Highly Reliable Health Care in the Context of Oncology Nursing: Part I

Oncology care is delivered under challenging circumstances. The principles of reliability science are used extensively in numerous high-risk and high-tech industries to improve quality and safety. This two-part series will discuss the concept of reliability science in the context of oncology nursing practice as a way to improve the quality and safety of care provided to patients with cancer.

Reliability Science

The principles of reliability science are used extensively in numerous high-risk industries, such as the nuclear and aviation industries. The principles help compensate for the natural limits of human performance and attention, as a means to improve operational performance and safety (Niedner, Muething et al., 2004). Putting these performance improvements into a broader context, highly reliable healthcare is defined as an organization as one that provides safe care processes, increase the consistency with which appropriate care is delivered, and improve patient outcomes. Some progressive healthcare organizations have applied lessons learned from highly reliable organizations to reduce risk and strengthen defenses against preventable harm by making care more reliable.

A definition of reliability, modified for healthcare, is the measurable capability of a healthcare process, procedure, or healthcare to perform its intended function in the required time (Berwick & Nolan, 2003). The Institute for Healthcare Improvement (IHI) defined reliable healthcare as a “failure-free operation over time” (Nolan, Resar, Haraden, & Griffin, 2004, p. 3). Melynk (2012) described a high-reliability healthcare organization as one that provides safe care and minimizes errors while achieving exceptional performance in quality and safety.

Reliability often is measured as a defect rate in units of 10 and generally represents the number of defects per opportunity for that defect. Therefore, 10^-1 means one defect per 10 attempts, 10^-2 is one defect per 100 attempts, and so on (Nolan et. al., 2004). Putting these performance levels into a broader context, highly reliable organizations, such as those in the nuclear industry, operate at 10^-4, which is one defect per one million tasks. Performance at the 10^-3 level is the level where most healthcare organizations currently perform (Niedner et al., 2013), indicating the need to focus on initial failure prevention through standardization.