

Patient Safety 102: Human Factors and Safety
Summary Sheet

Lesson 1: Understanding the Science of Human Factors

- According to the World Health Organization, human factors is an established science that uses many disciplines (such as anatomy, physiology, physics, and biomechanics) to understand how people perform under different circumstances.
 - We define human factors as: **the study of all the factors that make it easier to do the work in the right way.**
- Issues that impact human performance and increase risk for error include the following:
 - Factors that are in play before action takes place. These are predisposing mental and physiological states, such as fatigue, stress, dehydration, hunger, and boredom.
 - Factors that directly enable decision making, such as perception, attention, memory, reasoning, and judgment.
 - Factors that directly enable decision execution, such as communication and being able to carry out the intended action.
- The science of human factors is particularly useful for understanding human behavior in safety-critical situations, such as providing health care.

Lesson 2: Changes Based on Human Factors Design Principles

- The science of human factors – the study of the interrelationship between humans and their environment – has identified design principles that include the following:
 - **Simplify.** Simplifying involves taking steps out of a process.
 - **Standardize.** Standardizing removes variation and confusion, and promotes predictability and consistency.
 - **Use forcing functions and constraints.**
 - Forcing functions make it impossible to do a task incorrectly. They create a hard stop that you cannot pass unless you change your actions.
 - A constraint is the state of being checked, restricted, or compelled to avoid or perform some action.
 - **Use redundancies.** A typical example is double-checking someone's work.
 - **Avoid reliance on memory.** Checklists are a valuable tool to reduce this reliance.
 - **Take advantage of habits and patterns.**
 - Habits are those actions we perform in consistent circumstances and are triggered by our surroundings.
 - A pattern is a recognizable regularity in events.
 - **Promote effective team functioning.** Teamwork and communication are promoted in many industries.
 - **Automate carefully.** Technology can sometimes – but not always – be helpful.

Lesson 3: Using Technology to Mitigate the Impact of Error

- Examples of technology in health care include computerized prescriber orders entry systems (CPOEs), bar-coding systems, and intravenous medication infusion pumps.
- Technology should facilitate how you do your work, not dictate it.