Root Cause Analysis-Fail!

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Disclosure

I have no potential conflicts of interest to disclose

System Design

Our systems are producing the results they were designed to produce.

In other words:

Benefits and *harm* are designed into our Healthcare systems

Sources of Design Failure

- Procedures, tools and materials are used in ways not anticipated
- Multiple people involved with potentially different assumptions and goals
- Environmental conditions, expectations, and demands change over time
- Safety features, defenses become degraded over time
- System elements interact in unexpected ways
- Operations in the “real world” are more complex than our design models

System Design in Healthcare

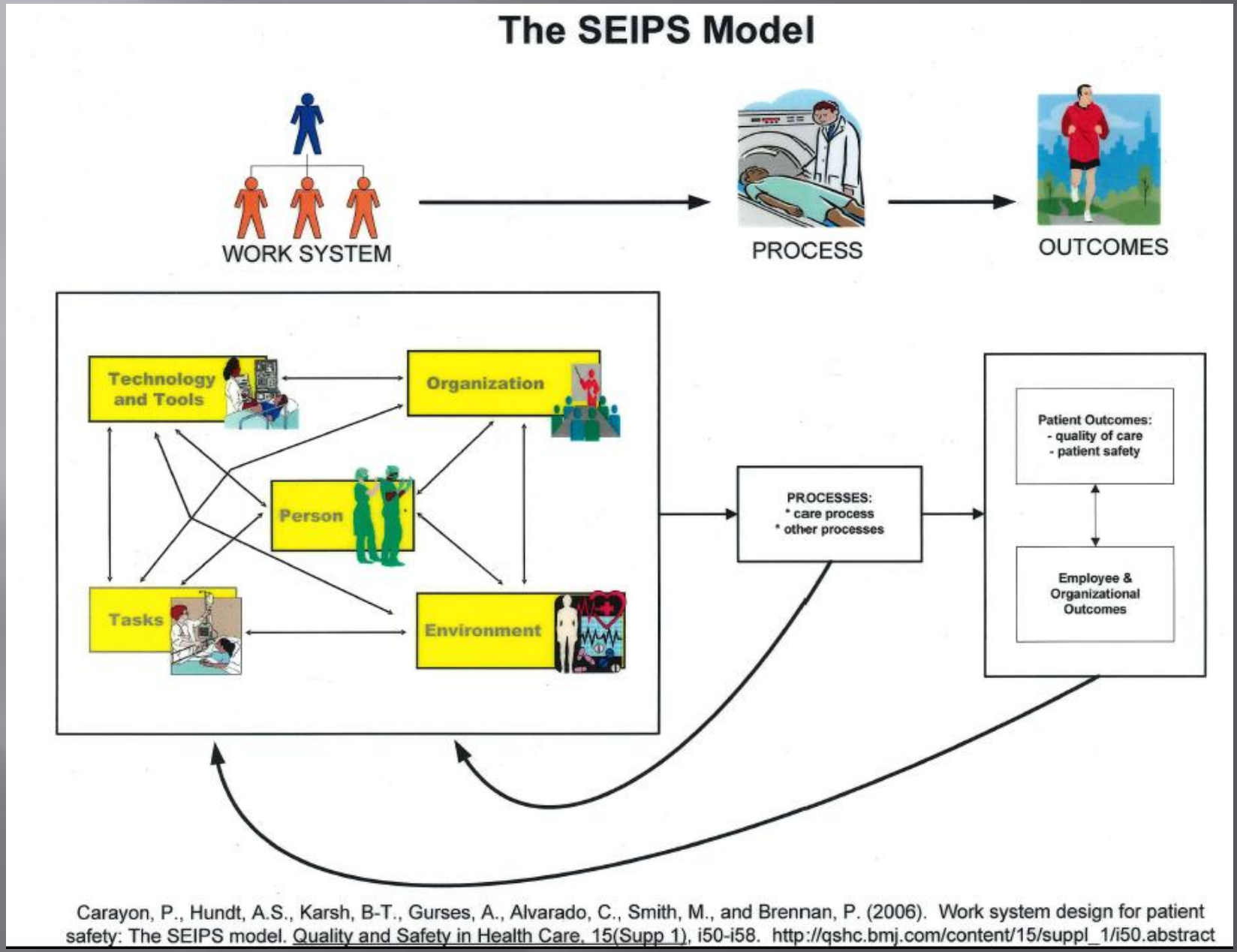
Design for System reliability…. Knowing systems will never be perfect

- Human factors designed to reduce the rate of error
- Barriers to prevent failure
- Recovery to capture failures before they become critical
- Redundancy to limit the effects of failure

Design for Human reliability…. Knowing humans will never be perfect

- Information
- Equipment/tools
- Design/configuration
- Job/task
- Perception of risk
- Individual factors
- Environment/facilities
- Organizational environment
- Supervision
- Communication

The Systems Engineering in Patient Safety Model



Carayon, P., Hundt, A.S., Karsh, B-T., Gurses, A., Alvarado, C., Smith, M., and Brennan, P. (2006). Work system design for patient safety: The SEIPS model. Quality and Safety in Health Care, 15(Supp 1), i50-i58. http://qshc.bmj.com/content/15/suppl_1/i50.abstract

Identifying design flaws in the system

In healthcare operations, design flaws generate:

- Errors, unsafe behaviors, procedure violations
- Near-misses
- Accidents
- Injury
- Sentinel events

We are often blind to design flaws

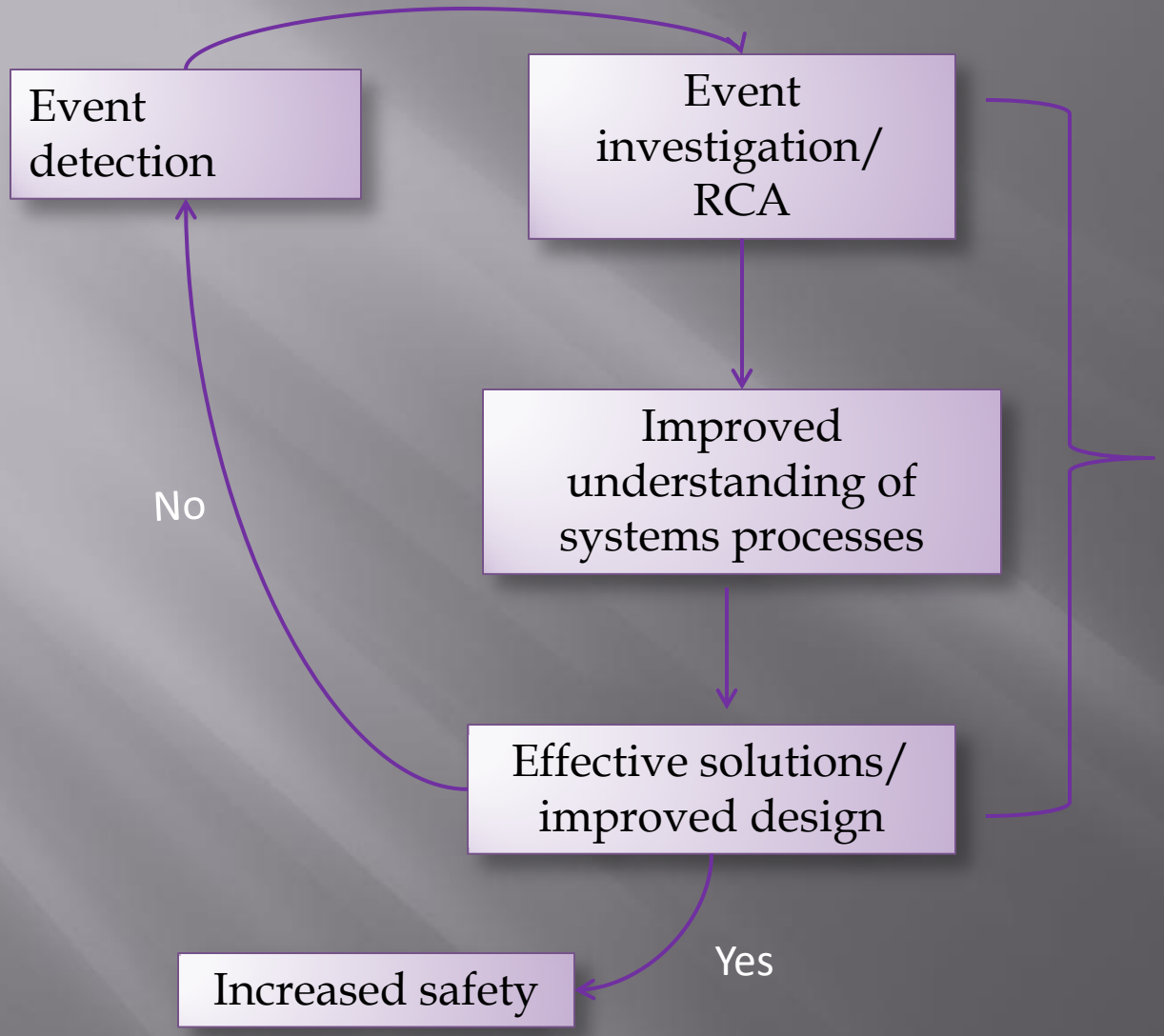
We suffer from the perception of success

- System designs work most of the time
- Healthcare professionals negotiate hazards by improvising the design for us
- We may not hear about failures or recognize them as associated with our decisions
- Because of this and other biases, failures and accidents may be believed to be the product of individual failures rather than design flaws

It is difficult to pay attention to all of the lessons available

- Rush to closure
- RCA focused on immediate causes/reluctance to look deeper
- There is always something else that seems more pressing

Event Investigation and RCA



Safety Culture

- Increase reporting, transparency, learning
- A "Just Culture" response to the quality of behavioral choices
- Organization demonstrated commitment and accountability to safety as a value
- Organizational learning culture

Event Investigation



EVENT IDENTIFICATION

You can't learn from events you don't investigate & you can't investigate events you don't know about

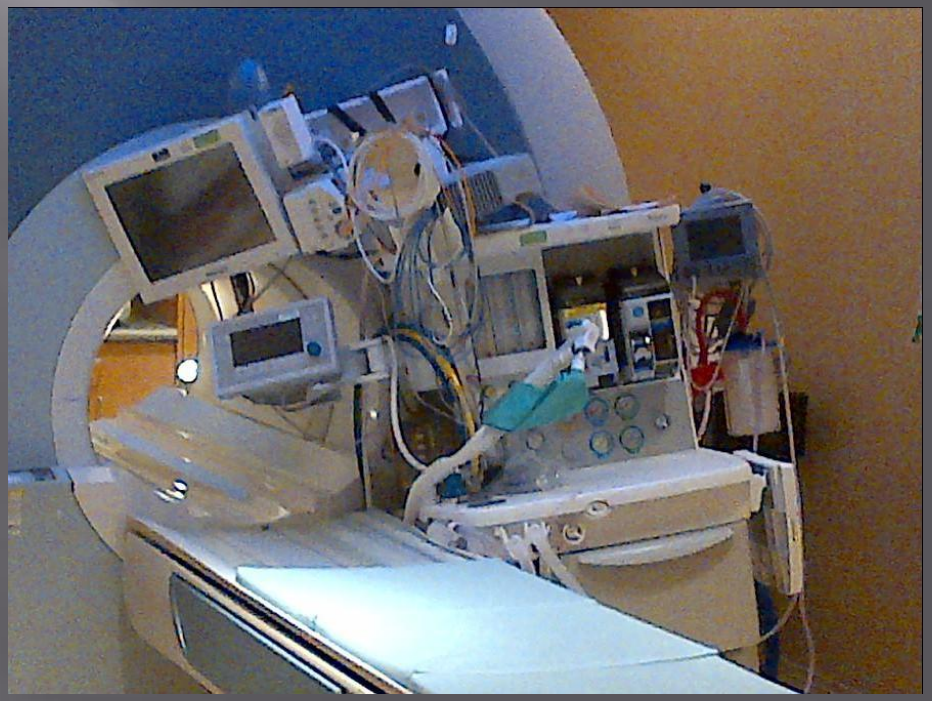
- Sentinel events
- Patient harm events
- No-harm events
- Near misses
- Unsafe acts
- Hazardous conditions

HOW ROBUST IS YOUR RISK IDENTIFICATION SYSTEM?

- Does your event reporting system & process place undue burdens on staff?
  - How easy is it to report an event?
  - Have expectations on what to report been clearly communicated?
- Are staff confident there will be a "just" response to events identified?
- How is feedback provided to reporters?

Why event investigation is tricky

- Our innate reaction to failure
- Propensity to stop too soon
- Overconfidence in our re-constructed reality
- The root cause *myth*



Reaction to failure

- Focus on the Active errors- “sharp end” of the stick
- Hindsight bias
- Severity bias
- Lay out what people could have done- ”counterfactual”
- Determine what people should have done- ”Judgmental”

Stopping too soon

- Lack of training in event investigation
  - Not asking the right questions
  - Not asking enough “why” questions
  - Superficial understanding of the causes of events
- Lack resources and commitment to conduct thorough investigations

Over confidence in our re-constructed reality

- People perceive events through their own "lens" –leaving each of us with a different perception of the same event
- Common sense is not common-it's an illusion
  - Unique senses
  - Unique knowledge
  - Unique conclusions



The Root Cause myth

- There are multiple causes to events
- RCA is not about finding the *one* root cause; it is about identifying systems-based solutions



BEHAVIORAL CHOICE IN SYSTEM DESIGN

- We are fallible human beings; we sometimes make mistakes (human error), engage in at-risk behavior and, are on rare occasion, reckless.
- Behavioral choices are not the cause of events, they are a symptom of deeper troubles in the system
- Identifying the quality of the behavioral choice (human error, at-risk, reckless) is not the conclusion of an investigation, it is the beginning
- Events are the result of multiple causes

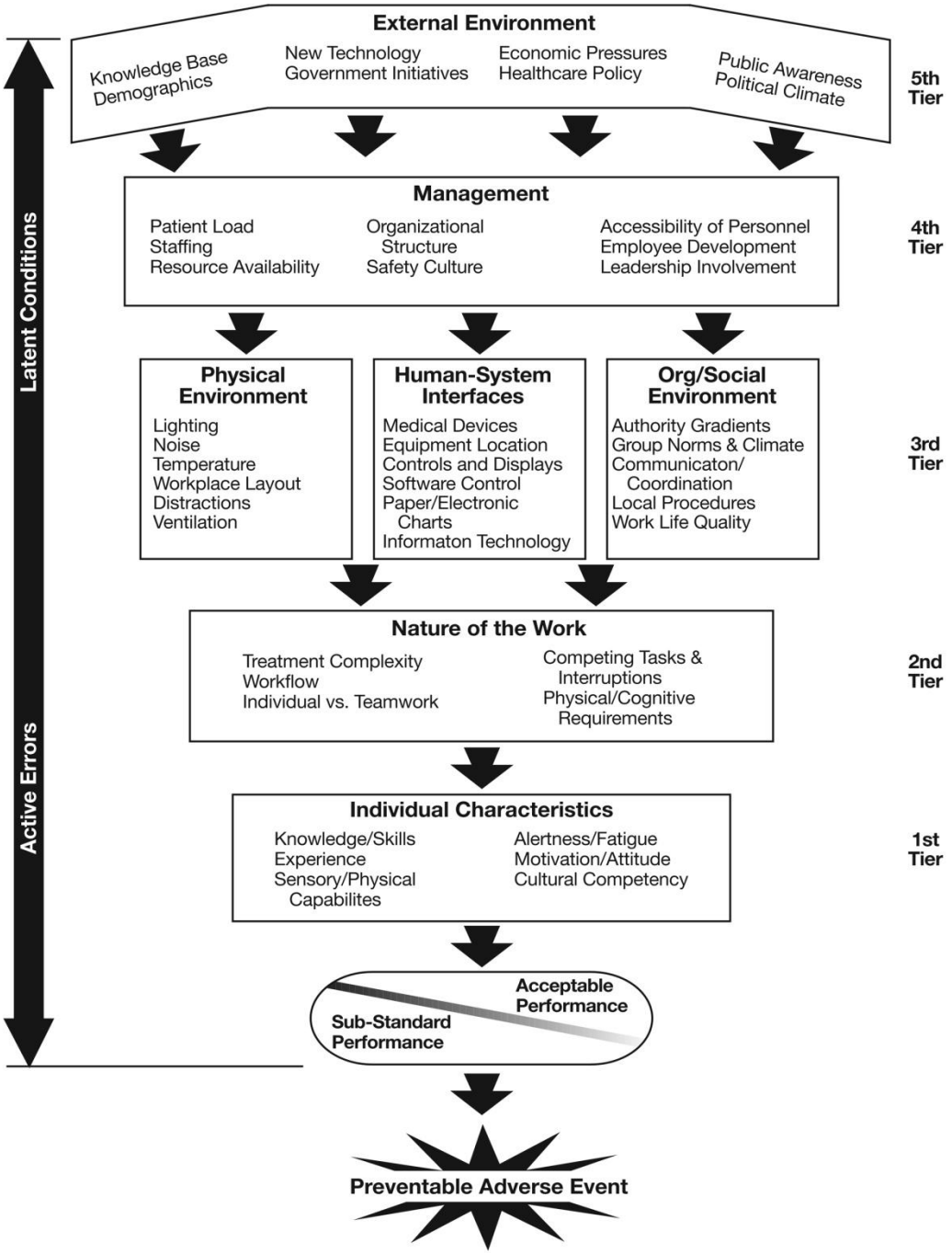
Holes in the Swiss Cheese

Active errors

- *Errors and violations (unsafe acts) committed at the "sharp end" of the system*
- *Have direct and immediate impact on safety, with potentially harmful effects*

Latent conditions

- *Present in all systems for long periods of time*
- *Increase the likelihood of active failures*



“Latent conditions are present in all systems. They are an inevitable part of organizational life.”

James Reason

“Managing the Risks of Organizational Accidents”

ROOT CAUSES

A root cause is typically a finding related to a process or system design which has potential for redesign to reduce risk

- Active failures are *rarely* root causes
- Latent conditions over which we have control are *often* root causes

INVESTIGATING HUMAN ERROR

"The point of a human error investigation is to understand why actions and assessments that are now controversial, made sense to people at the time. You have to push on people's mistakes until they make sense-relentlessly"

Sidney Dekker

Severity Bias

WITH SEVERITY BIAS LENS

- Outcome determines culpability
- "Look at this! It should have been so clear"
- We judge people for what they did

WITHOUT SEVERITY BIAS LENS

- Quality of the behavioral choice made is not determined by outcome. It is instead judged on its own merits
- Realize evidence does not arrive as revelations
- Refrain from judging people for errors

LESSONS TO BE LEARNED

- We haven't fully understood an event if we don't see the people involved actions as reasonable
- The point of a human error investigation is to understand why people did what they did, not to judge them for what they did not do
- Events are the result of many causes
- Active failures and latent conditions create holes in our system's defenses
- Root causes are those with potential for redesign to reduce risk
- Active failures are rarely root causes, latent conditions are often root causes

BUILDING A BETTER MOUSE TRAP



RCA

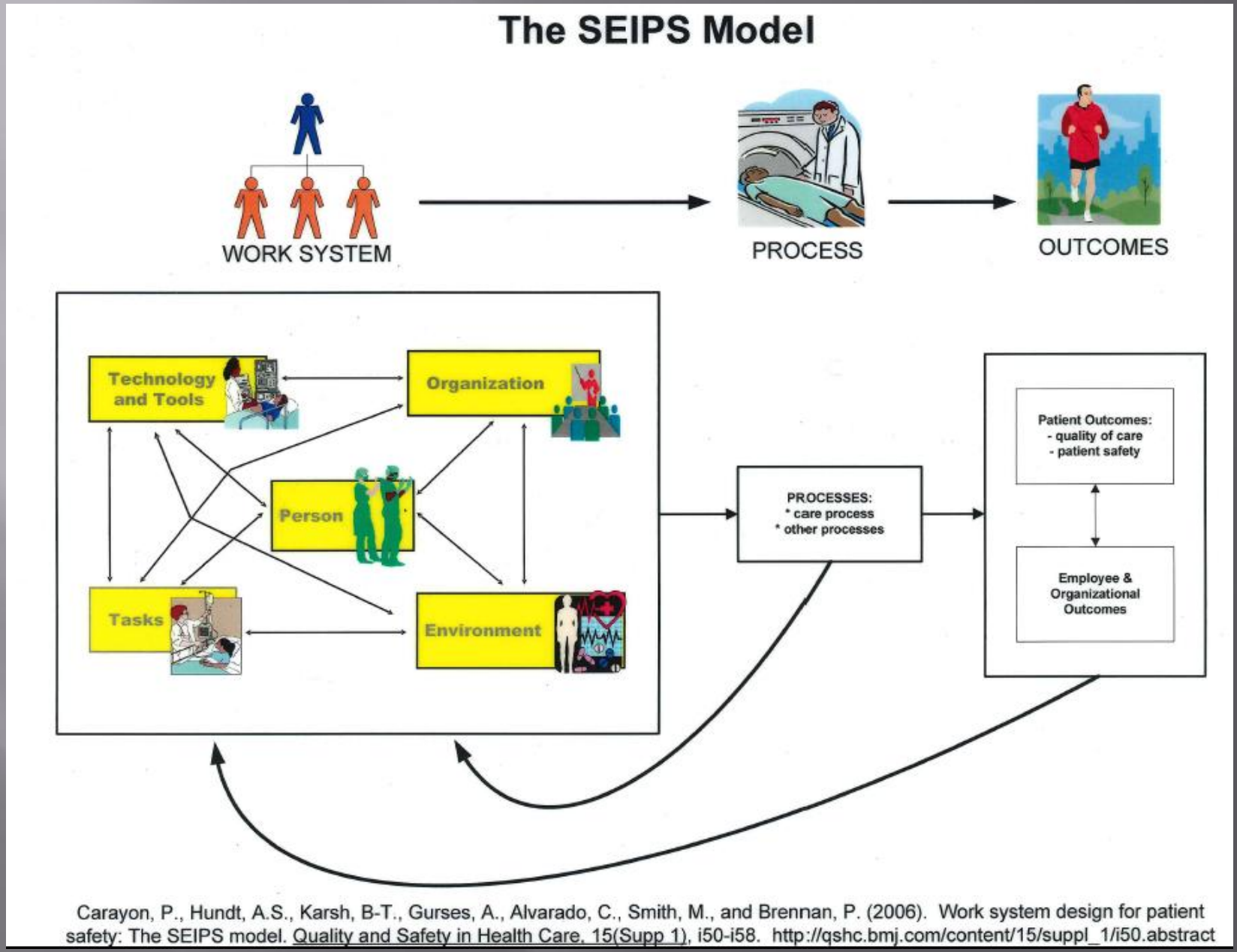
Pre-meeting

- RCA Team Member Introduction packet
- Literature review summary
- Pertinent Policies & Procedures
- Best Practices
- RCA Agenda

Meeting

- Agenda
- Ground rules
- Event Timeline
- Cause Map (to be completed during meeting)
- Other tools to help determine root causes (i.e. Barrier analysis, Contributing Factors Framework, Change Analysis, latent and active errors chart)

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Revised RCA Framework

Human Factors Engineering
ROOT CAUSE ANALYSIS
Framework

Facility:
Event Number:
Title: (Name your RCA)
Date of Incident:

Executive Summary:
NOTE: Provide a brief "story" of what happened, including the key issues. This should be 5 - 10 sentences with about 1000 characters. This is completed after the RCA is conducted.

Causative Factors: (list root causes and contributing factors)

Timeline of Events: *(attach)*
NOTE: Date-Activity

Cause and Effect Diagram (or process flow chart):

List and Attach Tools used for Analysis: (i.e. Barrier Analysis, flowcharting and change analysis)

Relevant Policies and Procedures:

Evidence Based Resources:
NOTE: External references list here (ex. WHO checklist, fall prevention checklists, HAPU programs etc)

Literature Review Summary: *(attach)*

Search for Causes:	**Questions to consider in the search for Causes**	**Description of Cause** What caused the undesirable outcome? **Just Culture** ❖ System Failure ❖ Human Error ❖ At Risk Behavior ❖ Reckless Behavior	**Preceding Causes** Ask why 5 times	**Root Cause (RC) or Contributing factor (CF) Identified?** ❖ Yes ❖ No	**Take Action?** ❖ Yes ❖ No
Technology and Tools Physical, cognitive and psychological dimensions Usability and support to healthcare work	How did the equipment performance affect the outcome?				
	Are systems in place to identify technology and equipment risks?				
	Are emergency and failure mode responses adequately planned and tested?				
Organizational Conditions Work schedules, organizational support (e.g. Social support from supervisors and managers, resources provided during a technological or organizational change) Communication, collaboration, coordination, decision-making structure, role characteristics such as ambiguity and	**Human Resource Issues** *Are staff properly qualifie and currently competent ir their responsibilities? *How did actual staffing levels compare with ideal levels? *What are the plans for dealing with contingencies that would tend to reduce effective staffing levels? *to what degree is staff performance in the operant process addressed?				
	Leadership issues *To what degree is the culture conducive to risk				

conflict, training, rewards, benefits, performance evaluation, teamwork, and organizational Culture	identification and reductions? *What are the barriers to communication of potential risk factors? * To what degree is the prevention of adverse outcomes communicated as a high priority? How?				
	How can orientation and in-service training be improved?				
	Communication *What re the barriers to communication of potential risk factors? *To what degree is the prevention of adverse outcomes communicated as a high priority? How?				
Physical Environment Noise, lighting, temperature-humidity-air flow, space, layout, vibration, and radiation	*To what degree was the physical environment appropriate for the proces being carried out? *What systems are in plac identify environmental risk				
Tasks Distinction between prescribed task and activity or task actually carried out. Difficulty or challenge, content variety,	**Information Management** *To what degree is all necessary information available when needed? Accurate? Complete? Unambiguous? *What were the differences between the prescribed task and				

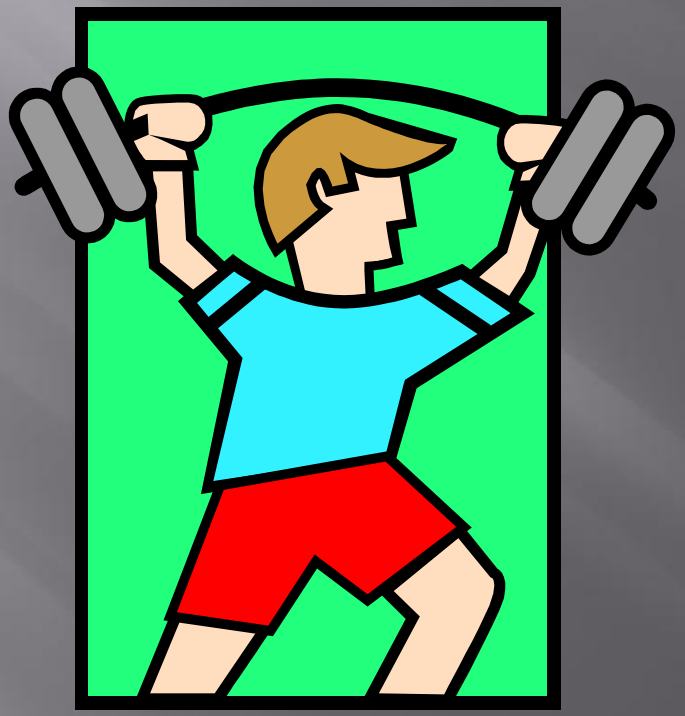
repetitiveness, skill utilization, autonomy and job control, uncertainty, demands, contact with others, and feedback.	activity and how the task/activity was actually carried out.?				
Uncontrollable Factors	What can be done to prote against the effects of thes uncontrollable factors?				
Other					

Action Plan

Facility:
Event Number:
Title: (Name your RCA)
Date of Incident:

Root Causes and Contributing Factors	Action Plan	Responsible Party	Due Date	Status

Testing the Strength of RCA and Action Plans



RCA Strength

RCA Matrix-Minimum Scope for RCA for Specific Types of Sentinel Events

	Suicide (24 hr care)	Med. Error	Procedural Complication	Wrong site surgery	Treatment delay	Restraint death	Elopement death	Assault/ rape/ homicide	Transfusion death	Patient Abduction	Unanticipated death of full term infant	Unintended Retention of foreign body	Fall related
Behavioral assessment process (1)	X					X	X	X					
Physical assessment process (2)	X	X	X	X	X	X	X				X		X
Patient identification process		X		X					X				
Patient observation procedures	X				X	X	X	X	X		X		X
Care planning process	X		X			X	X				X		X
Continuum of care	X	X			X	X							X
Staffing levels	X	X	X	X	X	X	X	X	X	X		X	X
Orientation & training of staff	X	X	X	X	X	X	X	X	X	X	X	X	X
Competency assessment/ credentialing	X	X	X	X	X	X	X	X	X	X	X	X	X
Supervision of staff (3)	X	X	X		X	X			X			X	
Communication with patient/ family	X	X		X	X	X	X			X			X
Communication among staff members	X	X	X	X	X	X	X	X	X	X	X	X	X
Availability of information	X	X	X	X	X	X			X		X		X
Adequacy of technological support		X	X										
Equipment maintenance/ management		X	X		X	X					X		X
Physical environment (4)	X	X	X	X		X	X	X	X	X			X
Security systems and processes	X						X	X		X			
Medication Management (5)		X	X		X				X		X		X

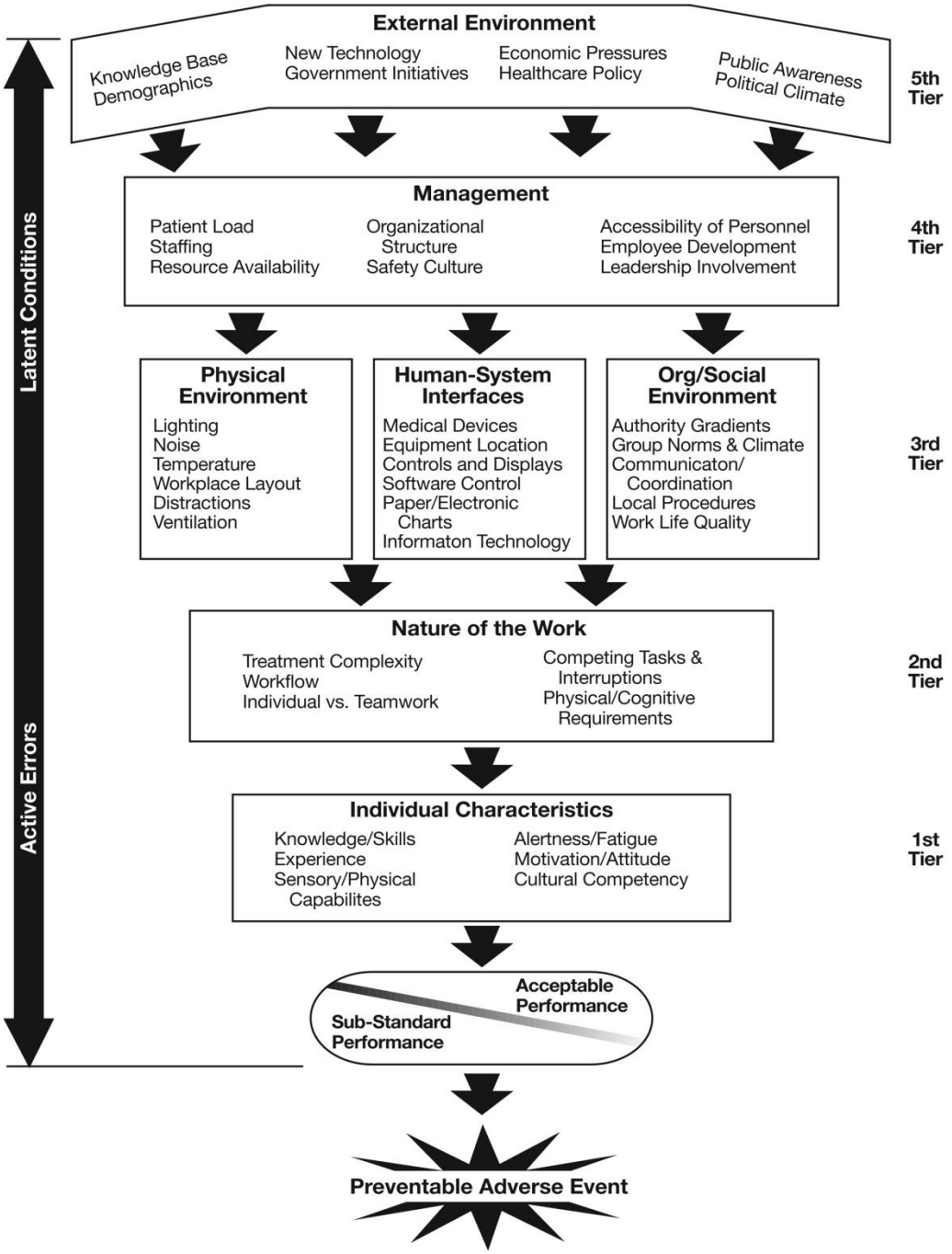
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Action Plan Strength

Have the strongest solutions possible been identified and implemented to prevent reoccurrence?

Strongest

- Automation
- Failsafe mechanism
- Forcing Function

Middling

- Simplification, Standardization, Minimize Choices
- Increase detectability
- Optimize redundancy

Weakest

- More documentation
- Training
- Education

Action Plan Strength

49 RCAs were evaluated to determine the strength of the action item solutions

Results

Solutions	Action items	%Strength
Strong	7	3%
Middle	58	27%
Weak	127	60%

NEXT STEPS ON OUR JOURNEY

- Build tools for analyzing effectiveness of RCAs across the enterprise
- Risk management team to continue to build on competencies:
  - Investigation
  - RCA facilitation
  - Identification of root causes
  - Just Culture
  - Human Factors Engineering for Patient Safety
- Leadership & management competencies:
  - Event management, investigation, RCA
  - Just Culture
  - Investigation
  - Accountability for building a safety culture

QUESTIONS OR COMMENTS

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