



FIGURE 89-1 The spectrum of illness and nomenclature for sepsis pathophysiology.

TABLE 89-2 MICROORGANISMS COMMONLY IDENTIFIED IN SEPTIC PATIENTS BASED ON HOST FACTORS

HOST FACTOR	ORGANISMS TO CONSIDER
Asplenia	Encapsulated organisms, particularly <i>Streptococcus pneumoniae</i> , <i>Haemophilus influenzae</i> , <i>Neisseria meningitidis</i> , <i>Capnocytophaga canimorsus</i>
Cirrhosis	<i>Vibrio</i> , <i>Salmonella</i> , and <i>Yersinia</i> species; encapsulated organisms, other gram-negative rods
Alcohol abuse	<i>Klebsiella</i> species, <i>S. pneumoniae</i>
Diabetes	Mucormycosis, <i>Pseudomonas</i> species, <i>Escherichia coli</i> , group B streptococci
Neutropenia	Enteric gram-negative rods, <i>Pseudomonas</i> , <i>Aspergillus</i> , <i>Candida</i> , <i>Mucor</i> species, <i>Staphylococcus aureus</i> , streptococcal species
T-cell dysfunction	<i>Listeria</i> , <i>Salmonella</i> , and <i>Mycobacterium</i> species, herpesviruses (including herpes simplex, cytomegalovirus, varicella-zoster virus)
Acquired immunodeficiency syndrome	<i>Salmonella</i> species, <i>S. aureus</i> , <i>Mycobacterium avium</i> complex, <i>S. pneumoniae</i> , group B streptococci

from 20% of mild to moderate cases to more than 60% of patients with septic shock.

The financial impact of sepsis cases is immense. Each episode of sepsis costs approximately \$50,000 in health care expenditures, for a total of more than \$17 billion dollars annually in the United States alone.

Bacterial infections are the most common cause of sepsis. Bloodstream infections due to bacteria account for the largest proportion of hospitalizations. The rates are highest for premature infants, the advanced elderly (especially those older than 85 years of age), and patients with intravenous catheters, implanted devices, or severe medical morbidities such as severe burns or hematologic malignancies.

Pathogens most commonly identified in bloodstream infections include staphylococci (e.g., *Staphylococcus aureus*), group A streptococci, *Escherichia coli*, *Klebsiella* species, *Enterobacter* species, and *Pseudomonas aeruginosa*. Immunocompromised patients and patients with long-term intravascular catheters are at increased risk for fungal bloodstream infections from *Candida*

species, and some species may be resistant to commonly used antifungal medications. Given the broad variety of potential pathogens, clinicians face the dual challenges of an accurate and timely diagnosis and choice of appropriate empirical therapy.

Several epidemiologic factors can guide the clinician in cases of sepsis when a source has not been identified. Table 89-2 lists microorganisms that are associated with certain host factors that predispose a patient to infection and sepsis. Host factors associated with worse outcomes include extremes of age, use of immunomodulating or immunosuppressing medications, and concomitant chronic medical conditions.

Several diagnostic and treatment factors are associated with severity of illness and clinical outcome. Delay in effective antimicrobial therapy correlates with worse outcomes. Infection with multidrug-resistant organisms may cause a delay in effective therapy, and for some organisms, particularly gram-negative enteric rods, the delay may be independently related to worse outcomes. Certain organisms (e.g., *P. aeruginosa*) are more virulent. The primary infection site also is important; respiratory sites