Bacterial Skin Infections

Basic Dermatology Curriculum

Last updated December, 2014
Module Instructions

- The following module contains a number of blue, underlined terms which are hyperlinked to the dermatology glossary, an illustrated guide to clinical dermatology and dermatopathology.
- We encourage the learner to read all the hyperlinked information.
Goals and Objectives

- The purpose of this module is to help medical students develop a clinical approach to the evaluation and initial management of patients presenting with cutaneous bacterial infections.

- By completing this module, the learner will be able to:
  - Describe the morphology of common cutaneous bacterial infections
  - Discuss the bacterial etiologies of cellulitis and erysipelas
  - Recognize clinical patterns and risk factors that suggest MRSA
  - Recommend initial steps for the evaluation and treatment of common cutaneous bacterial infections
  - Recognize characteristic features of necrotizing fasciitis and the need for emergent treatment, including surgical intervention
Case One

Mr. Neal Tolson
Case One: History

- **HPI:** Mr. Tolson is a 55-year-old man who presents with 5 days of worsening right lower extremity pain and a red rash. He reports recent fevers and chills since he returned from a camping trip last week.
- **PMH:** arthritis
- **Medications:** occasional NSAIDs, multivitamin
- **Allergies:** no known drug allergies
- **Family history:** father with history of melanoma
- **Social history:** lives in the city with his wife, two grown children
- **Health-related behaviors:** no alcohol, tobacco or drug use
- **ROS:** able to bear weight, no itching
Case One: Exam

- Vital signs: T 100.2, HR 80, BP 120/70, RR 18
- Skin: erythematous plaque with ill-defined borders over the right medial malleolus. Lesion is tender to palpation.
- Tender, slightly enlarged right inguinal lymph node
- Laboratory data: Wbc 12,000 (75% neutrophils, 10% bands)
Case One, Question 1

What is the most likely diagnosis?

a. Bacterial folliculitis
b. Cellulitis
c. Necrotizing fasciitis
d. Stasis dermatitis
e. Tinea corporis
Case One, Question 1

**Answer: b**

What is the most likely diagnosis?

- a. **Bacterial folliculitis** (Would expect pustules and papules centered on hair follicles. Without systemic signs of infection)
- b. **Cellulitis**
- c. **Necrotizing fasciitis** (Would expect rapidly expanding rash, usually appears as a dusky, edematous, red plaque. In this setting, it is always appropriate to ask the question, “Could this be necrotizing fasciitis?”)
- d. **Stasis dermatitis** (Although found in similar location, stasis dermatitis often presents with pruritus and scale, which may erode or crust. Without fever or elevated wbc)
- e. **Tinea corporis** (Would expect annular plaque with elevated border and central clearing. Painless, without fever or elevated wbc)
Diagnosis: Cellulitis

- **Cellulitis** is a very common infection occurring in up to 3% of people per year.
- Most do not require hospitalization.
- Results from an infection of the dermis that often begins with a portal of entry that is usually a wound, maceration between toes (strep component), or fungal infection (e.g., tinea pedis).
- Presents as a spreading erythematous, non-fluctuant tender plaque.
- More commonly found on the lower leg.
- Streaks of lymphangitis may spread from the area to lymph nodes.
# Differential of Lower Extremity Cellulitis

<table>
<thead>
<tr>
<th>Entity</th>
<th>Unilateral/Bilateral</th>
<th>Painful</th>
<th>Swollen</th>
<th>Red</th>
<th>Redness disappears with elevation</th>
<th>Other Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stasis Dermatitis (acute flare of chronic venous insufficiency)</td>
<td>Usually bilateral chronic problem but may have unilateral flare</td>
<td>No, itchy</td>
<td>Little if any</td>
<td>Erythema with yellowish or light brown pigmentation; sharply demarcated redness</td>
<td>No</td>
<td>Usually medial ankle area; assoc with papules, vesicles, weeping, crusting</td>
</tr>
<tr>
<td>Acute Lipodermato-sclerosis</td>
<td>Usually unilateral but may have bilateral</td>
<td>Yes, but develops over weeks to months</td>
<td>No</td>
<td>Red-purple plaque</td>
<td>No</td>
<td>Usually medial ankle, lower calf; indurated and warm</td>
</tr>
<tr>
<td>Asteatotic Eczema: dryness in net-like pattern</td>
<td>Bilateral</td>
<td>No, may be itchy</td>
<td>No</td>
<td>Reticular pattern</td>
<td>No</td>
<td>Lower legs; not hot; can be oozing, crusting, fissuring</td>
</tr>
<tr>
<td>Acute Allergic Contact, as with neomycin</td>
<td>Depends on exposure; at area of contact</td>
<td>No, itchy</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Well-demarcated; scaling, blistering, weeping</td>
</tr>
<tr>
<td>Acute Irritant Contact</td>
<td>Depends on exposure; at area of contact</td>
<td>Yes, painful, burning, stinging</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Well-demarcated; bullae, weeping, crusting</td>
</tr>
<tr>
<td>Gout: uric acid level may be normal during attack</td>
<td>Unilateral</td>
<td>Yes, severe</td>
<td>Yes</td>
<td>Yes, violaceous; extends beyond joint involved</td>
<td>No</td>
<td>Affects lower extremity, as great toe the most, instep, heel, ankle, knee</td>
</tr>
<tr>
<td>Lymphedema, primary or secondary as surgery, radiation, trauma</td>
<td>Almost always unilateral</td>
<td>No, but uncomfortable</td>
<td>Yes, including dorsal surfaces of feet and toes</td>
<td>Yes</td>
<td>Yes, usually disappears</td>
<td>May be warm but not hot</td>
</tr>
<tr>
<td>Dependent Rubor</td>
<td>Unilateral or bilateral</td>
<td>No, usually; may have pain at rest with arterial insufficiency</td>
<td>No</td>
<td>Fiery red-dusky erythema</td>
<td>Yes</td>
<td>Ischemic changes causal; not hot</td>
</tr>
</tbody>
</table>
Cellulitis: Risk Factors

- Risk factors for cellulitis include:
  - Local trauma (bug bites, laceration, abrasion, puncture wound)
  - Spread of a preceding or concurrent skin lesion (furuncle, ulcer)
    - Secondary cellulitis from blood-borne infection or from direct spread of subjacent infections (e.g. osteomyelitis) is rare
  - Following a preexisting skin infection due to compromise of skin barrier (interterdigital strep, tinea pedis)
  - Inflammation (local dermatitis, radiation therapy)
  - Edema and impaired lymphatics in the affected area
Cellulitis: Etiology

- 80% of cases are caused by gram positive organisms
- Group A streptococcus is most common; other strep less so
- *Staphylococcus aureus* is less common but occurs with open wound or penetrating trauma as with needle injection with drug abuse
- Think of other organisms if there have been unusual exposures or conditions:
  - *Pasteurella multocida* (animal bites)
  - *Eikenella corrodens* (human bites)
  - *MRSA* (with concurrent MRSA elsewhere/illicit drug use/purulent drainage)
Case One, Question 2

Based on Mr. Tolson’s history and findings, what is the next best step in management?

a. Apply topical antibiotics
b. Apply topical steroids, compression wraps, and encourage leg elevation
c. Begin oral antibiotics immediately with coverage for gram positive bacteria and encourage leg elevation
d. Order an imaging study
e. Hospital admission for IV antibiotics
Case One, Question 2

Answer: c

What is the next best step in management?

- a. Apply topical antibiotics (not effective)
- b. Apply topical steroids, compression wraps, and encourage leg elevation (this is the treatment for stasis dermatitis, not cellulitis)
- c. **Begin antibiotics immediately with coverage for gram positive bacteria and encourage leg elevation**
- d. Order an imaging study (radiographic examination is not necessary for routine evaluation of patients with cellulitis)
- e. Hospital admission for IV antibiotics (admission only with differential including deeper/necrotizing infection; severely immunocompromised or non-compliant patient; non-response to oral outpatient treatment)
Cellulitis: Treatment

- It is important to recognize and treat cellulitis early as untreated cellulitis may lead to sepsis and death
- The following guidelines are for empiric antibiotic therapy:
  - For outpatients with nonpurulent cellulitis: empirically treat for β-hemolytic streptococci (group A streptococcus) as cephalexin, amoxicillin, amoxicillin-clavulanate, dicloxacillin, or clindamycin
  - For outpatients with purulent cellulitis (purulent drainage or exudate in the absence of a drainable abscess)/injection drug use/other penetrating trauma/MRSA presence elsewhere: empirically choose treatment to cover community-associated MRSA as well as strep, as clindamycin; work with dermatology and infectious disease specialists
  - For unusual exposures: cover for additional bacterial species based on such exposure; work with dermatology and infectious disease specialists
Monitor patients closely and revise therapy if there is a poor response to initial treatment; usually a 5 day course of antibiotics is sufficient.

- Treat underlying derm disorder/condition, as venous eczema.
- Elevation of the involved area.
- Treat tinea pedis, toe maceration (strep) if present.
- Consideration of concurrent oral steroid treatment to decrease post-inflammatory lymphatic damage; more studies needed.
- For hospitalized patients: empiric therapy for MRSA should be considered.
- Cultures from abscesses and other purulent skin and soft tissue infections (SSTIs) are recommended in patients to be treated with antibiotic therapy but if case has a typical presentation, they need not be performed.
Healthcare-associated MRSA (HA-MRSA) and community-associated MRSA (CA-MRSA) risk factors include:

- Antibiotic use
- Prolonged hospitalization
- Surgical site infection
- Intensive care
- Hemodialysis
- MRSA colonization
- Proximity to others with MRSA colonization or infection
- Skin trauma
- Cosmetic body shaving
- Group facilities
- Sharing equipment that is not cleaned or laundered between users/body contact as in sports
# Antibiotics Used to Treat MRSA

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dosage (adult dosing with normal renal function)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clindamycin</td>
<td>600 mg/kg IV Q8H 300-450 mg PO QID</td>
<td>Excellent tissue and abscess penetration. Risk for C. difficile</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inducible resistance in MRSA</td>
</tr>
<tr>
<td>Trimethoprim-Sulfamethoxazole (TMP/SMX)</td>
<td>1 or 2 double-strength tablets PO BID</td>
<td>Unreliable for S. pyogenes (will need to combine with amoxicillin/equivalent to cover for group A strep)</td>
</tr>
<tr>
<td>Doxycyline, minocycline</td>
<td>100 mg PO BID</td>
<td>Unreliable for S. pyogenes (will need to combine with amoxicillin/equivalent to cover for group A strep). Do not use in children &lt; 8 years old.</td>
</tr>
<tr>
<td>Linezolid</td>
<td>600 mg IV Q12H 600 mg PO BID</td>
<td>Expensive. No cross-resistance with other antibiotic classes</td>
</tr>
<tr>
<td>Vancomycin</td>
<td>30mg/kg/d in 2 divided doses IV</td>
<td>Parenteral drug of choice for treatment of severe infections caused by MRSA</td>
</tr>
</tbody>
</table>
Case Two, Question 1
Does this person have cellulitis?
Yes - a type of cellulitis called Erysipelas
Erysipelas

- **Erysipelas** is a superficial cellulitis with marked dermal lymphatic involvement (causing the skin to be edematous or raised)
  - Main pathogen is group A streptococcus
  - Also caused by Staph aureus, Haemophilus, and others
- Usually affects the lower extremities and face
- Presents with pain, bright erythema, and plaque-like edema with a sharply defined margin to normal tissue
- Plaques may develop overlying blisters (bullae)
- May be associated with a high white count (>20,000/mcL)
- May be preceded by chills, fever, headache, vomiting, and joint pain
Example of Erysipelas

Large, shiny erythematous plaque with sharply demarcated borders located on the leg
Case Two, Question 2

What is the most appropriate treatment?

a. Oral antibiotics
b. Oral steroids
c. Topical antibiotics
d. Topical moisturizers
e. Topical steroids
Case Two, Question 2

Answer: a

What is the most appropriate treatment?

a. Oral antibiotics
b. Oral steroids
c. Topical antibiotics
d. Topical moisturizers
e. Topical steroids

Oral antibiotics are the most appropriate therapy in uncomplicated erysipelas.
Erysipelas: Treatment

- Immediate empiric antibiotic therapy should be started (cover most common pathogen - *Streptococcus*)
  - Such as penicillin V, amoxicillin, clindamycin, macrolide, and others

- Monitor patients closely and revise therapy if there is a poor response to initial treatment

- Elevation of the involved area

- Treat tinea pedis, erythrasma, or strep of toe spaces if present
Case Three

Mr. Jesse Hammel
Case Three: History

- **HPI:** Mr. Hammel is a 27-year-old man with a history of “skin popping” (subcutaneous or intradermal injection of drug) who presents to the emergency department with a painful, enlarging mass on his right arm for the last two days.
- **PMH:** History of skin and soft tissue infections, hospitalized with MRSA bacteremia two years ago
- **Medications:** none
- **Allergies:** no known drug allergies
- **Family history:** father with diabetes, mother with hypertension
- **Social history:** lives with friends in an apartment, works in retail
- **Health-related behaviors:** IVDU (intravenous drug use), including skin popping. No tobacco or alcohol use.
- **ROS:** no fevers, sweats or chills
Case Three: Skin Exam

- Erythematous, warm, fluctuant nodule with several small pustules throughout the surface
- Very tender to palpation
Diagnosis: Abscess

- A skin **abscess** is a collection of pus within the dermis and deeper skin tissues
- Present as painful, tender, fluctuant and erythematous nodules
- Often surmounted by a pustule and surrounded by a rim of erythematous edema
- Spontaneous drainage of purulent material may occur
Case Three, Question 1

What is the next best step in management?

a. Incision and drainage
b. Topical antibiotics
c. Offer HIV test
d. a and b
e. a and c
Case Three, Question 1

Answer: e

What is the next best step in management?

a. **Incision and drainage** (incision and drainage is the treatment of choice for abscesses)

b. **Topical antibiotics** (not effective)

c. **Offer HIV test** (patients with risk factors for HIV should be offered an HIV test, e.g. IVDU in this patient)

d. a and b

e. a and c
Abscess: Treatment

- **Abscesses require incision and drainage (I & D)**
  - Most experts recommend clearing pus and debris and probing the entire cavity following incision and drainage

- **Antibiotics are recommended for abscesses associated with:**
  - Severe or extensive disease (e.g., involving multiple sites)
  - Rapid progression in presence of associated cellulitis
  - Signs and symptoms of systemic illness
  - Associated comorbidities or immunosuppression
  - Extremes of age
  - Abscess in an area difficult to drain (e.g., face, hand, or genitalia)
  - Associated septic phlebitis
  - Lack of response to I&D alone
Abscess: Treatment (cont.)

- Recommended oral antibiotics include: clindamycin, TMP-SMZ, tetracyclines
  - For hospitalized patients, consider vancomycin, linezolid, daptomycin, or telavancin
- Wound cultures should be sent
- Patients with recurrent skin infections should be referred to a dermatologist
Do you know the following diagnoses?

HINT: Where are the bacteria and what are they causing?
What is the diagnosis?
A furuncle (boil) is an acute, round, tender, circumscribed, perifollicular abscess that generally ends in central suppuration.
What is the diagnosis?
Carbunculosis

- A **carbuncle** is a coalescence of several inflamed follicles into a single inflammatory mass with purulent drainage from multiple follicles.
Furuncle, Carbuncle

- Furuncles and carbuncles are a subtype of abscesses, which preferentially occur in skin areas containing hair follicles exposed to friction and perspiration
  - Common areas include the back of the neck, face, axillae, and buttocks
- Usually caused by *Staphylococcus aureus*
- Patients are commonly treated with oral antibiotics
- For a solitary small furuncle: warm compresses to promote drainage may be sufficient
- For larger furuncles and carbuncles: manage as you would an abscess
More Examples: Furuncle and Carbuncle
Case Four

Mr. Jeffrey Anders
Case Four: History

- Mr. Anders is a 19-year-old man who presents to dermatology clinic with two weeks of multiple “pimples” in his groin. He is concerned he has an STD.
- When asked, he reports occasionally shaving his pubic hair
- Sexual history reveals one female partner in the last year
Case Four: Skin Exam

- Multiple follicular pustules with surrounding erythema in the right groin
Case Four, Question 1

Which of the following recommendations would you provide Mr. Anders?

a. Prescribe oral antibiotics
b. Stop shaving that area
c. Wash the area (antibacterial soap may be used)
d. Check with his girlfriend to see if she has any breakout
e. All of the above
Answer: e

Which of the following recommendations would you provide Mr. Anders?

- a. Prescribe oral antibiotics
- b. Stop shaving that area
- c. Wash the area daily (antibacterial soap may be used)
- d. Check with his girlfriend to see if she has any breakout
- e. All of the above
Folliculitis

- **Folliculitis** is a superficial bacterial infection of the hair follicles.
- Presents as small, raised, erythematous, occasionally pruritic pustules less than 5 mm in diameter.
- Genital folliculitis may be sexually transmitted.
- **Pathogens:**
  - Majority of cases are due to *Staphylococcus aureus*.
  - If there has been exposure to a hot tub or swimming pool, consider pseudomonas as a possible cause.
  - Pustules associated with marked erythema in the groin may represent candidiasis.
Folliculitis: Management

- Cleanse with antibacterial soap
- Superficial pustules will rupture and drain spontaneously
- Oral or topical anti-staphylococcal agents as mupiricin or retapamulin ointment; topical clindamycin solution/lotion may be used
- Deep lesions of folliculitis represent small follicular abscesses and should be drained
More Examples of Folliculitis
Case Five

Mr. Danny Holden
Case Five: History

- Mr. Holden is a 17-year-old man who presents to his primary care provider with a three-week history of a facial rash. The rash is not painful, but occasionally burns and itches.
- About a month ago he babysat his 2 year old niece and she had “a rash on the face.”
- He tried over the counter hydrocortisone cream with no relief.
Case Five: Skin Exam

- Peri-oral papules and plaques with overlying honey-colored crust
- Minimal surrounding erythema
Case Five, Question 1

What is the most likely diagnosis?

a. Acne vulgaris
b. Impetigo
c. Orolabial HSV
d. Seborrheic dermatitis
e. Tinea faciei
Case Five, Question 1

Answer: b

What is the most likely diagnosis?

a. Acne vulgaris (would expect comedones and pustules, but not crusted plaques)

b. Impetigo

c. Orolabial HSV (would expect grouped and confluent vesicles with an erythematous rim; can evolve to crusting and easily be confused with impetigo)

d. Seborrheic dermatitis (would expect erythematous patches and plaques with a greasy, yellow scale)

e. Tinea faciei (would expect erythematous, annular scaly plaques but often are erythematous with slight scale)
Diagnosis: Impetigo

- **Impetigo** is a common superficial bacterial skin infection
- Most commonly seen in children ages 2-5, but older children and adults can be affected
- Impetigo is contagious, easily spread among individuals in close contact
- Most cases are due to *S. aureus* with the remainder either being due to *Strep pyogenes* or a combination of these two organisms
Examples of Non-bullous Impetigo

- Also called impetigo contagiosum; most common form
- Lesions begin as papules surrounded by erythema
- They progress to form pustules that enlarge and break down to form thick, adherent crusts with a characteristic honey-crusted appearance
Example of Bullous Impetigo

- A form of impetigo seen in young children is characterized by flaccid bullae with clear yellow fluid, which later becomes purulent.
- Ruptured bullae leave a thick brown crust
- Common locations are the face, extremities, and diaper area
Ecthyma

- Ecthyma is an ulcerative lesion which extends through the epidermis and into the dermis.
- Consist of “punched out” ulcers covered with yellow crust surrounded by raised margins.
- Heals slowly and may scar
- S. aureus and/or Strep may be the cause
Danny Holdon was diagnosed with non-bullous impetigo based on clinical findings.
Case Five, Question 2

Which of the following treatment recommendations is most appropriate for Danny?

a. Hand washing to reduce spread
b. Topical or oral antibiotics
c. Wash the affected area with antibacterial soap
d. Check to see if his niece still has her rash
e. All of the above
Case Five, Question 2

Answer: e

Which of the following treatment recommendations is most appropriate for Danny?

a. Hand washing to reduce spread
b. Topical or oral antibiotics
c. Wash the affected area with antibacterial soap
d. Check to see if his niece still has her rash
e. All of the above
Impetigo: Treatment

- Topical therapy with mupirocin or retapamulin ointment may be equally effective to oral antibiotics if the lesions are localized in an otherwise healthy patient and there are not multiple outbreaks in a family or group.
- Otherwise, oral antibiotics are used.
Impetigo: Treatment (cont.)

- Oral antibiotics are used to treat impetigo when it’s extensive or affecting several people (close contacts).
- Effective antibiotics include:
  - Dicloxacillin
  - Cephalexin
  - Erythromycin (some strains of *Staphylococcus aureus* and *Streptococcal pyogenes* may be resistant)
  - Clindamycin
  - Amoxicillin/clavulanate
Case Six

Mr. Rodney Gorton
Case Six: History

- HPI: Mr. Gorton is a 68-year-old man who presented to outpatient surgery for hernia repair. He reported that he had not been feeling well yesterday but did not wish to cancel his surgery. On PE, he was febrile, tachycardic, and found to have an expanding tender red rash on his left thigh. He was admitted to medicine and the dermatology service was consulted for evaluation of the rash.
- PMH: hypertension, diabetes mellitus type 2
- Medications: lisinopril, insulin, oxycodone
- Allergies: none
- Family history: noncontributory
- Social history: retired, lives with his wife
- Health-related behaviors: no alcohol, tobacco, or drug use
- ROS: fatigue, rash is very painful; deep bruise occurred last week while cutting wood in area of rash; also had skin tear from branch
Case Six: Exam

- Vital signs: T 102.5, HR 110, BP 90/50, RR 20
- General: ill-appearing gentleman lying in bed
- Skin: ill-defined, large erythematous plaque with central patches of dusky blue discoloration, which is anesthetic; upon re-examination 60 minutes later the redness had spread; the subcu tissue had a woody induration
Case Six, Question 1

Which of the following would the dermatologist recommend for initial management?

a. An urgent surgery consult  
b. IV fluids and narrow antibiotic coverage  
c. Schedule an MRI for tomorrow  
d. Schedule a skin biopsy in am  
e. All of the above
Case Six, Question 1

Answer: a

Which of the following would the dermatologist recommend for initial management?

a. An urgent surgical consult (it is a surgical emergency)

b. IV fluids and narrow antibiotic coverage (do need IV fluids but need broad spectrum coverage initially)

c. Schedule an MRI for tomorrow (If done, should be stat; could show edema along fascial plane but sensitivity and specificity not well defined; never delay surgery for MRI if necrotizing fasciitis is clinically suspected)

d. Schedule a skin biopsy in am (if done, should be an immediate deep biopsy; if diagnosis is suspected and general surgeon is present, deep tissue can be obtained during exploratory procedure; involved fascia would be edematous and dull gray with areas of necrosis; should order gram stain and C&S)

e. All of the above (no, only a)
Necrotizing Fasciitis: Treatment

- Considered a medical/surgical emergency with up to a 30-70% mortality rate with strep
- If you suspect necrotizing fasciitis: consult surgery immediately
- Necrotizing fasciitis is a clinical diagnosis.
- Treatment includes widespread debridement and broad-spectrum systemic antibiotics
- Do not delay treatment to obtain MRI
- Poor prognostic factors include: delay in diagnosis, age>50, diabetes, atherosclerosis, infection involving the trunk
- Necrotizing soft tissue infections can involve the skin, subcutaneous fat, superficial or deep fascia, and/or muscle.
Take Home Points

- Cellulitis is a bacterial infection of the dermis that often begins with a portal of entry that is usually a wound, insect bite, fungal infection (tinea pedis), or maceration with strep present.
- Untreated cellulitis may lead to sepsis and death.
- Lower extremity cellulitis has a deep differential.
- Erysipelas is a superficial cellulitis with marked dermal lymphatic involvement.
- A skin abscess is a loculated infection within the dermis and deeper skin tissues and is best treated with I&D.
- Furuncles and carbuncles are subtypes of abscesses, which preferentially occur in skin areas containing hair follicles exposed to friction and perspiration.
Folliculitis is a superficial bacterial infection of the hair follicles presenting as follicular pustules.

In impetigo, papules and vesicles progress to form pustules that enlarge and break down to form thick, adherent crusts with a golden or honey-colored appearance.

Necrotizing fasciitis presents as an expanding dusky, edematous, red plaque with blue discoloration.

Anesthesia of the skin of the affected area is a characteristic finding of necrotizing fasciitis.

Necrotizing fasciitis is a medical/surgical emergency.
Acknowledgements

- This module was developed by the American Academy of Dermatology Medical Student Core Curriculum Workgroup from 2008-2012.
- Primary authors: Laura S. Huff, MD; Cory A. Dunnick, MD, FAAD.
- Contributor: Sarah D. Cipriano, MD, MPH.
- Peer reviewers: Timothy G. Berger, MD, FAAD; Susan K. Ailor, MD, FAAD, Daniela Kroshinsky, MD, FAAD.
- Revisions and editing: Sarah D. Cipriano, MD, MPH, Alina Markova. Last revised August 2011.
- Revisions and editing: Susan K. Ailor, MD. Last revised Dec 2014.
References


References

RESOURCES

• Thanks to the American Academy of Dermatology for allowing use of their digital teaching library.
To take the quiz, click on the following link:

https://www.aad.org/quiz/bacterial-skin-infections-learners