Vaccination and Infection Prevention

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Vaccination remains a critical strategy for infection prevention in patients with hematologic malignancies, particularly those undergoing hematopoietic stem cell transplantation (HSCT) or receiving chimeric antigen receptor T-cell (CAR-T) therapy, who are characterized by profound and prolonged immune dysfunction. This lecture provides a focused review of adult vaccination strategies for these high-risk populations, emphasizing current evidence and guideline-based recommendations.

Key vaccine-preventable bacterial pathogens are reviewed with attention to their clinical impact in patients with hematologic malignancies. For *Streptococcus pneumoniae*, evolving serotype epidemiology and the expanded role of higher-valent conjugate vaccines are discussed in the context of invasive pneumococcal disease risk after HSCT and CART therapy. Seasonal influenza vaccination is reviewed with respect to variable vaccine effectiveness in immunocompromised hosts, and the preferential use of highly immunogenic formulations, including high-dose or adjuvanted vaccines, is discussed for older adults and selected patients with hematologic malignancies.

The lecture further addresses vaccines targeting clinically significant viral infections in this population. Recombinant zoster vaccine (RZV) is emphasized as a key preventive intervention against herpes zoster and postherpetic neuralgia. Newly available respiratory syncytial virus (RSV) vaccines are reviewed, focusing on efficacy data and their potential role in older or high-risk hematologic patients. SARS-CoV-2 vaccination strategies are briefly summarized, with attention to variant-adapted vaccines, booster timing, and protection against severe COVID-19 in transplant and CAR-T recipients.

Special consideration is given to optimal vaccination timing in HSCT and CAR-T recipients, supported based on international consensus guidelines and institutional protocols.