Clinical Human Factors: Judgment and Decision Making

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Human Factors At the Bedside

- Errors and Violations
- Judgment and decision making

Disclosures

- No financial disclosures
- I will not discuss off label or investigational use in my presentation

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Features of Anesthesiology

- Complex
- Event-driven, dynamic
- Tightly-coupled
  - Interacting systems
- Uncertain, risky
  - Imperfect data, critical decisions

Causes of Errors

- Unfamiliarity with task
- Poor human-system interface
- Misperception of risk
- Time pressure
- Fatigue
- And more…

Latent Errors

- Equipment design and maintenance
- Staffing
- Communication
- Training
- Teamwork, team training
- Procedures
- Situational awareness
- Incompatible goals
- Planning and organization
- Housekeeping

van Beuzekom M: *Br J Anaesth*. 2010 Jul;105(1):52-9.

Deviations

- Errors
  - Unintended
  - Incorrect decision or action
- Violations
  - Deliberate
  - Goal-directed: short cuts

Cognitive Errors

- Errors in thought process
  - Not due to a lack of knowledge
  - "I should have known better!"
- Recent study: Catalogue of error types
- Thinking tools may help to reduce risk

Stiegler M: *Br J Anaesth*. 2011 Dec 8.

Fixation Errors

- "This and Only This"
  - Failure to revise a diagnosis despite contradictory evidence
- "Everything But This"
  - Failure to commit to treatment of a problem
- "Everything's OK"
  - Failure to believe that a problem exists

Violation

A deliberate deviation from safe practice

Causes of Violations

- Organizational expectations
  - Production valued over safety
- Better way that violates existing rules
- Personal skills justify violation
- Poor planning requires improvised plan
- Lack of institutional safety culture

Violation Taxonomy

- Routine violation
  - “The rules don’t matter.”
- Optimizing violation
  - “It’s better if I do it this way.”
- Situational violation
  - “I can’t do my job if I follow the rules.”
- Reckless violation
  - “I don’t care what happens.”

Hazardous Attitudes

- Risk-taking "macho"
  - "I can do it!"
- Invulnerability
  - "Nothing ever happens to me."
- Anti-authority
  - "Don't tell me."
- Learned helplessness
  - "What's the use?"
- Impulsivity
  - "Do it quickly!"

FAA *Airplane Flying Handbook* (FAA-H-8083-3A)

Anesthesia Decision Making

- 3P Model
  - *Perceive, Process, Perform*
- Rule of Three
  - Consider 3 explanations for any problem even if reason seems obvious
  - Consider alternative diagnoses before treating a problem for 3rd time

Stiegler M, Ruskin K: *Curr Opin Anaesthesiol.* 2012 Dec;25(6):724-9.

Situation Awareness

- Mental model: Current state of environment
- 3 Levels
  - Perception
  - Comprehension
  - Projection
- “What’s happening now? What will happen next?”
- “How can I prepare for what happens next?”

Endsley MR *Proceedings of the Human Factors Society 32nd annual meeting*. Santa Monica, CA: Human Factors Society, 1988:97–101.

Risk Management

- Identify the hazard
  - What can go wrong? How can it harm the patient?
- Assess the risk
  - How likely is it to happen?
  - How badly will the patient be harmed?
- Manage the risk
  - Minimize the probability or severity
  - Choose best course of action

Risk Assessment: PAVE

- Pilot
  - Skills, knowledge, training
- Aircraft
  - Suitability for mission
- enVironment
  - Airports, weather, terrain
- External pressures:
  - Passengers, deadlines

Risk Assessment: PAVE

- Patient:
  - Medical problems, surgical plan
- Anesthesiologist:
  - Knowledge, technical skills
- enVironment:
  - Where will the case be done? What equipment is available?
- External pressures:
  - Surgeons, patient, family, institution

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Patient Safety: Next Steps

- Prevent errors
  - Decision-making checklists
  - Risk management tools
- Understand why critical events occur
  - Confidential "near miss" reporting
  - Clinical outcomes registry
- Human factors, simulation research

Thank you