

# Oncology Care Setting Design and Planning Part I: Concepts for the Oncology Nurse That Improve Patient Safety

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This is the first article in a two-part series on designing healthcare settings to improve patient safety. Part I addresses concepts of error theory and evidence-based practice as they relate to planning safe care environments. Part II describes the design and planning of oncology care settings to prevent fungal infections and improve provider handwashing.

## The Building Boom

The United States is facing one of the largest healthcare building booms in the country's history (Ulrich, Quan, Zimring, Joseph, & Choudhary, 2004). In the past five years, the hospital industry has spent almost \$100 billion in inflation-adjusted dollars on new facilities, an increase of 47% from the previous five years (*USA Today*, 2006).

Reasons for the construction boom are many: the need to replace aging care centers built during the 1970s (Zigmond, 2006), new technologies (Ulrich et al., 2004), and remodeling of older buildings to be in compliance with new regulatory guidelines (Czarnecki & Havrilak, 2006). Other reasons for the building boom are bed shortages, capacity bottlenecks, and challenges by governmental and employer coalitions for health care to become safer, more productive, and more efficient (Berry et al., 2004). Given the projected increase in patients with cancer, oncology care centers also are experiencing a huge growth in new construction and remodeling of existing care centers.

Because of the current and projected increase in healthcare construction, opportunity exists to improve the quality of new healthcare construction by applying error theory, the evolving science of evidence-based design, and involving oncology nurses working at the bedside. In an effort to help prepare oncology nurses to become part of this growth opportunity, this article describes concepts relating to error theory, highlighting the work of James Reason; and evidence-based design.

## Error Theory

Reason's (1997) work says that human error is attributed to the way humans think, the limitations of memory, and thought processes. Most daily activities are routine and can be accomplished with little or no higher-level thought processes. When errors occur in such activities, they are known as slips or lapses. Slips or lapses can occur because of distractions, interruptions, multitasking, or deviations from routine activity. For example, Mr. Smith has an IV fluid running and the pump begins beeping, indicating the need for a new bag. You go to the medication area and pick up a bag. While you are choosing the solution for Mr. Smith, you are paged to call Mr. Jones' family while a nursing assistant

reports Mr. Jones' latest vital signs. You then proceed to accidentally take Mr. Jones' IV solution to Mr. Smith. In contrast to slips, mistakes are a result of lack of knowledge, lack of experience, miscommunication, or misjudgment. For example, an inexperienced oncology nurse is completing a skin assessment on a neutropenic patient. The nurse notes a 3 mm, very light pink area on the left arm, where an IV catheter was discontinued two days ago. Because the inexperienced nurse does not know that neutropenic patients cannot summon an immune reaction typically seen with phlebitis, the finding is not documented.

When those who provide direct care to patients commit errors, the errors are called active failures. Active failures often are the result of latent conditions in the environment (Reason, 2000). Typically, latent conditions are out of the control of bedside care providers and are a result of decisions made by management or, in the case of hospital design, architects (Reiling, Breckbill, Murphy, McCullough, & Chernos, 2003). Latent conditions typically arise from decisions made by architect's management and equipment designers (Reiling, 2006).

According to Reason (2004), gaps that can lead to errors are created unwittingly as a result of decisions made in the planning stages, because the decision

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