Infections and stress, immune responses, and hormones are interconnected, ensuring immune competence to deal with immediate threat of overwhelming infection and metabolic collapse. Emergence of cytokines as key signal mediators and appreciation of autocrine-paracrine influences of hormones have helped explain how signals are transmitted and responses evoked. This has led to possibilities of creating therapies that might be used to enhance protective signals and dampen signals emanating from host and invading organism interaction that might otherwise be detrimental. Correcting certain metabolic abnormalities, such as hyperglycemia and metabolic acidosis, benefits the host by decreasing morbidity and mortality.

Infections in diabetes mellitus are relatively more common and serious. Diabetic patients run the risk of acute metabolic decompensation during infections, and conversely patients with metabolic decompensation are at higher risk of certain invasive infections. Tight glycemic control is of paramount importance during acute infected or high stress state. Infections in diabetic patients result in extended hospital stays and additional financial burden. Given the risks of not alleviating the metabolic dysregulation and the benefits of decent glycemic control, it is necessary that besides antimicrobial therapy, equal emphasis be placed on intensified glycemic control.
Hypercortisolemia and Infection
Gilbert G. Fareau and Rena Vassilopoulou-Sellin

Hypercortisolemia is a condition involving a prolonged excess of serum levels of cortisol that can develop as a result of disregulatory abnormalities in the hypothalamic-pituitary-adrenal axis or from exogenous-source steroids. Hypercortisolemia induces a state of immunocompromise that predisposes the patient to various bacterial, viral, fungal, and parasitic infections. To ensure optimal management of hypercortisolemia, the primary clinician must be cognizant of its different causes and aware of the different infections associated with cortisol excess. In the hypercortisolemic patient, it is necessary to restore normal cortisol levels to reduce the risk of infection or to improve the control and cure of established infection.

Infections in Patients with Chronic Kidney Disease
Robert N. Foley

There has been a notable lack of research activity regarding major infections in patients with advanced chronic kidney disease. To an outsider, this might seem unexpected, because uremia has long been considered a state of immune hyporesponsiveness and rates of major bacterial infection, like septicemia and pneumonia, are known to be orders of magnitude more likely in dialysis populations than in the general population. This article reviews recent literature on the topic, focusing predominantly on the clinical epidemiology of major bacterial infections in dialysis patients, the links between bacterial infections and cardiovascular disease, and randomized trials of interventions designed to prevent these infections.

Infections in Chronic Lung Diseases
G. Iyer Parameswaran and Timothy F. Murphy

Chronic lung diseases are prevalent worldwide and cause significant mortality and suffering. This article discusses infections that occur in three chronic lung diseases: chronic obstructive pulmonary disease, bronchiectasis, and cystic fibrosis. Rather than discussing the role of infections as etiology of these diseases, this article focuses on infections that occur in the background of established chronic lung disease.

The Prevention and Management of Infections in Children with Asplenia or Hyposplenia
Victoria E. Price, Victor S. Blanchette, and E. Lee Ford-Jones

Overwhelming sepsis remains a significant complication of asplenia and hyposplenia. The mainstays of prevention are education, immunization, and prophylactic antibiotics. Evidence to base recommendation and guidelines is lacking. Such decisions as the specific immunizations required, the timing of immunizations, the duration of antibiotic prophylaxis, and the prevention of overwhelming postsplenectomy sepsis in children undergoing splenectomy are often empiric. This article reviews the current
literature on the prevention and management of severe infections in children with underlying asplenia or hyposplenia.

Infection in the Elderly 711
Tin Han Htwe, Adnan Mushtaq, Sherry B. Robinson, Richard B. Rosher, and Nancy Khardori

Many functional, demographic, and immunologic changes associated with aging are responsible for increasing the incidence and severity of infectious diseases in the elderly. Management is complicated by age-related organ system changes. Because many of the elderly are on multiple medications for underlying illnesses, antimicrobial therapy needs to be chosen keeping drug interactions and adverse events in mind. Common infections seen in the elderly are infections of skin and soft tissue, urinary tract, respiratory tract, and gastrointestinal tract. Organized and well-funded programs to address infectious disease issues in the elderly are the only way to improve care.

Infection in Patients with Severe Burns: Causes and Prevention Thereof 745
B.R. Sharma

The better understanding of burn pathophysiography has resulted in effective fluid resuscitation in the acute stage, but the morbidity and mortality of burn patients are mostly linked to the burn wound consequences. Once the initial acute phase is over, the burn wound becomes the source of virtually all ill effects, local and systemic. The dysfunction of the immune system, a large cutaneous bacterial load, the possibility of gastrointestinal bacterial translocation, prolonged hospitalization, and invasive diagnostic and therapeutic procedures all contribute to infectious complications. Wound infection may lead to septicemia that may not only consume additional resources but is associated with significant morbidity and mortality despite the advances in burn care.

Infections in Residents of Nursing Homes 761
Catharina Matheı¨, Luc Niclaes, Carl Suetens, Béatrice Jans, and Frank Buntinx

Infectious diseases are a very common occurrence in nursing homes. While the reasons for preventing infections are the same in nursing homes and in acute hospitals, several considerations relevant to prevention of infection differ in nursing homes. Infection control measures should be based upon the particularities of the specific setting of a nursing home and its residents.

Infections in Confined Spaces: Cruise Ships, Military Barracks, and College Dormitories 773
Vivek Kak

The presence of a vast cohort of individuals in semi-confined settings such as cruise ships, military barracks, and college
dormitories is often accompanied by an increase in the risk of particular infections. These are often gastrointestinal infections on cruise ships and respiratory pathogens that are easily transmitted in the barrack and dormitory setting. The control of these infections involves attention to good personal hygiene, safe food and water handling, and use of vaccines to prevent vaccine-preventable diseases.

**Infections Associated with Long-Term Prosthetic Devices**  
Marta Fernandez Sampedro and Robin Patel

The extensive and ever-increasing use of long-term prosthetic devices has improved quality of life and survival for many patients. Prosthetic device–related infection occurs infrequently but is associated with significant morbidity and mortality. Management is challenging, often requiring prolonged antimicrobial therapy and surgical intervention. Better understanding of the interaction between microorganisms, devices, and the host should improve the ability to manage device-related infections. This article reviews recent advances in the diagnosis and treatment of infections associated with indwelling medical devices, highlighting those associated with prosthetic joints, cerebrospinal fluid shunts, and prosthetic heart valves.

**Pharmacokinetic and Pharmacodynamic Aspects of Antibiotic Use in High-Risk Populations**  
Scott J. Bergman, Cristian Speil, Michael Short, and Janak Koirala

The study of pharmacokinetics includes the absorption, distribution, metabolism, and elimination of drugs. The pharmacologic effect that a medication has on the body is known as pharmacodynamics. With antimicrobials, pharmacokinetic and pharmacodynamic parameters become especially important because of the association between host drug concentrations, microorganism eradication, and resistance. This article focuses on the pharmacokinetic changes that can occur with antimicrobials when they are used in patients at high risk of infections and how they influence pharmacodynamic effects. The populations described here include patients with obesity and diabetes mellitus, renal or hepatic failure, chronic lung disease, severe burns, and long-term prosthetic devices and the elderly.

**Erratum**

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