The Science of Reliability

Dr. Craig Clapper

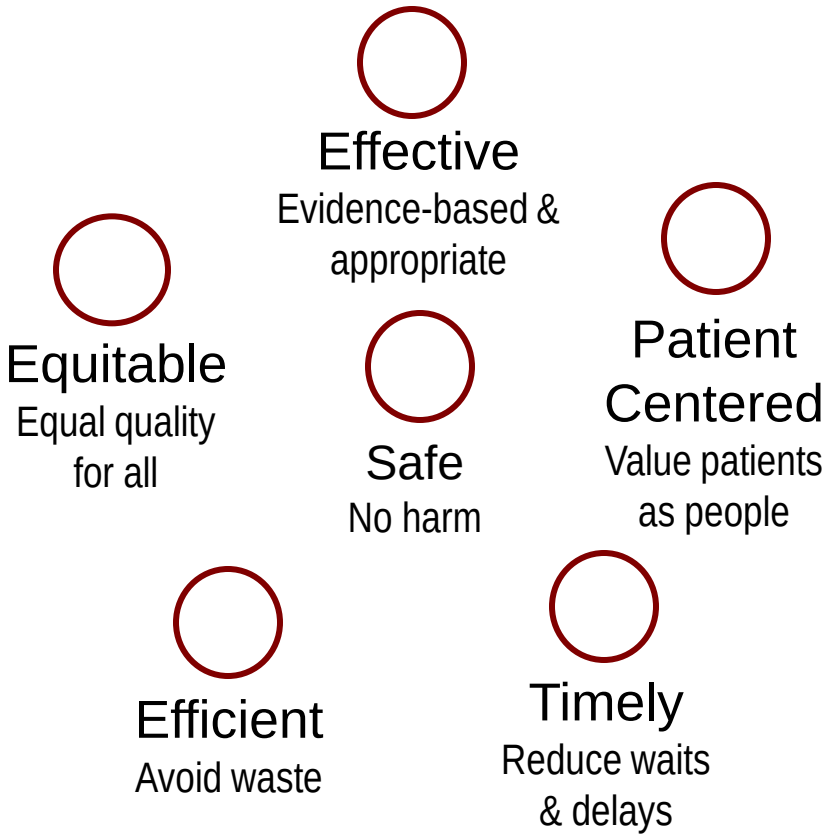
HPI – A *Reliability* Company

The One Vision

We lead the innovation that makes healthcare as reliable as it should be.

The Zero Mission

We create the Culture of Safety that achieves ZERO events of harm.



Six Aims for Improvement, Institute of Medicine

From Your Patient's Perspective

Don't hurt me

Heal me

Be nice to me

Defining Reliability

Reliability: The **probability** that a system, structure, component, process, person will successfully provide the intended function(s).

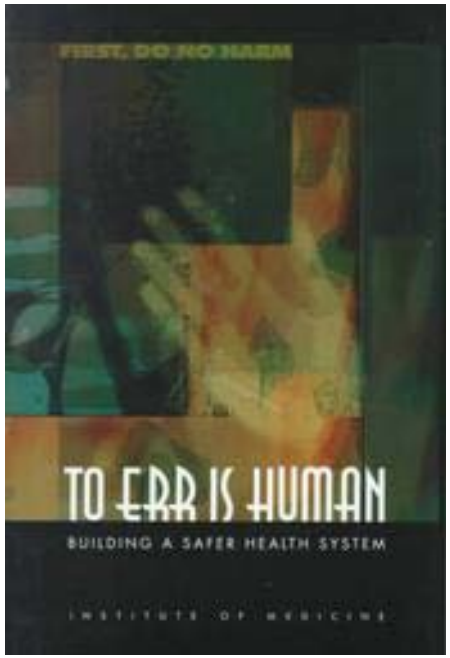
Often expressed as a **ratio** such as 0.96 or 96%

Sometimes a **frequency** such as 8.76 per year or one (1) per 1,000 years

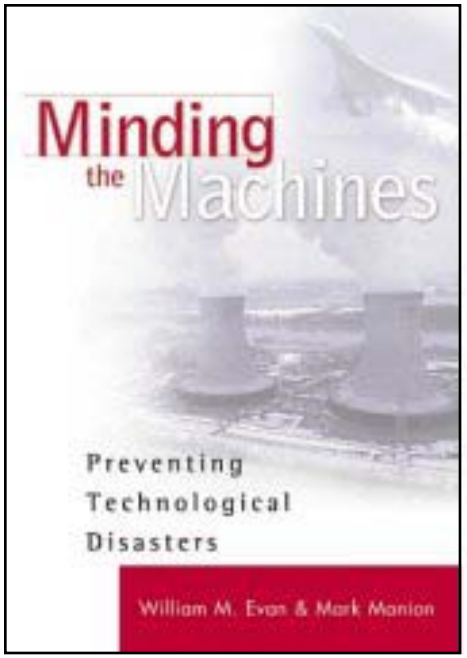
Measuring Reliability

- Probability: count number of satisfactory events, divide by the total number of demands
- Frequency: count number of events (typically adverse), divide by time interval of sample
- Use for System, Process, and Activity
- Reverse Tracer Method for process
- Estimate system or process:
  - Probabilistic Safety Assessment (PSA)
  - Quantitative methods such as HEART

Healthcare Differentiators



Human-based Systems
10^{-1} to 10^{-3}



Technology-based Systems
10^{-5} to 10^{-7}

More Differentiation

Healthcare

- Human-based
- Open
- Non-linear
- Goal is to increase the well-being of people

Other Complex & High Consequence Systems

- Machine-based
- Closed
- Linear
- Goal is to not affect the well-being of people

Applied Unreliability

	Healthcare	Aviation	Nuclear
Safe (unexpected death)	10^{-3} (per admission)	10^{-7} (per departure)	10^{-8} (per year)
Effective	82.1% (care for heart attack)	83.8% (on time in Charlotte)	89.6% (capacity factor)
Efficient	$15,417 (per admission)	14.6 ¢ (per ASM)	1.72 ¢ (per kWh)
Customer Centered	89.2% (listened & explained)	664 (of 1000)	commodity

What Will It Take?

Patient Safety WalkRounds

+

Addressed JCAHO Patient Safety Alerts

+

Non-Punitive Approach to Reporting

+

Crew Resource Management

+

Strategies in Targeted Venues
(e.g., bundles to reduce VAP or SSI)

***BUT…* Will This Produce Significant Sustained Reduction in Serious Safety Events & Culture Change Across the Organization?**

New Thinking

Systems Thinking

- All people are fallible and experience errors
- System factors are the majority cause of error
- Reliable outcomes can be obtained using the right mix of people and process.

Bad Apple Theory

- People who make mistakes are poor performers
- System performance is ensured by removing poor performers

Human Error – A Symptom, Not Cause

Human error is not the cause of failure,

but a *symptom of failure.*

Human error – by any other name or by any other human – should be the *starting point* of our investigations, not the conclusion.

Source: Fitts, P. M., & Jones, R. E. (1947). “Analysis of factors contributing to 460 'pilot error' experiences in operating aircraft controls.” *Memorandum Report TSEAA-694-12*, Aero Medical Laboratory, Air Material Command, Wright-Patterson Air Force Base, Dayton, Ohio.

Dekker's Certaintudes

#1 People Make Mistakes

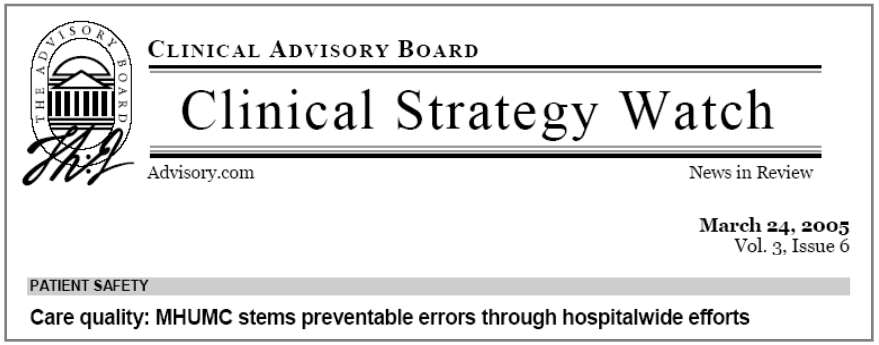
#2 People Drift

HRO Lesson: Do not detect
drift through actual events.
Find drift before it finds you.

Published Cases

Memorial HEALTH

- 89% reduction in 2 years
- $ 10M savings first year
- $ 11M savings second year


CLINICAL ADVISORY BOARD

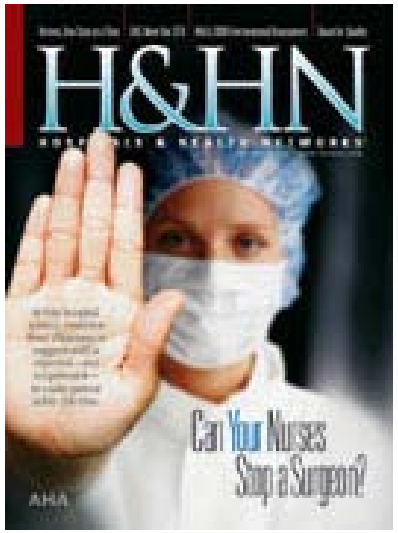
Clinical Strategy Watch

Advisory.com — News in Review

March 24, 2005
Vol. 3, Issue 6

PATIENT SAFETY

Care quality: MHUMC stems preventable errors through hospitalwide efforts



SENTARA™

- 50% reduction in 18 months
- AHA Quest for Quality Award 2004
- JCAHO Eisenberg Quality Award 2005

Advocate Health Care

"Can Your Nurses Stop a Surgeon?"
Hospitals & Health Networks, September 2007

Safety Culture Participants

As of October 2, 2008

26 Organizations
102 Hospitals

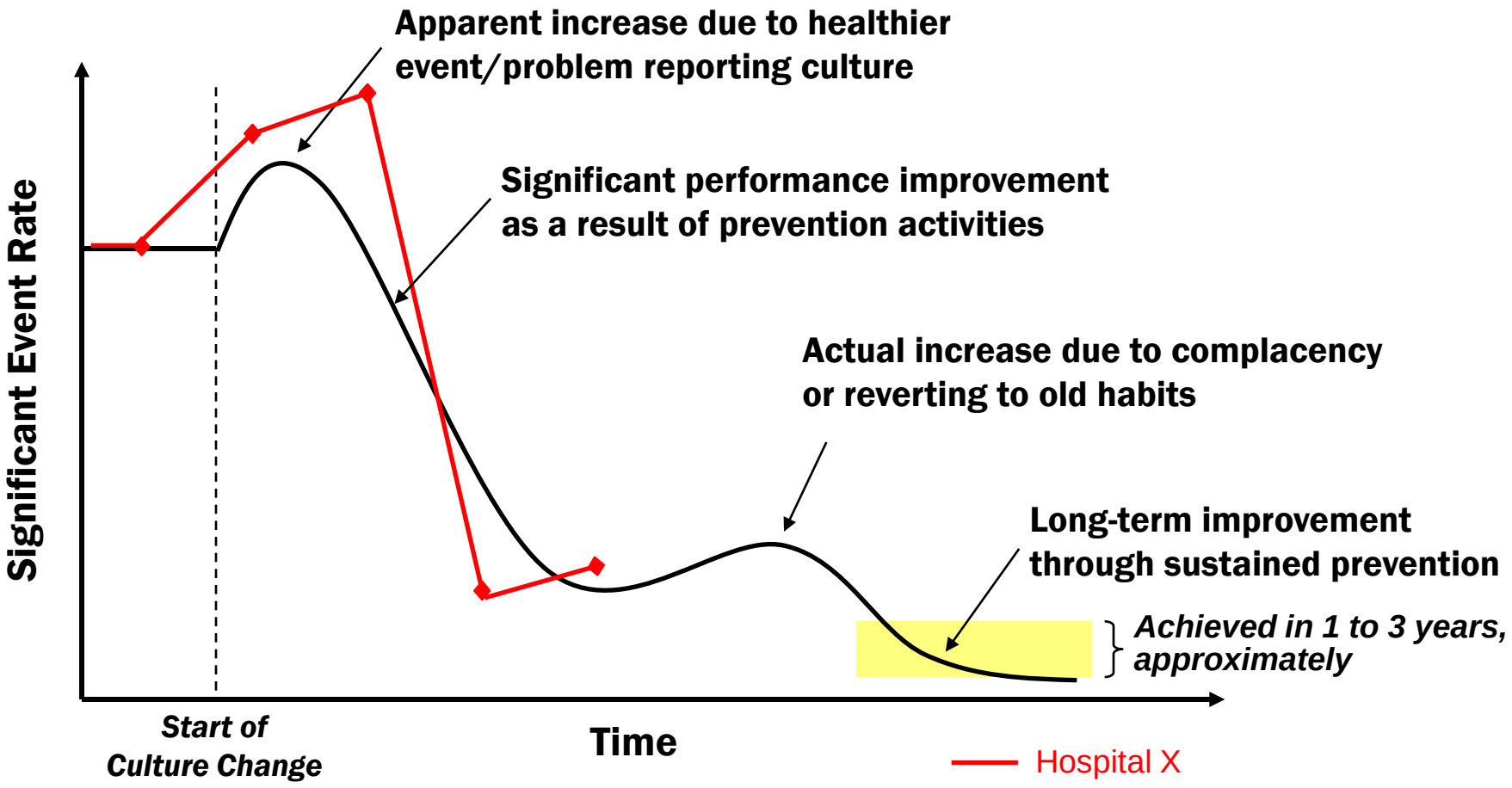
PII
Performance Improvement International
San Clemente, CA

HPI

Healthcare Performance Improvement
Norfolk, VA

	System/Hospital	Hospitals	
1	William Beaumont Hospitals	1	PII
2	Memorial Health University	1	PII then HPI
3	Sentara Healthcare	7	PII then HPI
4	Inova Health System	6	PII then HPI
5	Palmetto Health Trust Services, Ltd	6	PII
6	Prince William Hospital	1	PII
7	OhioHealth	5	PII then HPI
8	Scottsdale Healthcare	3	PII then HPI
9	Advocate Health Care	8	PII
10	Southern Ohio Medical Center	1	PII
11	University Health Systems	7	HPI
12	Yakima Valley Memorial Hospital	1	HPI
13	Cincinnati Children's Hospital	1	HPI
14	Memorial Hermann	9	HPI
15	Community Health Network	5	HPI
16	Ascension Health	11	HPI
17	WellStar Health System	5	HPI
18	Mercy Hospital	1	HPI
19	Children's National Medical Center	1	HPI
20	Carolinas Medical Center-Lincoln	1	HPI
21	Spectrum-Helen DeVos Children's Hospital	1	HPI
22	Asante Health System	2	HPI
23	VCU Health System	1	HPI
24	Centra Health	2	HPI
25	Genesis Health System	3	HPI
26	Novant Health	8	HPI

Typical Improvement Curve



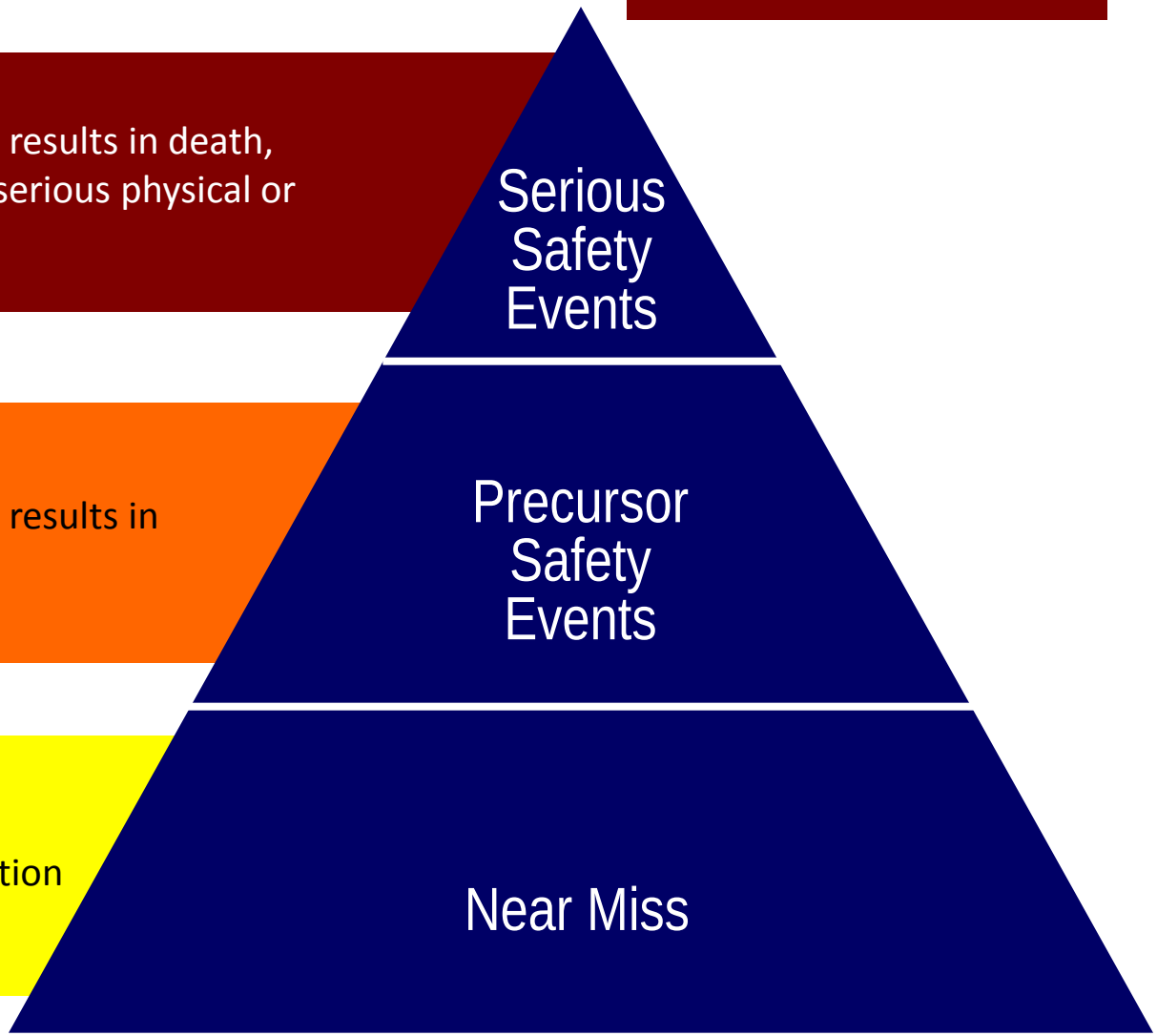
Variation from standard of care that results in:

SEC Safety Event Classification SM

Serious Safety Event
Event that reaches the patient and results in death, life-threatening consequences, or serious physical or psychological injury
Cause Analysis Level: RCA

Precursor Safety Event
Event that reaches the patient and results in minimal to no harm
Cause Analysis Level: ACA or RCA

Near Miss
Event that almost happened - the error was caught by one last detection barrier
Cause Analysis Level: ACA or RCA



HPI®

Input

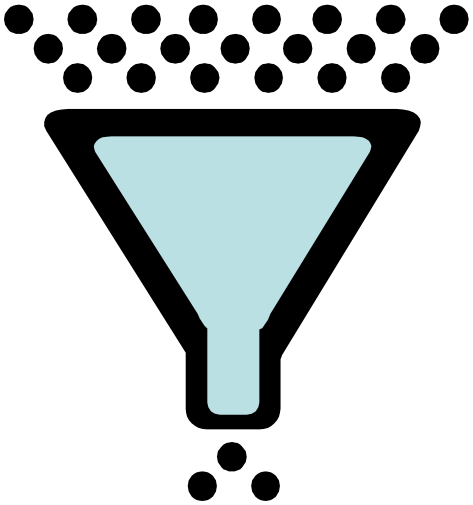
Capture events from various sources

JC Sentinel Events
NQF "never events"
State reportable events

Clinical quality incidents
Medication errors
Peer review cases
Claims and suits

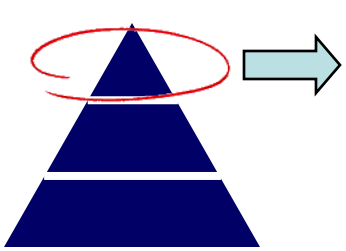
SEC Process

Screen events based on **organization or individual culpability** and **level of harm to the patient**

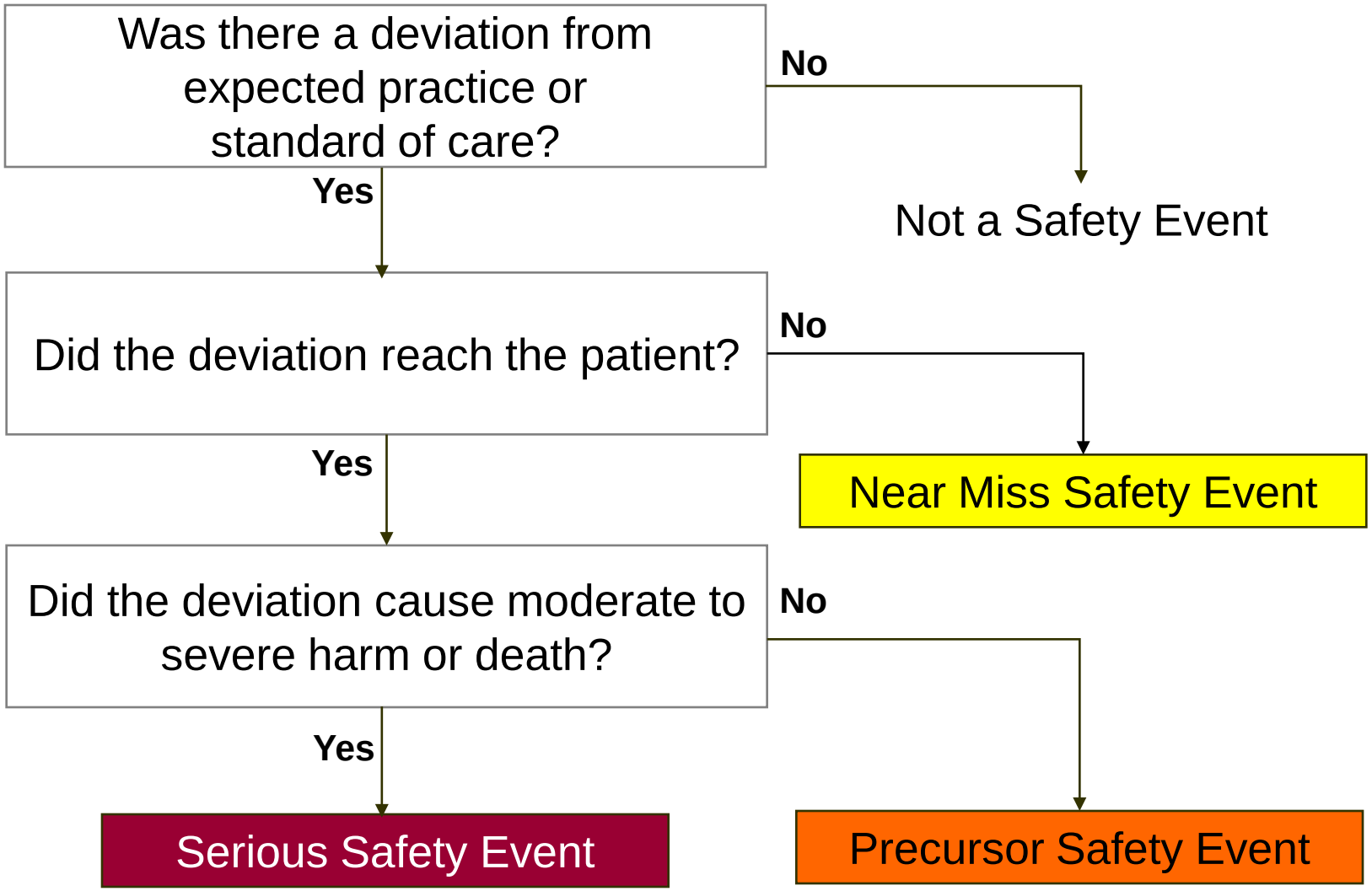


Output

SEC classification & SSER



Safety Event Decision Algorithm



SSER Serious Safety Event Rate SM

Rolling 12-month rate of Serious Safety Events per 10,000 adjusted patient days

$$\text{SSER} = \frac{\text{\# SSE during past 12 months}}{\text{\# APD for past 12 months}} \times 10{,}000$$

Why a 12-month rolling average?

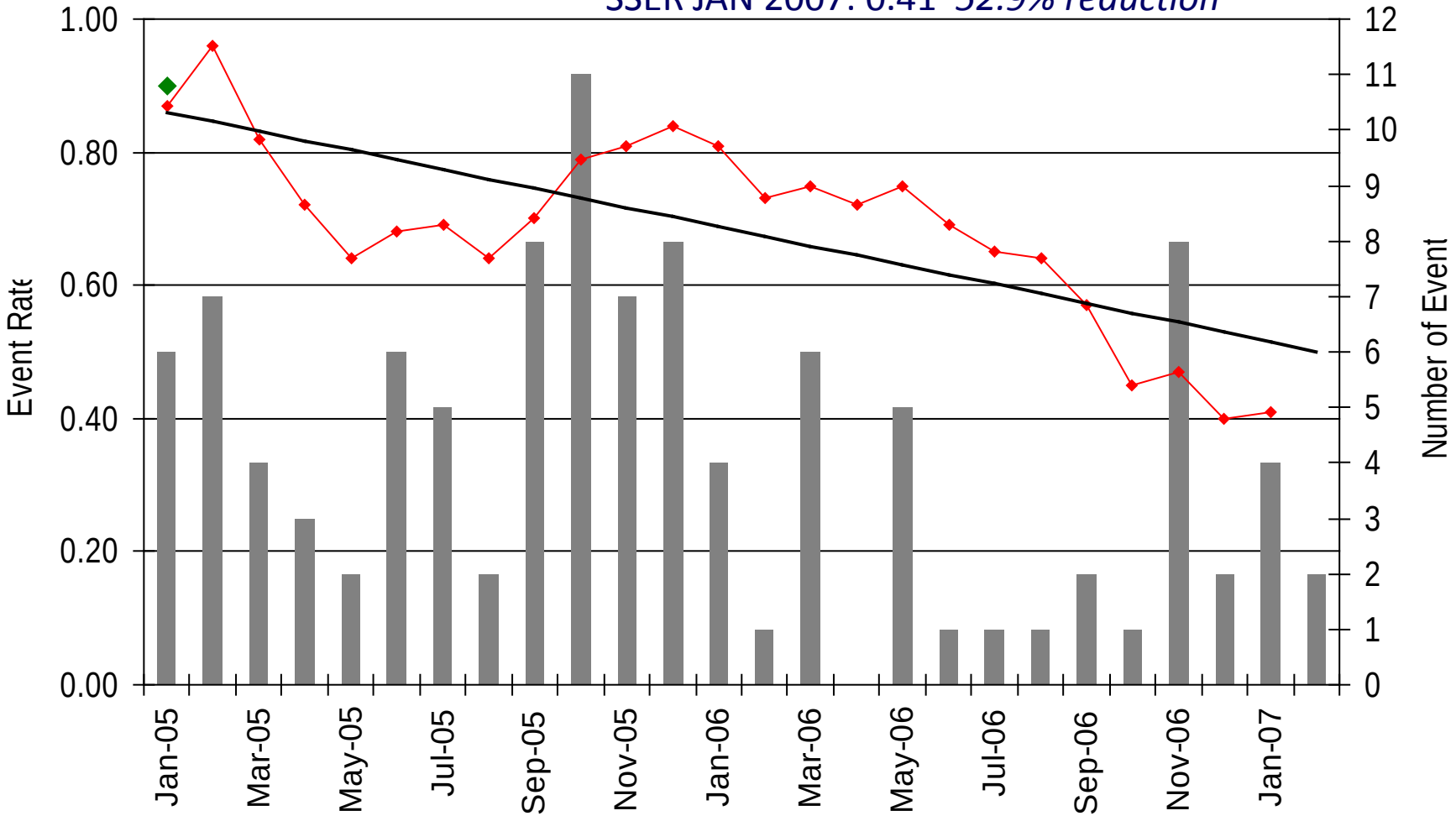
- Smoothes the curve for infrequent events
- Encourages sustainability in reliable safety performance (it takes 12 months for an event to "drop out" of the average)

SSER Serious Safety Event Rate SM

Midwest System (7 hospitals)

SSER JAN 2005: 0.87

SSER JAN 2007: 0.41 *52.9% reduction*

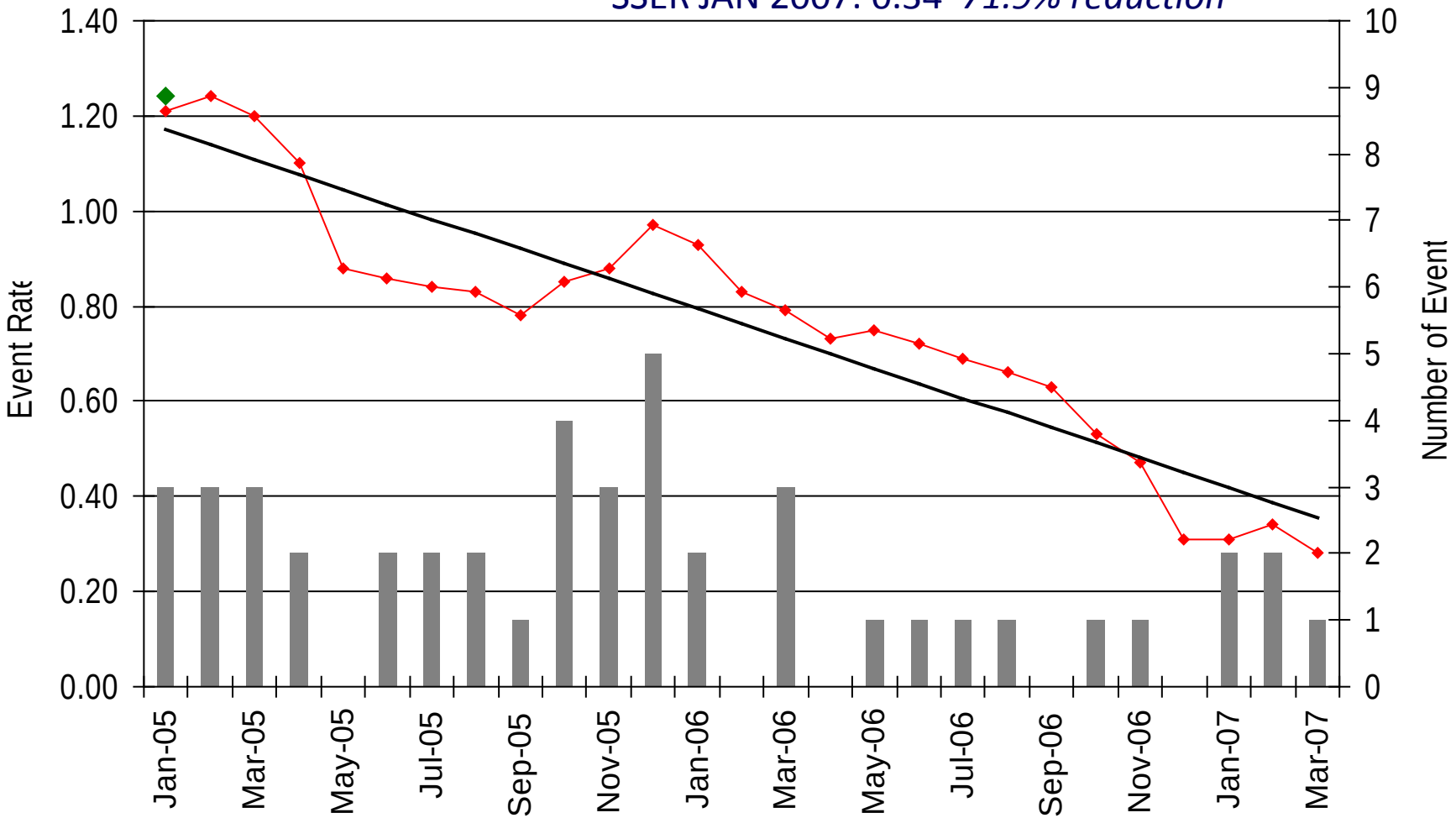


SSER Serious Safety Event Rate SM

1000 Bed Hospital – Midwest US

SSER JAN 2005: 1.21

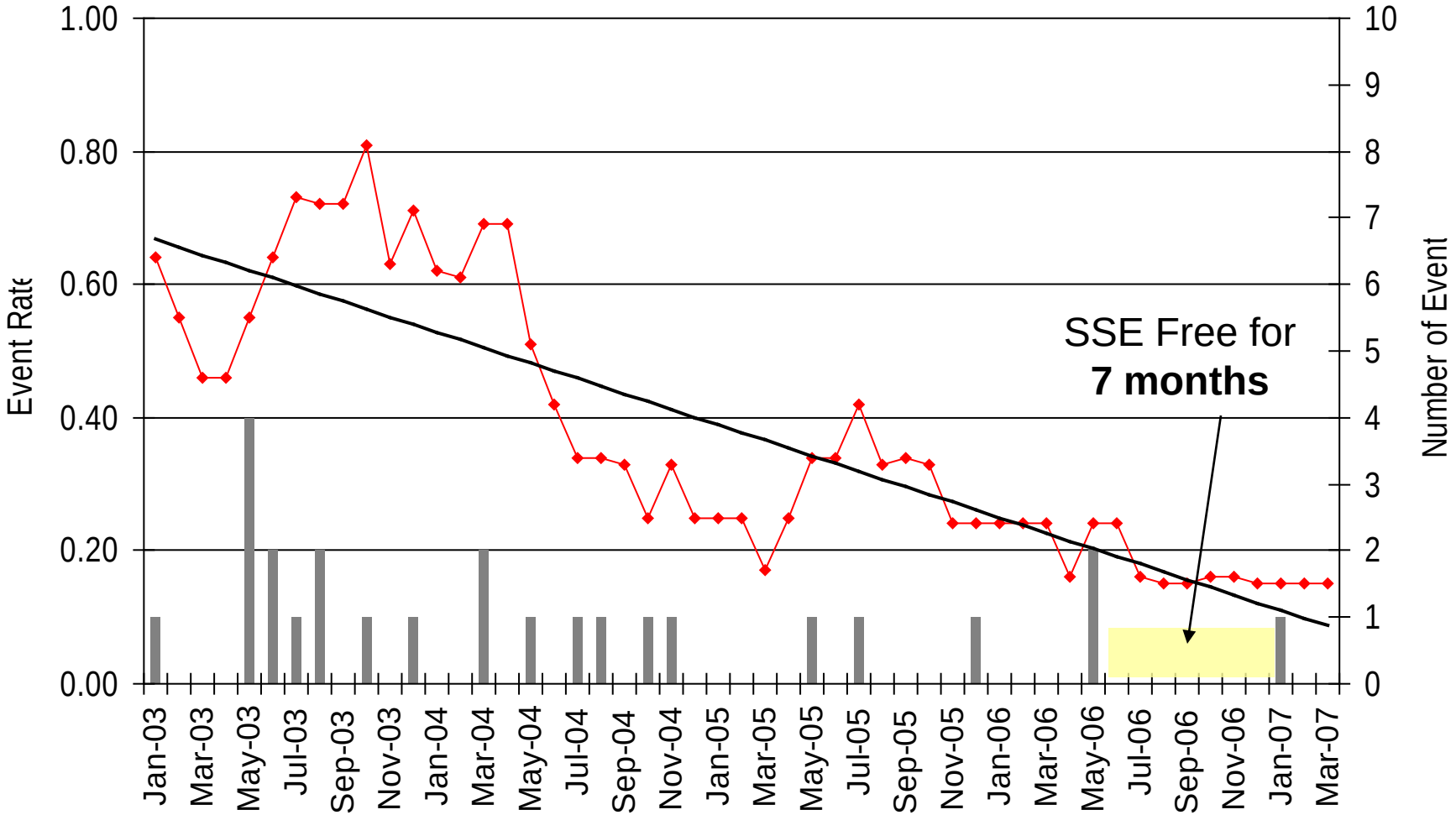
SSER JAN 2007: 0.34 *71.9% reduction*



HPI

SSER Serious Safety Event Rate SM

Creating a Safe Day

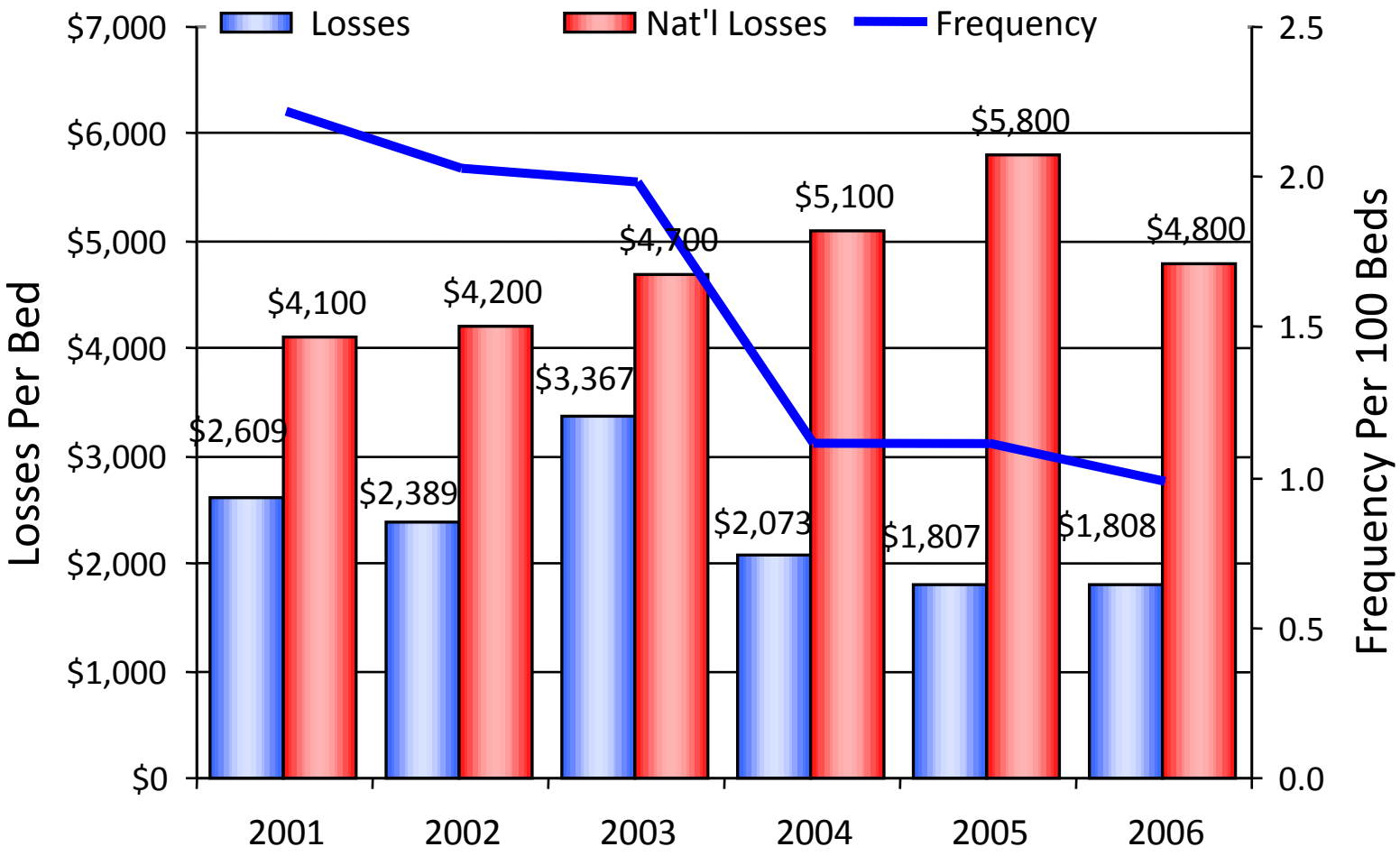


Quality's Interest in Safety Culture

Selected Quality Indicators

	2003	2004	2005	2006	2007	Improvement
Falls with Injury Per 1,000 adjusted patient days	0.63	0.48	0.43	0.42	0.37	**41.3% ↓**
Ventilator-Associated Pneumonia Per 1,000 ventilator days	4.55	2.23	1.57	0.97	0.42	**90.8% ↓**
Blood Stream Infections Per 1000 device days	3.46	2.35	1.78	2.23	1.05	**69.7% ↓**
Surgical Care Infection Prevention Overall Antibiotic Prophylaxis Compliance	90.8	91.0	90.3	93.8	94.8	**4.4% ↑**

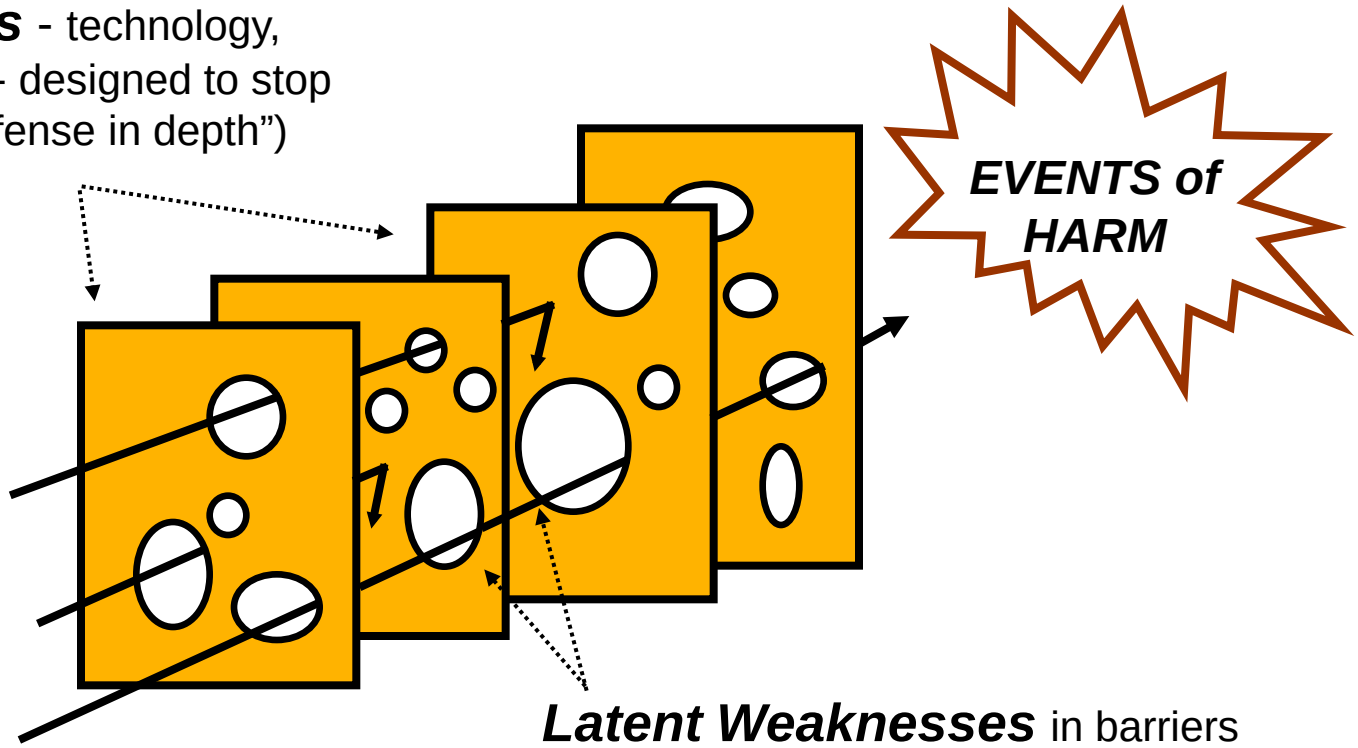
Effect on Claim Frequency & Loss Cost Per Adjusted Acute Care Bed



Source: ASHRM Hospital Professional Liability & Physician Liability 2006 Benchmark Analysis

The Swiss-Cheese Effect

Multiple Barriers - technology, processes, and people - designed to stop active errors (our “defense in depth”)



Active Errors by individuals result in initiating action(s)

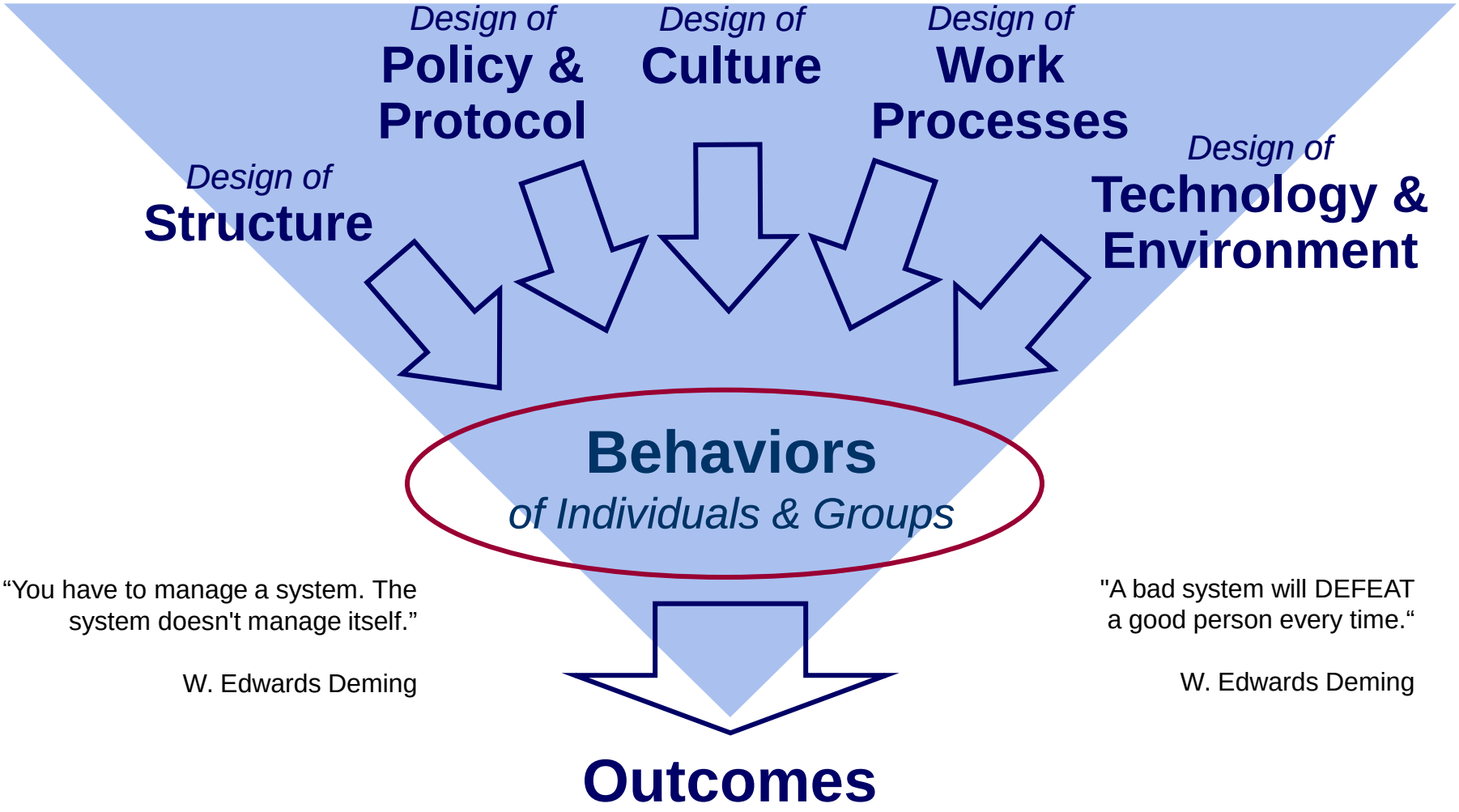
Latent Weaknesses in barriers

PREVENT
The Errors

DETECT & CORRECT
The System Weaknesses

Adapted from James Reason, *Managing the Risks of Organizational Accidents* (1997)

Influencing Behaviors at the Sharp End



"You have to manage a system. The system doesn't manage itself."

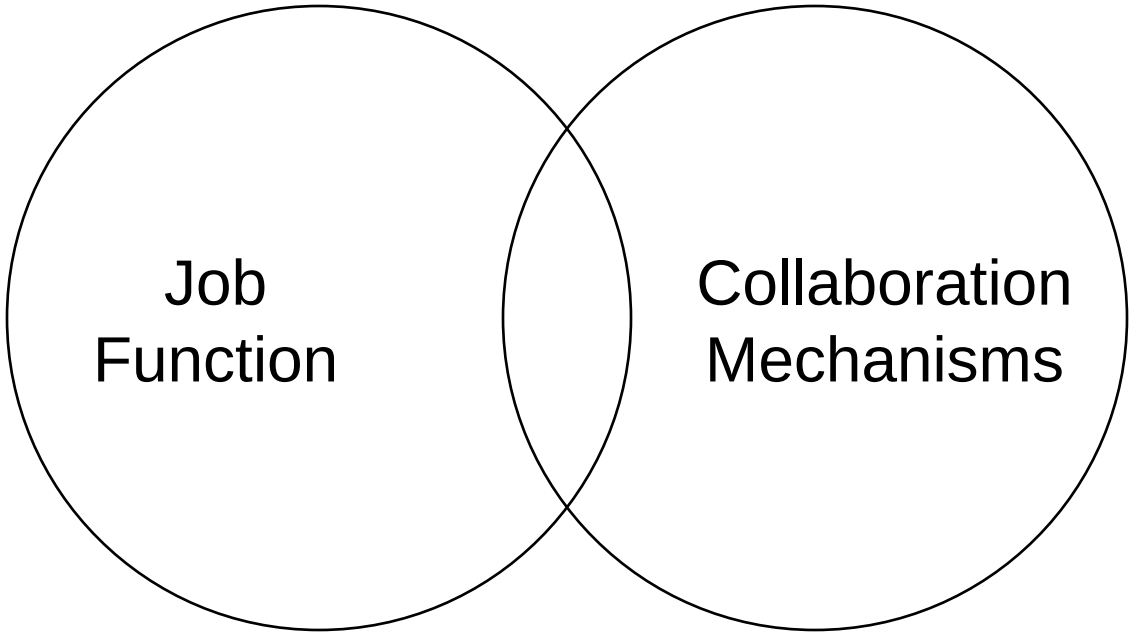
W. Edwards Deming

"A bad system will DEFEAT a good person every time."

W. Edwards Deming

Adapted from R. Cook and D. Woods, *Operating at the Sharp End: The Complexity of Human Error* (1994)

Structure

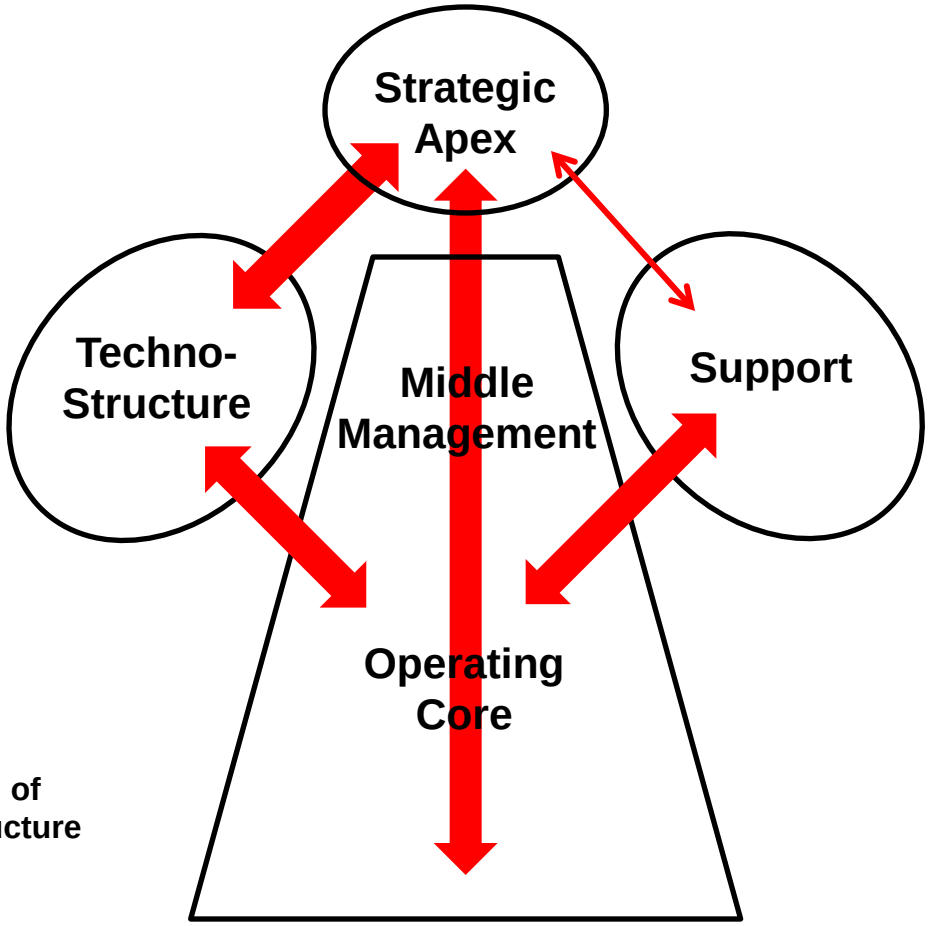


Scope
Roles & duties
Responsibilities

Mutual adjustment
Communication channels
System & process designs

Structure at Work

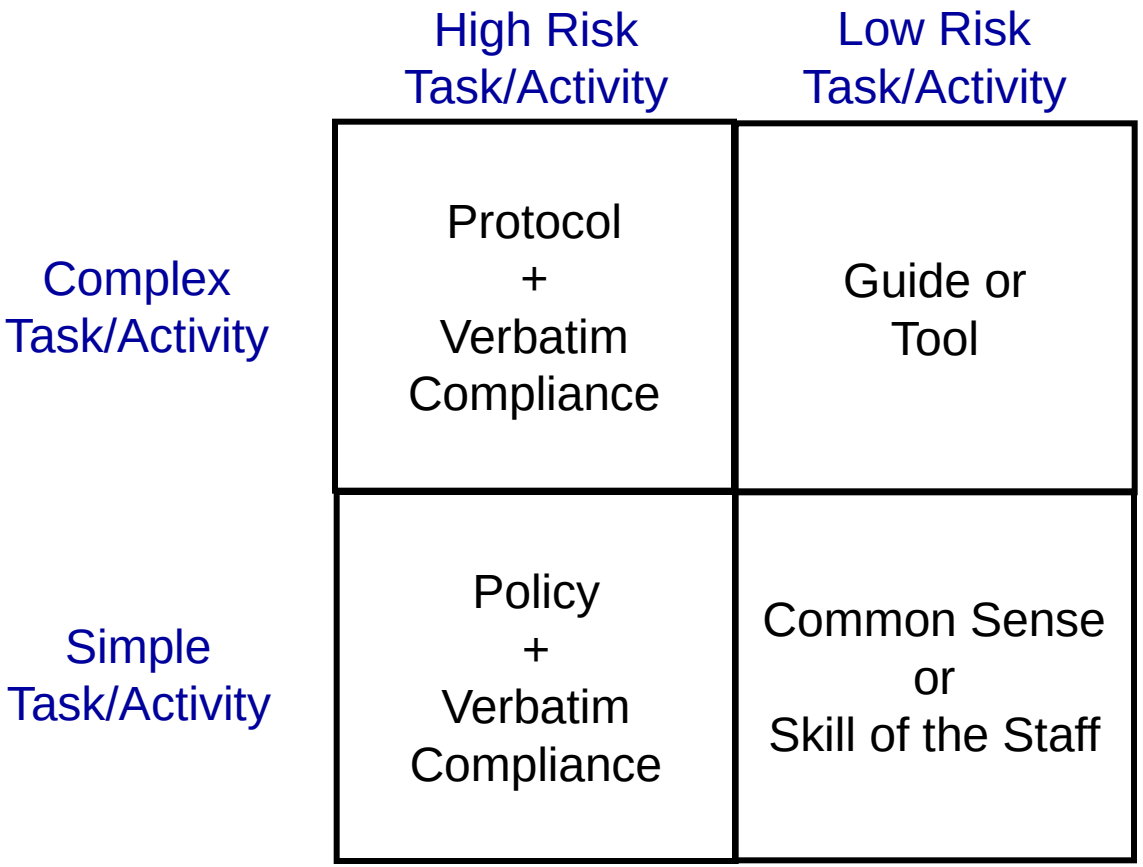
- Micro-systems
- Self-directed teams
- Service-line structure
- Team specialization
- Job specialization
- Span of control
- Levels of management



Mintzberg Model of Organizational Structure

Prevention Strategies for Protocols

Strategy driven by degree of *risk* and *complexity* of the task or activity…



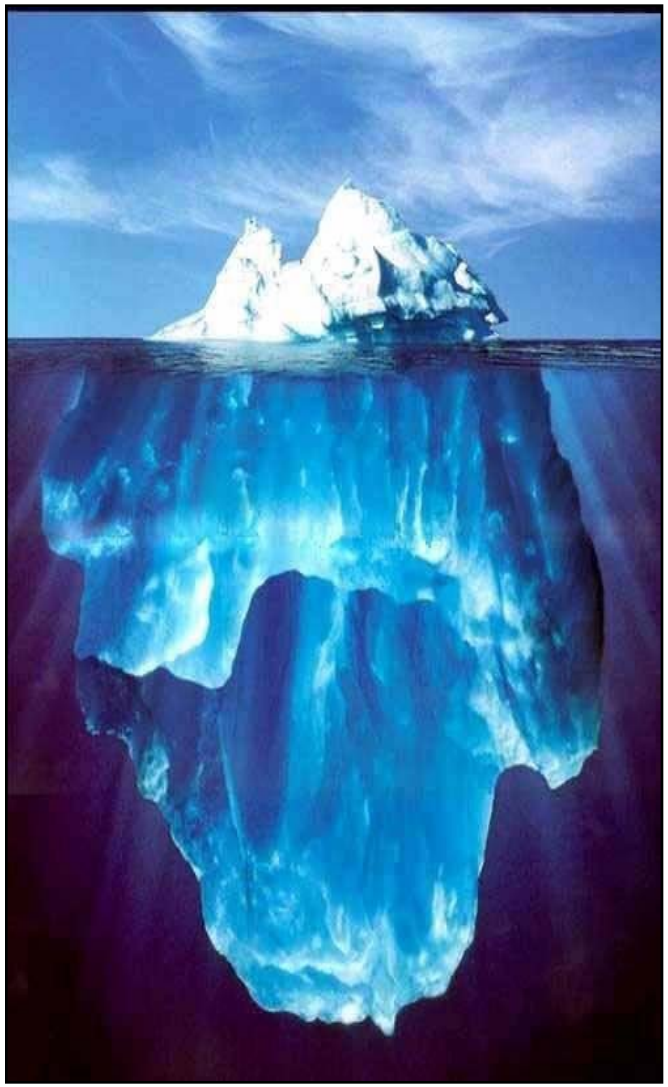
Protocol at Work

- Focus & Simplified™ protocols
- Flow sheets
- Standardized order sets
- Checklists
- Job aids (charts, tables, decision trees)
- Job-site aids (charts, tables, decision trees)

Best when:

1. Evidence-based
2. Seamless with technology

Why Culture Is Important



Culture

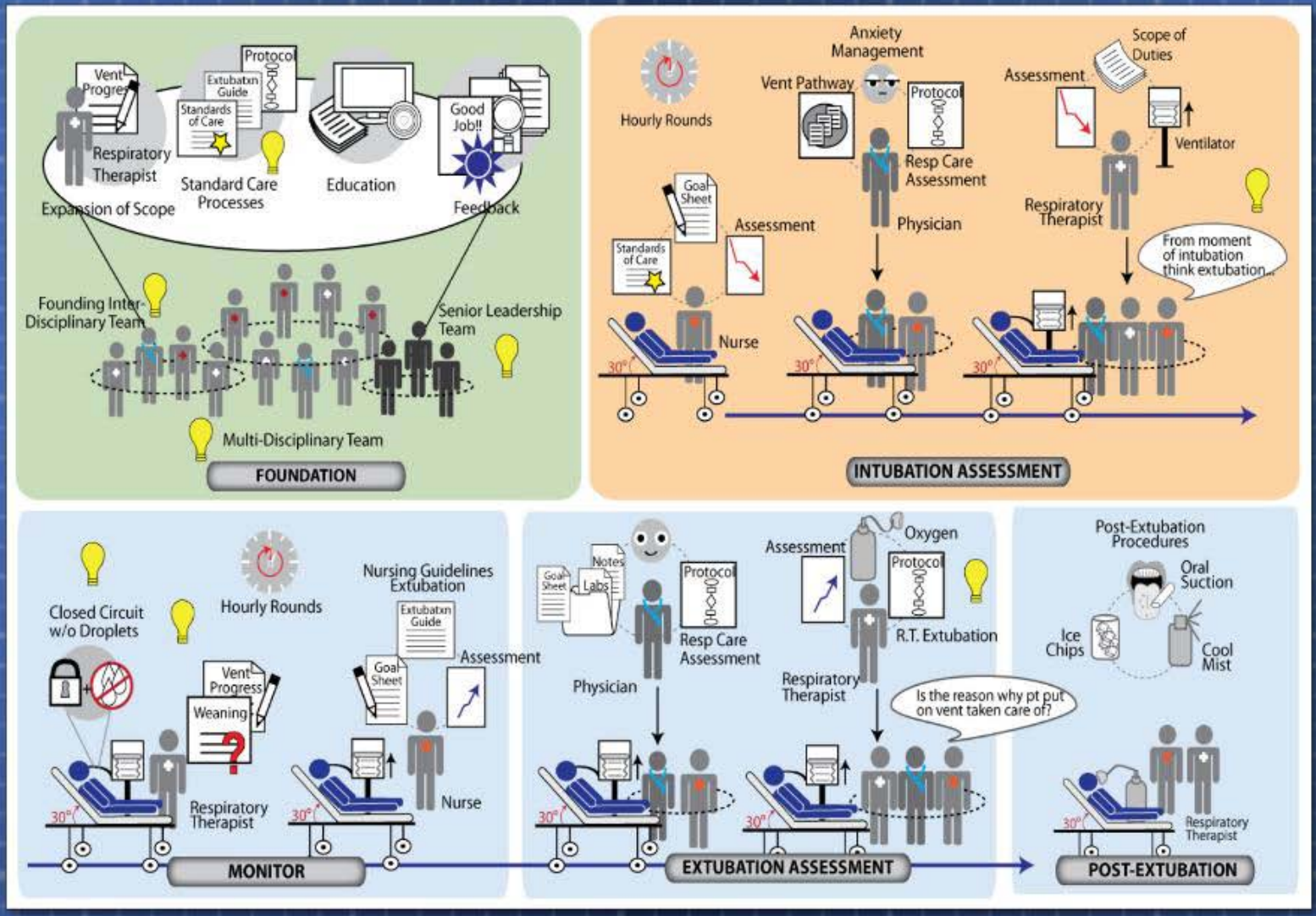
The shared values and beliefs of individuals in a group or organization

Culture	=	Shared Values & Beliefs
Shared Values & Beliefs	→	Our Behaviors
Our Behaviors	→	***Outcomes***

Culture at Work

- Safety Behaviors
  - Staff
  - Physicians
  - Leaders
- Crew Resource Management (CRM) *(team tools)*
- Just Culture
- Learning Organization *(as in the 5th Discipline)*

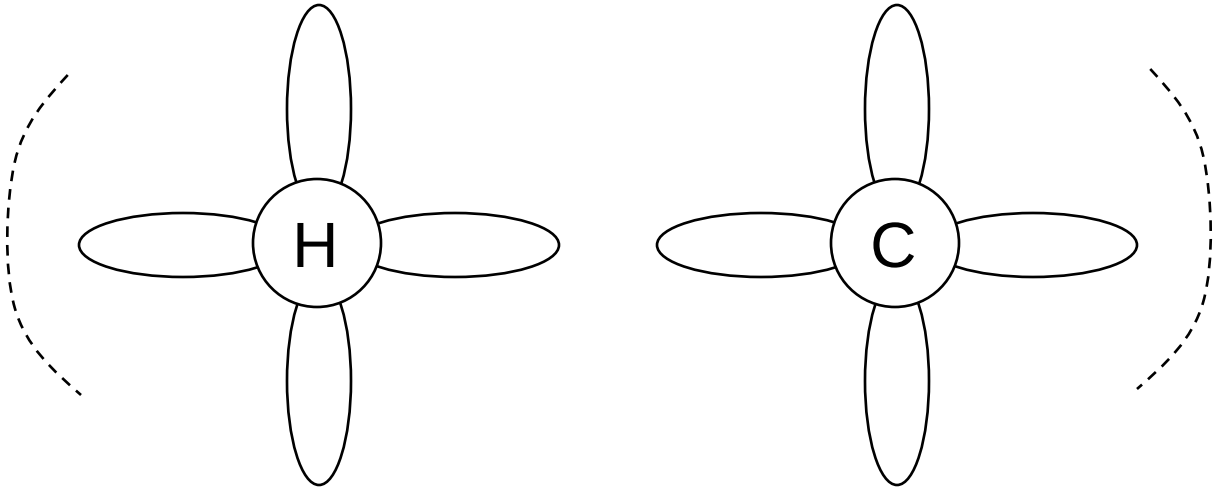
Process


Vent Progress
Protocol
Extubatxn Guide
Standards of Care
Respiratory Therapist
Standard Care Processes
Education
Good Job!!
Feedback
Expansion of Scope
Founding Inter-Disciplinary Team
Senior Leadership Team
Multi-Disciplinary Team
FOUNDATION
Hourly Rounds
Anxiety Management
Vent Pathway
Protocol
Resp Care Assessment
Physician
Assessment
Scope of Duties
Ventilator
Respiratory Therapist
Goal Sheet
Standards of Care
Assessment
Nurse
From moment of intubation think extubation...
INTUBATION ASSESSMENT
Closed Circuit w/o Droplets
Hourly Rounds
Nursing Guidelines Extubation
Extubatxn Guide
Assessment
Goal Sheet
Vent Progress
Weaning
Respiratory Therapist
Nurse
MONITOR
Notes
Goal Sheet
Labs
Protocol
Resp Care Assessment
Physician
Assessment
Oxygen
Protocol
R.T. Extubation
Respiratory Therapist
Is the reason why pt put on vent taken care of?
EXTUBATION ASSESSMENT
Post-Extubation Procedures
Oral Suction
Ice Chips
Cool Mist
Respiratory Therapist
POST-EXTUBATION

Process at Work

- Minimal hand-offs
- Error detection & recovery
- Single piece flow
- Kanban systems
- Just-in-time supply, information, education, etc.

What Is Intuitive Environment?



Place an arrowhead on the direction that you would turn each handle to turn the water ON.

Technology & Environment at Work

- eMR & eMAR
- eICU
- CPOE
- Automated dispensing
- Bar coding
- Robotics
- Smart pumps & PCA
- Remote telemetry

- Hospital at home
- Acuity scalable rooms
- Zero entry rooms
- Short paths
- Shadow trays
- Baka-yoke
  - Interlocks, unique fittings
- Poka-yoke
  - Postings, color coding

The reliability chain is only as strong as the weakest link.

Implications of the “System”

- Unemployment
- Desocialization: fewer people per team
- Remoteness from the product
- Deskilling: low ability to perform
- Intimidation: the stakes are higher
- Technological illiteracy: lack understanding of how
- Mystification: “big brother” type authority
- Abandonment of responsibility

“Computer Control & Human Alienation”
T. Sheridan (1980, 1987)

More Toxic Effects

- Seen as dehumanizing; lower job satisfaction; consumer resistance
- Low alertness of human operators
- Systems are fault intolerant – may lead to larger errors
- Silent failures
- Lower proficiency of operators in case of need for manual takeover
- Over-reliance; complacency; willingness to uncritically accept results
- False alarms
- Automation-induced failures
- Increase in mental work load

Source: Wiener EL, Nagel DC, ed. *Human Factors in Aviation.* New York: Academic Press, 1988.

For Every Action, an Opposite Reaction

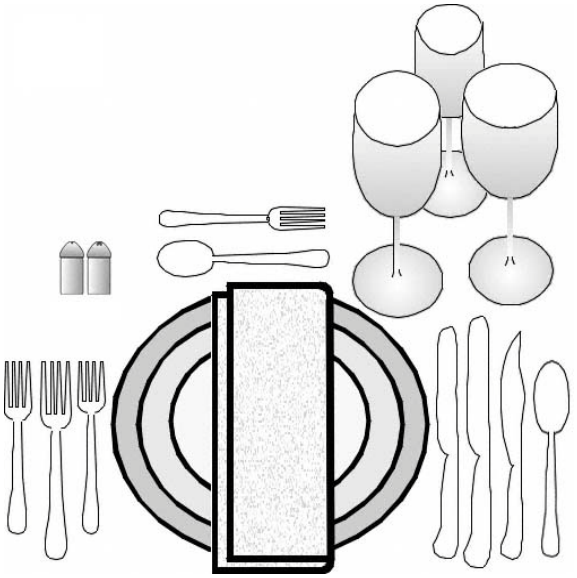
- Forcing functions lead to work-arounds
- Scanners lead to poor self-checking
- Alerts lead to alert fatigue
- Independent checks lead to co-dependency
- Decision support leads to poor critical thinking
- Giving report electronically leads to a loss of situational awareness

The X Factor

- Keeps the people of the system “in the game”
- Also known as:
  - Safety Culture or Performance Culture
  - Safety Behaviors or Behavior-Based Expectations
  - Mindfulness or the Rickover Effect
  - 00, Old-Fashioned Accountability
- Yields the genius of the AND
  - Speed and accuracy of automation
  - Thought and caring of humans
- Realizes the high reliability of the system

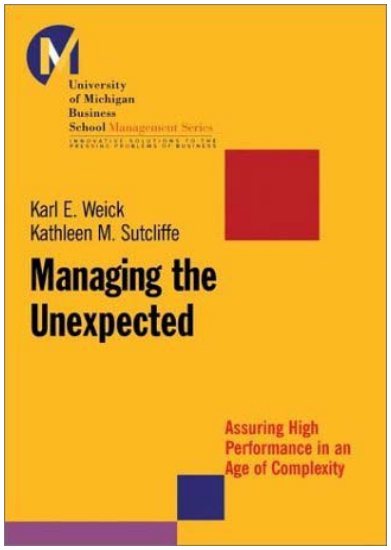
Set the Table

(above the plate. left to right): **bread & butter plate, butter knife, wine/water glass.**
(plate row. left to right): **napkin, salad fork, dinner fork, salad plate, plate, dinner knife.**



(above the plate. left to right): **salt & pepper, dessert fork & spoon, water/wine glasses.**
(plate row. left to right): **fish fork, dinner fork, salad fork, napkin, rim soup plate, plate, salad knife, dinner knife, fish knife, soup spoon.**

High-Reliability Organizations (HROs) "operate under very trying conditions all the time and yet *manage* to have fewer than their fair share of accidents."



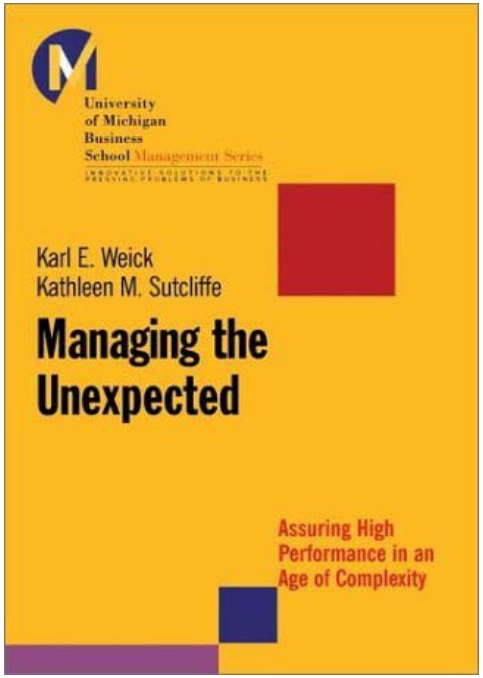
Managing the Unexpected
By Karl E Weick & Kathleen M Sutcliffe

Descriptive Theories

- Karl Weick & Kathleen Sutcliffe
  - *Managing the Unexpected*
- Rene Almaberti
  - *Cognitive Engineering in the Aviation Domain*
- Adm Hyman Rickover
  - *The Rickover Effect*

The Weick/Sutcliff 5

1. Preoccupation with failure
   Regarding small, inconsequential errors as a symptom that something is wrong; finding the half-event
2. Sensitivity to operations
   Paying attention to what's happening on the front-line
3. Reluctance to simplify
   Encouraging diversity in experience, perspective, and opinion
4. Commitment to resilience
   Developing capabilities to detect, contain, and bounce-back from events that do occur
5. Deference to expertise
   Pushing decision making down and around to the person with the most related knowledge and expertise



Sensitivity to Operations

- Paying attention to what's happening on the front line
- Anticipating problems and building a system of ongoing checks designed to spot expected as well as unexpected safety problems
- Acting to prevent human errors and to find and fix latent system problems that can lead to an event

Sensitivity to Operations

Basketball Hall of Fame
(as a player and a coach)
Four 30-0 perfect seasons
20 Pac-10 Championships
10 NCAA Championships
(7 of them consecutive)

His "secret" was preparation

"…little things make big things happen. It's putting your shoes on properly. It's getting the wrinkles out of your socks so you won't get blisters…."

John Robert Wooden
Stayed ready so he wouldn't have to get ready

Walking the Deck at Sentara

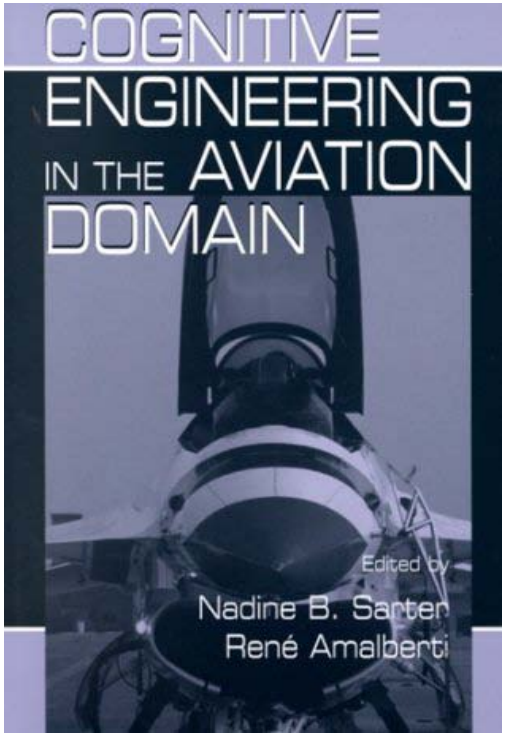
Walking-the-deck ensures that environment is ready to shape behavior

Walking the Deck

- Automated dispensing unit
- Red tiles indicate a quiet zone as in *sterile cockpit*
- CEO walking-the-deck challenges two conversing
- Finds (the hard way) a nurse preceptor
- CEO cautioned not to interrupt

The Amalberti 5

1. Accepting limits on discretionary actions (e.g., pilots and when it is OK to take off)
2. Abandoning autonomy (e.g., drivers aware of other drivers on the road … system effects)
3. Transitioning from a craftsmanship attitude to the principle of equivalent actor (e.g., anesthesiology vs. surgery)
4. Sharing residual risk along the vertical axis (how the hierarchy deals with failure)
5. Managing the visibility of risk (when effects of change cannot be observed)



Accepting Limits on Discretion

A-37 Dragon Fly

Ejection system
designed for altitude
and forward air speed.

Airman, US Air Force
Stuck with what he knew
was right – and lived.

Red Rules at Memorial Hermann

1. Patient Identification before patient care

2. Time-Out before invasive procedure

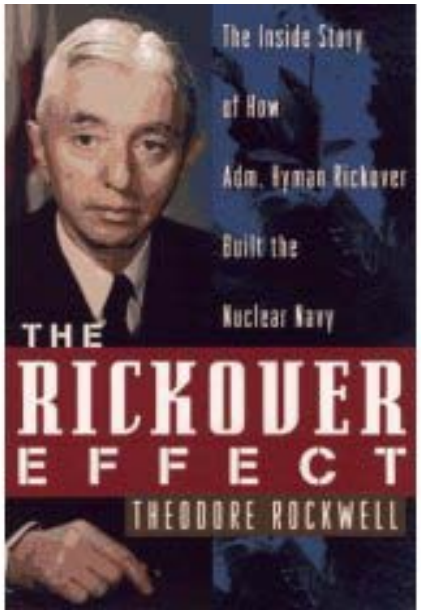
3. Two-Provider check before administration of high-risk medications, blood, and blood products

MEMORIAL® HERMANN
Breakthroughs every day

OPERATION BREAKTHROUGH
PATIENT SAFETY
BEST OF THE BEST

The Rickover 7

1. Rising Standards over Time – Much Greater than the Minimum Required
2. Highly Capable People Trained over Wide Range of Conditions
3. Leaders in Field Face Bad News - - - Mobilize Effort & Talent, Report Up
4. Healthy Respect for Dangers (of radiation)
5. Training Is Constant and Rigorous
6. All Functions Fit Together
7. Able & Willing to Learn from the Past

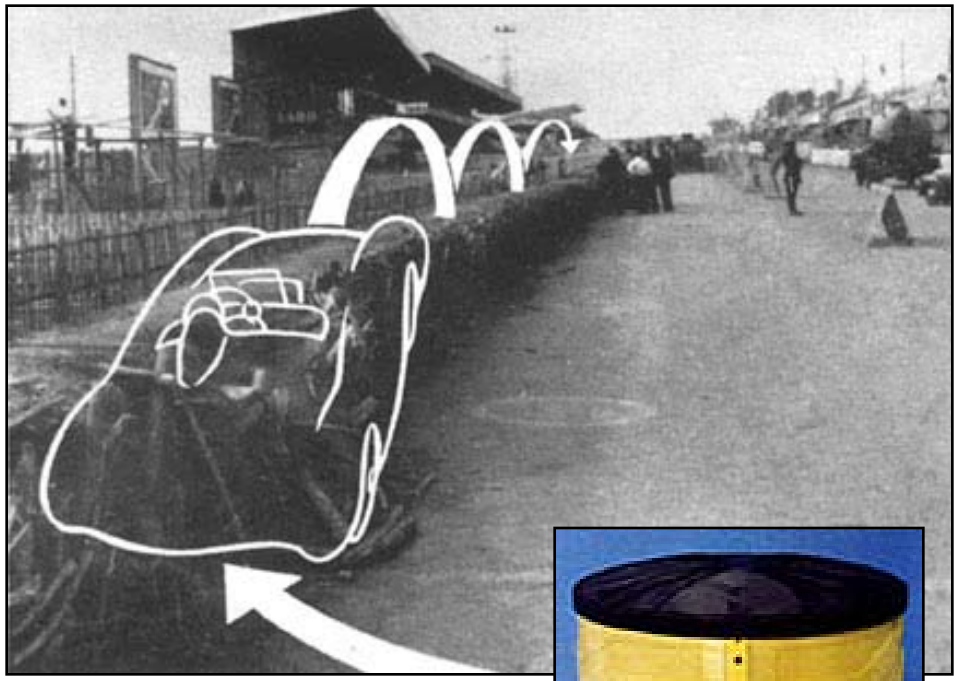


Learning from the Past

Le Mans, France 1955

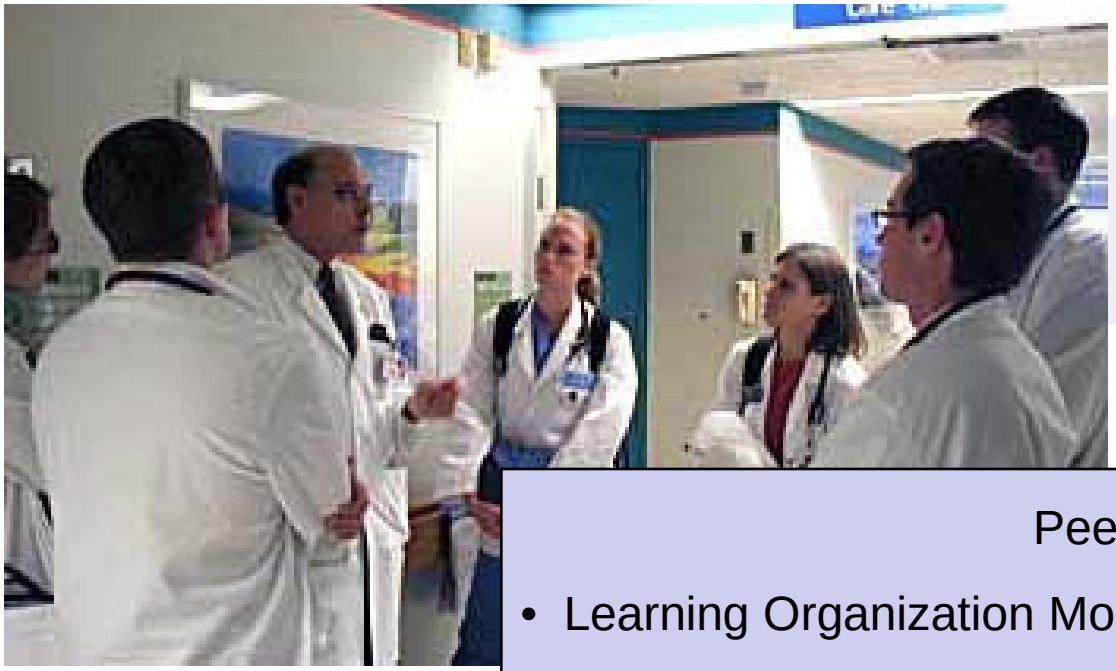
24-hour test on a 8.38-mile course

…. The hood decapitated tightly jammed spectators like a guillotine. The engine and front axle cut a swathe like an artillery barrage. And the car's magnesium body burst into flames like a torch, burning others to death. In a few searing seconds 82 people were dead and 76 were maimed….



John Cooper Fitch
chose not to quit

Peer Review at Pitt County

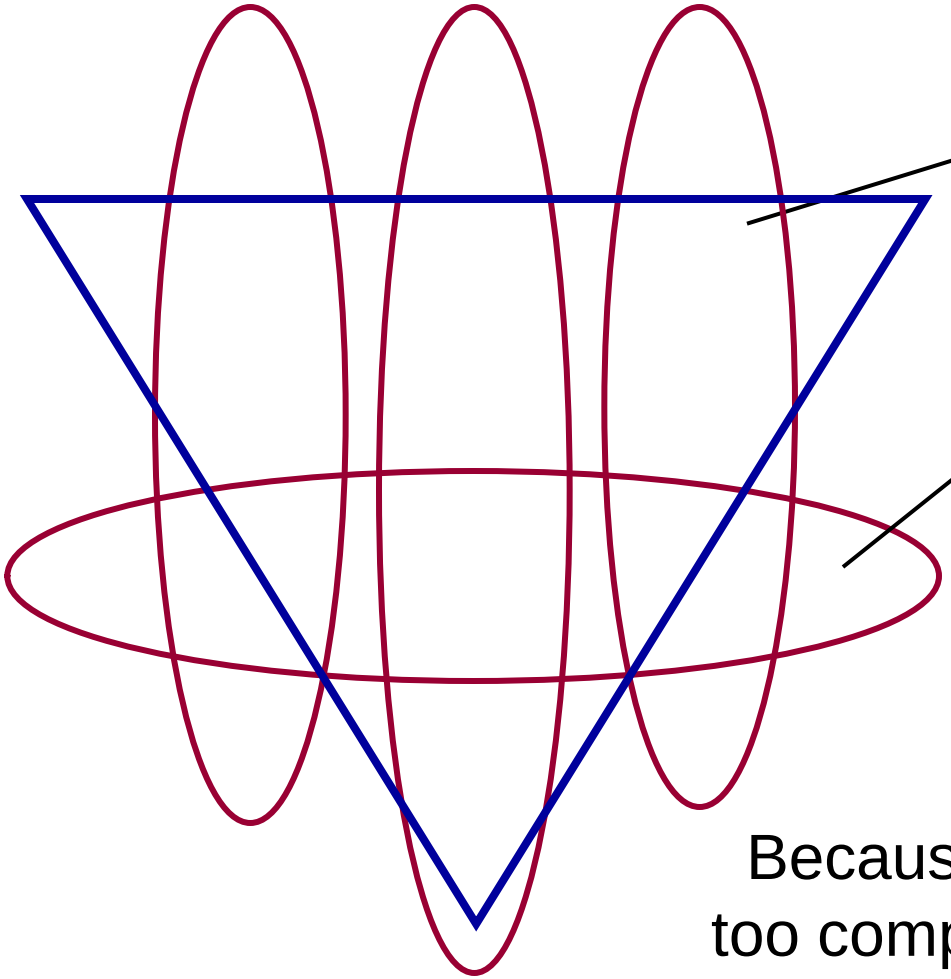


University Health Systems
Pitt County Memorial Hospital

Peer Review

- Learning Organization Model
- Analyze cases for inappropriate acts as in *apparent cause*
- *Rules, rates, and referred cases*
- Allows for aggregating analysis of system & people failures
- Less emphasis on floor (distance to minimum standard)
- More emphasis on ceiling (distance to best practice)

Two Complementary Strategies



Vertical Interventions

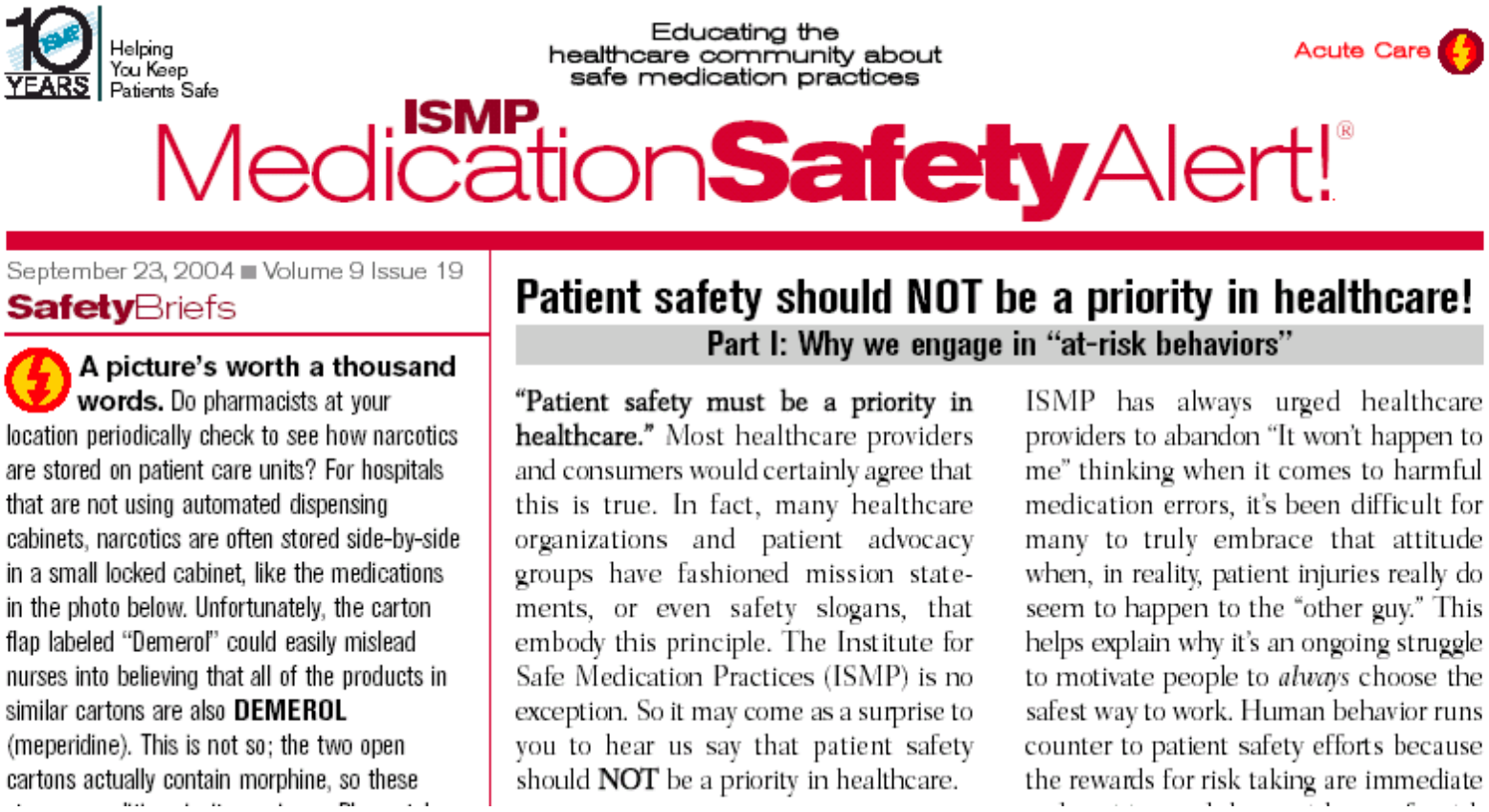
Process or Technology
(e.g., BPOC for med administration)

Horizontal Interventions

Culture or Environment
(e.g., Behavior-Based Expectations)

Because people-based systems are too complex to address all possibilities with a vertical intervention.

Set the Tone



10 YEARS ISMP Helping You Keep Patients Safe

Educating the healthcare community about safe medication practices

Acute Care

ISMP Medication Safety Alert!®

September 23, 2004 ■ Volume 9 Issue 19

SafetyBriefs

A picture's worth a thousand words. Do pharmacists at your location periodically check to see how narcotics are stored on patient care units? For hospitals that are not using automated dispensing cabinets, narcotics are often stored side-by-side in a small locked cabinet, like the medications in the photo below. Unfortunately, the carton flap labeled "Demerol" could easily mislead nurses into believing that all of the products in similar cartons are also **DEMEROL** (meperidine). This is not so; the two open cartons actually contain morphine, so these

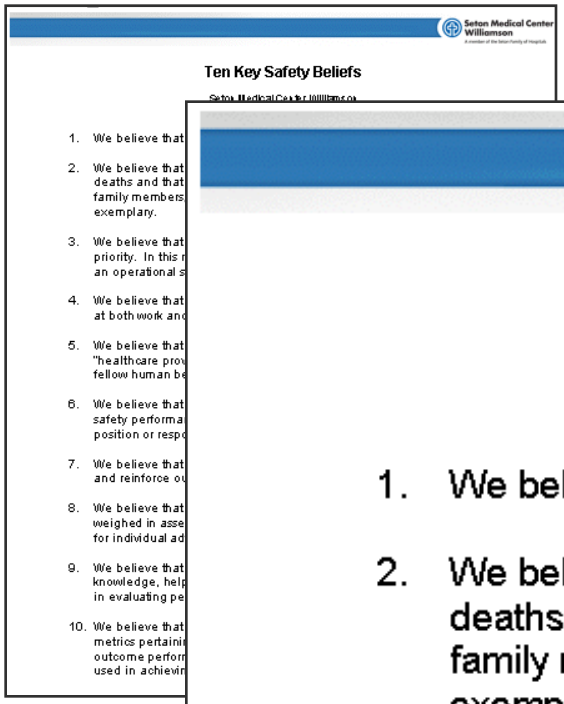
Patient safety should NOT be a priority in healthcare!

Part I: Why we engage in "at-risk behaviors"

"Patient safety must be a priority in healthcare." Most healthcare providers and consumers would certainly agree that this is true. In fact, many healthcare organizations and patient advocacy groups have fashioned mission statements, or even safety slogans, that embody this principle. The Institute for Safe Medication Practices (ISMP) is no exception. So it may come as a surprise to you to hear us say that patient safety should **NOT** be a priority in healthcare.

ISMP has always urged healthcare providers to abandon "It won't happen to me" thinking when it comes to harmful medication errors, it's been difficult for many to truly embrace that attitude when, in reality, patient injuries really do seem to happen to the "other guy." This helps explain why it's an ongoing struggle to motivate people to *always* choose the safest way to work. Human behavior runs counter to patient safety efforts because the rewards for risk taking are immediate

Safety as an *Explicit* Core Value



Seton Medical Center Williamson
A member of the Seton Family of Hospitals

Ten Key Safety Beliefs

Seton Medical Center Williamson
Mark Hazelwood, Chief Executive Officer

1. We believe that all injuries are preventable.
2. We believe that SMCW will achieve zero preventable injuries and deaths and that our overall safety performance pertaining to patients, family members, associates, physicians and volunteers will be exemplary.
3. We believe that safety is more important than any other competing priority. In this regard, we view safety as both a moral imperative and an operational standard.
4. We believe that safety must be "lived" 24 hours a day, 7 days a week at both work and home.

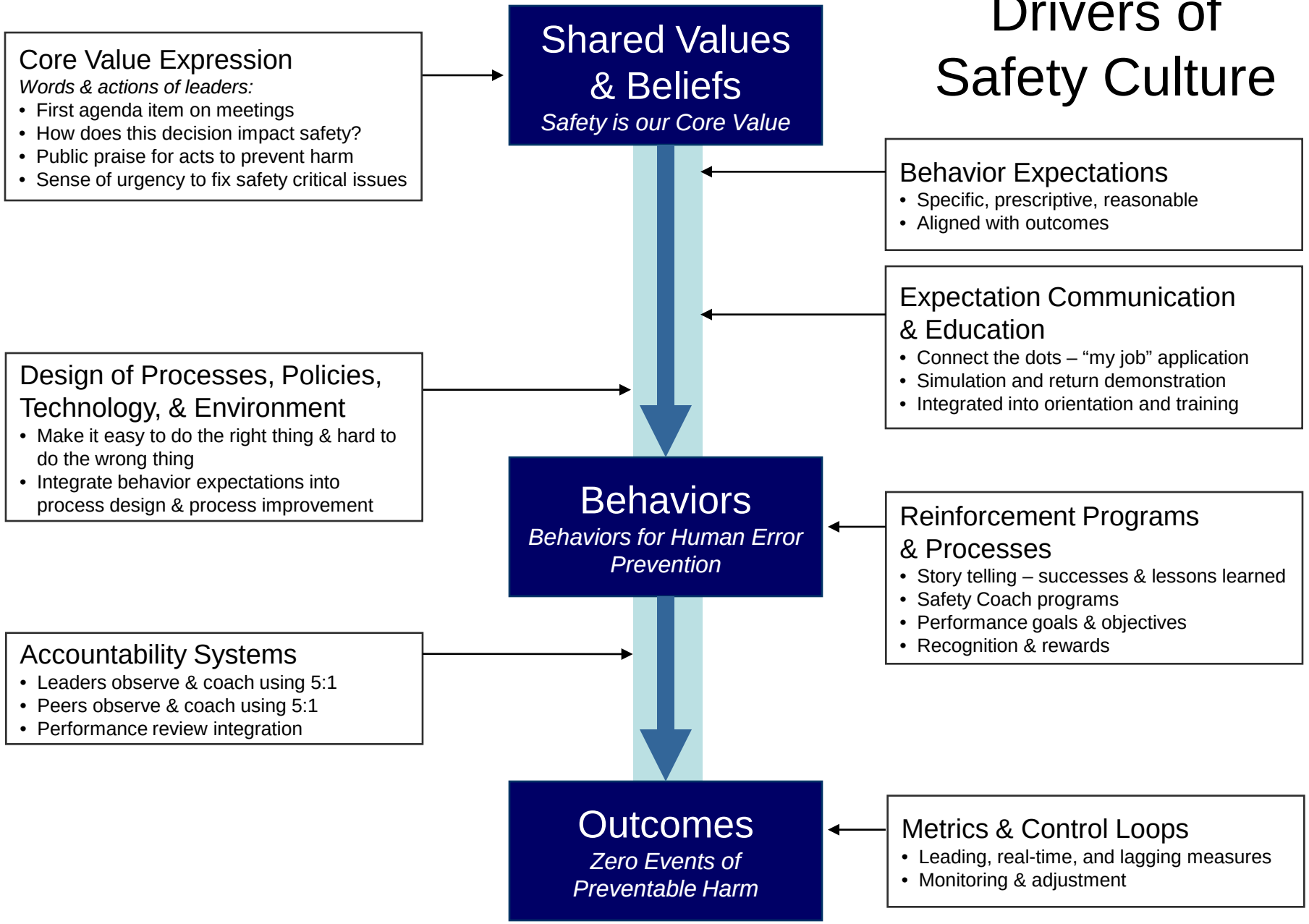
Mark L. Hazelwood
President & CEO
Seton Medical Center Williamson

HPI®

What Is Culture?

1) Styles as evidence by climate (Likert, 1967)
2) Group norms (Homans, 1950)
3) Espoused values (Deal & Kennedy, 1982)
4) Formal philosophy (Ouchi, 1981)
5) Shared meanings (Weick, 1995)
6) Rules of the game (Schein, 1978)
7) Habits of thinking, mental models (Douglas, 1986)
8) Observed behavioral regularities (Goffman, 1959)

Drivers of Safety Culture



Vertical Alignment

For example:

Vision — *Safest Hospital*

Mission & Goals — Zero events of harm

Policy & Programs — Infection prevention

Behavior Expectations — "Wash hands before & after"

- Soap & warm water
- 15-second scrub (sing "Happy Birthday")
- Paper towel to turn off faucet

Specific Tools & Techniques

Safety Culture Transformation

Step 1: **Set Expectations**

Define Safety Behaviors & Error Prevention Tools proven to help reduce human error

Step 2: **Educate**

Educate our staff and medical staff about the Safety Behaviors and Error Prevention Tools

Step 3: **Reinforce & Build Accountability**

Practice the Safety Behaviors and make them our personal work habits

Getting Started

1. Authentic “safety first” leadership
2. Safety Culture or Safety Climate assessment (to confirm a firm foundation)
3. Safety Governance assessment (to confirm functioning Accountability Systems)
4. Common Cause Analysis:
   a. Rule-out broken process(es) and knowledge & skill deficiencies as majority causes
   b. Select behaviors indicated by individual failure modes
5. Educate leaders, medical staff, and staff

Human Error Classification

Based on the Skill/Rule/Knowledge classification of Jens Rasmussen and the Generic Error Modeling System of James Reason

	Skill Based	Rule Based	Knowledge Based
Activity Type	Familiar, routine acts that can be carried out smoothly in an automatic fashion	Problem solving in a known situation according to set of stored "rules," or learned principles	Problem solving in new, unfamiliar situation for which the individual knows no rules – requires a plan of action to be formulated
Error Types	▪ Slips ▪ Lapses ▪ Fumbles	▪ Wrong rule ▪ Misapplication of a rule ▪ Non-compliance with rule	Formulation of incorrect response
Error Prevention Themes	Self checking – stop and think before acting	▪ Educate if wrong rule ▪ Think a second time if misapplication ▪ Non-compliance – reduce burden, increase risk awareness, improve coaching culture	Stop and find an expert
Error Probability	1:1000	1:100	3:10 *to* 6:10

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Sentara Error Prevention Toolbox

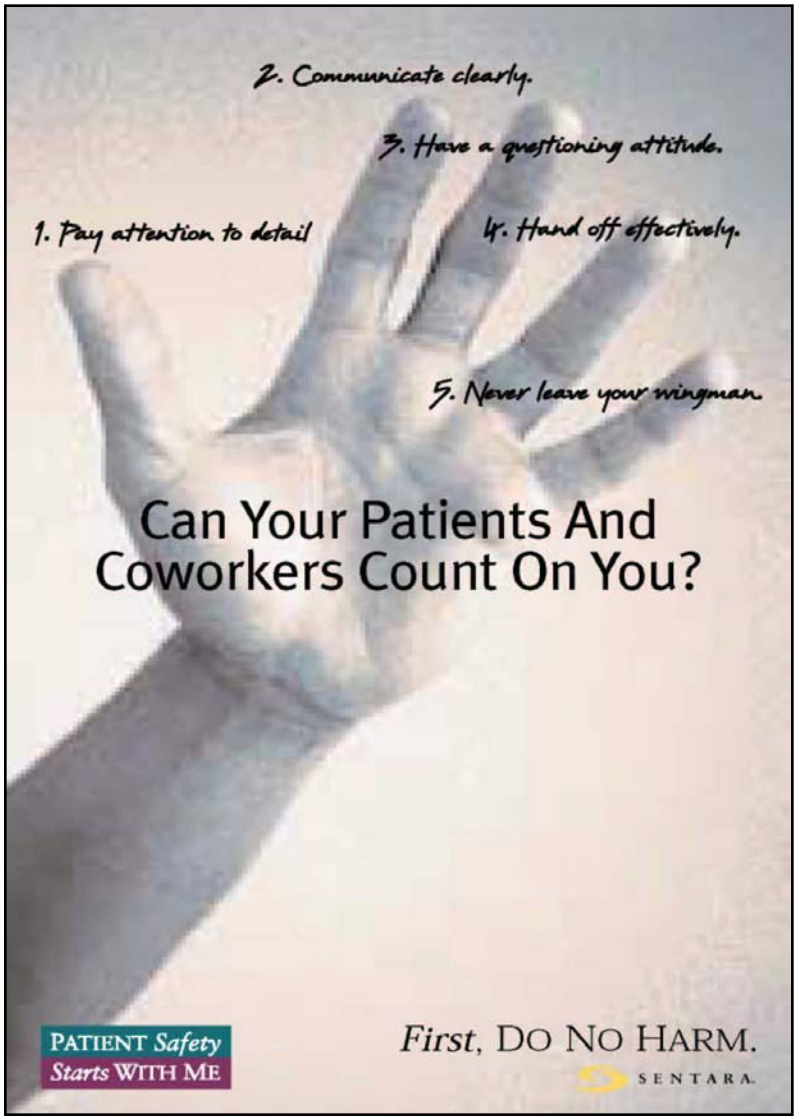
1. Pay Attention to Detail
   - STAR

2. Communicate Clearly
   - Repeat Backs & Read Backs
   - Clarifying Questions
   - Phonetic & Numeric Clarifications

3. Have a Questioning Attitude
   - Validate & Verification
   - Intelligent Compliance with Expectations

4. Handoff Effectively
   - 5Ps (Patient, Plan, Purpose, Problems, Precautions

5. Never Leave Your Wingman
   - Peer Checking
   - Peer Coaching



Self-Checking Using STAR

Stop: Pause one second to focus on what you are about to do

Think: Think about what you are about to do - is it the right thing?

Act: Concentrate and perform the task

Review: Check for the desired result

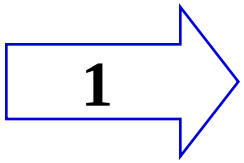
Self-Checking

The most effective way to avoid slips and lapses.

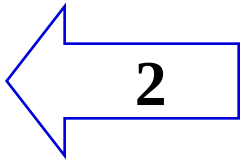
It takes ***only seconds*** and reduces the probability of making an error by a factor of 10 or MORE!

3 Way Repeat Back

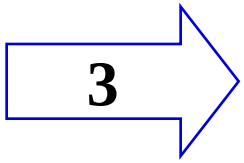
When information is transferred...



Sender initiates communication using Receivers Name. Sender provides an order, request, or information to Receiver in a clear & concise format.



Receiver acknowledges receipt by a repeat-back of the order, request, or information.



Sender acknowledges the accuracy of the repeat-back. If not correct, repeats the communication.

Clarifying Questions

Ask 1 to 2 clarifying questions

When in ***high-risk*** situations

When information is ***incomplete***

When information is ***ambiguous***

WHY: To reduce the probability of making a wrong assumption. Asking clarifying questions reduces the risk by 2 1/2 times!!

HOW: Phrase your clarifying questions in a positive way and in a manner that will get an answer that improves your understanding of the information

Phonetic Clarification

When communication involves a letter, say the letter followed by a word that begins with the letter. For example:

A	Alpha	N	November
B	Bravo	O	Oscar
C	Charlie	P	Papa
D	Delta	Q	Quebec
E	Echo	R	Romeo
F	Foxtrot	S	Sierra
G	Golf	T	Tango
H	Hotel	U	Uniform
I	India	V	Victor
J	Juliet	W	Whiskey
K	Kilo	X	X-Ray
L	Lima	Y	Yankee
M	Mike	Z	Zulu

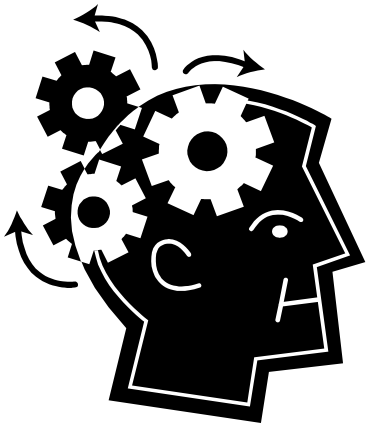
Numeric Clarification

Say the number by the digits:

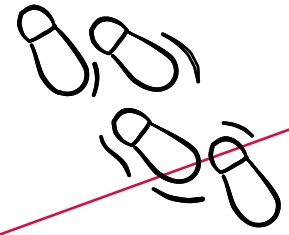
For 15 say “15, that’s one – five”

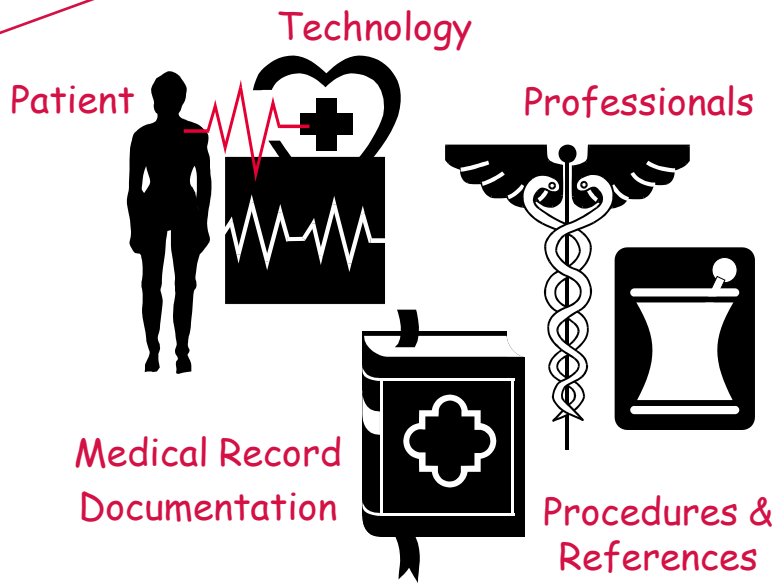
For 50 say “50, that’s five – zero”

Validate & Verify Technique



Validate: Does it make sense to me?





Verify: Check with an *independent, qualified* source

Speak-Up for Safety using ARCC

Use the lightest touch possible…

Ask a question

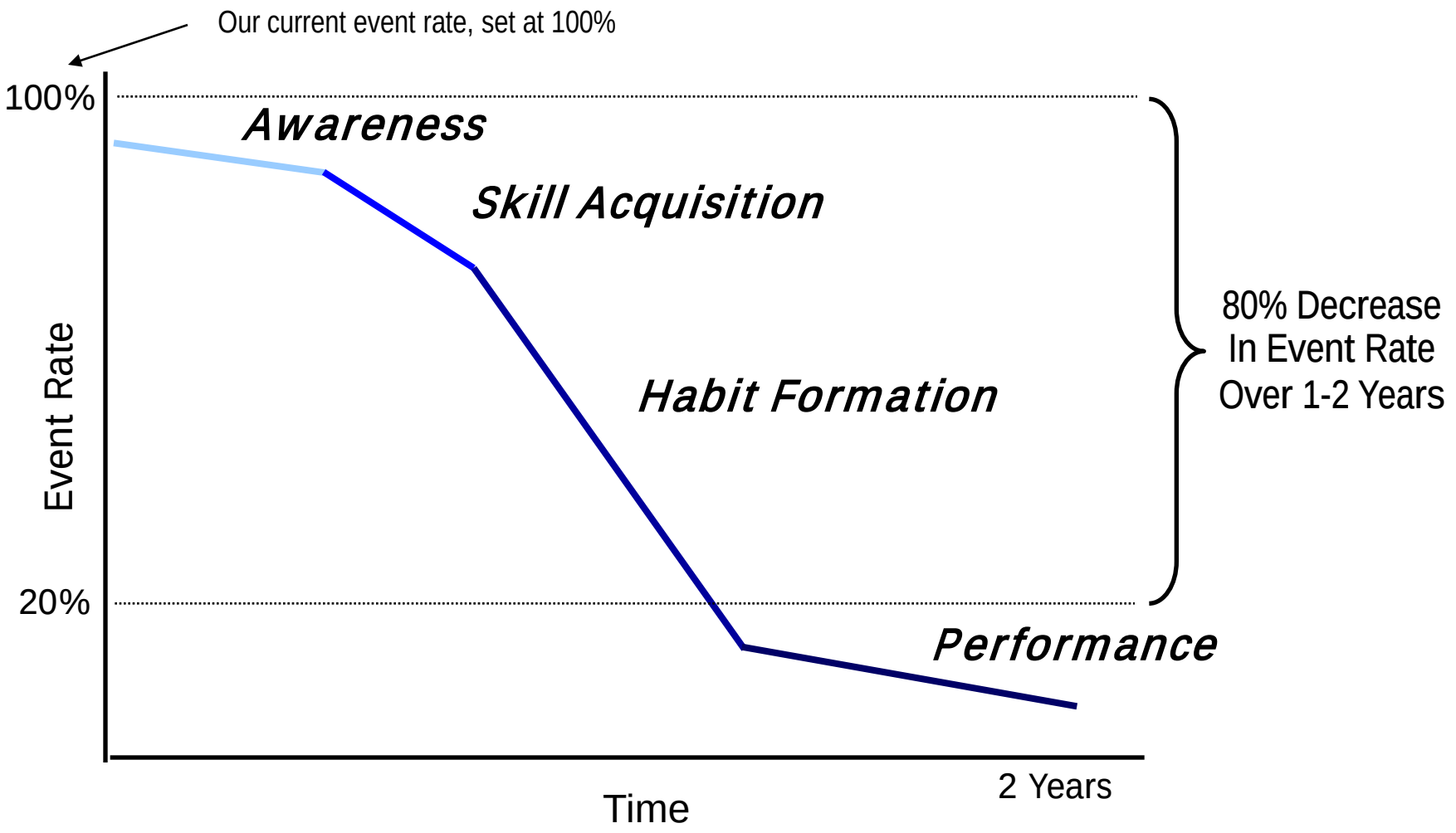
Request a change

Voice a Concern

Chain of command

When asserting, use a safe word such as concern or safety.
If not, then use chain of command.

Set the Pace


Our current event rate, set at 100%
100%
20%
Event Rate
Awareness
Skill Acquisition
Habit Formation
Performance
80% Decrease
In Event Rate
Over 1-2 Years
Time
2 Years

"Good ideas are not adopted automatically. They must be driven into practice with courageous impatience. Once implemented they can be easily overturned or subverted through apathy or lack of follow-up, so a continuous effort is required."

Admiral Hyman G. Rickover
1900-1986

Managing the *Uninspected*

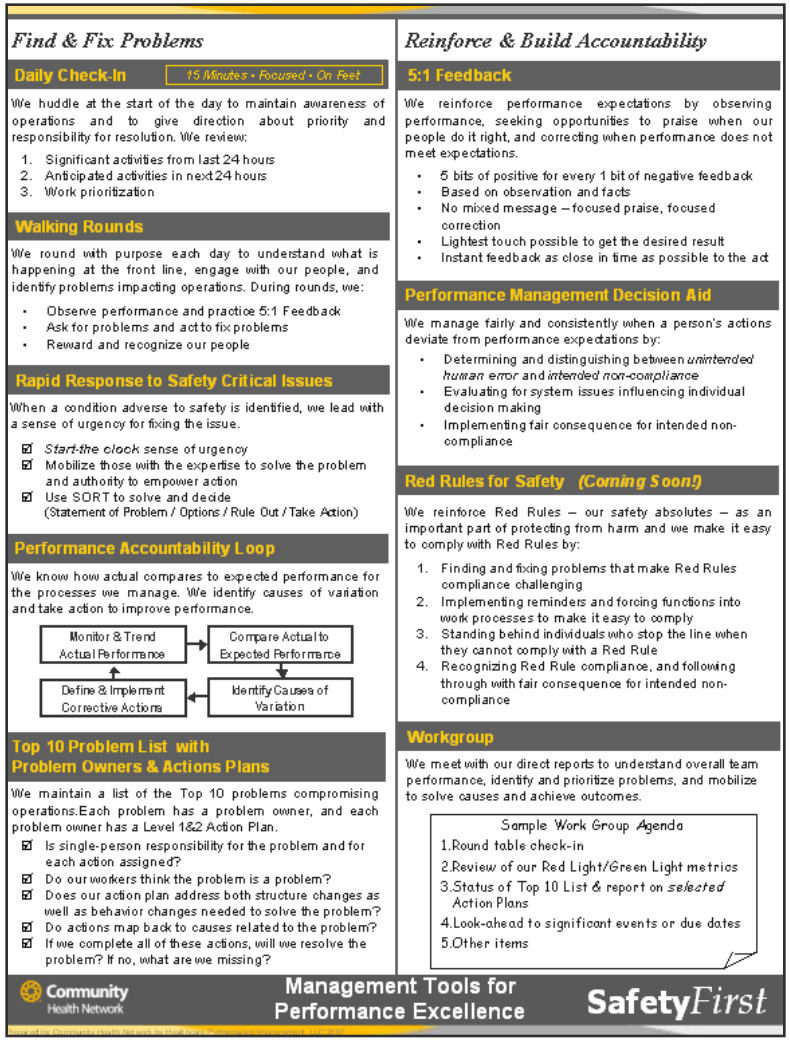
Queen Elizabeth II on June 2, 1953
First day on the job

Queen Elizabeth II in 2003
Still at it

HRO Lesson: You get what you inspect – not what you expect.

Management Method

Structure + Deliverables + Measurement = Accountability



Find & Fix Problems

Daily Check-In — 15 Minutes • Focused • On Feet

We huddle at the start of the day to maintain awareness of operations and to give direction about priority and responsibility for resolution. We review:

1. Significant activities from last 24 hours
2. Anticipated activities in next 24 hours
3. Work prioritization

Walking Rounds

We round with purpose each day to understand what is happening at the front line, engage with our people, and identify problems impacting operations. During rounds, we:

- Observe performance and practice 5:1 Feedback
- Ask for problems and act to fix problems
- Reward and recognize our people

Rapid Response to Safety Critical Issues

When a condition adverse to safety is identified, we lead with a sense of urgency for fixing the issue.

- ☑ *Start-the clock* sense of urgency
- ☑ Mobilize those with the expertise to solve the problem and authority to empower action
- ☑ Use SORT to solve and decide (Statement of Problem / Options / Rule Out / Take Action)

Performance Accountability Loop

We know how actual compares to expected performance for the processes we manage. We identify causes of variation and take action to improve performance.

Top 10 Problem List with Problem Owners & Actions Plans

We maintain a list of the Top 10 problems compromising operations. Each problem has a problem owner, and each problem owner has a Level 1&2 Action Plan.

- ☑ Is single-person responsibility for the problem and for each action assigned?
- ☑ Do our workers think the problem is a problem?
- ☑ Does our action plan address both structure changes as well as behavior changes needed to solve the problem?
- ☑ Do actions map back to causes related to the problem?
- ☑ If we complete all of these actions, will we resolve the problem? If no, what are we missing?

Reinforce & Build Accountability

5:1 Feedback

We reinforce performance expectations by observing performance, seeking opportunities to praise when our people do it right, and correcting when performance does not meet expectations.

- 5 bits of positive for every 1 bit of negative feedback
- Based on observation and facts
- No mixed message – focused praise, focused correction
- Lightest touch possible to get the desired result
- Instant feedback as close in time as possible to the act

Performance Management Decision Aid

We manage fairly and consistently when a person's actions deviate from performance expectations by:

- Determining and distinguishing between *unintended human error* and *intended non-compliance*
- Evaluating for system issues influencing individual decision making
- Implementing fair consequence for intended non-compliance

Red Rules for Safety *(Coming Soon!)*

We reinforce Red Rules – our safety absolutes – as an important part of protecting from harm and we make it easy to comply with Red Rules by:

1. Finding and fixing problems that make Red Rules compliance challenging
2. Implementing reminders and forcing functions into work processes to make it easy to comply
3. Standing behind individuals who stop the line when they cannot comply with a Red Rule
4. Recognizing Red Rule compliance, and following through with fair consequence for intended non-compliance

Workgroup

We meet with our direct reports to understand overall team performance, identify and prioritize problems, and mobilize to solve causes and achieve outcomes.

Sample Work Group Agenda
1. Round table check-in
2. Review of our Red Light/Green Light metrics
3. Status of Top 10 List & report on *selected* Action Plans
4. Look-ahead to significant events or due dates
5. Other items

Community Health Network — Management Tools for Performance Excellence — SafetyFirst

5:1 Feedback
Culpability Determination
Daily Check-In
Walking Rounds
Control Loops
Pre-Job Briefs
After-Action Reviews
Start-the-Clock Rapid Response
Top 10 Problem List
Level 1&2 Action Plans

"Attention is the currency of leadership."

Ronald Heifetz
Director of the Leadership Education Project
Harvard University's John F. Kennedy School of Government

Nuclear-Powered Safety Evaluation*

A licensee shall…amend (the license)… prior to implementing a proposed change, test, or experiment if the change, test, or experiment would:

- Increase frequency of occurrence of an accident previously evaluated,
- Increase likelihood of a malfunction previously evaluated,
- Increase consequences of an accident previously evaluated,
- Increase consequences of a malfunction previously evaluated,
- Create a possibility for an accident of a different type,
- Create a possibility for a (new) malfunction of an SSC important to safety,
- Result in a design basis limit being exceeded or altered; or
- Result in a departure from a method of evaluation.

* The 50.59 Rule (10CFR50.59)

Commitments to Safety First at VCU

Safety First Every Day.

Safety First Leadership Team Commitments

1. Put safety first on every meeting agenda
2. Take the “Safety First Introduction and Diagnostics” presentation on the road to share with key groups of managers and staff
3. Ask questions about system failure modes during discussions about safety events and near misses and during Leadership Safety Rounds

VCU Medical Center
Virginia Commonwealth University
Every Day, A New Discovery.

Safety First Every Day.

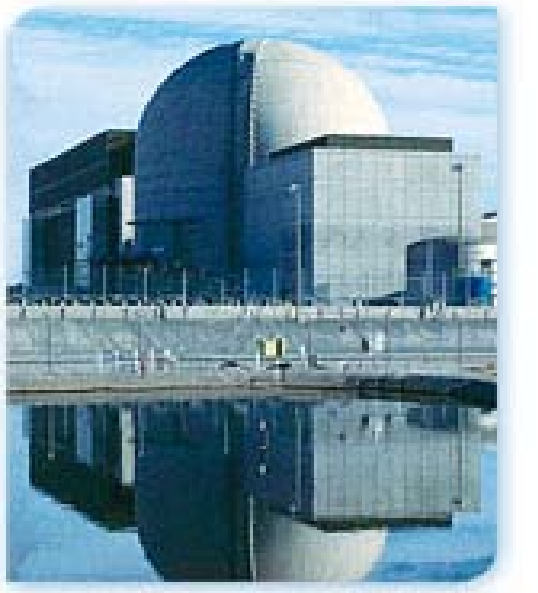
Safety First Leadership Team Commitments

4. Link decisions to safety: When describing decisions to staff and managers, relate them to safety when appropriate
5. Encourage reporting of near miss events in the PSN
6. Recognize staff who “raised the safety question” including physically going to the work unit to recognize individual staff member(s)

VCU Medical Center
Virginia Commonwealth University
Every Day, A New Discovery.

Plan-of-the-Day Meeting in the Nuclear Power Industry

1-hour meeting of operational leadership for providing situational awareness of plant operations and command and control for issue prioritization, ownership, and resolution



Palo Verde Nuclear Generating Station
Pressurized water reactor

Agenda

- Emergent safety issues
- Status of Top 10 Problem List
- Routine reports (operations priorities, operations workarounds, alarms not working, alarms locked-in, temporary modifications)
- Priorities for the day

Daily Check-In/Huddle
to share situational awareness

Start-of-Shift Huddle

…plan of the day, critical patients, staffing status, out-of-the-ordinary events

Daily Check-In Meeting

…last 24 hours/next 24 hours, patient safety issues, staffing status, facility issues

…share situational awareness, plan of the day

…15 minutes, standing in the CNE's office

HRO Lesson: Leaders need structure.

Critical Questions

Get Ready to Get Ready

Consider yourself and ask others:

1. Do we have any high-risk patients or procedures?
2. Do we anticipate any non-routine procedures or tasks?
3. Are we dealing with any situations or conditions that distract our ability to focus or think critically about our patients?
4. Are there any safety issues that I know about that may impact other departments?
5. Do I have any deficiencies in information, equipment, supplies, or staff that will make it hard to deliver safe, high quality care?

If any of the above…

What actions will I take to make this a safe day?

If no issues…

We have what it takes to

Create a Safe Day

At Helen DeVos Children's Hospital

What must be changed or added to make this work for your hospital?

Rounding to Influence Script

Greeting *Hello! Do you have a few minutes for a brief conversation about _____”*

Core Value	❑ Relate to our core value of safety protecting patients and employees from harm. ❑ Tell a story or share facts.
Can Do’s	❑ Review practice expectations and share facts.
Concerns	❑ Ask, “What makes this hard to do?”
Commitment	❑ Ask for a personal commitment: ✓ do it yourself ✓ help others do it ✓ STOP if you see a safety risk

Rounding Benefits

- Improved leader awareness of issues facing the front line – provides mental organization at the start of the day
- Improved accountability for problem resolution – owners are assigned and action plans are expected
- Increased timeliness of problem resolution
- Provides opportunity to employee recognition
- Bridges the blunt end/sharp end disconnect – employees know that the senior leaders know what's happening on the front line

"It saves me time."

Genemarie McGee, RN, Nurse Executive
Sentara Leigh Hospital

Making Feedback Work

- Positive x 5
- Immediate (consequence)
- Certain (consequence)

- Negative
- Future (consequence)
- Uncertain (consequence)

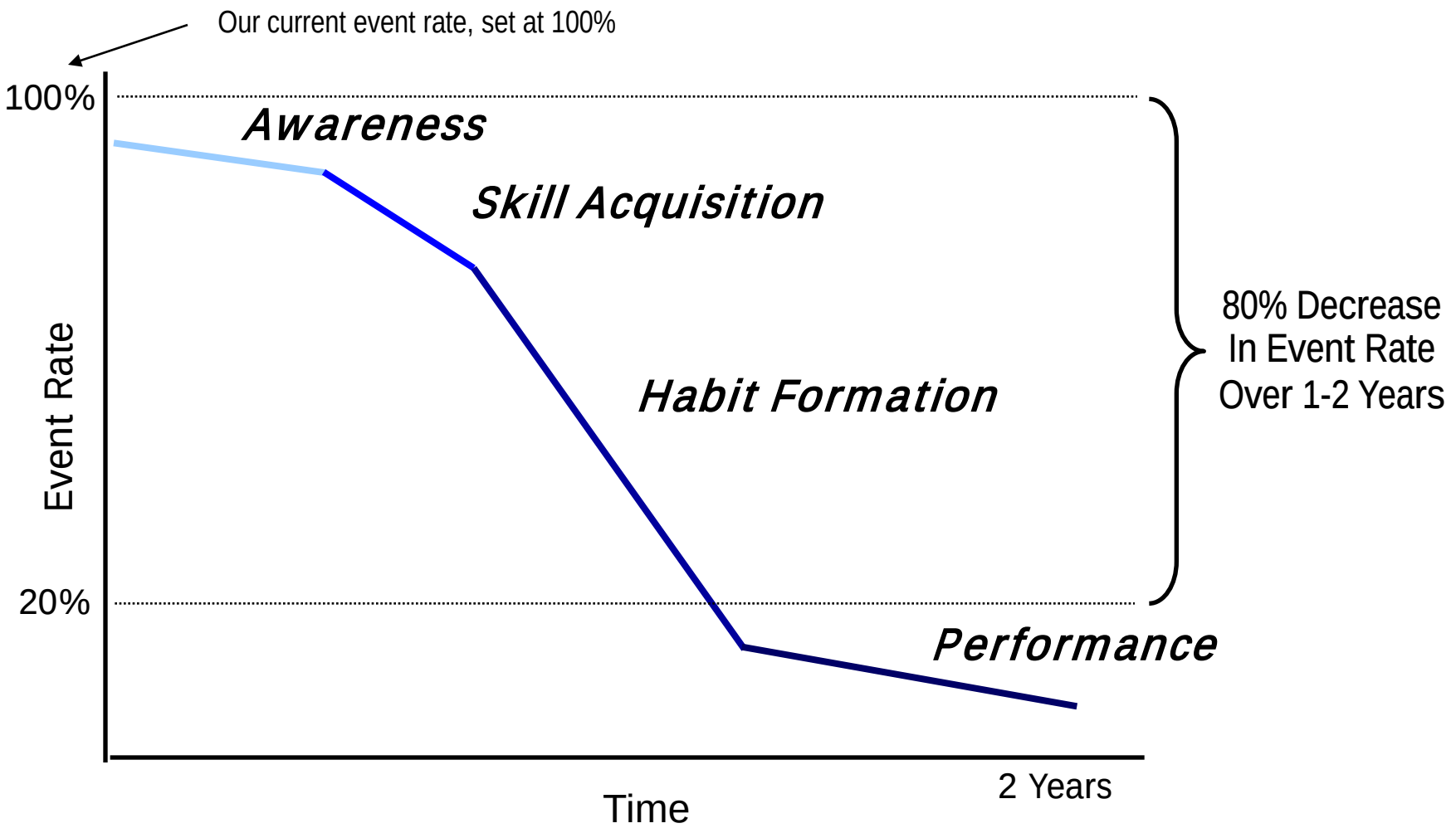
Top Positive Reinforcements
1. Head nod
2. Yes
3. Thank you

Top Negative Reinforcements
1. Furrowed brow
2. No
3. Practice tip (a 2 for 1)

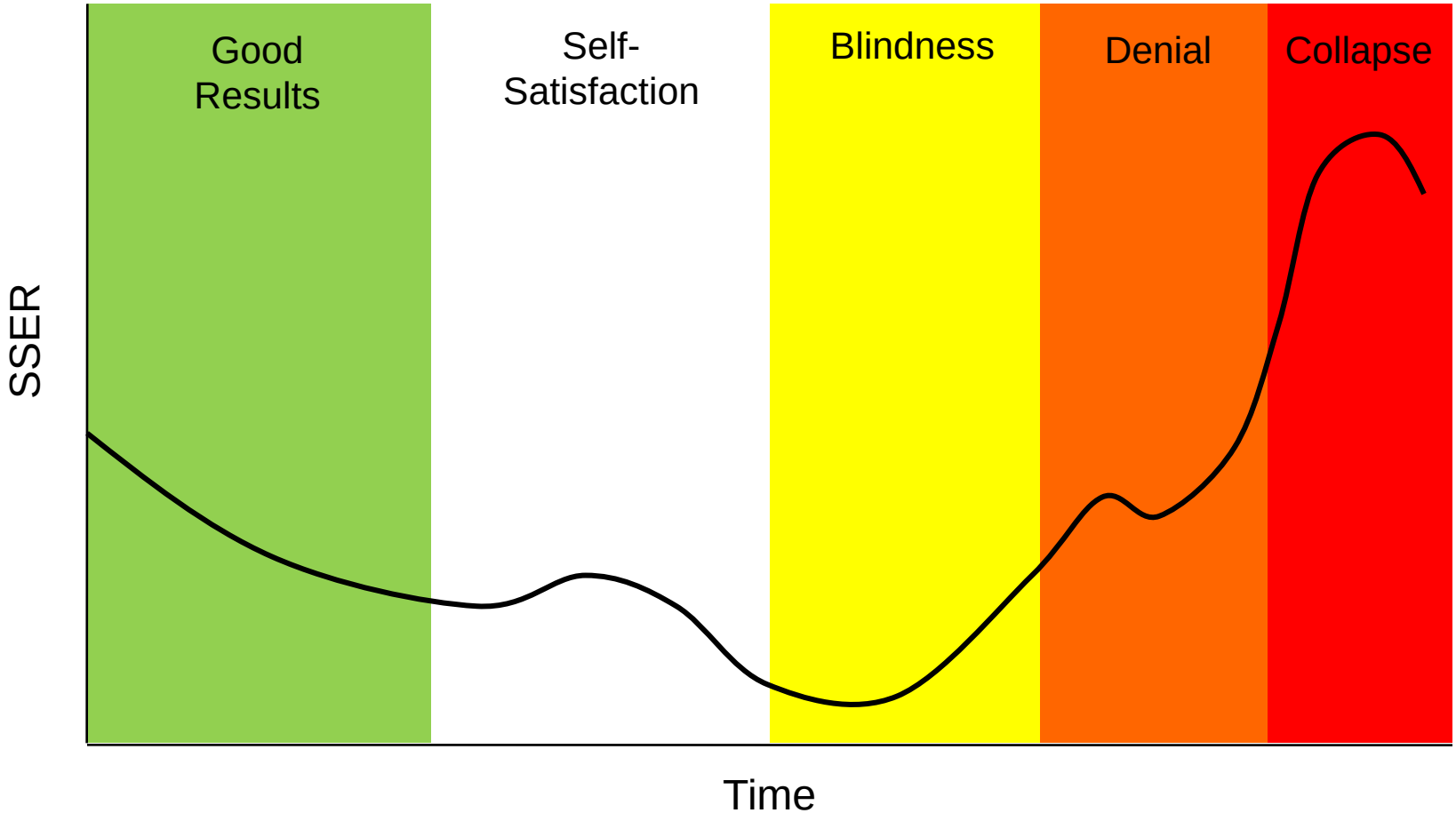
When verbal, link the result to the behavior. Example: the nurses work well with you as a physician because you are active listener.

Adapted from *Bringing Out the Best in People,* Dr Aubrey Daniels, 1994

Set the Pace

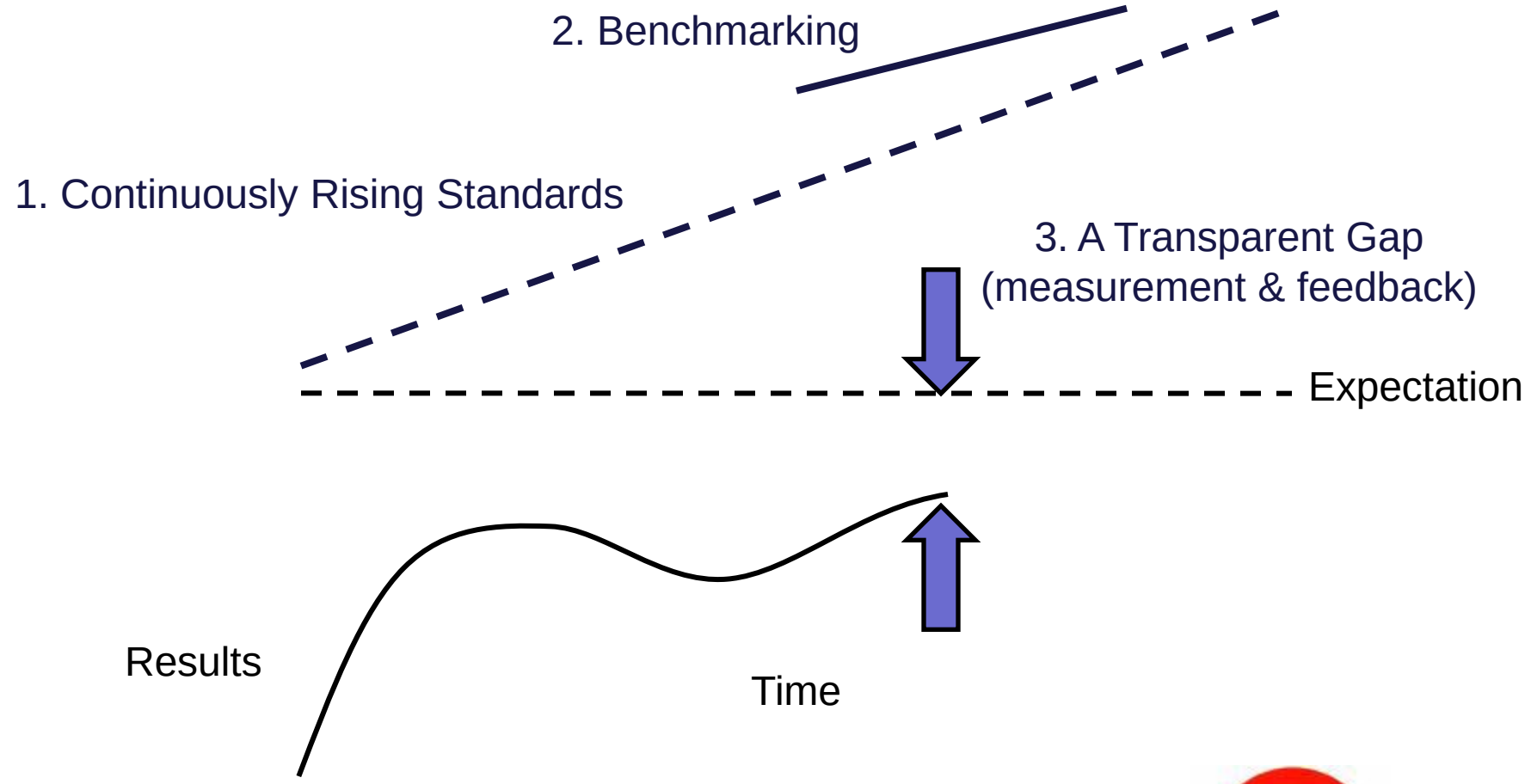

Our current event rate, set at 100%
100%
20%
Event Rate
Awareness
Skill Acquisition
Habit Formation
Performance
80% Decrease
In Event Rate
Over 1-2 Years
Time
2 Years

Five Stages of Complacency



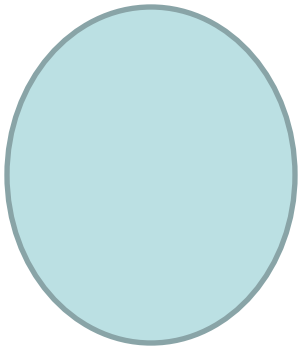
Adapted from *Dr Chong Chiu*,
Performance Improvement International, 1997

Three Complacency Breakers

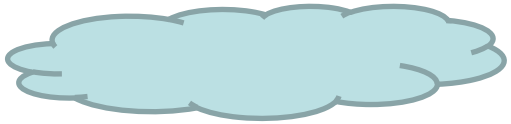


HRO Lesson: Progress is leaders creating gaps.

Lewin Unfreeze-Refreeze Model



Unfreeze



Transform

Refreeze

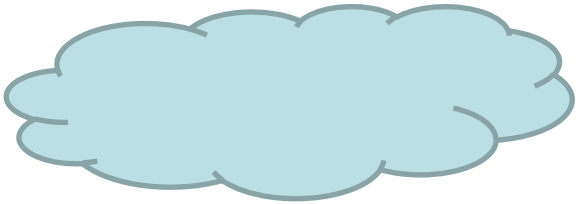
B = f(P,E)

Behavior is a function of people & environment

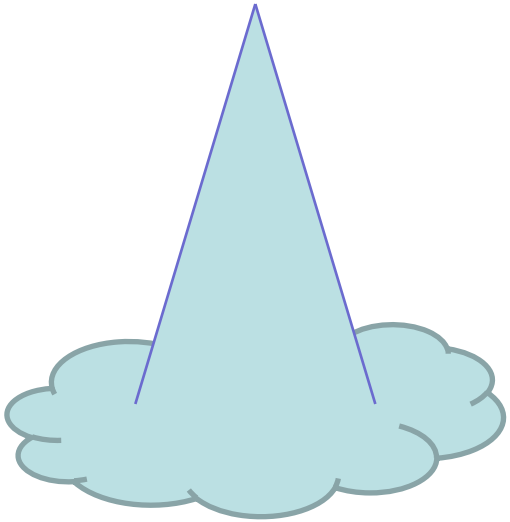
Kurt Zadek Lewin (1890 - 1947)

Principles of Topological Psychology, 1936.

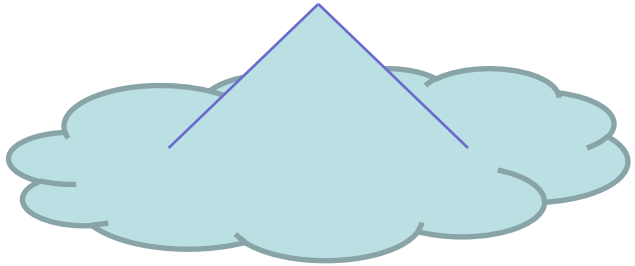
Slushiness



Slush



Transformed Slush



Back to Slush

A proposed solution

Containment:
Give the slush structure

Sustaining the Containment

Culture = Input + Efforts – Drift – Output

- Sustainment
- New people
- Actions to change
- Return to comfort
- Turnover

Five for Containment

- Cope with Turnover
  1. CEO and medical staff leaders: select for commitment, get the board on board as influencers
  2. Change agent(s): make redundant & diverse, use a Patient Safety Leadership Team (PSLT)
  3. Staff: train in orientation and make mandatory for appointment, manage their first care experience
- Slow the Drift
  4. Leaders need structure: use more leader structures (Check-In, Work Group, etc) and use fewer behaviors
  5. Staff need cross-monitoring: make peer checking the core of the safety culture behaviors

Deep Dive on New Leaders

During transformation, leaders select new culture.

In sustainment, culture selects new leaders.

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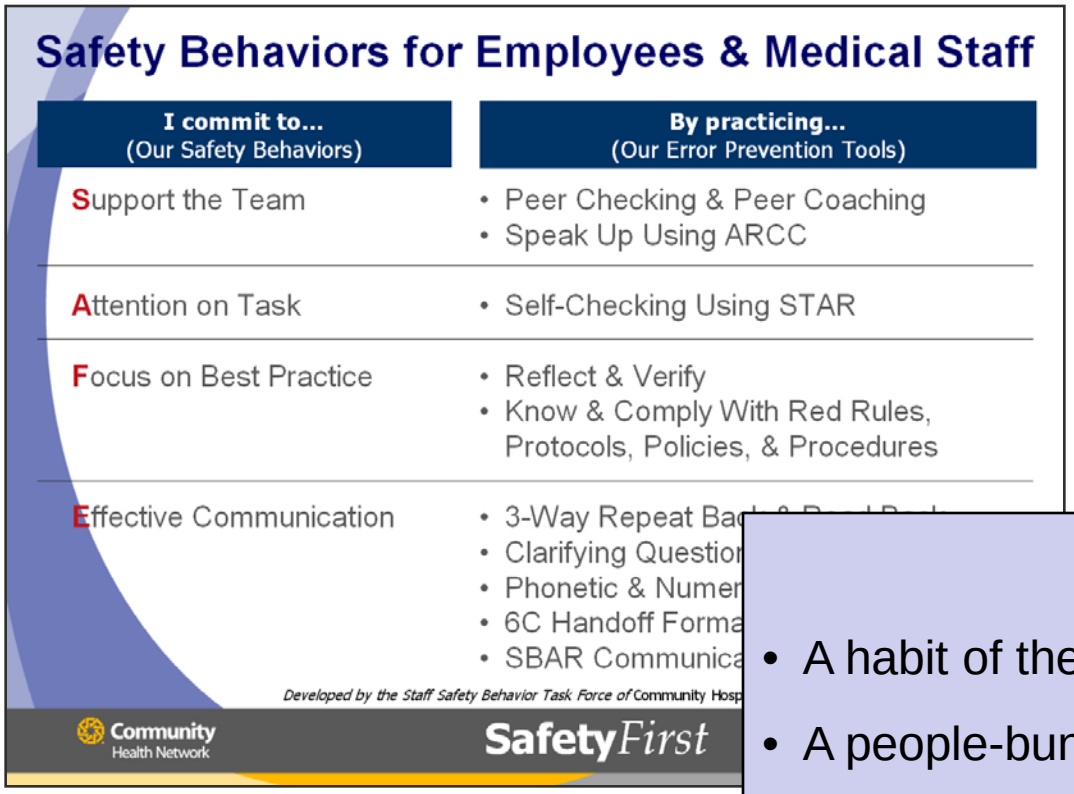
Select new leaders from those who get the right results using the right methods.

HRO Lesson: Culture selects leaders.

Deep Dive on Drift

- Leader Structure
  - Daily Check-In
  - Start the Clock
  - Rounding to Influence
  - Work Group with Top 10 and Action Plans
- Cross-Monitoring
  - Cross-Monitoring at Community Health Network
  - Rapid Cycle Feedback

Cross-Monitoring at Community



Ventilator-Associated Pneumonia

50% mortality rate

ZERO cases @ 56mo

Cross-Monitoring

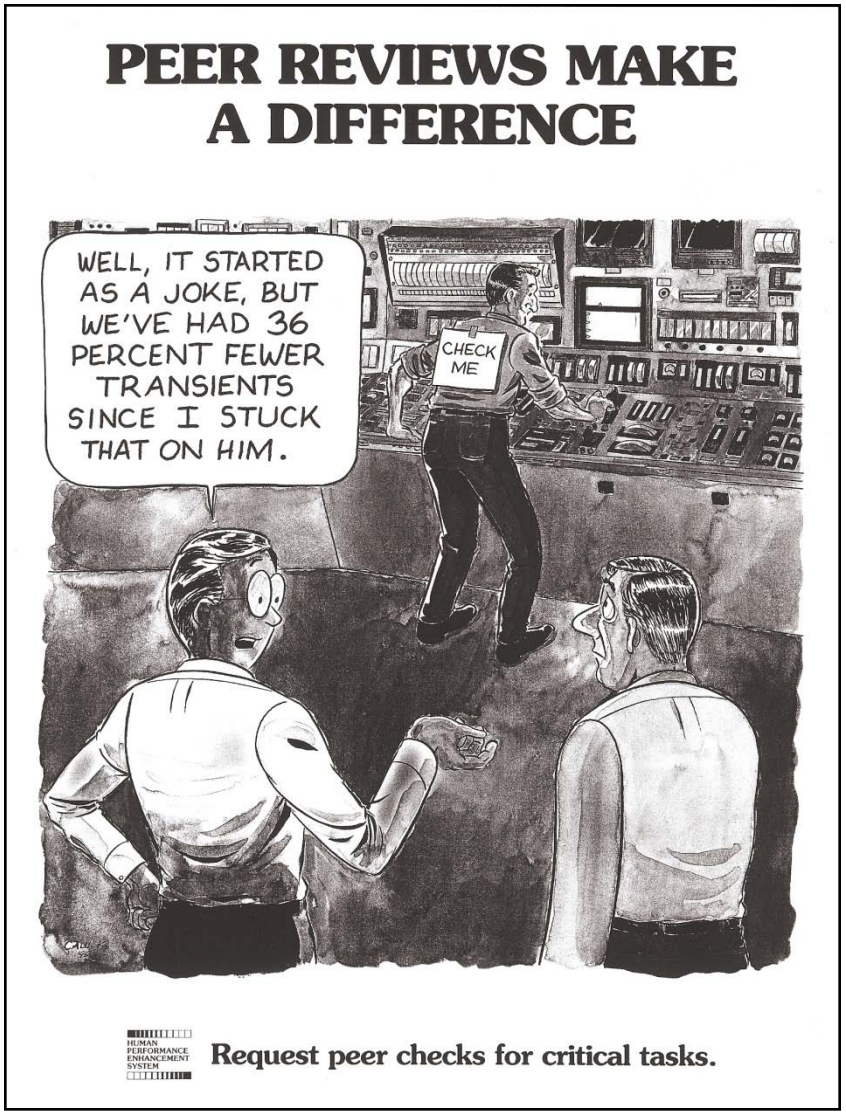
- A habit of the mind
- A people-bundle to make clinical bundles work
- Shown here as Peer Checking & Peer Coaching
- Checking prevents slips & lapses
- Coaching prevents *drift* as in *broken windows*

HRO Lesson: Staff will drift.

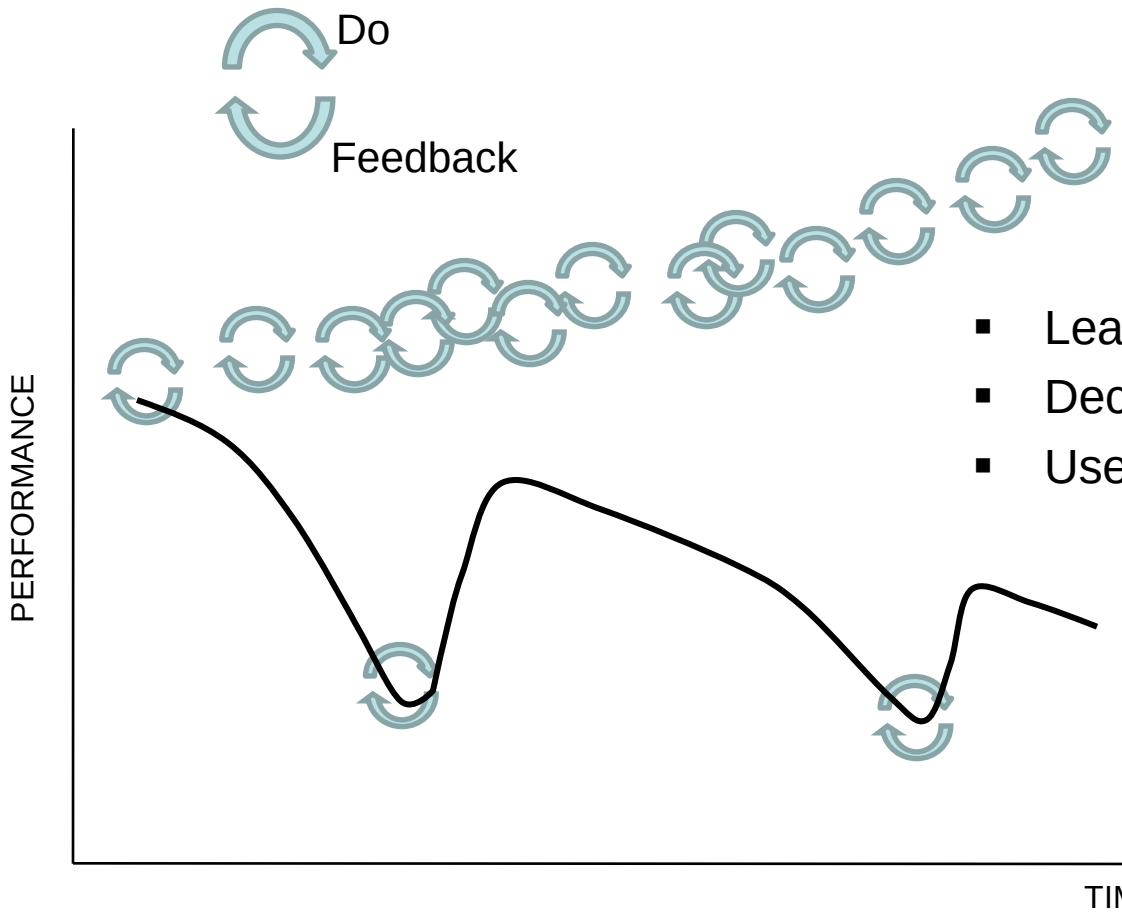
Help Me, Please

Peer Checking
Watching-out for each other. Peers share situational awareness and provide on-the-spot second opinions.

Peer Coaching
Involves feedback. Peers provide a 5:1 ratio of positive to negative feedback to reinforce good habits, extinguish poor habits, and build better practice habits.

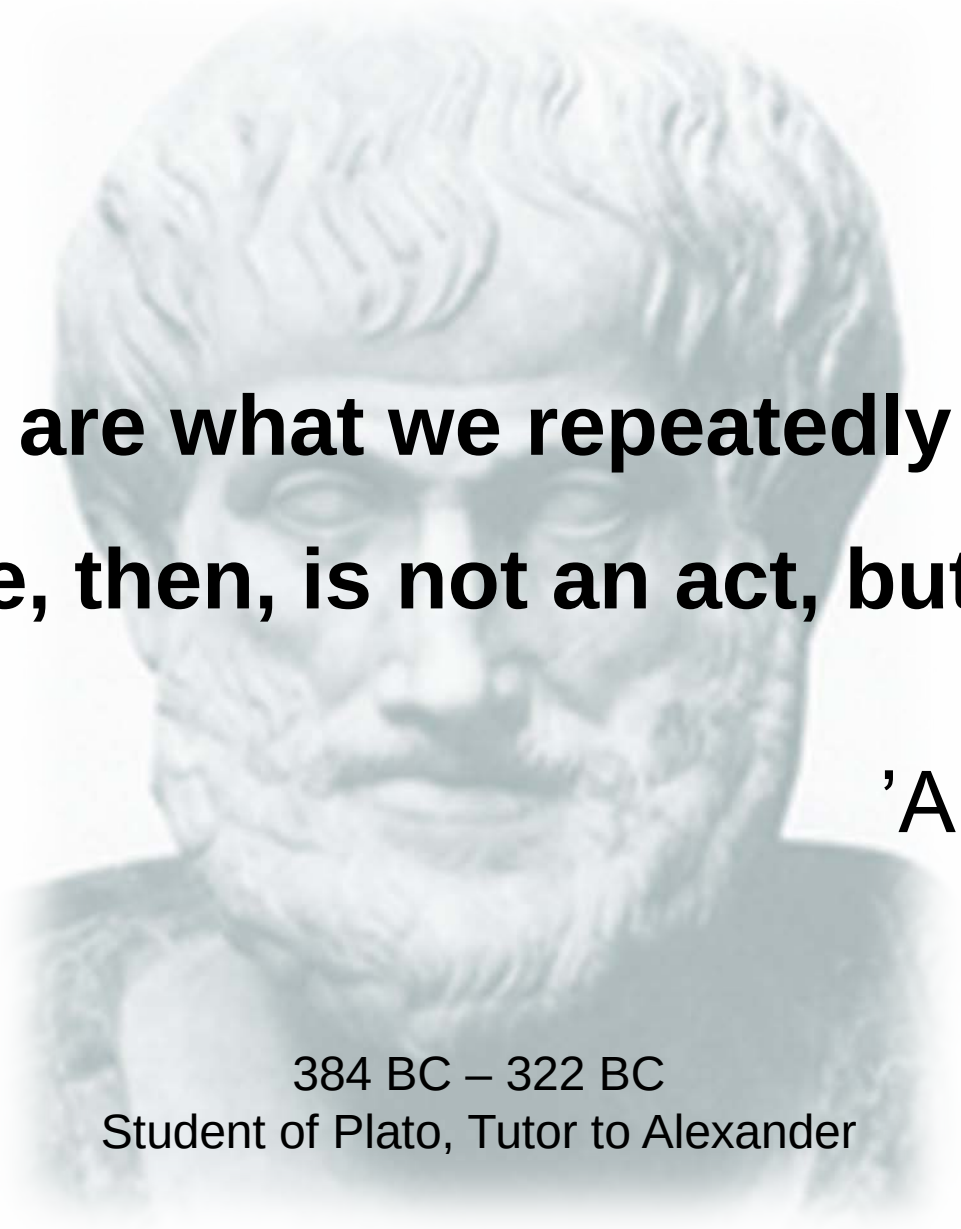


Rapid Cycle Feedback



- Learning is doing with feedback
- Decrease cycle time for feedback
- Use brief, execute, debrief (BED)

HRO Lesson: Staff will drift.



“We are what we repeatedly do.

Excellence, then, is not an act, but a habit.”

’Αριστοτέλης

384 BC – 322 BC
Student of Plato, Tutor to Alexander