

TABLE 172-1 COMMON ILLNESSES CAUSED BY STAPHYLOCOCCUS AUREUS

Skin and Soft Tissue Infections
Folliculitis
Abscess, furuncle, carbuncle
Cellulitis
Impetigo
Mastitis
Surgical wound infections
Musculoskeletal Infections
Septic arthritis
Osteomyelitis (hematogenous or contiguous spread)
Pyomyositis
Psoas abscess
Respiratory Tract Infections
Ventilator-associated or nosocomial pneumonia
Septic pulmonary emboli
Postviral pneumonia (e.g., influenza)
Empyema
Bacteremia and its Complications
Sepsis, septic shock
Metastatic foci of infection (kidney, joints, bone, lung)
Infective endocarditis
Infective Endocarditis
Injection drug use–associated
Native-valve
Prosthetic-valve
Nosocomial
Device-Related Infections (e.g., intravascular catheters, prosthetic joints)
Toxin-Mediated Illnesses
Toxic shock syndrome
Food poisoning
Staphylococcal scalded-skin syndrome
Invasive Infections Associated with Community-Acquired Methicillin-Resistant <i>S. aureus</i>
Necrotizing fasciitis
Waterhouse-Friderichsen syndrome
Necrotizing pneumonia
Purpura fulminans

or (less commonly) other streptococcal species. Common factors predisposing to *S. aureus* cutaneous infection include chronic skin conditions (e.g., eczema), skin damage (e.g., insect bites, minor trauma), injections (e.g., in diabetes, injection drug use), and poor personal hygiene. These infections are characterized by the formation of pus-containing blisters, which often begin in hair follicles and spread to adjoining tissues. *Folliculitis* is a superficial infection that involves the hair follicle, with a central area of purulence (pus) surrounded by induration and erythema. *Furuncles* (boils) are more extensive, painful lesions that tend to occur in hairy, moist regions of the body and extend from the hair follicle to become a true abscess with an area of central purulence. *Carbuncles* are most often located in the lower neck and are even more severe and painful, resulting from the coalescence of other lesions that extend to a deeper layer of the subcutaneous tissue. In general, furuncles and carbuncles are readily apparent, with pus often expressible or discharging from the abscess. Other cutaneous *S. aureus* infections include impetigo and cellulitis. *S. aureus* is one of the most common causes of surgical wound infection.

Mastitis develops in 1–3% of nursing mothers. This infection of the breast, which generally presents within 2–3 weeks after delivery, is characterized by findings that range from cellulitis to abscess formation. Systemic signs, such as fever and chills, are often present in more severe cases.

Musculoskeletal Infections *S. aureus* is among the most common causes of bone infections—both those resulting from hematogenous dissemination and those arising from contiguous spread from a soft tissue site. *Hematogenous osteomyelitis* in children most often involves the long bones. Infections present as fever and bone pain or with a child's reluctance to bear weight. The white blood cell count and erythrocyte sedimentation rate are often elevated. Blood cultures are positive in ~50% of cases. When necessary, bone biopsies for culture and histopathologic examination are usually diagnostic. Routine x-rays may be normal for up to 14 days after the onset of symptoms. ^{99m}Tc-phosphonate scanning often detects early evidence of infection. MRI is more sensitive than other techniques in establishing a radiologic diagnosis.

In adults, hematogenous osteomyelitis involving the long bones is less common. However, *vertebral osteomyelitis* is among the more common clinical presentations. Vertebral bone infections are most often seen in patients with endocarditis, those undergoing hemodialysis, diabetics, and injection drug users. These infections may present as intense back pain and fever but may also be clinically occult, presenting as chronic back pain and low-grade fever. *S. aureus* is the most common cause of epidural abscess, a complication that can result in neurologic compromise. Patients complain of difficulty voiding or walking and of radicular pain in addition to the symptoms associated with their osteomyelitis. Surgical intervention in this setting often constitutes a medical emergency. MRI most reliably establishes the diagnosis (Fig. 172-2).

Bone infections that result from contiguous spread tend to develop from soft tissue infections, such as those associated with diabetic or vascular ulcers, surgery, or trauma. Exposure of bone, a draining fistulous tract, failure to heal, or continued drainage suggests involvement of underlying bone. Bone involvement is established by bone culture and histopathologic examination (revealing evidence of PMN infiltration). Contamination of culture material from adjacent tissue can make the diagnosis of osteomyelitis difficult in the absence of pathologic confirmation. In addition, it is sometimes hard to distinguish radiologically between osteomyelitis and overlying soft tissue infection with underlying osteitis.

In both children and adults, *S. aureus* is the most common cause of *septic arthritis* in native joints. This infection is rapidly progressive and may be associated with extensive joint destruction if left untreated. It presents as intense pain on motion of the affected joint, swelling, and fever. Aspiration of the joint reveals turbid fluid, with >50,000 PMNs/ μ L and gram-positive cocci in clusters on Gram's stain (Fig. 172-1). In



FIGURE 172-2 *S. aureus* vertebral osteomyelitis and epidural abscess involving the thoracic disk between T9 and T10. Sagittal postcontrast MRI of the spine illustrates destruction of the T9–T10 intervertebral space with enhancement (arrow). There is impingement on the thoracic cord and an epidural collection extending from T9 through T11 (short arrows).