




Exposure to herpes simplex virus types 1 and 2 (HSV-1 and HSV-2) at abraded skin sites allows entry into the epidermis and dermis. Infection typically occurs from sexual contact, but it occasionally occurs at extraoral or extragenital sites, such as the hands of health care workers, producing a painful erythema primarily at the junction of the nail bed and skin (i.e., whitlow). This progresses to a vesicopustular lesion that can mimic a bacterial infection (i.e., paronychia). Sexually transmitted diseases are discussed in [Chapter 100](#).

Mycobacterium marinum is an atypical, acid-fast bacillus; it is the most common atypical mycobacterium that causes infection in humans. After inoculation of a skin abrasion or puncture wound in salt or fresh water (nonchlorinated), lesions appear as papules on an extremity. Lesions progress to shallow ulcers and form scars. Typically, lesions are solitary, but they may take on the appearance of ascending, sporotrichoid-like, nodular lymphangitis that may involve the local joint or tendons.

Mycobacterium leprae is a slow-growing, acid-fast bacillus that cannot be grown in vitro. It is the cause of leprosy (Hansen's disease). It is primarily transmitted by the airborne route and causes chronic disfiguring skin lesions and nerve damage.

 For a deeper discussion of this topic, please see [Chapter 326, "Leprosy \(Hansen's Disease\)"](#) in *Goldman-Cecil Medicine, 25th Edition*.

Pasteurella multocida is a gram-negative coccobacillus that may occur at the site of a scratch or bite from a dog or cat. Cellulitis results within 24 hours of the injury, producing swelling, erythema, tenderness, serous or purulent discharge with or without regional lymphadenopathy, chills, and fever.

Pseudomonas aeruginosa is a gram-negative rod and primarily a nosocomial pathogen. In the community, serogroup O: 11 may cause folliculitis related to the use of hot tubs, whirlpools, and swimming pools. Typically, the eruption occurs 48 hours after exposure and consists of tender, pruritic papules, papulopustules, or nodules. It is an important pathogen in burn wound infections, which may progress to sepsis.

Sporothrix schenckii is a dimorphic fungus ubiquitous primarily in the tropical parts of North and South America. Cutaneous inoculation from thorny plants (e.g., rose bushes) is followed by development of a painless papule that enlarges slowly to become a nodular lesion with a violaceous hue or ulceration. Secondary lesions may form along the lymphatic drainage distribution.

Primary varicella-zoster virus (VZV) infection occurs by the respiratory route but may occur through contact with infected lesions. Viremia results in crops of papules that primarily occur on the trunk and progress to vesicles and then to pustules, followed by crusting. Zoster or shingles represents reactivation of the latent virus in the sensory neurons of the dorsal root ganglion, resulting in pain that proceeds to a rash in the distribution of the affected dermatome in a few days. The appearance of papules and vesicles in a unilateral dermatomal distribution confirms the diagnosis. Ramsay Hunt syndrome occurs when the VZV infection involves the geniculate ganglia and causes a painful eruption in the ear canal and tympanic membrane that is associated with ipsilateral seventh cranial nerve palsy. Vesicles that appear on the tip of the nose (i.e., Hutchinson's sign) may be preceded by development of ophthalmic zoster and involvement of the cornea.

Immunosuppressed individuals are at higher risk for disseminated disease.

Vibrio vulnificus is a gram-negative bacillus that is spread by contamination of a superficial wound with warm seawater. It can cause rapidly developing and intense cellulitis, necrotizing vasculitis, and ulcer formation. Aggressive soft tissue infection may occur with necrosis, fever, sepsis, and bullae formation. Ingestion of raw oysters, particularly by immunocompromised (e.g., liver cirrhosis, iron overload) patients may be followed 1 to 3 days later by septicemia associated with necrotizing cutaneous lesions.

[Table 94-1](#) provides a classification for the spectrum of skin involvement by bacteria and fungi.

DIAGNOSIS

A thorough medical history is critical; it should assess the specific risk factors, such as travel history, animal contacts, marine exposures, occupational and avocational hazards (e.g., farming, gardening), and immune status. If an animal bite has occurred, the timing of the bite, circumstances of injury, and health status of the animal should be determined. Human bites are classified as self-inflicted, occlusal (i.e., intentional), or closed-fist injuries.

In addition to wound assessment, evaluation for other transmissible pathogens, including human immunodeficiency virus (HIV), HSV, *Treponema pallidum* (the etiologic agent of syphilis), and hepatitis B and C viruses, should be pursued. A thorough clinical examination should follow. Initial antimicrobial management, if indicated, is directed by the history and physical examination findings.

Evaluation of hospitalized patients should include a complete blood count and a basic metabolic panel. The C-reactive protein level may be useful as a marker for inflammation and guidance for treatment. The creatine phosphokinase concentration may be helpful, but it is not specific for cases of compartment syndrome and necrotizing fasciitis involving the musculature. Cultures are not indicated for uncomplicated common forms of SSTIs managed in the outpatient setting. The benefit of blood cultures for cellulitis in hospitalized patients is uncertain because the yield is low. Cultures are indicated for patients who require incision and drainage because of the risk of deep structure and underlying tissue involvement.

The most sensitive and specific test for the diagnosis of HSV and VZV cutaneous lesions is nucleic acid amplification. A sample is scraped from the base of an active dermal lesion with a swab. Direct fluorescent antibody testing is less sensitive. Incision and drainage of these lesions is contraindicated.

Special Diagnostic Considerations

Animal Bites

Blood cultures, tissue biopsy, and aspirates for culture of aerobic or anaerobic organisms are preferred methods in cases of animal bites.

Human Bites

Wounds swabs may produce misleading information in cases of human bites. A Gram stain should be performed to assess