesar dressing</td>
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</tr>
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<td>9</td>
</tr>
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<table>
<thead>
<tr>
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<tbody>
<tr>
<td><strong>14oz Ribeye</strong> Mashed potatoes, seasonal vegetables, demi glace</td>
<td>38</td>
</tr>
<tr>
<td><strong>Boeuf Filet Mignon</strong> Mashed potatoes, seasonal vegetables, demi glace</td>
<td>38</td>
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<tr>
<td><strong>Duck à L’Orange</strong> Carrot, fingerling potatoes, blood orange</td>
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<td><strong>Roasted Lamb</strong> Polenta cake, pearl onion, demi glace, herb salad</td>
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</tr>
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<td><strong>Chicken Au Vin</strong> Mashed potatoes, Shiitake mushroom, carrot, red wine, brandy</td>
<td>26</td>
</tr>
</tbody>
</table>
Which Ingredient Is The Culprit?

A. Shiitake mushroom
B. Jalapeno jelly
C. Anchovy
D. Chicken
Shiitake Dermatitis (toxicoderma)
Shiitake Mushrooms
Bleomycin
Shiitake Mushroom Dermatitis

- 1-3 days after eating raw or undercooked mushrooms
- Not an allergy
- Oral challenge might confirm
- Toxic reaction to lentinan (thermolabile and destroyed by cooking)
- Resolution in 1-8 weeks
Case
Case

• This patient returned from vacation
• She mostly hung out at the pool all day, now..
• With itchy/tender bumps
• She is otherwise healthy and ros are all negative
Case
Question: What is the most likely cause of this rash?

A. Bad shellfish
B. Infestation in guest room
C. Hot tub
D. Alcohol
Hot Tub Folliculitis

- 1-4 days after hot tub
- *Pseudomonas aeruginosa*
- Pink papules/pustules
- Topical/Po antibiotics
- Rarely severe: abscess, bacteremia
  - More severe in immunocompromised
Case

After swimming in the lake every day on vacation, your patient developed a red itchy rash. She is otherwise healthy and ros are all negative. She did not improve with cephalexin.
Gram Negative Folliculitis
E. coli test results high at Bagnell Dam Access but low at Lake of the Ozarks public beach

Department of Natural Resources issues swimming advisory
Gram Negative Folliculitis

- History of acne treatment with po antibiotics
- Long courses of po gram positive treatment
- Water
  - *E. coli, Klebsiella, Enterobacter*...
- Gentamicin topical, benzoyl peroxide
- Po gram negative coverage if necessary
Case

- Rash after swimming in the lake
- Itchy
- Not follicular
- Culture negative
Swimmer’s Itch

Cercarial dermatitis
Occurs in uncovered areas around swimwear

Fresh water
Schistosomes in birds, mammals drop into snails which release cercaria which..

Penetrate the skin of humans but
Do not develop further
Swimmer’s Itch

1. Eggs are passed in feces.
2. Eggs hatch and liberate miracidia.
3. The parasite develops in a molluscan intermediate host.
4. Cercariae penetrate the skin of definitive hosts and migrate to blood vessels to complete the cycle.
5. Humans are exposed to the dermatitis-producing cercariae.

Adult schistosomes in definitive host

Cercarial Dermatitis

CDC

DPDx
Seabathers Eruption

Larvae of thimble jellyfish

Occurs under swimwear
Seabathers eruption

The scoop has been right there under our noses on the conservation department’s website, home of an entire field guide devoted to “Freshwater Jellyfish,” aka Craspedacusta sowerbii.

According to the U.S. Geological Survey, freshwater jellyfish have been reported in 44 states - in the Lake of the Ozarks and along the Missouri River in the Show-Me state, and in the Little Arkansas and lower and upper portions of the Kansas River in the Sunflower State.