

CUTANEOUS DISORDERS

I. INTRODUCTION

Cutaneous disorders comprise a small portion (3%) of the board exam content. Pictorial identification is important because many of these questions contain an image. The lesions and rashes you may be asked to identify and manage are described in this chapter. Cutaneous disorders may appear differently in different skin tones. Images in this chapter may not be representative of the appearance of these conditions in all patients. You may also wish to consult a color dermatology atlas for additional examples.

The cutaneous disorders with higher acuity that require immediate recognition and action are presented first. Those with lower acuity are presented later in the chapter.

II. GENERAL APPROACH TO THE PATIENT PRESENTING WITH A RASH

A. Inquire about prodromal symptoms, time course, antecedent events (eg, new medications), and the presence or absence of systemic symptoms (eg, fever, myalgias).

B. Note patient's age, immune status, past medical history, sexual history, social history (including the use of IV drugs), travel history, medications, allergies, and presence/absence of toxicity.

C. Examine the rash and determine its characteristics.

1. Appearance
 - a. Macular → flat and ≤ 1 cm
 - b. Patchy → flat and > 1 cm
 - c. Papular → raised and ≤ 1 cm
 - d. Plaque → raised and > 1 cm
 - e. Maculopapular, nodular → dermal or subcutaneous solid lesion 1–2 cm
 - f. Tumor → dermal or subcutaneous solid lesion > 2 cm
 - g. Vesicular → blister ≤ 1 cm
 - h. Bullous → blister > 1 cm
 - i. Pustules → small blister containing purulent material
 - j. Scales or keratoses → built up epidermis
 - k. Crusts, erosions → loss of part or all of epidermis
 - l. Ulceration → loss of dermis or deeper
2. For blistering lesions, note the presence or absence of the Nikolsky sign. A rash is Nikolsky positive if, when pressure is applied to an intact blister, the blister spreads as opposed to ruptures. A positive Nikolsky sign indicates a dangerous dermatologic condition.
3. Evolution: determine where the rash started, how it spread, and the time course of its evolution.
4. Distribution: note location of the rash, specifically including involvement of mucous membranes, palms, and soles.
5. Symptoms: determine if pruritic or painful; note any systemic symptoms (fever, odynophagia, malaise).
6. Treatments: determine what, if anything, the patient has done to treat the rash (eg, applied topical steroids, zinc, or a neomycin-containing antibacterial ointment) because this may have changed the appearance of the rash or caused a secondary contact dermatitis.

III. STEVENS-JOHNSON SYNDROME AND TOXIC EPIDERMAL NECROLYSIS

A. Overview

1. A drug reaction that causes sloughing of skin and mucous membranes
2. Spectrum of disease: Stevens-Johnson syndrome (SJS) → SJS/toxic epidermal necrolysis (TEN) overlap → toxic epidermal necrolysis

3. Worse outcome with increased body surface area involvement, advanced age, malignancy, tachycardia, BUN >10 mEq/L, acidosis, and hyperglycemia
4. Common inciting agents are NSAIDs, sulfonamides (sulfasalazine), antibiotics (penicillins, cephalosporins, quinolones), anticonvulsants (lamotrigine, carbamazepine), and allopurinol; can be precipitated by acetaminophen use.
5. When no causative drug precipitant is identified, infectious triggers such as mycoplasma should be considered.
6. Incidence is increased in patients with HIV and tuberculosis.
7. Erythema multiforme is *no longer* considered to be part of this disease spectrum.

B. Clinical presentation

1. Classic clinical scenario: Very ill-appearing patient, recently started on a new medication, has a history of fever, malaise, myalgias, and arthralgias, followed by the abrupt onset of bullous mucocutaneous lesions that subsequently eroded. Multiple mucosal surfaces (eyes, mouth, lips, urogenital area, and anus) are involved. Patients often cannot eat because of painful stomatitis. Conjunctivitis is common, and vesicles on the conjunctiva are sometimes seen. The eyelids may be red, swollen, crusted and painful. An overall skin examination is likely to reveal widespread erythematous (or purpuric) macules or flat atypical "targets."
2. A flu-like prodrome often precedes development of the mucocutaneous lesions by several days.

Table 54: Disease Spectrum

	Body Surface Area Affected (%)	Mortality (%)
SJS	<10	1–5
SJS/TEN	10–30	6
TEN	>30	25–35

3. SJS, SJS/TEN, and TEN are all characterized by widespread bullous lesions, severe mucous membrane involvement, palm and sole involvement, and multisystem pathology. The bullae evolve into painful erosions.
4. Nikolsky sign (extension of bullae with gentle pressure) is positive in all.
5. TEN is characterized by extensive cutaneous and mucosal blistering as well as desquamation; epidermis becomes necrotic and sloughs in large sheets, leaving behind exposed dermis.
6. Denuded skin and mucous membranes result in fluid loss and susceptibility to secondary bacterial infection.
7. Significant ocular sequelae (corneal ulceration, blindness) are possible.
8. Productive cough and dyspnea suggest tracheobronchial involvement. Patients may require endotracheal intubation.
9. Dysphagia, odynophagia, severe abdominal pain, gastrointestinal bleeding, and diarrhea suggest digestive tract involvement. These are predictive of high mortality.
10. Kidney involvement (hematuria, renal tubular necrosis, kidney failure) can occur but is rare.
11. Death, when it occurs, is most often due to fulminant sepsis.

C. Management

1. Consult with a dermatologist.
2. Identify the precipitant cause (if possible) and treat accordingly. Discontinue any drug(s) thought to be the precipitant.
3. Hospitalization, IV fluid resuscitation to correct hypovolemia, and correction of electrolyte abnormalities
4. Intravenous immunoglobulin (IVIG), systemic steroids, or other agents may be used, but no therapeutics have demonstrated consistently improved outcomes compared with supportive care measures alone.
5. Obtain ophthalmology consult for patients with ocular lesions because of the risk of long-term morbidity from scarring.
6. Consider ENT, gastroenterology, urology, and gynecology consults depending on the distribution of disease involvement.
7. Check laboratory results for renal function, transaminitis, albumin levels, and electrolyte abnormalities. Consider arterial blood gases and chest radiograph if pulmonary involvement is suspected.
8. Close monitoring for infections (avoid prophylactic antibiotics).
9. Consider burn unit admission.



Toxic epidermal necrolysis due to allopurinol use
 Courtesy of Laura Bontempo, MD, MEd, FACEP

IV. STAPHYLOCOCCAL SCALDED SKIN SYNDROME

A. Overview

1. A skin infection caused by exotoxin-producing *S aureus* of phage group 2
2. Mainly affects children <6 years old
3. The mortality rate in affected adults is >60% and potentially higher if immunocompromised. In contrast, pediatric patients have a mortality of 0.3%.

B. Clinical presentation

1. Classic clinical scenario: 5-year-old with recent upper respiratory infection now presents with an erythematous rash that started on the face and then became generalized over 2 days. Rash has now become bullous and is sloughing.
2. Often follows an upper respiratory infection or purulent conjunctivitis
3. Prodrome includes generalized fussiness, malaise, and fever.
4. Tender erythema of the face (perioral area is classic), neck, or axillae that generalizes over the body within 48 hours. Flaccid bullae develop and, within 48 hours, skin sloughs. Desquamation duration is 5 days.
5. Crusting around the mouth and eyes, and lip fissuring are also frequently present.
6. In newborns, the entire skin surface may be involved (Ritter disease).



Staphylococcal scalded skin syndrome
 Courtesy of Carmen Avendano, MD

7. Mucous membranes are *not* involved, which helps differentiate this syndrome from toxic epidermal necrolysis.
8. Nikolsky sign is positive (extension of bullae with gentle pressure).
9. Lesions usually resolve in 2 weeks without scarring.

C. Management

1. Penicillinase-resistant antibiotics to treat *S aureus*: clindamycin, oxacillin, or nafcillin. Vancomycin may be considered if MRSA is a concern.
2. Steroids are contraindicated (they may exacerbate the illness).
3. Hospitalization for hydration and skin care is indicated for most patients (especially infants).
4. There is no benefit to culturing the fluid from the bullae; it is sterile.
5. Treatment is similar to that for thermal burn patients; therefore, consider burn unit admission.

V. TOXIC SHOCK SYNDROME**A. Overview**

1. A skin infection caused by exotoxin-producing *Staphylococcus aureus* or group A strep (*Streptococcus pyogenes*)
2. Mainly affects adults
3. Thought to be related to retained foreign bodies (high absorbency tampons, prolonged nasal packing, surgical packing)
4. Mortality from streptococcal-related infection is significantly higher than that from staphylococcal-related infection.

B. Clinical presentation

1. Classic clinical scenario: A systemically ill, 23-year-old woman has mucous membrane hyperemia and a diffuse, blanching, macular erythroderma. The rash has the appearance of a first-degree sunburn, and the patient is febrile and hypotensive.
2. Diffuse erythroderma (including palms and soles) with possible mucous membrane involvement
3. Nikolsky sign is absent.
4. Flu-like prodrome with fever that *rapidly progresses* to rash, sepsis, and organ failure.
5. Multisystem organ failure can involve the kidneys (elevated creatinine), coagulation (thrombocytopenia, DIC), liver (transaminitis), and lungs (respiratory distress, infiltrates).
6. Erythroderma will fade within 72 hours of appearance, then desquamate in 1–2 weeks.
7. There is no skin sloughing, which helps to differentiate from staphylococcal scalded skin syndrome.
8. More than 50% of severely ill patients experience hair and nail loss 2–3 months after initial infection.



Toxic shock syndrome showing erythema and (later) desquamation
Image appears with permission from VisualDx (www.visualdx.com)

C. Management

1. Remove foreign body, if present.
2. Sepsis resuscitation (IV fluids, vasopressors as needed, blood cultures)
3. Administer anti-group A β -hemolytic streptococci and anti-methicillin-resistant *Staphylococcus aureus* (MRSA) antibiotics.
 - a. vancomycin and clindamycin *or*
 - b. linezolid and clindamycin
 - (1) Clindamycin should be added to suppress toxin production.
4. IVIG can be considered if the patient does not improve after initial treatments.

VI. NECROTIZING FASCIITIS

A. Overview

1. A bacterial infection that tracks along the fascial planes; surface erythema often underrepresents the extent of infection.
2. Type 1 necrotizing fasciitis is polymicrobial.
3. Type 2 necrotizing fasciitis is monomicrobial, mostly due to group A β -hemolytic streptococci, MRSA, *Vibrio vulnificus*, or *Clostridium*.
4. Polymicrobial infections may be caused by gram-positive, gram-negative, and anaerobic bacteria, including *S aureus*, *Streptococcus*, *Clostridium*, Enterobacteriaceae, and *Bacteroides*.
5. *Vibrio vulnificus* and *Aeromonas hydrophila* infections are related to exposure to seawater, brackish water, and soil.
6. Can be rapidly fatal. The mortality rate is as high as 46%.
7. Fournier gangrene is necrotizing fasciitis of the groin, scrotum, and lower abdomen.
8. Approximately 80% of cases are associated with some form of skin trauma, including very minor injuries or procedures.

B. Clinical presentation

1. Patients are systemically ill; symptoms include fever, tachycardia, lethargy, and possibly hypotension.
2. Pain and tenderness extend beyond the area of erythema and can be severe.
3. Classically, patients have pain out of proportion to their examination.
4. Skin may have erythema resembling cellulitis, edema, hemorrhagic bullae, crepitus, and/or necrosis, depending on the stage of disease. The presence of hemorrhagic bullae is highly suggestive of necrotizing fasciitis.
5. Skin findings progress quickly over hours to days.
6. Significant leukocytosis, hyponatremia, increased creatinine, lactic acidosis, and increased inflammatory markers may be present.
7. Risk factors include IV drug use, skin or soft-tissue trauma, diabetes mellitus, malignancy, cirrhosis, recent surgery, peripheral artery disease, and wounds with water exposure.



Necrotizing fasciitis
Image appears with permission from VisualDx (www.visualdx.com)

C. Diagnostic evaluation

1. Contrast-enhanced CT or MRI may show edema along fascial planes or gas in the tissue. Although highly sensitive, a negative imaging study does *not* exclude the diagnosis.
2. Plain radiographs have limited utility and cannot be used to rule out the disease.
3. Blood cultures can be helpful for long-term management.
4. Definitive diagnosis is made through wound exploration and direct tissue sampling.
5. Patient may have hyponatremia, lactic acidosis, extreme leukocytosis, and increased creatine kinase.
6. The Laboratory Risk Indicator for Necrotizing Fasciitis (LRINEC) score is of questionable utility in identifying necrotizing fasciitis and cannot be used to exclude the disease.

D. Management

1. Early surgical consultation is essential. Surgical debridement of the necrotic tissue is the mainstay of treatment.
2. Broad-spectrum antibiotics are needed. Options include:
 - a. Piperacillin-tazobactam *plus* vancomycin *plus* clindamycin (clindamycin may reduce exotoxin production by group A streptococci)
 - b. Piperacillin-tazobactam *plus* linezolid (linezolid may also reduce exotoxin production by group A streptococci)
 - c. Linezolid *plus* meropenem
 - d. Add doxycycline *plus* either ciprofloxacin or cefepime if *Vibrio vulnificus* or *Aeromonas hydrophila* infection is suspected.
3. Sepsis resuscitation with IV fluids and vasopressors, as needed
4. Admit to ICU.

VII. ROCKY MOUNTAIN SPOTTED FEVER**A. Overview**

1. A vasculitis due to *Rickettsia rickettsii*; transmitted by the *Dermacentor* tick
2. Seen throughout the US (all states) but most common in the southeastern and southcentral US
3. Transmission occurs quickly following the bite of an infected tick. Therefore, transmission can occur without the patient being aware of the exposure.
4. Occurrence is more common April through October because of the increased risk of tick exposure.

B. Clinical presentation

1. Classic triad is fever, headache, and petechial rash.
 - a. Present the minority of the time
2. Symptoms begin days to 2 weeks after the tick bite.
3. Flu-like prodrome to the rash
4. Red papules and macules start on the distal extremities (wrists and ankles) and move inward.
 - a. Palms and soles are involved.
 - b. The face is spared from the rash, but iritis and uveitis can develop.
5. Lesions evolve into purpuric petechia.
6. Complications include:
 - a. CNS (headache, seizure, meningitis, mental status change)
 - b. Cardiac (myocarditis) involvement
 - c. GI (hepatitis)
 - d. Cardiac (dysrhythmias)

C. Diagnostic evaluation

1. IgM and IgG antibody testing, blood PCR, or ELISA. Antibody tests may be negative during the first week of symptoms.
2. Patients may have associated hyponatremia, thrombocytopenia, and increased aspartate aminotransferase (AST) and alanine aminotransferase (ALT).

D. Management

1. Doxycycline for 5–7 days, for all ages
 - a. For adults, treat for 5–7 days. Treatment should be IV for systemically ill patients and oral for those whose illness is less severe.
2. For children, IV treatment should continue for a minimum of 3 days after fever resolves. Treat based on clinical suspicion, not confirmatory testing.
3. Without antibiotic treatment, mortality is 20%–30%.



Rocky Mountain spotted fever. The image on the left shows petechia. The image on the right shows the evolution to purpura. Left image courtesy of Laura Bontempo, MD, MEd, FACEP. Right image appears with permission from VisualDx (www.visualdx.com).

VIII. PEMPHIGUS VULGARIS

A. Overview

1. An autoimmune bullous disease of skin and mucous membranes
2. Most commonly affects patients 40–60 years old with equal incidence in both genders
3. Associated with the presence of other autoimmune diseases, particularly myasthenia gravis
4. Mortality rate is currently 5%; before the use of corticosteroid therapy, this disease was almost always fatal.

B. Clinical presentation

1. Classic clinical scenario: A 55-year-old patient with a past medical history of myasthenia gravis has multiple fluid-filled bullae and painful, crusted ulcers. The patient has a recent history of several months of painful oral blisters of unknown etiology. Physical examination is significant for a positive Nikolsky sign.
2. Oral lesion(s) typically precede development of cutaneous lesions by several months.
3. The cutaneous lesions are initially painful, tense bullae that evolve over 2-3 days into flaccid vesicles and bullae that rupture easily, leaving behind superficial erosions and crusted ulcerations. They are painful and can be seen anywhere, including on the palms and soles (rarely).
4. Mucosal lesions can affect any mucosal surface, including the conjunctiva, larynx, pharynx, and genitals.
5. Nikolsky sign is positive.
6. Large areas of denuded skin increase risk of secondary infection.



Pemphigus vulgaris
Image on left courtesy of Laura Bontempo, MD, MEd, FACEP
Image on right appears with permission from VisualDx (www.visualdx.com).