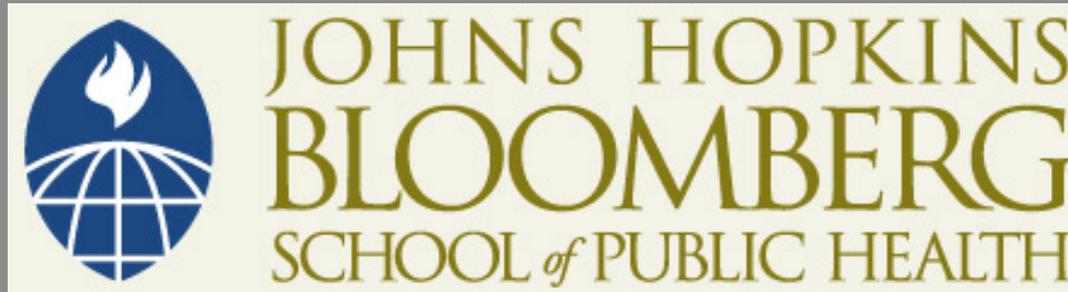


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## *Investigating a Defect*

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# *Adverse Event Investigation and Analysis*

- Objectives
  1. Describe the techniques for investigating adverse events
  2. Identify the system factors that lead to a medical error
  3. Identify the relationship between active failures and latent failures
- Methods
  - Lecture and case discussions
- Exercise
  - Frame a negative life factor as medical resident



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## *Section A*

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Process and Examples

# What is a defect?

Anything you do not want to have happen again

# *Sources of Defects*

- Adverse event reporting systems
- Sentinel events
- Claims data
- Infection rates
- Complications
- Where is the next patient going to be harmed?

# *Key Aspects of Learning from Defects*

1. Describe what happened
2. Identify why it happened
3. Define what you will do to reduce the chance it will recur
  - Person, issue, follow-up

# *Investigation Process*

- What happened?
  - Reconstruct the timeline and explain what happened
- For this investigation
  - Put yourself in the place of those involved—in the middle of the event as it was unfolding—to understand what they were thinking and the reasoning behind their actions/decisions
  - Try to view the world as they did when the event occurred

# *Why Did It Happen?*

- System (latent) failures
  - Arise from managerial and organizational decisions (or lack of decisions) that shape working conditions
  - Often result from production pressures
  - Damaging consequences may not be evident until a “triggering event” occurs

“Rather than being the main instigators of an accident, operators tend to be the inheritors of system defects. . . . Their part is that of adding the final garnish to a lethal brew that has been long in the cooking.”

— James Reason, *Human Error* (1990)

## Safety tips:

- Label devices that work together to complete a procedure
- Rule: stock together devices needed to complete a task

CASE IN POINT: An African American male  $\geq 65$  years of age was admitted to a cardiac surgical ICU in the early morning hours. The patient was status-post cardiac surgery and on dialysis at the time of the incident. Within 2 hours of admission to the ICU it was clear that the patient needed a transvenous pacing wire. The wire was threaded using an IJ Cordis sheath, which is a stocked item in the ICU and standard for PA catheters, but not the right size for a transvenous pacing wire. The sheath that matched the pacing wire was not stocked in this ICU since transvenous pacing wires are used infrequently. The wire was threaded and placed in the ventricle and staff soon realized that the sheath did not properly seal over the wire, thus introducing risk of an air embolus. Since the wire was pacing the patient at 100%, there was no possibility for removal at that time. To reduce the patient's risk of embolus, the bedside nurse and resident sealed the sheath using gauze and tape.

### SYSTEM FAILURES:

*Knowledge, skills, competence.* Care providers lacked the knowledge needed to match a transvenous pacing wire with appropriate sized sheath.

*Unit environment: availability of device.* The appropriate size sheath for a transvenous pacing wire was not a stocked device. Pacing wires and matching sheaths packaged separately... increases complexity.

*Medical equipment/device.* There was apparently no label or mechanism for warning the staff that the IJ Cordis sheath was too big for the transvenous pacing wire.

### OPPORTUNITIES for IMPROVEMENT:

Regular training and education, even if infrequently used, of all devices and equipment.

Infrequently used equipment/devices should still be stocked in the ICU. Devices that must work together to complete a procedure should be packaged together.

Label wires and sheaths noting the appropriate partner for this device.

### ACTIONS TAKEN TO PREVENT HARM IN THIS CASE

The bedside nurse taped together the correct size catheter and wire that were stored in the supply cabinet. In addition, she contacted central supply and requested that pacing wires and matching sheaths be packaged together.

## *Toolbox Case Example*

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## *Section B*

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Learning from Defects

# *Learning from Defects Mortality/Morbidity Conference*

- Select 1 or 2 meaningful cases
- Invite everyone who touches the process, including administrators
- Summarize event
- Identify hazardous systems
- Close the loop (issue, person, f/u)
- Share what you learn

# *How Often Should You Investigate Defects?*

- Toyota production system
- Realistic in health care?
  - Hazardous
  - Complicated systems
  - Luxury to stop process

# *Imagine*

- Imagine what would happen if you each learned from one a month