Partnering for Improvement:  
*Case Studies Using* Human Factors Analysis Classification System (HFACS)

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Methods

Nemours asked ECRI Institute PSO to review five cases and provided incident files, depositions, expert opinions, root cause analyses and peer review documents. Nemours specifically requested review from a human factors and systems engineering perspective.
Nemours-ECRI-NTSB Collaboration

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Chief Safety Officer
New York Metropolitan Transit Authority

October 15, 2015
Human Factors Analysis and Classification System (HFACS)

- Developed for Dept. of Defense
  - Alternative to RCA
    - Addresses problems with RCA
      - Standardization
      - Focus on reasons for error rather than human blame
      - Increases specificity in identified causes
      - Standardized Nomenclature for analysis of recurring errors

- Applied to Healthcare
  - Retrospective and Prospective
  - Retrospective
  - Prospective

1. Shappell and Wiegmann, USDOT FAA 2000
3. Cornelius et al. Surgical Never Events and Contributing Human Factors 2015
Used DOD HFACS

Four Main Levels

- Organizational Influences
- Supervision
- Preconditions
- Acts

Figure 1. Human factors analysis classification system (HFACS) framework.
Nanocodes

- Further subdivide the categories and subcategories
- To be as specific as possible
- To provide information that will be actionable
Methods

Documents reviewed.

- Medical records
- Depositions
- Expert opinions for both plaintiff and defense
- RCA and peer review records
- Risk management case files

Findings from the document reviews were summarized on a case review form designed for this project.
Methods

- HFACS DOD nanocodes were assigned to each case using the DOD in depth descriptions and recorded on a spreadsheet designed to list the HFACS codes per case.
- The number of times a nanocode was used for each case was tallied on a separate spreadsheet to identify trends and common causes.
Methods

- Patient Safety Clinical Expert and Human Factors Expert reviewed all case summaries and, through consensus, assigned codes.
- The number of times a nanocode was used for each case was tallied.
Methods

- To quantify trends and common causes, the data was sorted to identify those codes used frequently.
  - One code appeared in 4 of the 5 cases and 5 codes appeared in 3 of the 5 cases.
  - Frequently occurring codes were used to describe trends.
NEMOURS CASES
<table>
<thead>
<tr>
<th>Category</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<tbody>
<tr>
<td>Skill error</td>
<td>X</td>
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<tr>
<td>Decision error</td>
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<tr>
<td>Violation – Bending the Rules</td>
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<tr>
<td>Violation – Breaking the Rules</td>
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<tr>
<td>Technological environment</td>
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<tr>
<td>Cognitive Factors</td>
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<td>Perceptual Factors</td>
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<tr>
<td>Physical-mental limitations</td>
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<tr>
<td>Psycho-behavioral limitations</td>
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<tr>
<td>Adverse physiological state</td>
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<td>Coordination, Communication</td>
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<tr>
<td>Inadequate supervision</td>
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<tr>
<td>Inappropriate Planned Operations</td>
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<td>Failure to address a known problem</td>
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<td>Supervisory Violation</td>
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<tr>
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<td>Organizational Process</td>
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<td>Organizational Climate</td>
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</table>
Summary

- Leadership and supervision of processes such as resident oversight, team communication with students or residents and charge nurses assigned patients as well as charge responsibilities.

- Procedures for use of students, residents and assignments of enough clinicians for special situations/high risk situations. Routine procedures were followed instead of enhanced procedures for the high risk situation.
Summary

- Lack of policies and procedures, and guidelines.
  - Although not everything should be written and turned into policy, procedure or checklist, this is important because subject matter experts get to make a thoughtful decision outside critical, emergent or urgent situation about what conditions should always exist.
  - This allows for human judgment to be left out of these split second decisions as the situation has already been anticipated and planned for.

- The process through which staffing or personnel assignment is allocated is inadequate to allow for special or rare situations.
Summary

- Team leadership techniques failed to facilitate a proper climate,
  - establishing and maintaining an accurate and shared understanding of the evolving care/treatment plan on the part of all team members.
  - Delineation of leadership within team environments is required and briefing of all team members of the plan of care.

- Lack of policy or guidance is leading to unsafe situations.
  - Leadership must assure that both clinical departments and operational departments have policies and procedures that are complete, up to date, have a process to assure they are reviewed regularly and approved by all stakeholders.
Trend identified:

Despite limitations, trends were seen in six areas:

1. Resident oversight and team communication
2. Preparation for special/high risk situations
3. Preparation for split second decisions/situations
4. Assignments to allow for special or rare situations
5. Delineation of leadership within team environments
6. Practical Clinical policy or guidance
Three areas for recommended action

- Team process and communication.
- Documentation of written policies, procedures and guidelines.
- Documentation of staffing and assignment processes.
Attention

1. Team process and communication
2. Documentation of written policies, procedures and guidelines and staffing and assignment processes.
“Initial” Countermeasures

- System-wide T&A Management Guidelines
- System-wide Difficult Airway
  - Identification and Certification
- Aggressive Child Emergency Program
- I-PASS tool for handoffs
- The Nemours Logistics Center
  - [http://youtu.be/QBHLNULt8IQ](http://youtu.be/QBHLNULt8IQ)
## Culture of Safety Survey Analysis

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<th>Key Area</th>
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<th>75th %ile</th>
<th>90th %ile</th>
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<td>Handoffs and Transitions</td>
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<td>Nonpunitive Response to Error</td>
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<td>Staffing</td>
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<td>Frequency of Events Reported</td>
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<td>Teamwork Across Units</td>
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<td>Communication Openness</td>
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<td>Feedback and Communication about Error</td>
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<tr>
<td>Overall Perceptions of Patient Safety</td>
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<td>Organizational Learning/Continuous Improvement</td>
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<td>Management Support for Patient Safety</td>
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<td>Supervisor/Manager Expectations and Actions Promoting Patient Safety</td>
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<td>Teamwork Within Units</td>
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</table>
Now

- Disclosure
- Team work
- Continuous Improvement ("LEAN")
Daily Huddle – Patient Safety Issues

VPQS number of safety issues surfaced at major huddles and reported at each VPQS 12:45 pm daily huddle
(shown is daily number and moving average trend in that number)

Number on that day
Trend the number of reports per day

Daily safety report to Senior Leadership

Proprietary
VPQS - Lawless
Thank you

Questions?