Crossing the Abyss: Applying Human Factors Analysis to Prevent Medical Errors and Patient Harm

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Learning Objectives

- Takeaway #1
  - Apply Human Factors Analysis in event analysis

- Takeaway #2
  - Identify specific actions to take to impact Human Factors in the current work place setting

- Takeaway #3
  - Evaluate areas where implicit bias can influence Human Factors application
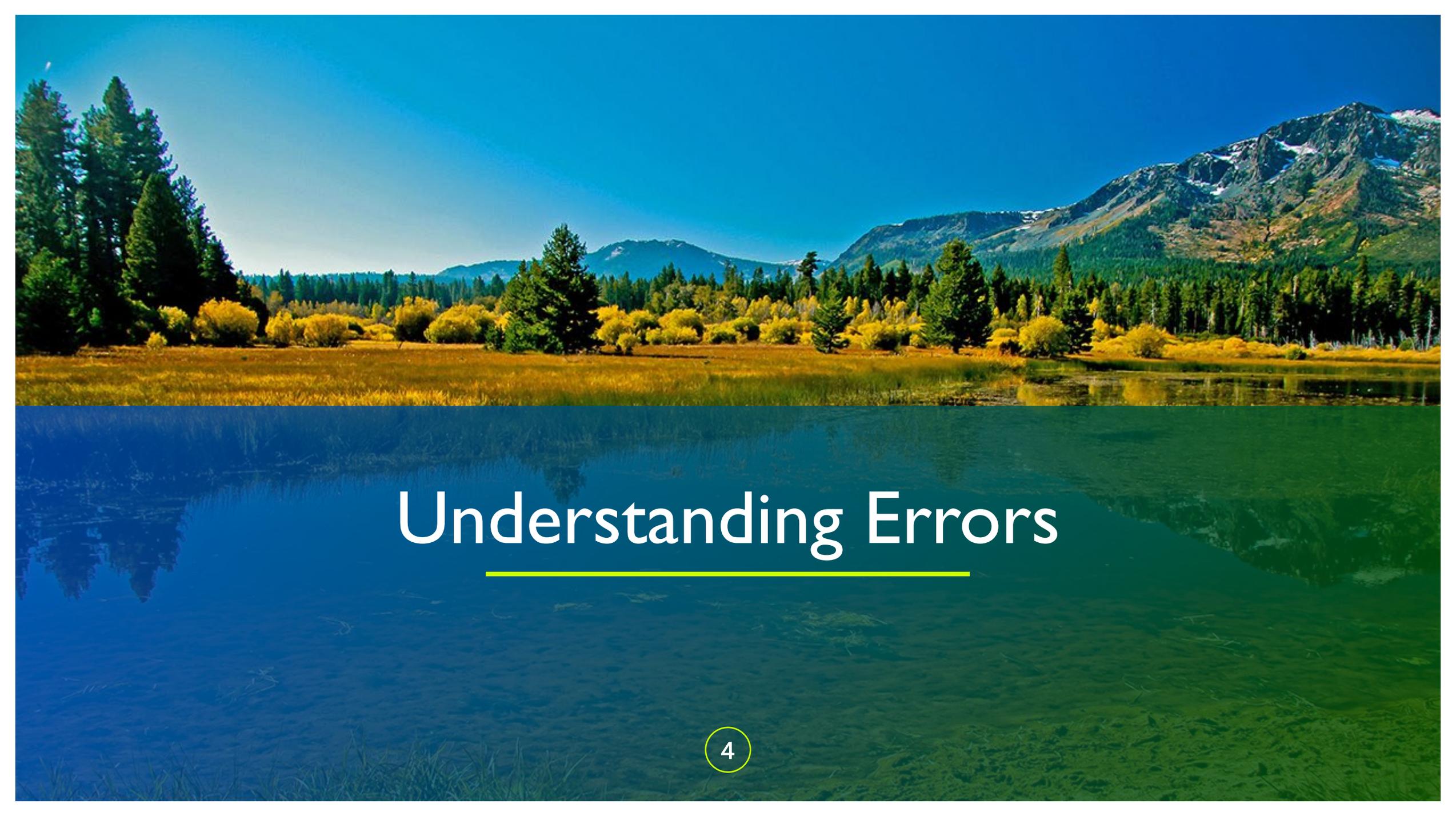
What is an Abyss?

Dictionary Definition

- bottomless gulf or pit; any unfathomable (or apparently unfathomable) cavity or chasm or void extending below

Healthcare Organization
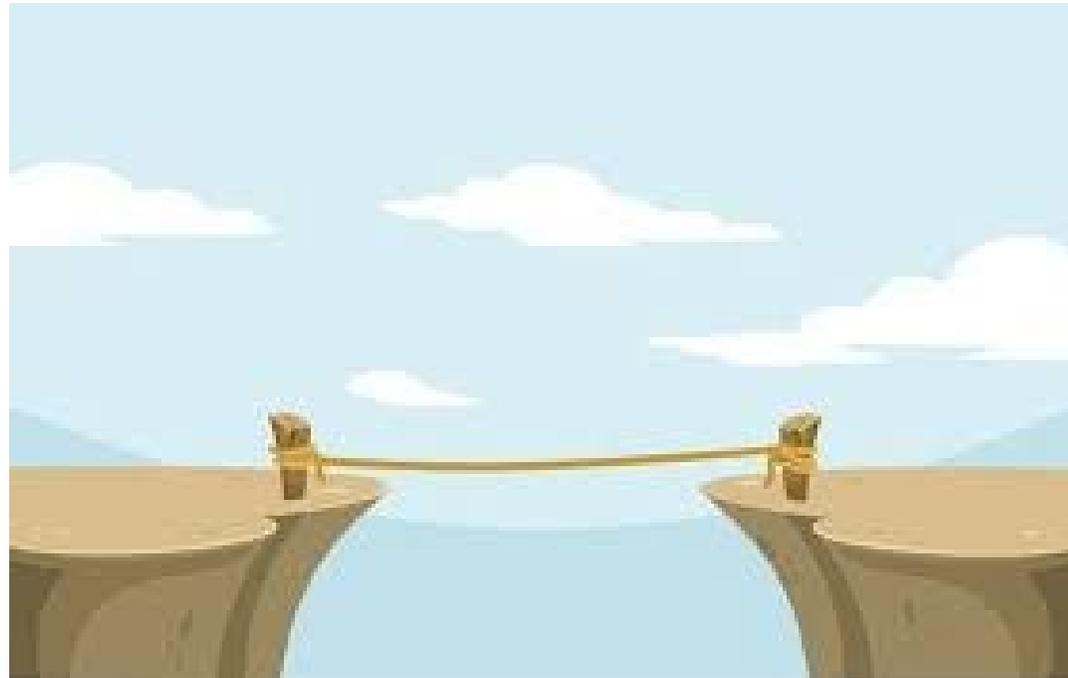
Ideal Patient Safety Outcomes

Understanding Errors

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Error Definition

Failure of a planned sequence of mental
or physical activities to achieve their
<u>intended</u> outcome

- James Reason

What is a Medical Error?

- A **medical error** is a preventable adverse effect of care, whether or not it is evident or harmful to the patient
  - This might include an inaccurate or incomplete diagnosis or treatment of a disease, injury, syndrome, behavior, infection, or other ailment.
  - Process failures
  - Timing errors

PROCESS ERRORS

ADVERSE OUTCOMES

To Error is Human

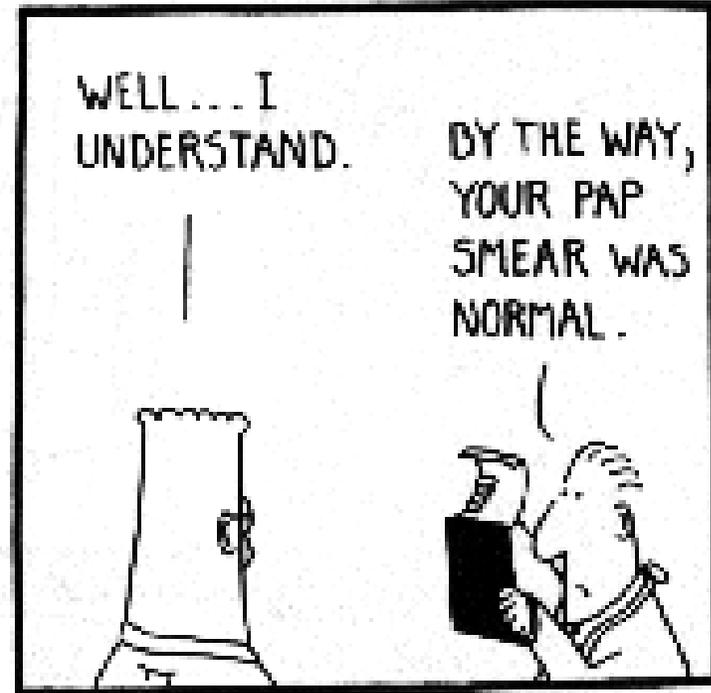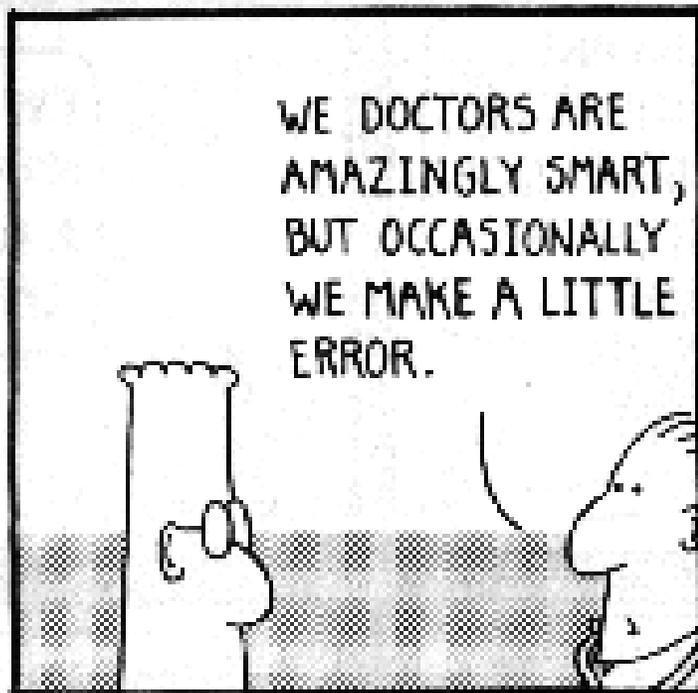## Understanding the nature of being human

- Health Care is essentially human beings caring for human beings using technology or medications created by human beings

- Critical to understand how humans work in order to install/ enhance processes that make it hard to do the wrong thing and easier to do the right thing

- Human Factors impact every aspect of the care continuum

- There is an interconnectedness of human factors and our culture of patient safety and ensuring positive outcomes for patients

Understanding Human Factors

There are 5 basic human factors

- Physical
- Cognitive
- Social
- Cultural
- Emotional

that impact how we interact with our environment, which include

- Tasks
- Technology
- Other people

Quick check in

- Show of hands
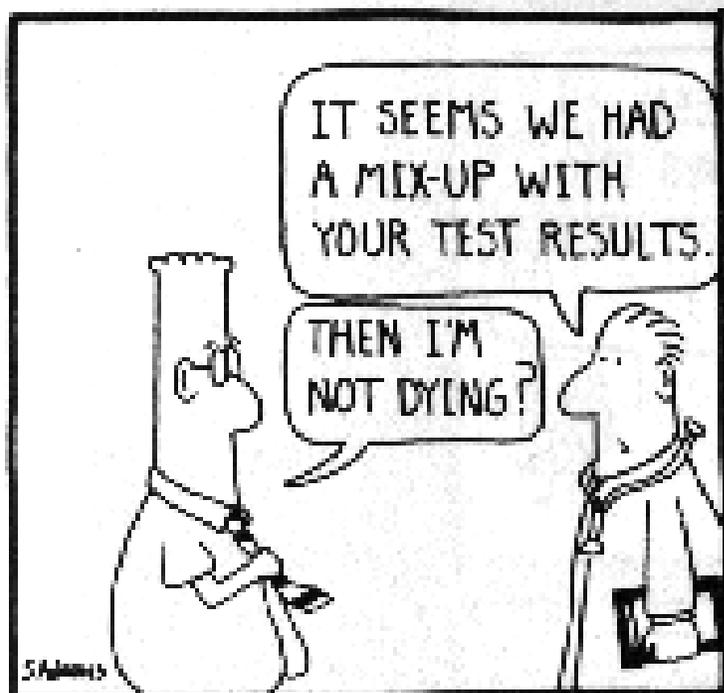
To Error is Human

Policies, Training, Inspection

Minimize consequences of errors

Mitigate

Make errors visible

Make it easy to do the right thing

Facilitate

Make it hard to do the wrong thing

Eliminate

Eliminate the opportunity for error

Standardization & Simplification
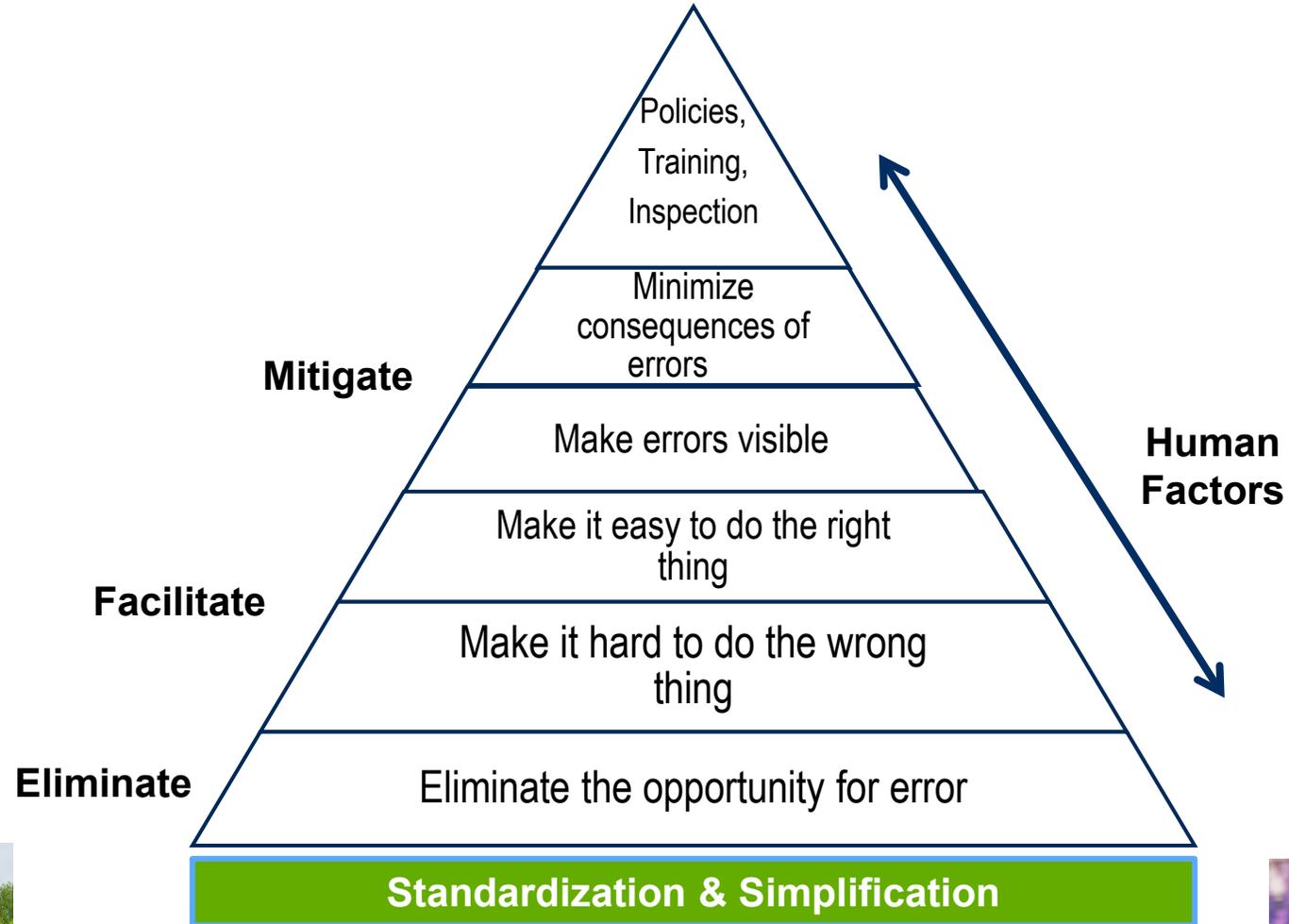
Human Factors

What are Human Factors?

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The Dirty Dozen of Human Factors

- 12 factors that lead to errors have been identified by the FAA. They are entitled "The Dirty Dozen."
  - The Dirty Dozen include:
    - Pressure
    - Stress
    - Norms
    - Fatigue
    - Distraction
    - Complacency
    - Communication
    - Resources
    - Assertiveness
    - Awareness
    - Teamwork
    - Knowledge

Pressure

- Definition:
  - NOUN
    - The use of persuasion, influence, or intimidation to make someone do something
    - The influence or effect of someone or something
    - The feeling of stressful urgency caused by the necessity of doing or achieving something, especially with limited time
  - VERB
    - Attempt to persuade or coerce (someone) into doing something
- How to address pressure
  - Avoid "Group Think"
  - Try not to "Rush"
  - Do not do tasks or activities not trained or competent to do
  - Only perform tasks within your scope of licensure/ job description
  - Implement chain-of-command
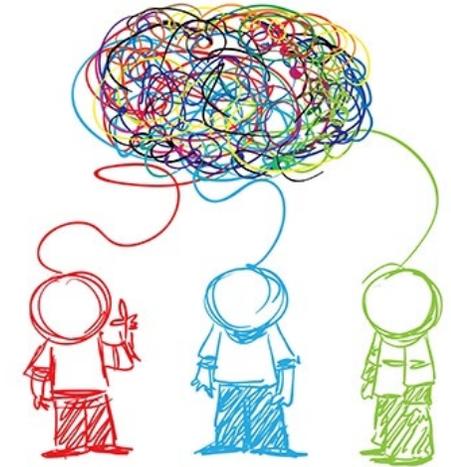
Stress

- Definition:
  - A state of mental or emotional strain or tension resulting from adverse or very demanding circumstances:
  - Something that causes mental strain

- How to address stress
  - Utilize "Situational Awareness"
  - Ask for help – "Wingman"
  - Avoid "Rushing"

A wingman sees from a different vantage point.

Stress

- Signs and symptoms of chronic stress or stress overload
  - The following table lists some of the common warning signs and symptoms of chronic stress. The more signs and symptoms you notice in yourself, the closer you may be to stress overload

Cognitive symptoms	Emotional symptoms
• Memory problems • Inability to concentrate • Poor judgment • Seeing only the negative • Anxious or racing thoughts • Constant worrying	• Depression or general unhappiness • Anxiety and agitation • Moodiness, irritability, or anger • Feeling overwhelmed • Loneliness and isolation • Other mental or emotional health problems
Physical symptoms	**Behavioral symptoms**
• Aches and pains • Diarrhea or consitpation • Nausea, dizziness • Chest pain, rapid heart rate • Loss of sex drive • Frequent colds or flu	• Eating more or less • Sleeping too much or too little • Withdrawing from others • Procrastinating or neglecting responsibilities • Using alcohol, cigarettes, or drugs to relax • Nervous habits (e.g. nail biting, pacing)

Norms

- Definition:
  - Norms are cultural products (including values, customs, and traditions) which represent individuals' basic knowledge of what others do and think that they should do. Sociologists describe norms as informal understandings that govern individuals' behavior in society
  - The customary situation or circumstances

- How to address norms
  - Follow policies, procedures and protocols
  - Avoid "Complacency"
  - Avoid "Confirmation Bias"

Fatigue

- Definition:
  - Extreme tiredness, typically resulting from mental or physical exertion or illness
  - A subjective feeling of tiredness which is distinct from weakness, and has a gradual onset. Unlike weakness, fatigue can be alleviated by periods of rest. Fatigue can have physical or mental causes

- How to address fatigue
 - Understand how to prevent fatigue by taking care of self

Fatigued workers can exhibit the following conditions:

- *Lapses in attention and inability to stay focused*
- *Reduced motivation*
- *Compromised problem solving*
- *Confusion*
- *Irritability*
- *Memory lapses*
- *Impaired communication*
- *Slowed or faulty information processing and judgment*
- *Diminished reaction time*
- *Indifference and loss of empathy*

Distraction

- Definition:
  - A thing that prevents someone from giving full attention to something else
  - Distraction is caused by: the lack of ability to pay attention; lack of interest in the object of attention; or the great intensity, novelty or attractiveness of something other than the object of attention

I would put a picture here, but it would just distract you.
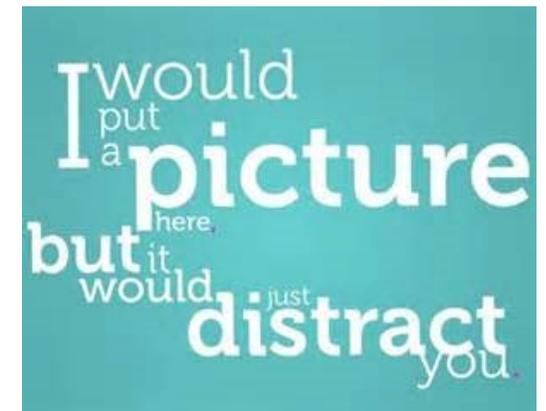
Complacency

- Definition:
  - Marked by self-satisfaction especially when accompanied by unawareness of actual dangers or deficiencies
  - A feeling of being satisfied with how things are and not wanting to try to make them better

- How to address Complacency
  - Pay attention to details
 - Ask questions
  - Ask more questions

Communication

- Definition:
  - Process by which information is transmitted and understood between two or more people
  - Transmitting the sender's intended message is the essence of good communication

- How to improve communication
  - TeamSTEPPS principles
    - SBAR
    - Briefing/ Debriefing
    - Advocacy / Assertion
    - Two challenge rule
    - CUS phrases

Assertive Statements to Use in Communication

I am **C** ONCERNED!

I am **U** NCOMFORTABLE!

This is a **S** AFETY ISSUE!

"Stop the Line"

Assertion

Team

Effective Communication

Knowledge

Situational Awareness
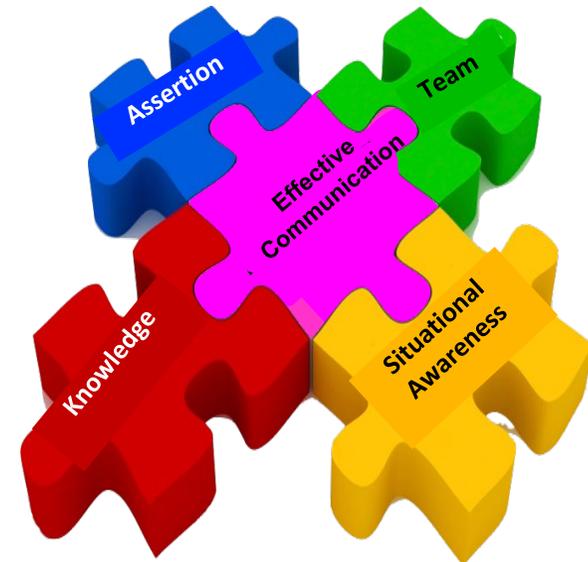
Communication is….

- Poor communication often appears at the top of contributing and causal factors in accident reports, and is therefore one of the most critical human factor elements.

  - Communication refers to the transmitter and the receiver, as well as the method of transmission.
    - Transmitted instructions may be unclear or inaccessible.
    - The receiver may make assumptions about the meaning of these instructions, and the transmitter may assume that the message has been received and understood.
    - With verbal communication it is common that only 30% of a message is received and understood.

Communication Rules from FAA Translated to HealthCare

- Detailed information must be passed before, during and after any task, and especially across the handover of shifts

- Therefore, when messages are complex they should be written down

- Organizations should encourage full use of logbooks, worksheets, and checklists etc.

- Verbal messages can be kept short, with the most critical elements emphasized at the beginning and repeated at the end

- Assumptions should be avoided and opportunities for asking questions both given and taken
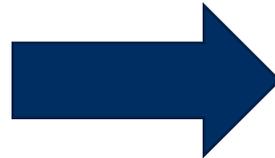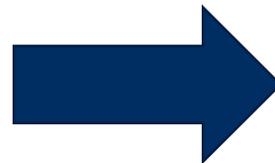
- **Hand-off processes**

- **Write down, read-back and verify**

- **Checklists**

- **Limit verbal orders to only life-threatening situations and physician in sterile garb**

- **Opportunities for asking questions**

Resources

- Definition:
  - A stock or supply of money, materials, staff, and other assets that can be drawn on by a person or organization in order to function effectively
  - An action or strategy that may be adopted in adverse circumstances

- How to address issues related to resources
  - Be "Accountable" for your actions and words
  - Avoid "Complacency"
 - Speak Up – Ask for help

Assertiveness

- Definition:
  - Assertiveness is the quality of being self-assured and confident without being aggressive
  - Means being able to stand up for your own or other people's rights in a calm and positive way, without being either aggressive, or passively accepting 'wrong'

- How to improve assertiveness
  - Learn about "TeamSTEPPS Communication Principles"
 - Train on TeamSTEPPS
  - Speak Up – Ask for help

TeamSTEPPS®
Team Strategies & Tools to Enhance Performance & Patient Safety

Two-Challenge Rule
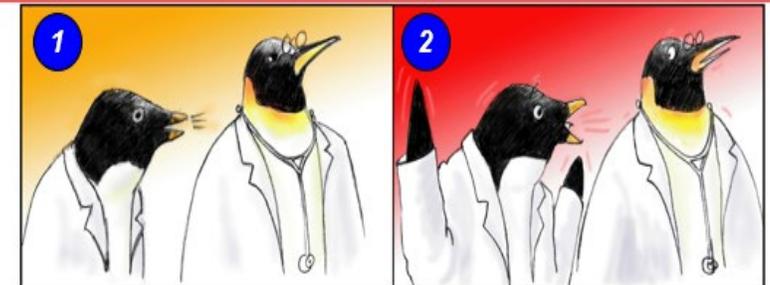
Invoked when an initial assertion is ignored…

Awareness

- Definition:
  - Situational awareness is the perception of environmental elements with respect to time or space, the comprehension of their meaning, and the projection of their status after some variable has changed, such as time, or some other variable, such as a predetermined event:

- How to improve awareness
  - Read about "Situational Awareness"
  - Review "Wingman" topic
 - Ask for help and encourage others to ask for help
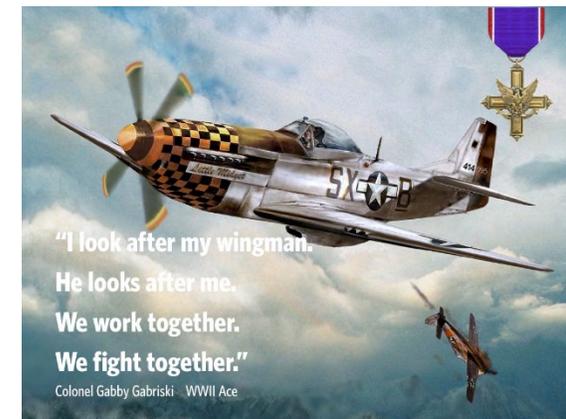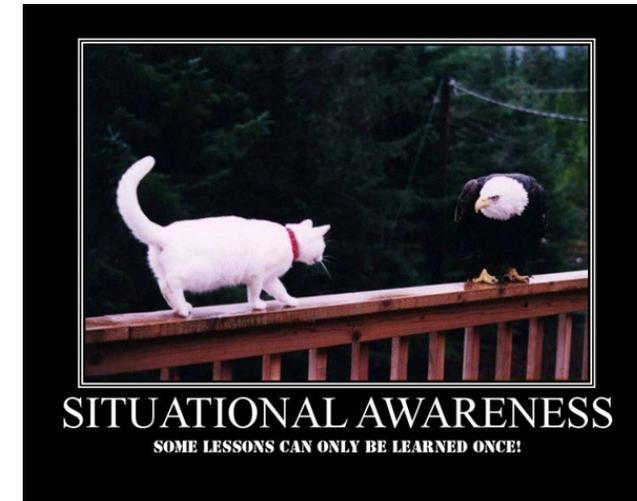
Teamwork

- Definition:
  - The ability of a group or team to work together as a single unit to achieve a common goal

- How to improve teamwork
  - Encourage questions and avoid "Group Think"
  - Encourage the development of teamwork principles within your department
    - Huddles
  - Stay focused on the common goal

Knowledge

- Definition:
  - Information and facts gained through education, time, and experience:
- How to utilize and enhance knowledge
  - Avoid "Confirmation Bias"
  - Avoid "Cognitive Biases"
  - Read policies, procedure, and protocols
  - **Ask questions**
  - Continue to educate yourself
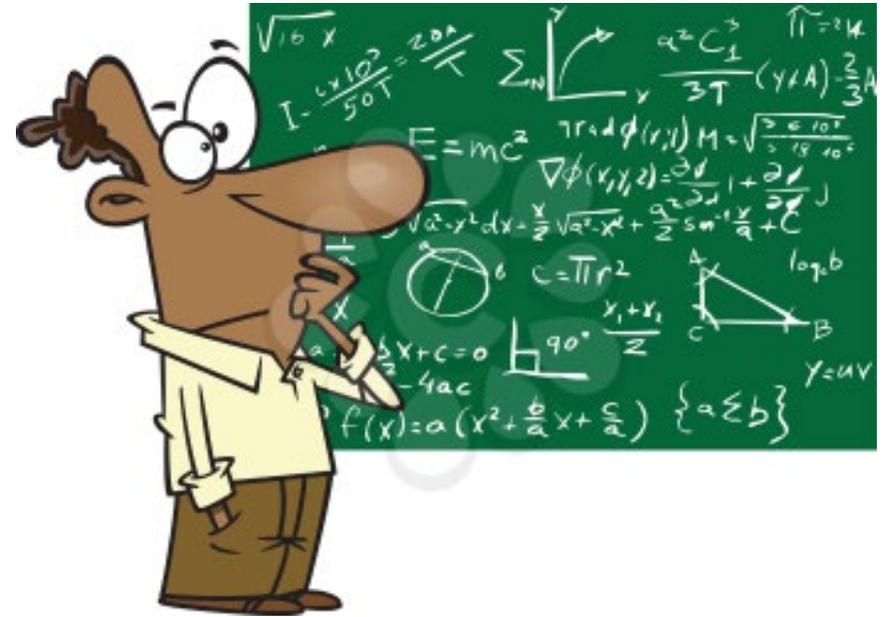
Knowledge

- Healthcare systems can be so complex and integrated that it is nearly impossible to perform many tasks without
  - Substantial technical training
  - Current relevant experience
  - Adequate reference documents
- Furthermore, systems and procedures can change substantially and employees' knowledge can quickly become out-of-date

- Part of this learning process should include the latest knowledge on human error and performance
  - *It should not be taken as a sign of weakness to ask someone for help or for information; in fact this should be encouraged*
  - *Checklists and publications should always be referred to and followed, and never make assumptions or work from memory*

Workflow

- Team must know the goal – what direction are we headed

- Checkpoints to make sure keeping on mission / plan

- Flow must be unimpeded

- Good use of time

Digging Deeper

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Areas of Discussion

Group Think	Norms	Complacency
Distractions	Situational Awareness	Confirmation Biases
Rushing	Wingman	Understanding Human Factor Errors

Group Think

- What does this mean?
  - Groupthink occurs when a group values harmony and coherence over accurate analysis and critical evaluation. It causes individual members of the group to unquestioningly follow the word of the leader and it strongly discourages any disagreement with the consensus.
  - *Implicit Bias might play a role here*

- Groupthink was coined as a term in 1952

From "Groupthink" by William H. Whyte, Jr. in *Fortune* magazine, March 1952

- Irving Janis pioneered the initial research on the groupthink theory

Symptoms of Groupthink

To make groupthink testable, Irving Janis devised eight symptoms indicative of groupthink.

- Type I: Overestimations of the group — its power and morality
  - *Illusions of invulnerability* creating excessive optimism and encouraging risk taking.
  - *Unquestioned belief* in the morality of the group, causing members to ignore the consequences of their actions.

- Type II: Closed-mindedness
  - *Rationalizing warnings* that might challenge the group's assumptions.
  - *Stereotyping* those who are opposed to the group as weak, evil, biased, spiteful, impotent, or stupid.

- Type III: Pressures toward uniformity
  - *Self-censorship* of ideas that deviate from the apparent group consensus.
  - *Illusions of unanimity* among group members, silence is viewed as agreement.
  - *Direct pressure* to conform placed on any member who questions the group, couched in terms of "disloyalty"
  - *Mindguards*— self-appointed members who shield the group from dissenting information
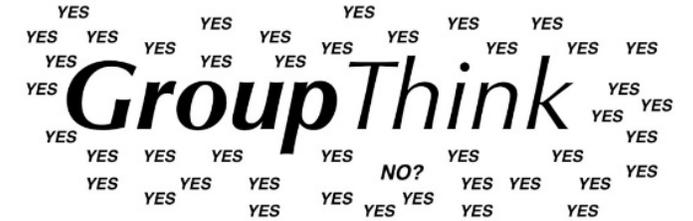
# How to Prevent Groupthink

- Sometimes, the best thing a leader or member can do to prevent Groupthink is to take a step back from his or her team, and allow the group to reach its own independent consensus before making a final decision.

- Leaders can also be helpful by encouraging the members of the group to speak their minds openly so that different perspectives are discussed and debated.
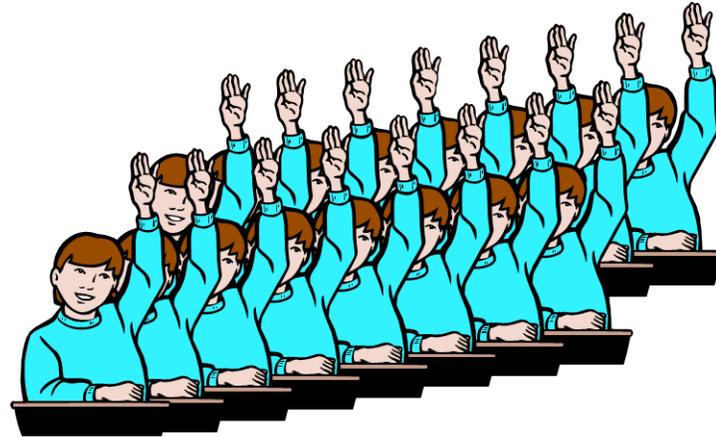
Distraction is….

- Distraction is the process of diverting the attention of an individual or group from the desired area of focus and thereby blocking or diminishing the reception of desired information.

- Distractions come from both external sources, and internal sources.
  - Some distractions in the workplace are unavoidable, such as
    - loud noises,
    - requests for assistance or advice,
    - and day-to-day safety problems that require immediate solving.
  - Other distractions can be avoided, or delayed until more appropriate times, such as
    - messages from home,
    - management decisions concerning non-immediate work (e.g. shift patterns, leave entitlement, meeting dates, administrative tasks etc),
    - and social conversations.
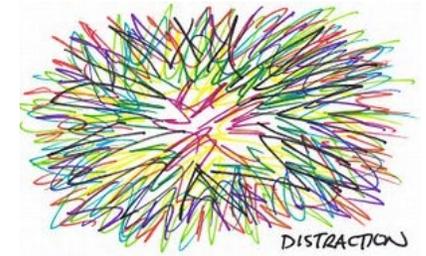
DISTRACTION

Strategies to Reduce Risk of Distraction

Since distraction is the number one cause of forgetting things, it is important to avoid becoming distracted and to avoid distracting others.

Tools to use:

- Checklists

- Environmental Cues
  - i.e. white boards

- Prepare medications in closed room/ control zone rather than hallway

- Simulation/ task practice

- Communication strategies

Rushing is Human Nature

- It's human nature to want to get a job done as quickly as possible

- Getting a task done in a hurry gives you:
  - The ability to start your next ask sooner
  - In some cases, more time to do other things that may be more enjoyable

- Many of us grew up being told that it's important to accomplish as much as we can
  - But what we are often aren't told is that rushing can result in accidents, errors, and more time spent in the long run.

We need to do our jobs correctly and safely.

How to Manage Your Behavior

- Always put safety first
- Don't take shortcuts
- Use the correct tools
- Identify hazardous situations in advance
- Take responsibility for your actions
  - Do the best job you can, not the fastest job that you can

Norms

- Workplace practices develop over time, through experience, and often under the influence of a specific workplace culture. These practices can be both, good and bad, safe and unsafe; they are referred to as "the way we do things round here" and become norms.

- *Implicit Bias might play a role here*

- **How to address norms**
  - Follow policies, procedures and protocols
  - Avoid "Drifts in Practice"
  - Avoid "Complacency"
  - Avoid "Confirmation Bias"

Drifts in Practice

- Systematic Migration of Boundaries: Deviation is Normal

Vaughan, *The Challenger Launch Decision*, 1997
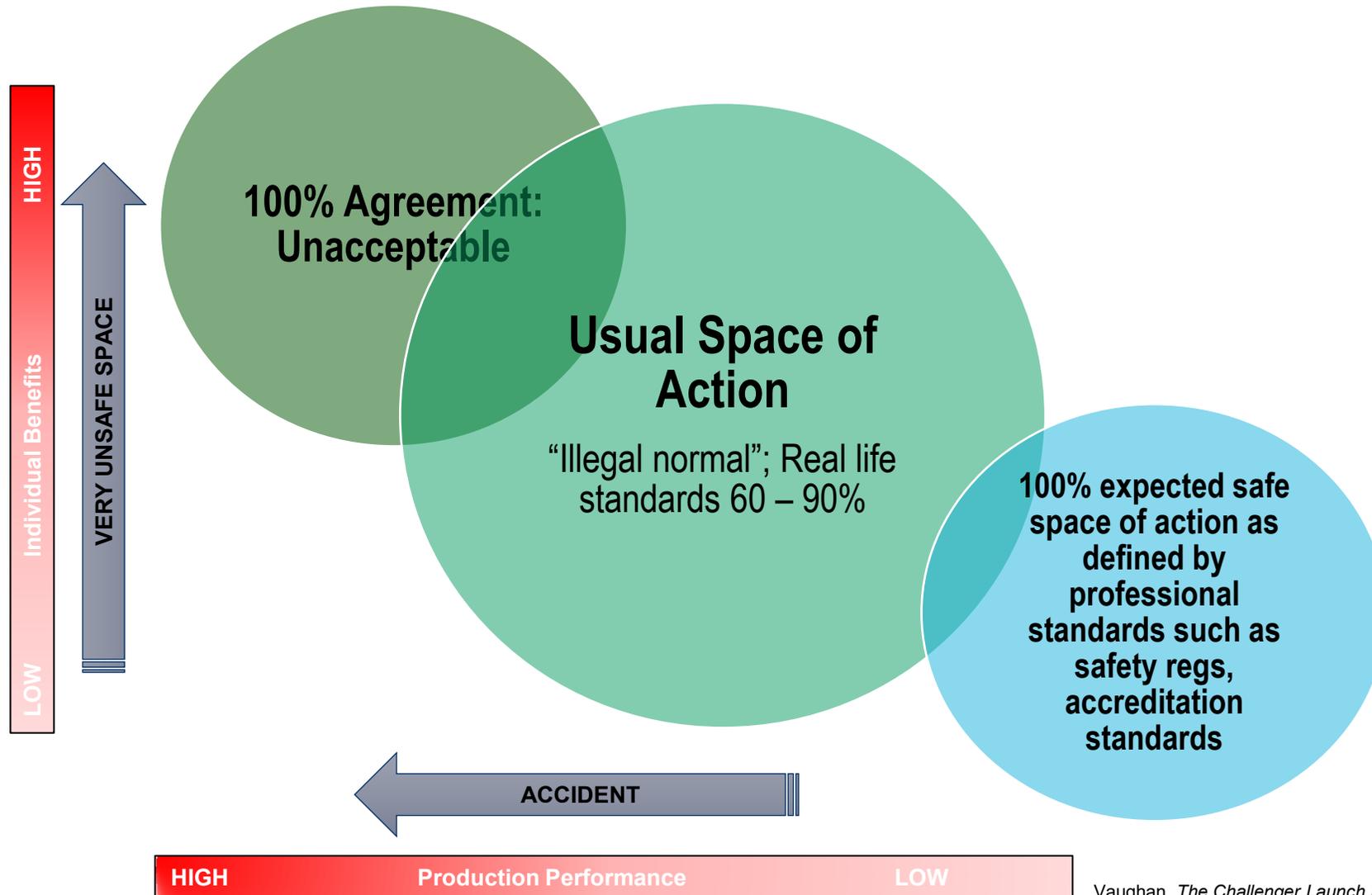
Strength of Behavioral Incentives

- "I will consider deviating if

  - Consequences are weaker than the rules or other preconditions

  - The consequences are uncertain

  - The consequences are delayed or not apparent"

- Need to monitor for and discourage practices of deviating from expectations
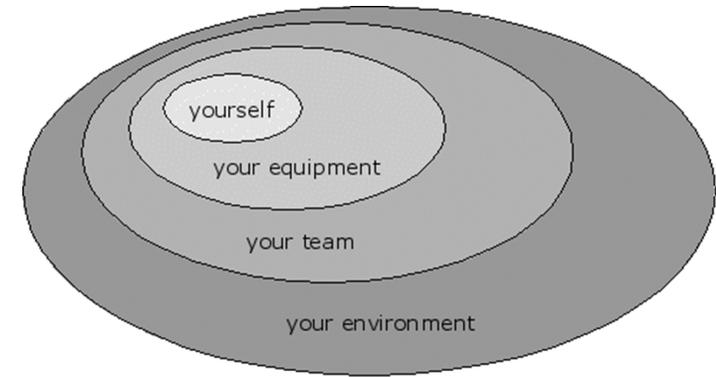
SITUATIONAL AWARENESS

SOME LESSONS CAN ONLY BE LEARNED ONCE!

Situation awareness actions

To be successful, all team members must

- Recognize and make others aware when the team deviates from standard procedures
- Monitor the performance of other team members
- Provide information in advance
- Identify potential or existing problems (i.e. equipment-related or operational)
- Demonstrate awareness of task performance

- Communicate a course of action to follow as needed
- Demonstrate ongoing awareness of "mission" status
- Continually assess and reassess the situation in relation to the "mission" goal(s)
- Clarify expectations of all team members to eliminate doubt

Wingman Theory Concept

- What does this mean?
  - in aerial combat, the wingman protects your "six"
  - in a larger sense, the wingman is a colleague who looks out for you, especially in tough situations

"I look after my wingman.
He looks after me.
We work together.
We fight together."
Colonel Gabby Gabriski   WWII Ace

You are not alone – you have a Wingman;

you are a Wingman

Value of a Wingman

- One reason wingmen are so valuable is that they see the world from a slightly different perspective.

- The lead pilot (other individual) looks around and from his perspective, he thinks he's safe.

- But the wingman, from a different perspective, is able to spot the danger and therefore can help his friend.

A wingman sees from a different vantage point.

Role of a Wingman

- Sometimes people are reluctant to seek help on their own, out of fear of embarrassment, or a mistaken belief that they have the strength to go it alone.
  - Being a wingman really means being a good listener, being a voice of reason, being a cheerleader and partner with the other person.
  - But in those rare situations when your challenges seem really serious, the wingman's role is to help.

Complacency is….

- A state of self-satisfaction with one's own performance coupled with an unawareness of danger, trouble, or controversy.
  - Such a feeling often arises when conducting routine activities that have become habitual and which may be "considered", by an individual (sometimes by the whole organization), as easy and safe.

- A general relaxation of vigilance results and important signals will be missed, with the individual only seeing what he, or she, expects to see.

- Complacency can also occur following a highly intense activity such as recovering from a possible disaster;
  - The relief felt at the time can result in physical relaxation and reduced mental vigilance and awareness.

5 Stages of Complacency

- Good Operating
  - New to task
  - See task with fresh eyes and with awareness of processes

- Self-satisfaction
  - One has confidence in their ability

- Blindness
  - Tasks becomes second nature

- Denial
  - Refusing to acknowledge a new way of doing something

- Collapse
  - An accident or event causes the standards to be evaluated

5 Strategies to Reduce Risk of Complacency

1. Start every day from scratch.
   - Sustainable excellence is about getting better every day.

2. Surround yourself with people who will tell you like it is.
   - Successful people attract followers who want to be associated with success but aren't willing to pay the price to achieve it themselves.

3. Focus on process instead of outcome.
   - Successful people, organizations and relationships develop a process for achieving and sustaining excellence.

4. Continuously learn and adapt.
   - Many successful people and organizations rely on the same methods that brought them to the top to keep them there.

5. Recharge the batteries.
   - Successful people are extremely driven. They do not work a 9-to-5 day and often go for long periods of time without what most people would call "work-life balance."
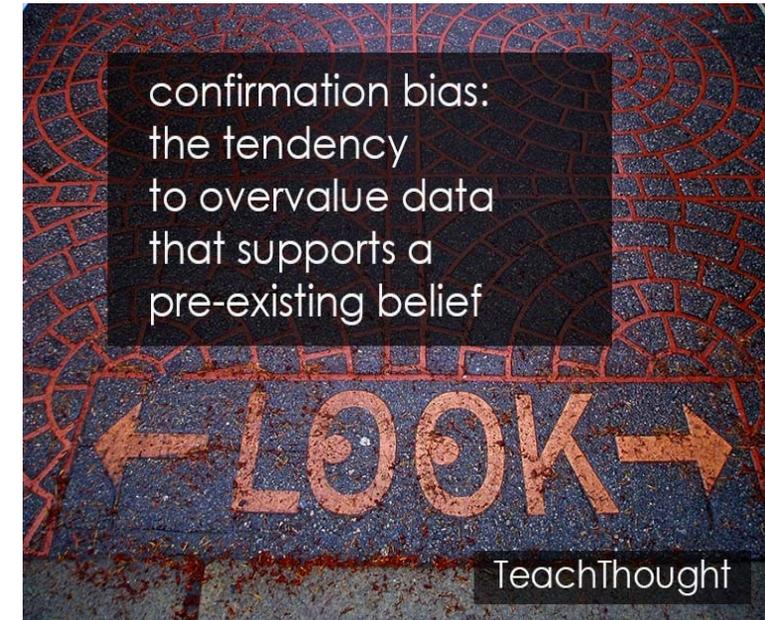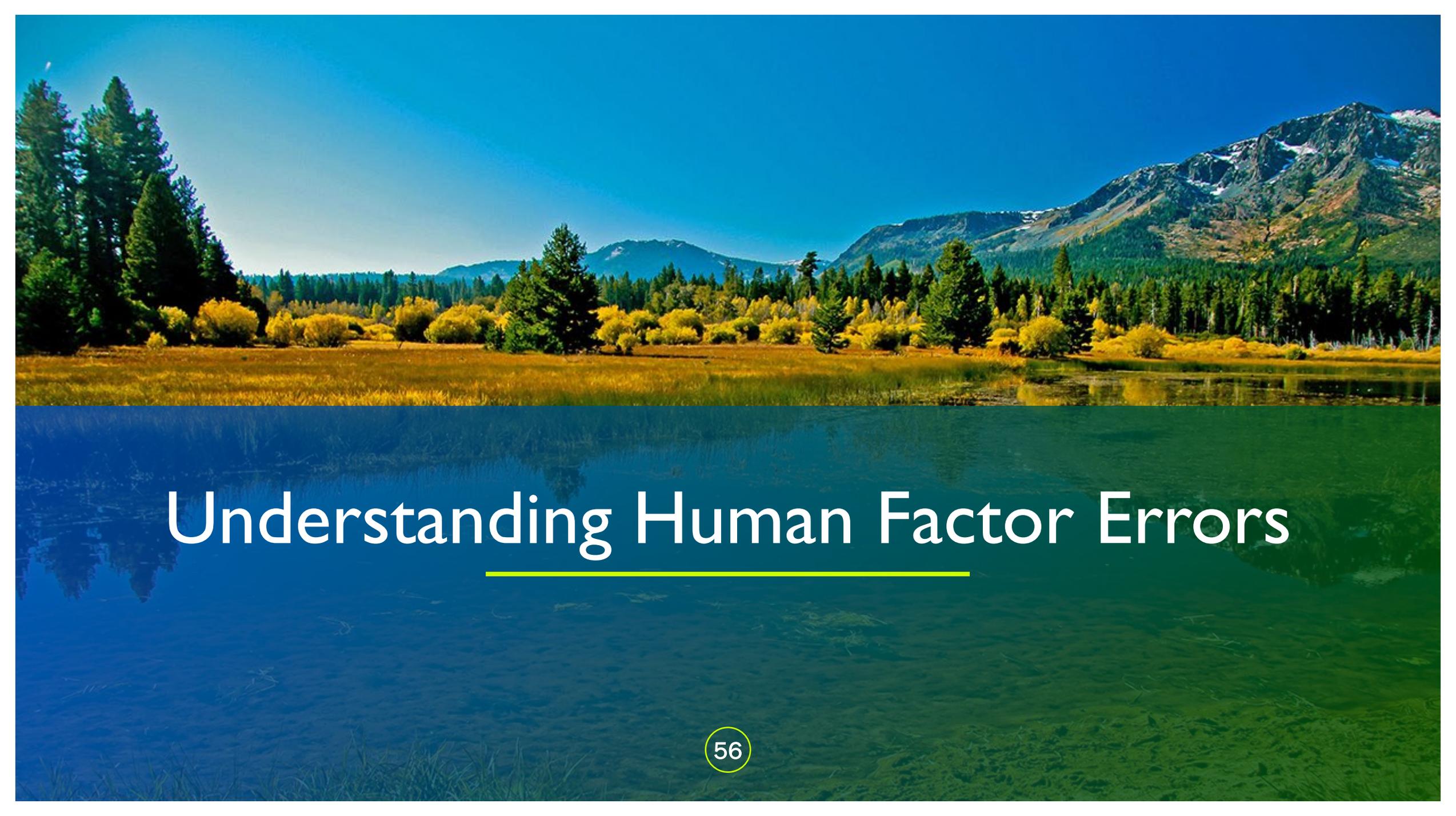
Complacency

- Following written instructions, and adhering to procedures that increase vigilance, such as inspection routines, can provide suitable stimulus.

- It is important to avoid:
  - working from memory;
  - assuming that something is ok when you haven't checked it;
  - signing off work that you are unsure has been completed.

- Teamwork and mutual cross-checking will provide adequate stimulus when fatigued.
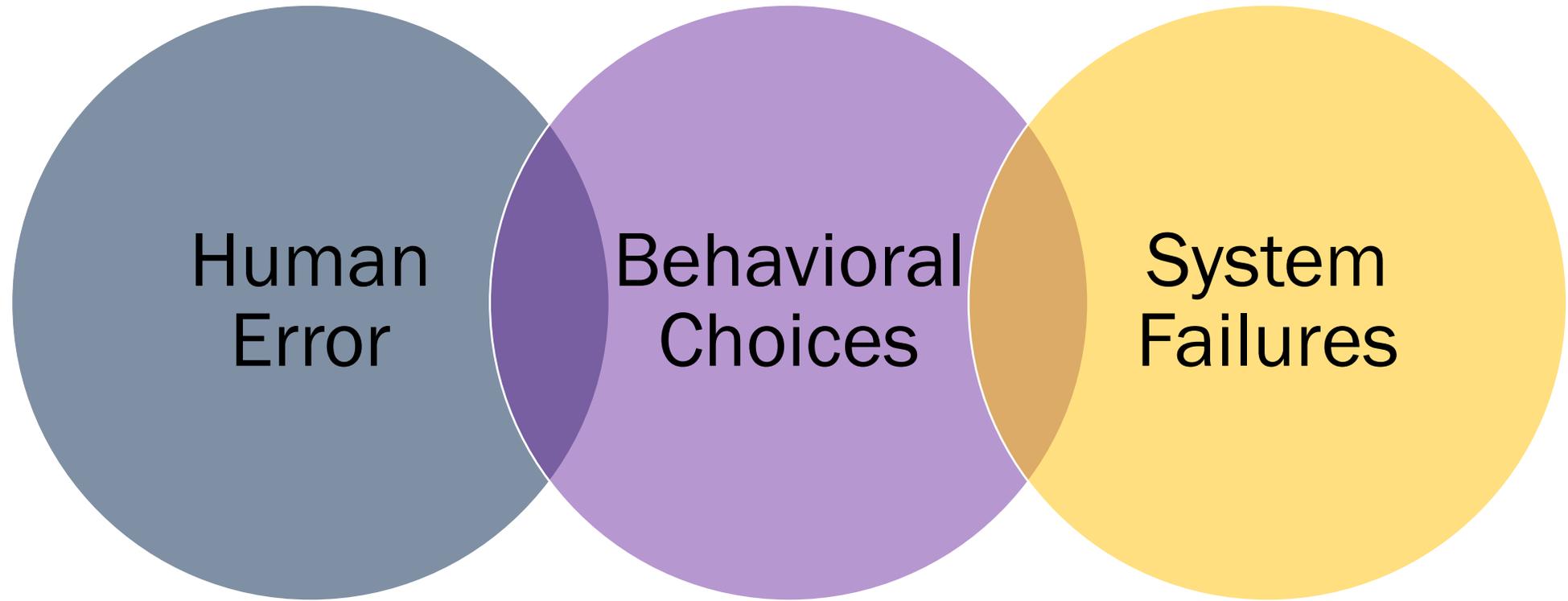
Confirmation Bias

- A tendency to search for or interpret information in a way that confirms one's preconceptions, leading to errors

- Tips for avoiding confirmation bias
  - Consider the sources of information you tend to rely on when you make decisions
  - Ask questions
    - Ask More Questions
  - Are the answers you received fact-based or based hunches and guesses
  - Refer back to policies/ guidelines

confirmation bias: the tendency to overvalue data that supports a pre-existing belief

← LOOK →

TeachThought

STUFF YOU AGREE WITH

Understanding Human Factor Errors

Determining Causative Factors

Human Factors

- Levels of Behavior and Error

KNOWLEDGE - BASED	CONSCIOUS
Improvisation in unfamiliar environments No routines or rules available to help handle	Trial and error
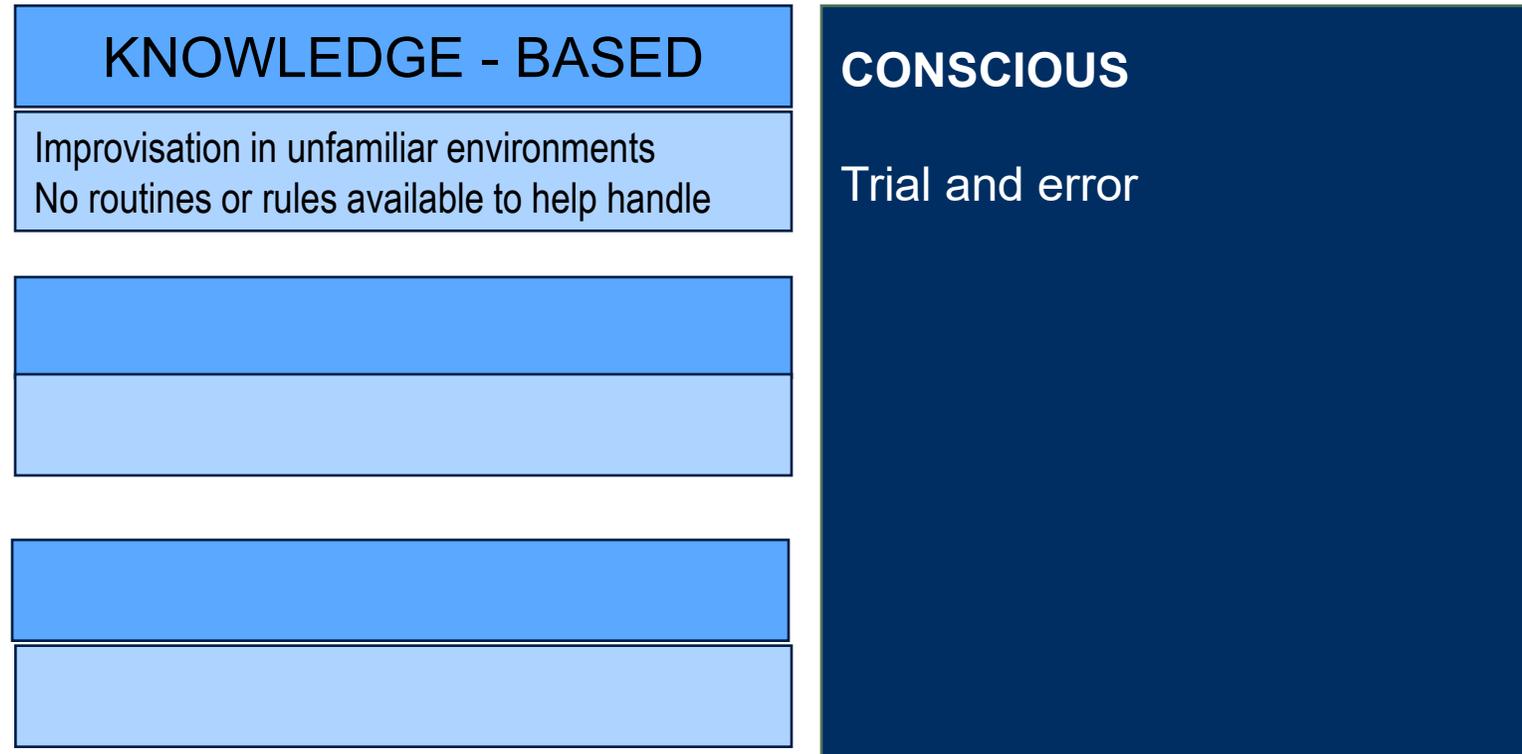
Human Factors

- Levels of Behavior and Error

KNOWLEDGE - BASED
Improvisation in unfamiliar environments No routines or rules available to help handle

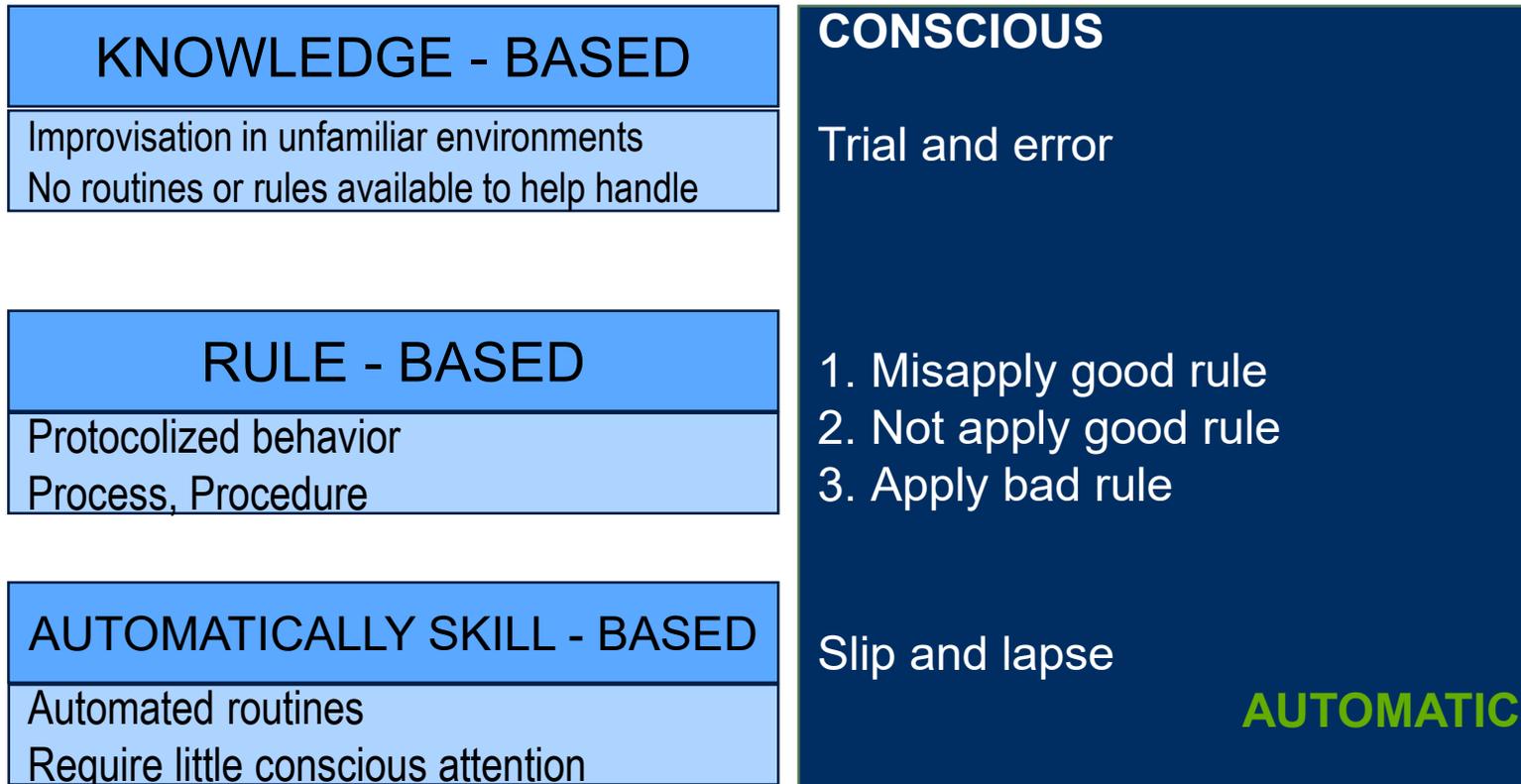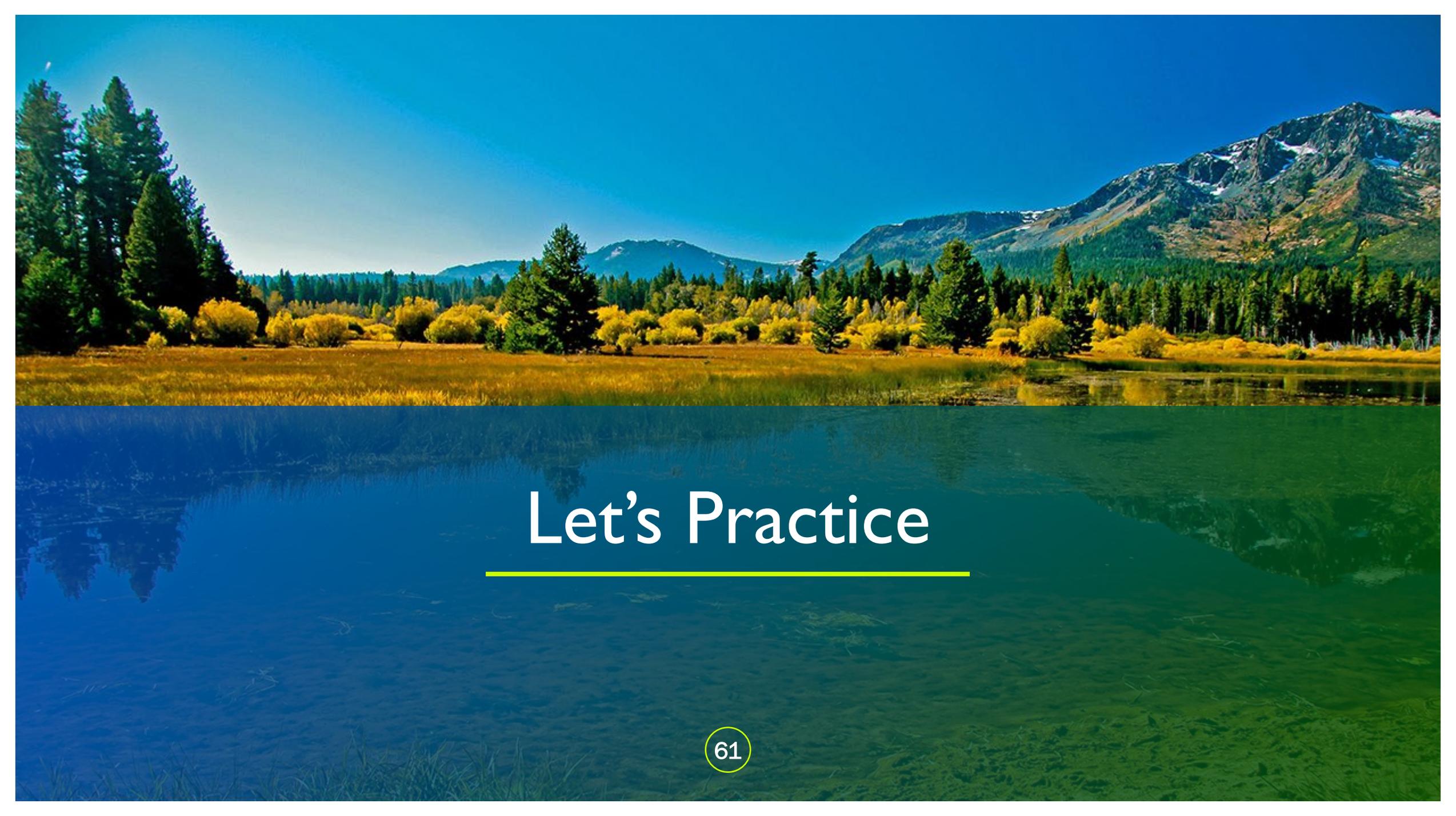| RULE - BASED |
|---|
| Protocolized behavior
Process, Procedure |

CONSCIOUS

Trial and error

1. Misapply good rule
2. Not apply good rule
3. Apply bad rule

Human Factors

- Levels of Behavior and Error

KNOWLEDGE - BASED	CONSCIOUS
Improvisation in unfamiliar environments No routines or rules available to help handle	Trial and error
RULE - BASED	
Protocolized behavior Process, Procedure	1. Misapply good rule 2. Not apply good rule 3. Apply bad rule
AUTOMATICALLY SKILL - BASED	Slip and lapse
Automated routines Require little conscious attention	AUTOMATIC

Let's Practice

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Case Study #1

Case Study

- A nurse is coming on duty after working a double shift the previous day. She is floated to a different unit than she is normally assigned and is nervous/ anxious. A physician has ordered medication with which the nurse is not familiar. The staff member from previous shift says that the physician always orders the meds that way and everything is "okay." She proceeds on.

- The nurse administers the medication to the incorrect patient and the patient has an adverse reaction to the medication.

What Human Factors Were in Effect Here?

What Level of Human Error was this?

Case Study #2

Case Study

- A surgical procedure is underway with the patient open. Inadvertently, the desired piece of mesh for the procedure falls on the floor of the surgical suite. The staff inform the surgeon that that is the last piece of that specific type of mesh in stock.

- The physician and lead staff begin discussion options and they all agree that it will be acceptable to soak the mesh in betadine for 5 minutes prior to inserting.

- Staff proceed with soaking the mesh

What Human Factors Were in Effect Here?

What Level of Human Error was this?

Case Study #3

Case Study

- A staff member works in a procedural area and has participated in this procedure over 100 times. Today, a new proceduralist comes into the room to perform the procedure

- The proceduralist is on a tight time schedule and insists that the procedure begins without completing a time-out and tells the staff that they will just have to get caught up on what he needs

- The proceduralist asks the staff for devices for which they have never used before and the procedure begins

What Human Factors Were in Effect Here?

What Level of Human Error was this?

What I hope you take away from here

- Takeaway #1
  - Apply Human Factors Analysis in event analysis

- Takeaway #2
  - Identify specific actions to take to impact Human Factors in the current work place setting

- Takeaway #3
  - Evaluate areas where implicit bias can influence Human Factors application

THANK YOU!

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