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Infections in Oncology

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I. INTRODUCTION

- A. As more intensive regimens are developed and more therapy is administered on an outpatient basis, the management of infections has become an important issue in oncology. This article will provide a broad overview of infectious aspects of oncology, with a strong focus on management of the febrile neutropenic patient. Topics relevant to evolving medical practice, in addition to issues covered on the board certification examinations, will also be emphasized.
- B. When cancer patients with infections are treated, basic management needs to include the following 7 questions.
1. **What is the nature of the underlying immune defect?**
 - a. Neutropenia primarily conveys a risk for bacterial and fungal infections.
 - b. Barrier compromise (mucositis, colitis, and catheters) also conveys a risk for bacterial and fungal infections but alters the spectrum of organisms to which patients may be susceptible when compared with neutropenia alone.
 - c. Cell-mediated immune defects (HIV, certain chemotherapy agents including some alkylating agents and purine analogs, bone marrow transplantation [BMT]) may increase risk for atypical pathogens such as unusual bacteria (*Listeria monocytogenes*), endemic fungi (*Cryptococcus* species, coccidioidomycosis, histoplasmosis), mold, and *Pneumocystis carinii*.
 - d. Humoral defects (qualitative and quantitative) are seen in patients with myeloma, chronic lymphocytic leukemia (CLL), or those who have had BMT. These defects convey a risk of infection with encapsulated organisms, including pneumococcus and *Haemophilus influenzae* B, as well as with enterovirus.
 - e. Splenectomy may increase risk of fulminant infection with pneumococcus, *H. influenzae*, meningococcus, *Capnocytophaga canimorsus* (also known as dysgonic fermenter, an anaerobe associated with dog bites), and babesiosis (only on the east coast of the United States).
 - f. Combined defects would increase the spectrum of organisms to which patients may be susceptible.
2. **When did the infection occur?** This question considers at what point infection presents during the course of the malignancy, including treatment. This timeframe is crucial in the evaluation of infected BMT patients, in whom the likelihood of acquiring particular infections may vary substantially at different times after BMT.
 3. **Are there deficits in the current antibiotic regimen?** As antibiotic prophylaxis becomes more common in outpatient treatment, it is important to choose appropriate antibiotics that add synergy or scope rather than redundancy.
 4. **When antibiotic failure is suspected, why have the drugs failed?** Surgical intervention may be necessary for successful outcome for patients with infected hardware, abscess, or certain infections.
 5. **Can the underlying immune defect be corrected?** This question addresses management issues such as the addition of intravenous immunoglobulin as secondary prophylaxis in patients with hypogammaglobulinemia, the use of highly active antiretroviral therapy as an adjunct against AIDS-related malignancies, the use of hardware (eg, catheters), and the gradual reduction of ongoing immunosuppressive therapy where appropriate.
 6. **What is the duration of therapy, and will long-term suppressive therapy be necessary?**