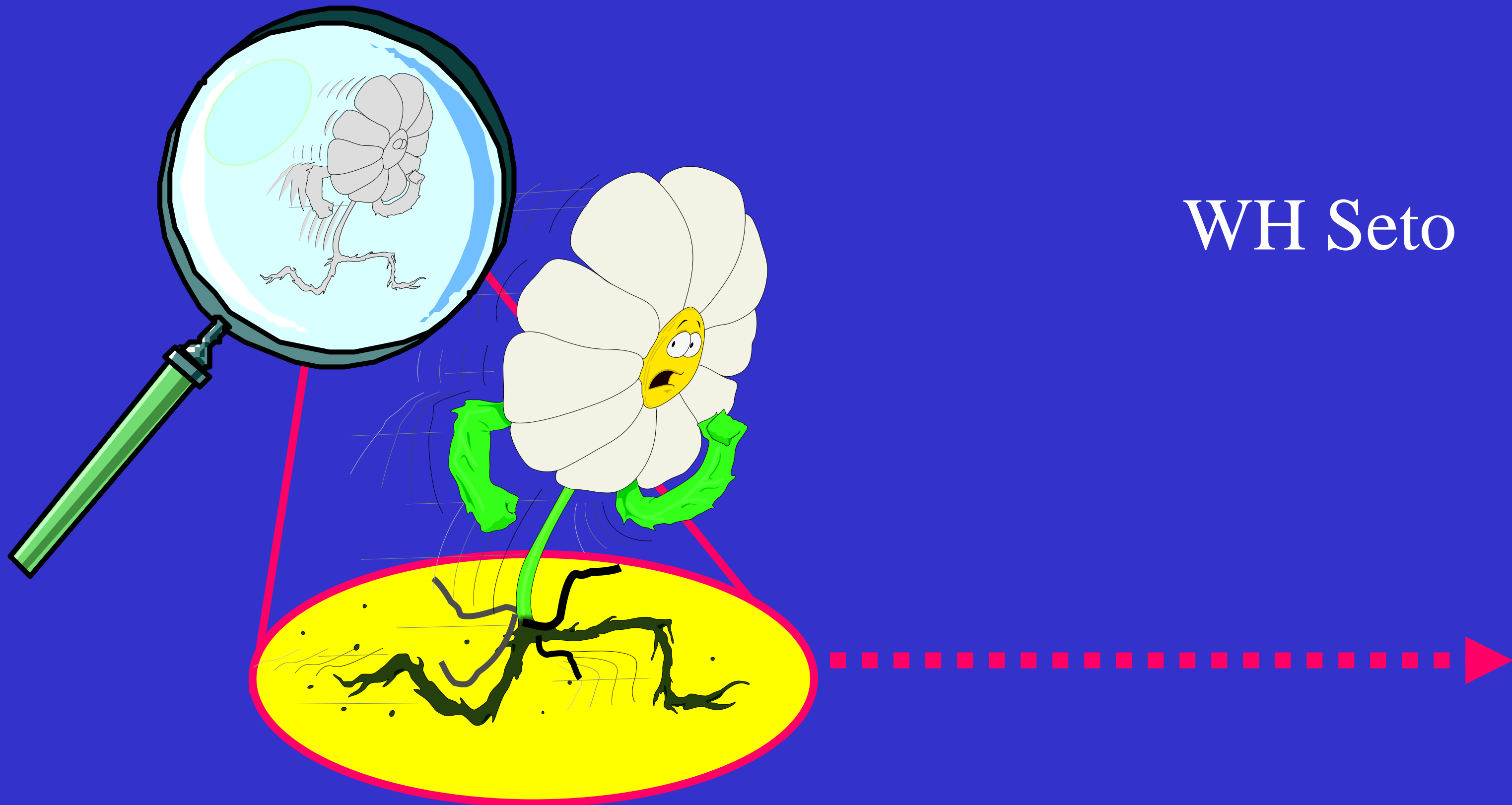
Root Cause Analysis

- for preventing recurrences



WH Seto

Error-prone Systems

- Variable input
- Complex
- Non-standardized
- Tightly coupled – systems too close to prevent error
- Hierarchical vs.team – no challenge across levels
- Tight time constraints
- Loose time constraints

Joint Commission - 2000

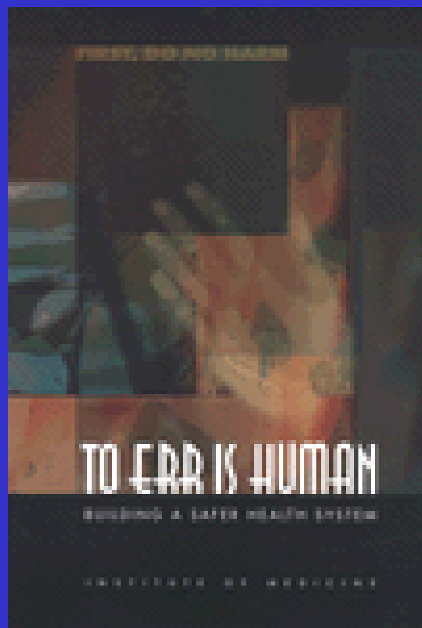
"Workloads are heavier, creating increased stress and fatigue for health care professionals."

"Caregivers are working in new settings and performing new functions, sometimes with minimal training."

"Skill mixes are shifting."

"In short, the health care environment is ripe for errors caused by systems failures."

“To Err is Human” – IOM Report - 1999



Injuries caused by medical management:
974,400 to 1,243,200 annually
- 53% to 58% preventable

44,000 (8th leading cause of death) to 98,000 (4th leading cause of death) Americans die from preventable adverse events

Cost: $17 to $29 billion US dollars

Vehicle accidents 43,458; breast cancer 42,297; AIDS 16,516

HA reported 12,513 medication incidents in 1st 2Q of 2000

Preventing Adverse Events

After the occurrence – Root Cause Analysis

Before the Occurrence – Failure Modes & Effects Analysis

and SERAE

Joint Commission Sentinel Even Policy 1997

To create

1. Encourage internal reporting of events
2. Undertake Root Cause Analysis
3. Develop & implement action plan based on RCA

No blame culture

Ability for credible intense analysis

Proactive safety culture

"The end product is an action plan"

Root Cause Analysis

A process for identifying the most basic or causal factor(s) that underline variation in performance, including the occurrence of an adverse sentinel event.

"RCA is a structured investigation that aims to identify the true cause of a problem, and actions necessary to eliminate it."
Andersen & Fagerhaus

Joint Commission
on Accreditation of Healthcare Organizations

JCAHO

Sentinel Event

An "unexpected" occurrence involving death or serious physical or psychological injury,
or the risk thereof.

涉及死亡或嚴重身體或心理創傷的意外事故，或相關的風險。

Reference: Joint Commission on Accreditation of Healthcare Organization (2002)

Reportable Sentinel Events (for HA)

1. **Surgery / interventional procedure involving the wrong patient or body part.**
2. **Retained instruments or other material after surgery / interventional procedure requiring re-operation or further surgical procedure.**
3. **Haemolytic blood transfusion reaction resulting from ABO incompatibility.**
4. **Medication error resulting in major permanent loss of function or death of a patient.**
5. **Intravascular gas embolism resulting in death or neurological damage.**
6. **Death of an in-patient from suicide (including home leave).**
7. **Maternal death or serious morbidity associated with labor or delivery.**
8. **Infant discharged to wrong family or infant abduction.**
9. **Unexpected death or serious disability reasonably believed to be preventable (not related to the natural course of the individual's illness or underlying condition).** Assessment should be based on clinical judgment, circumstances and context of the incident**.**

Reporting

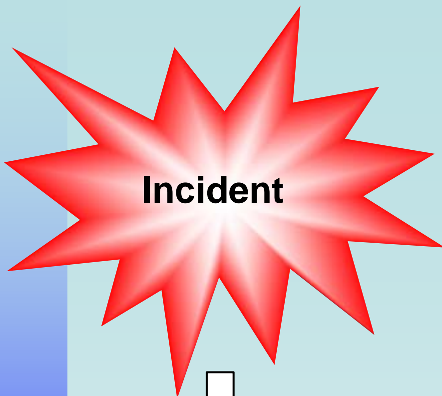
- **Mandatory reporting of all sentinel events**
- **Via AIRS**
  For very serious SE, to inform DM/COS & HCE immediately (by phone).
  HCE may also wish to inform CM(Q&RM) / D(Q&S).
- **Within 24 hours**
- **Preliminary information to be submitted**
  Only simple factual description of the incident
  No need to provide opinion or comment
- **Mark the case as "SE" in AIRS**

Reporting staff:	± preliminary marking of the incident as SE
AIRS filter person:	mark / confirm the case is a SE (joint decision by dept & hospital management)

- **Forward report to Legal Section**
  AIRS filter person to forward the report to HAHO Legal Section

Quality & Safety

Recommended management plan for reportable incidents, including Sentinel events



- Manage the incident.
- Grade severity of the incident.
- Report incident through AIRS by the member of staff who know most about the incident.

- Manage the incident through routine procedures.
- Report to management within 48 hours.

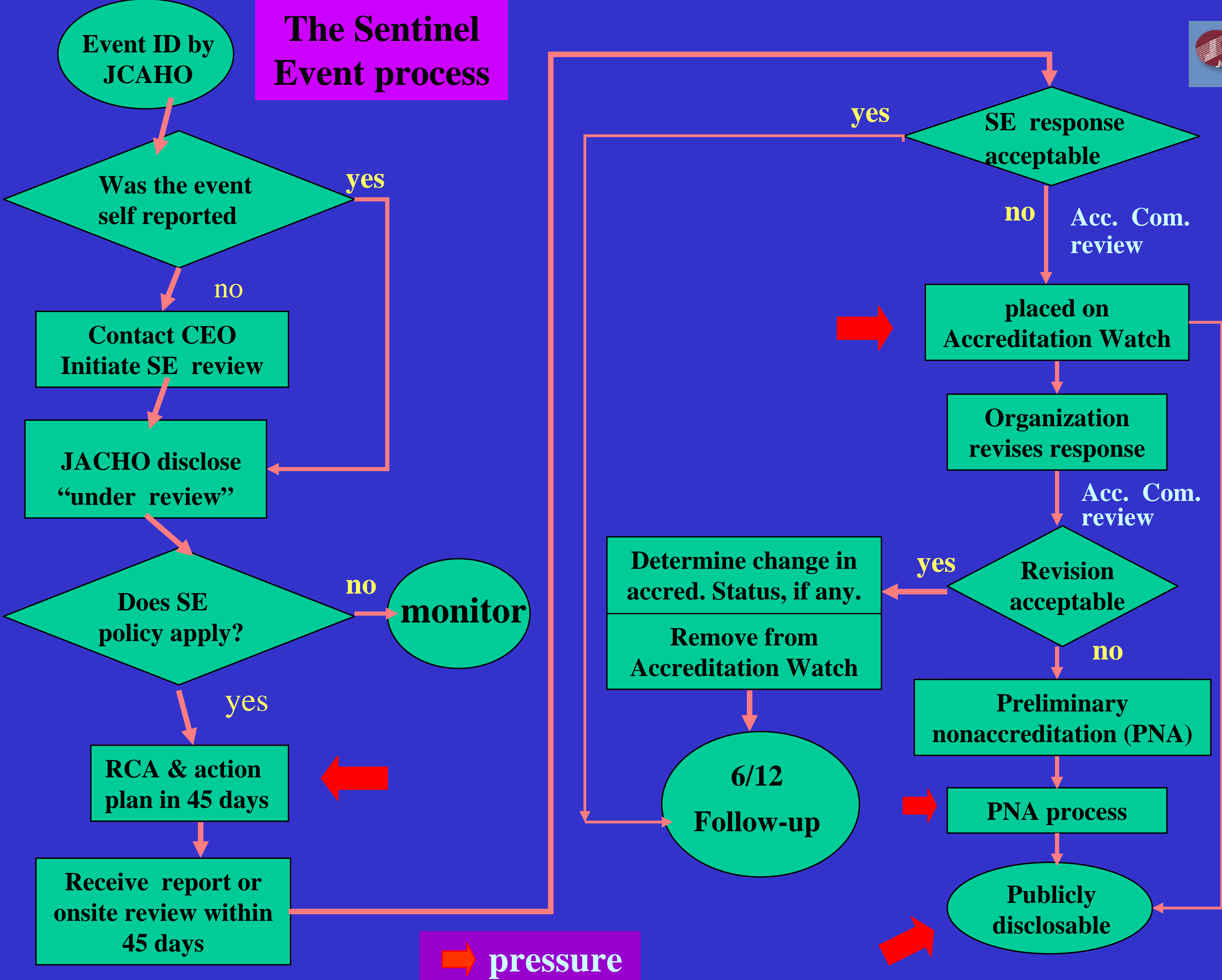
- Management action needed.
- Report to management within 24 hours.

- Urgent management action needed.
- Report to management immediately

Sentinel event

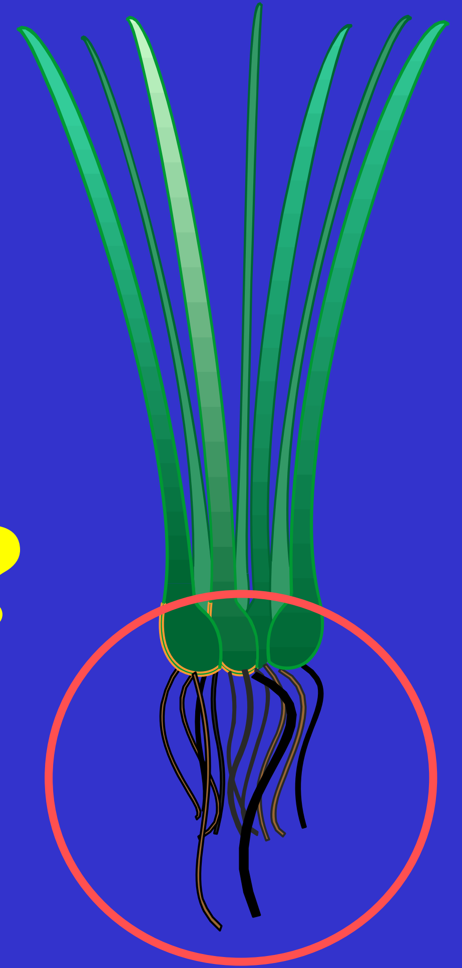
may result in SI of (1) 2 to 6, must be reported within 24 hours after occurrence of / knowing the incident

Quality & Safety



The Sentinel Event process
Event ID by JCAHO
Was the event self reported
yes
no
Contact CEO Initiate SE review
JACHO disclose "under review"
Does SE policy apply?
no
monitor
yes
RCA & action plan in 45 days
Receive report or onsite review within 45 days
pressure
SE response acceptable
yes
no
Acc. Com. review
placed on Accreditation Watch
Organization revises response
Acc. Com. review
Revision acceptable
yes
Determine change in accred. Status, if any.
Remove from Accreditation Watch
6/12 Follow-up
no
Preliminary nonaccreditation (PNA)
PNA process
Publicly disclosable
JCAHO

Why do Root Cause Analysis?



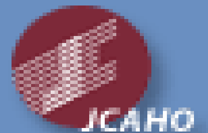
"To get rid of weeds, dig up the root; to stop a pot from boiling, withdraw the fuel."

-- Ancient Chinese Proverb

Don’t just swat mosquitoes…

drain the swamp.

Joint Commission
on Accreditation of Healthcare Organizations



Root Cause Analysis

- Focuses primarily on systems and processes
- Progresses from special cause to common cause
- What? Why? Why? Why?
- Goal is to redesign for risk reduction

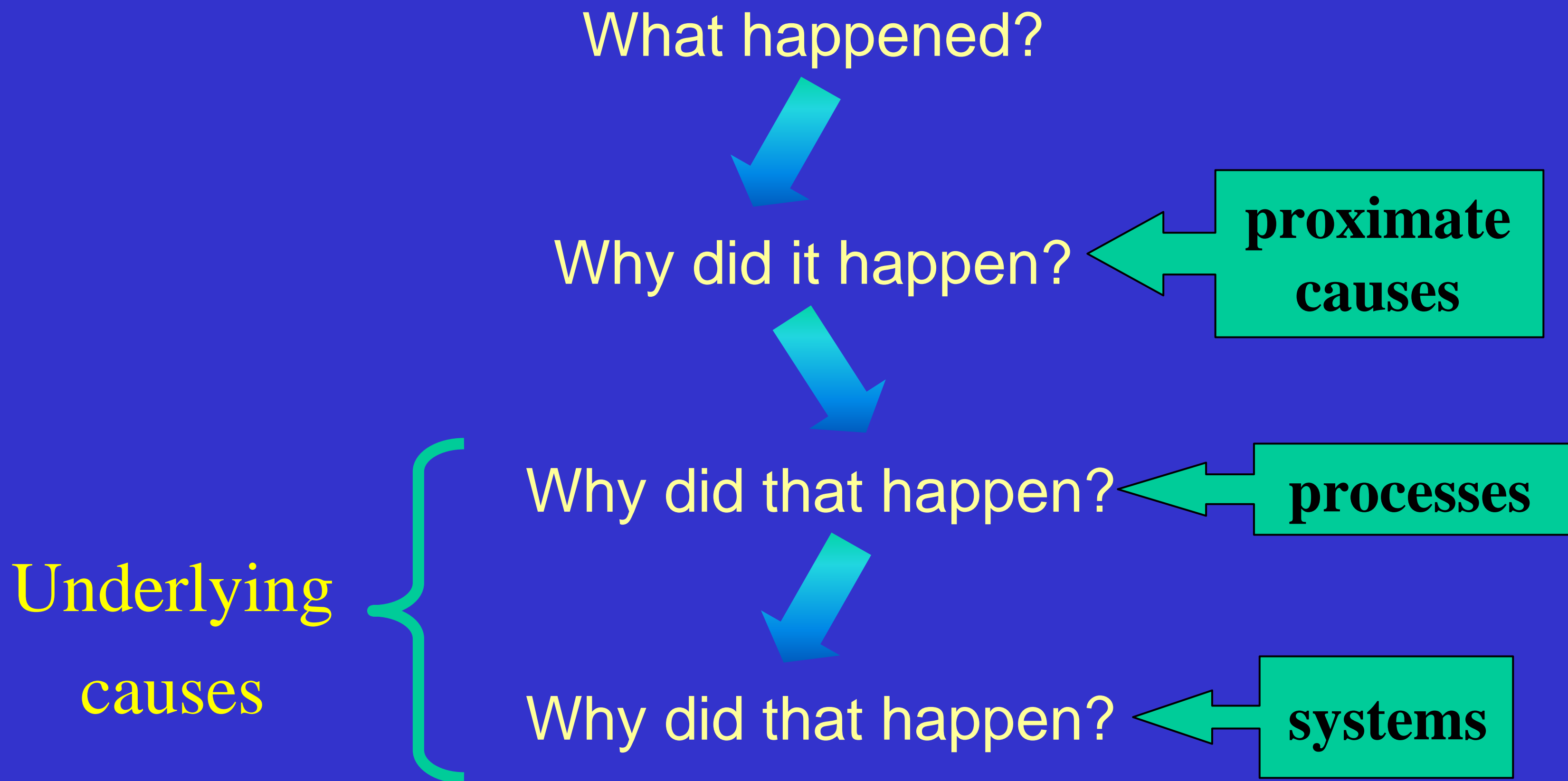
"Special cause in one process are usually the result of common causes in a larger system"

Joint Comission
Root Cause Analysis in Health Care, pp7

Root Cause Analysis

- Focuses primarily on systems and processes
- Progresses from special cause to common cause
- What? Why? Why? Why?
- Goal is to redesign for risk reduction

Root Cause Analysis



Joint Commission
on Accreditation of Healthcare Organizations

Root Cause Analysis

- Focuses primarily on systems and processes
- Progresses from special cause to common cause
- What? Why? Why? Why?
- Goal is to redesign for risk reduction

Root Cause Analysis

1st Level of Analysis

- What happened?
  - -What are the details of the event?
  - -What area/service was impacted?

Joint Commission
on Accreditation of Healthcare Organizations

Root Cause Analysis

Second Level of Analysis

- What was the proximate cause(s)?
  - -Human error
  - -Process deficiency
  - -Equipment breakdown
  - -Controllable environmental factors
  - -Uncontrollable external factors

Root Cause Analysis

Third Level of Analysis

- What process(es)* were involved?
  - -What are the steps in the process?
  - -What steps were involved?
  - -What is done to prevent failure at this step?
  - -What is done to protect against failure at this step?
  - -What other areas/services are impacted?

** Focus on patient care process(es)*

Root Cause Analysis

Fourth Level of Analysis

- What systems underline those processes?
  - -Human resource issues
  - -Information management issues
  - -Environmental management issues

Joint Commission
on Accreditation of Healthcare Organizations

Root Cause Analysis

The Critical Level of Analysis

- Leadership issues

  -Corporate culture

  -Encouragement of communication

  -Clear communication of priorities

- Uncontrollable factors

Joint Commission

on Accreditation of Healthcare Organizations

The Major Hurdle

Having the Courage to Keep Digging

- Excessive attention to blame rather than improvement.
- The Leaders:
  - -Lack of insight
  - -Personalizing the analysis
  - -Lack of commitment
- It is difficult and uncomfortable

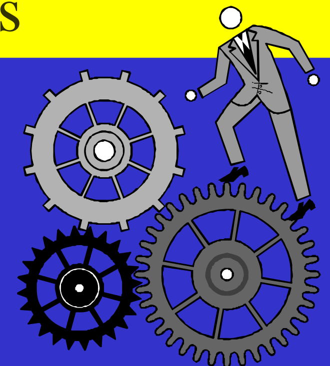
21 – Steps Root Cause Analysis

Preparation
- Organize a team
- Define problem
- Study problem

Proximate Causes
- Find out what happened
- ID process contributing factors
- ID other contributing factors
- Collect and assess data
- Interim changes

Root causes
- ID systems involved
- Prune list
- Confirm root causes

Action Plan
- ID risk reduction strategies
- Formulate improvement actions
- Evaluate actions proposal
- Design improvement
- Ensure plan acceptability
- Implement plan
- Develop measures
- Evaluate improvement efforts
- Take addition action
- Communicate results



21 – Steps Root Cause Analysis

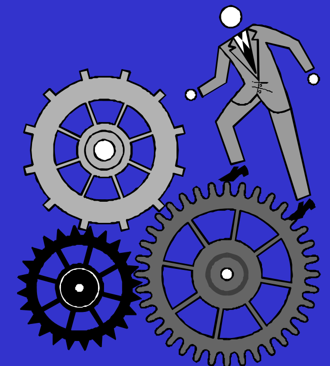
Understand process, change process & content expert

<u>Preparation</u>

- Organize a team
- Define problem
- Study problem

Focus on outcomes

Archival data & Interviews



21 – Steps Root Cause Analysis

Get the details

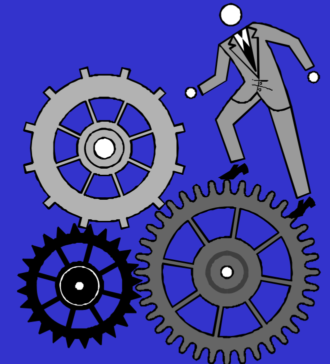
Proximate Causes

- Find out what happened
- ID process contributing factors
- ID other contributing factors
- Collect and assess data
- Interim changes

Use minimum scope table

Only if repeated

Only obvious ones



Minimum Scope of RCA

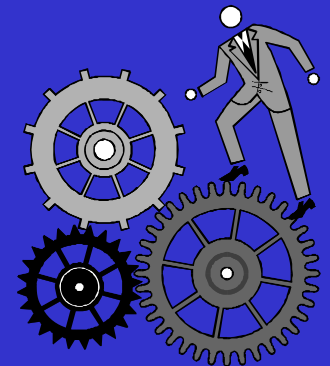
From JACHO

Areas of Investigation	Suicide (24 hr. care)	Medication error	Procedure complication	Wrong-site surgery	Treatment delay	Restraint death	Elopement death	Assault/ rape/homicide	Transfusion death	Infant abduction/ wrong discharge
Behavioral assessment process*	X					X	X	X		
Physical assessment process†	X			X		X	X			
Patient identification process		X		X					X	
Patient observation procedures	X					X	X	X	X	
Care planning process	X		X			X	X			
Staffing levels	X	X	X	X	X	X	X	X	X	X
Orientation and training of staff	X	X	X	X	X	X	X	X	X	X
Competency assessment/ credentialing	X	X	X		X	X	X	X	X	X
Supervision of staff‡		X	X		X	X			X	
Communication with patient/family	X			X	X	X	X			X
Communication among staff members	X	X	X	X	X	X			X	X
Availability of information		X	X	X	X				X	
Adequacy of technological support		X	X							
Equipment maintenance / management		X	X			X				
Physical environment §	X	X	X				X	X	X	X
Security systems and processes	X						X	X		X
Control of medications: storage/access		X								
Labeling of medications		X							X	

21 – Steps Root Cause Analysis

<u>Root causes</u>
- ID systems involved
- Prune list
- Confirm root causes

Interview experience staff and be specific



21 – Steps Root Cause Analysis

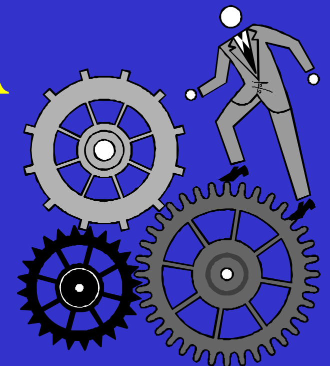
Use Check List

<u>Action Plan</u>

- ID risk reduction strategies
- Formulate improvement actions
- Evaluate actions proposal
- Design improvement
- Ensure plan acceptability
- Implement plan
- Develop measures
- Evaluate improvement efforts
- Take addition action
- Communicate results

Workable

CQI project
Focus PDCA

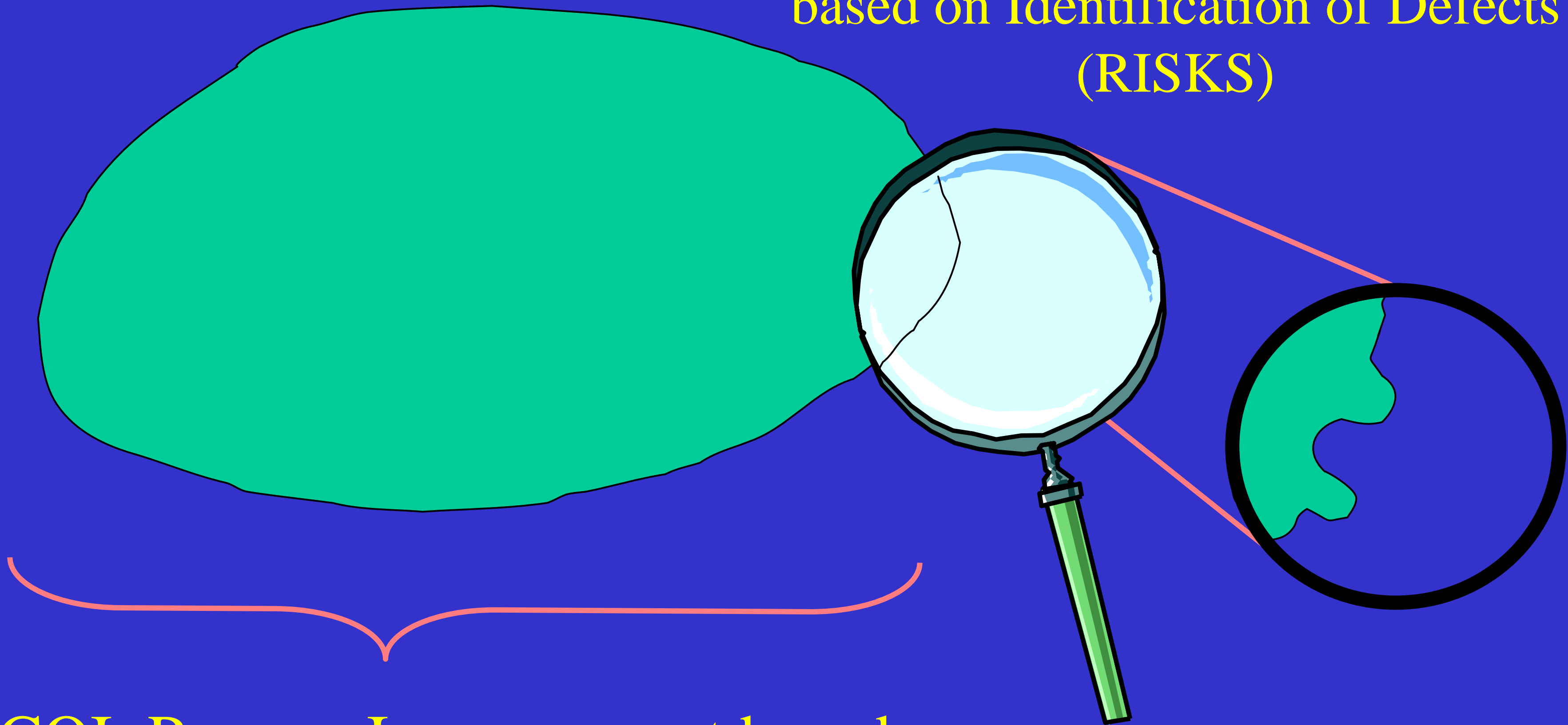


Risk reduction strategies

1. Use engineering approach
2. Assume anything can and will go wrong
3. Make safest thing the easiest thing to do
4. Make it difficult to err
5. Build in as much redundancy as possible
6. Use fail-safe design whenever possible
7. Simplify and standardised procedures
8. Automatic procedures
9. Rigidly enforced training and competence assessment
10. Non punitive reporting of near misses
11. Eliminate risk points

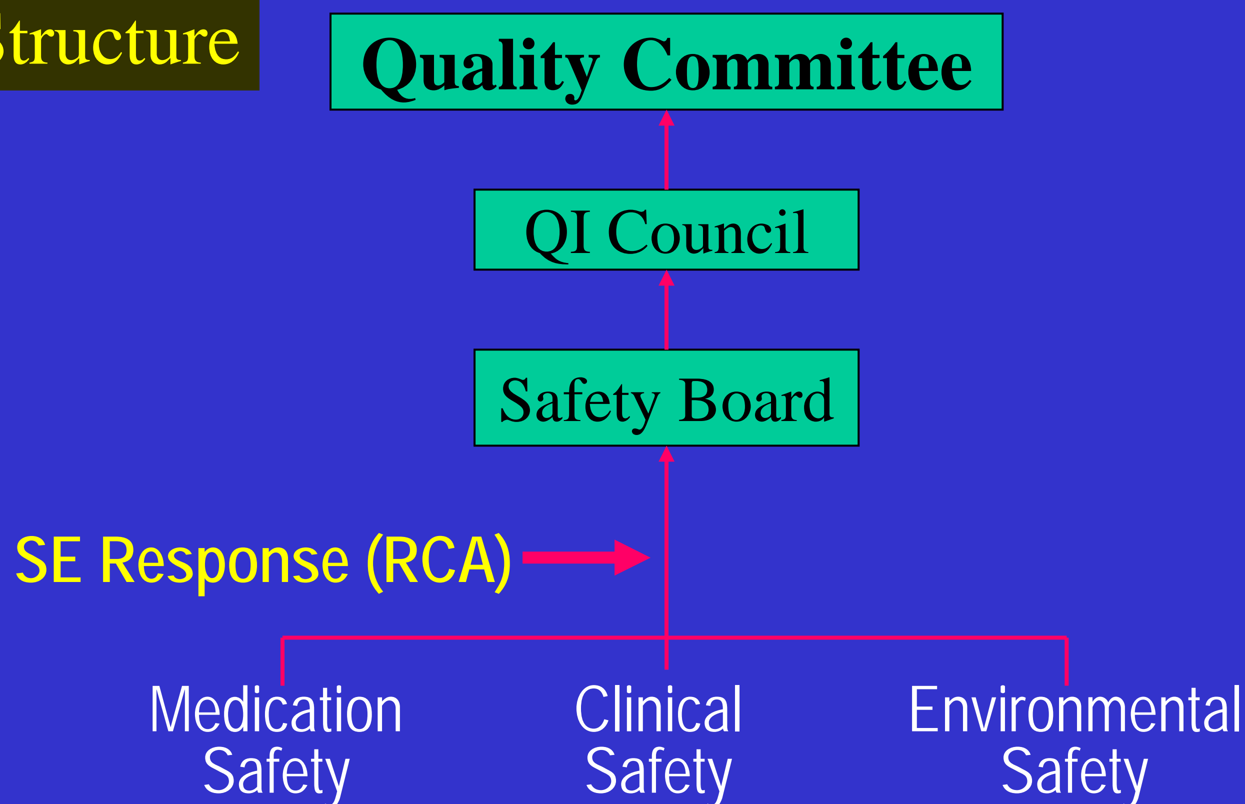
Aim: Streamline Systems for Quality

Risk Management: Improvement based on Identification of Defects (RISKS)



CQI: Process Improvement based on Overall Strategy

Hospital Safety Structure



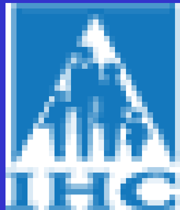
"The Safety Board reports to Quality Improvement Council to ensure that safety is embedded in the quality structure and to eliminate any debate about what activities belong to safety and what belong to quality"

Wong, Helsinger, Petry, JQI July 2002:363

Characteristics of an Acceptable Root Cause Analysis

- Thorough
  - Proximate cause(s) correctly identified
  - Analysis of underlying systems & processes
  - Inquire into all important areas
  - ID error prone points in process (risk points)
    eg. calculation of doses
  - Potential improvements by risk reduction
  - Measurement strategy

JCAHO



INTERMOUNTAIN HEALTH CARE

Doctors, hospitals and health plans working together for you.

Salt Lake City

Steps in developing a sentinel event policy

- **Define sentinel events**
- **Determine process of reporting**
- **Determine what warrant a RCA**
- **Determine management of sentinel events and preventive efforts**
- **Address confidentiality and legal aspect**
- **Educate staff**

Adapted from Joint Commission

Departments - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites History Mail Print Edit Copy Paste

Links Address http://ihcweb.co.ihc.com/departments.htm Go

home contact us index site map ihc.com search

Compliance

drkoop.com

GroupWise Web

Discussion Groups

How to get on IHCWeb

IHC General Information

The Wellness Network

Year 2000

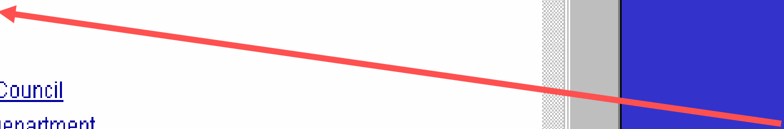
IHC Departments & Teams on the Web

AR Management
Ambulatory Coding and Reimbursement
Enterprise Clinical Technology Management
Customer Support Process Team

Department Index
Environmental Services
Finance
Human Resources
IHC Libraries

Information Systems
Institute for Health Care Delivery Research
QCTS (Quality Care Tracking System)

Quality Management
Quality Resources - UCRH
Rehab Services
Respiratory Care Guidance Council
Risk Management & Legal Department
Services Index
UCR Emergency Preparedness



If you'd like to see your department on the web, click here for instructions.

Intermountain Health Care

http://ihcweb.co.ihc.com/ucrh/quality_resources/ Local intranet

Start GroupWise - Mailbox Microsoft PowerPoint - [Pr... Departments - Micros... 10:23 AM

QRD Monitoring - Microsoft Internet Explorer

Address http://ihcweb.co.ihc.com/ucrh/quality_resources/monitoring.html

Quality Resources

Monitoring

Data Collection & Monitoring Team

Leader: Barbara Riser
Guidance Team: Sue Osborn, Gail Hedrick, Beth Naley, Mike DeLong, Paul Christiansen

Mission: Review and revise collection of required elements for UCR. Identify elements to be automated and refer to automation team. Evaluate, coordinate and improve the structure of medical staff peer review in UCR.

Automation Team

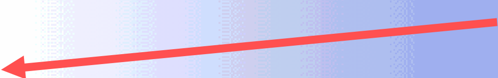
Leader: Jan Orton
Guidance Team: ChinLi Fan, Olaf Golubjatnikov, Shelly Pederson, Paul Christiansen

Mission: Implementation of an automated Organizational Functions Report that supports hospital and medical staff functions.

Organizational Functions

Performance Measures vs. Key Measures vs. Physician Profiles

- Blood Usage
- Drug Usage
- Environment of Care
- Invasive Procedures
- Mgmt of Information (ISET)
- Mgmt of Information (Med Rec)
- Medical Staff Profiling
  - Peer Review *(Medical Staff)*
- Mortality/Autopsy/Organ Donation
- Pain Management
- Patient Satisfaction
- ORYX Performance Measures
- Restraint/Seclusion
- Resuscitation
- Sentinel Events/Root Cause Analysis
- Screening Triggers - Dietary
- Screening Flags - Medical Social Work



Click here

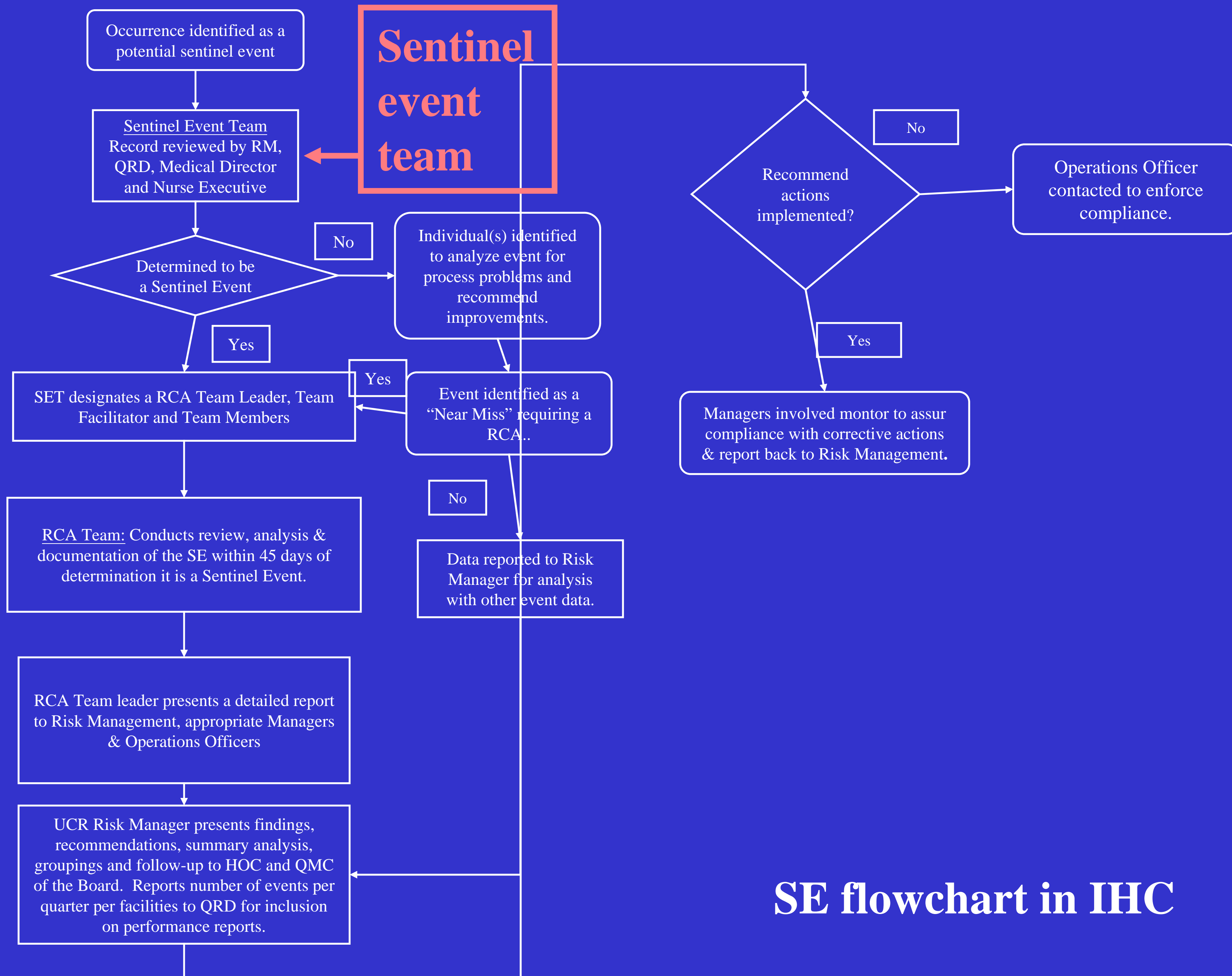
Last updated 2/13/2001

Local intranet

Steps in developing a sentinel event policy

- Define sentinel events
- Determine process of reporting
- Determine what warrant a RCA
- Determine management of sentinel events and preventive efforts
- Address confidentiality and legal aspect
- Educate staff

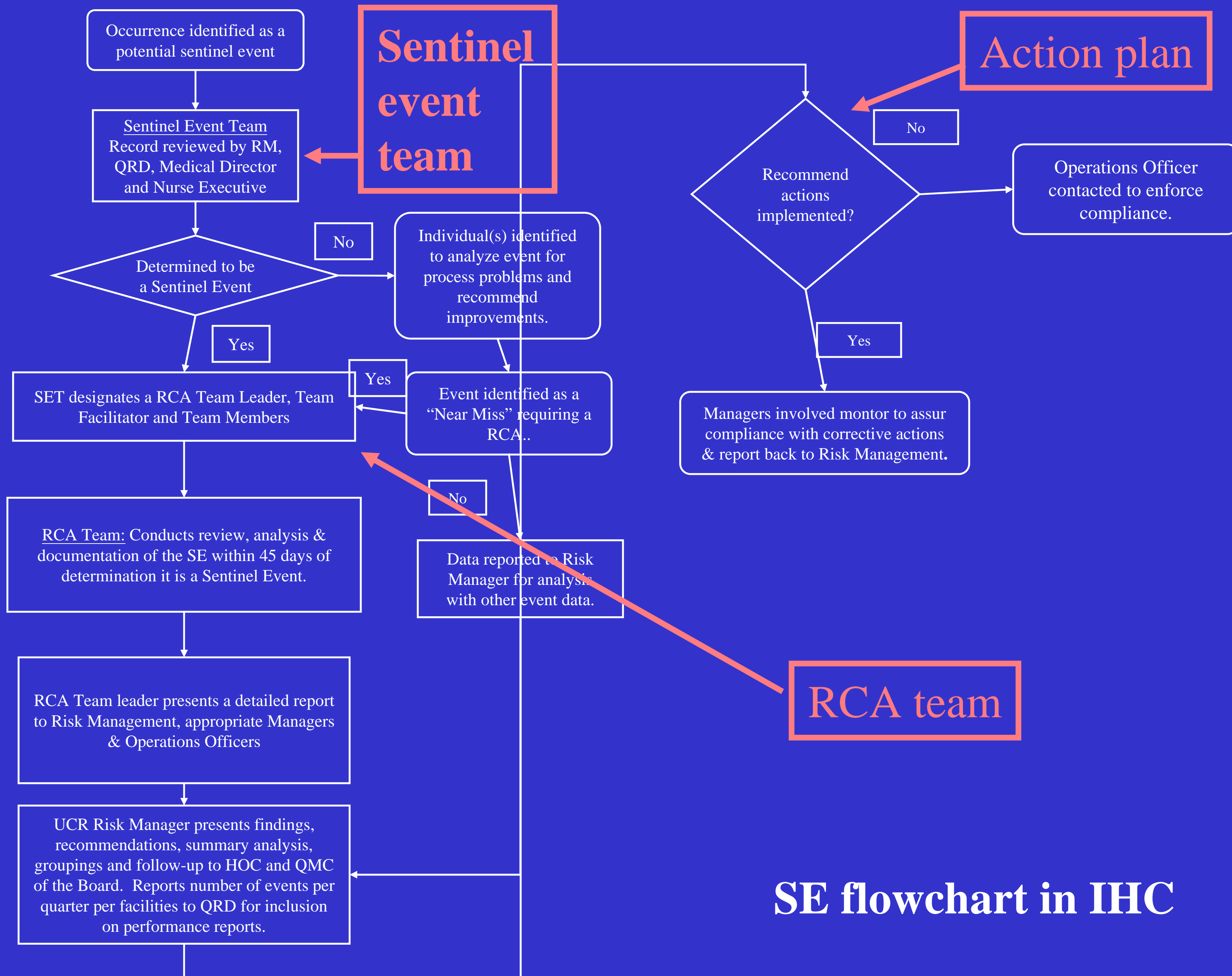
Adapted from Joint Commission


Occurrence identified as a potential sentinel event
Sentinel event team
Sentinel Event Team
Record reviewed by RM, QRD, Medical Director and Nurse Executive
Determined to be a Sentinel Event
No
Yes
Individual(s) identified to analyze event for process problems and recommend improvements.
SET designates a RCA Team Leader, Team Facilitator and Team Members
Yes
Event identified as a "Near Miss" requiring a RCA..
No
Data reported to Risk Manager for analysis with other event data.
RCA Team: Conducts review, analysis & documentation of the SE within 45 days of determination it is a Sentinel Event.
RCA Team leader presents a detailed report to Risk Management, appropriate Managers & Operations Officers
UCR Risk Manager presents findings, recommendations, summary analysis, groupings and follow-up to HOC and QMC of the Board. Reports number of events per quarter per facilities to QRD for inclusion on performance reports.
Recommend actions implemented?
No
Operations Officer contacted to enforce compliance.
Yes
Managers involved montor to assur compliance with corrective actions & report back to Risk Management.
SE flowchart in IHC

Steps in developing a sentinel event policy

- Define sentinel events
- Determine process of reporting
- Determine what warrant a RCA
- Determine management of sentinel events and preventive efforts
- Address confidentiality and legal aspect
- Educate staff

Adapted from Joint Commission



SE flowchart in IHC

- Leader officially appointed & recognized
- **Facilitator is full time QA nurse: takes 40 – 80 hours**
- RCA Team usually meets 2-3 x

- **NCPS has Pat. Safety Of.**
- **NCPS reports near misses**
- **RCA team do most of the work**
- **Team meets more often**

RCA Team Role Accountabilities

Leader: provides direction, provides secretarial support, initiates activities (including setting up interviews, meetings, etc.),plans and coordinates with facilitator prior to meetings, manages the meeting process, participates in team decisions, ensures completion of RCA and reports outcome to the appropriate individuals at conclusion.

Facilitator: serves as data collector, coach, educator, consultant and expert on the RCA process and use of the methods or tools.

Members: provide clinical or support expertise from front-line experience, study the processes involved, analyze variances, and make recommendations.

Microsoft Excel - MOCRCA.xls

File Edit View Insert Format Tools Data Window Help

D24 = Where in the report process was this missed?

	A	B	C	D
1	Date / Time	Notation Source	Description	Concerns
2	08/23/2000 15:00	Admission Sheet	Admission = AAA, possible surgery	
3	08/24/2000 12:44		Time clock 2 minute difference noted in December, 2000 during investigation	
4	09/11/2000 0:00		Discharged to rehab - sl. Short term memory, otherwise same	
5	08/24/2000 11:40	??? Time	Arrive in angio, placed in waiting area	Not given call light although one available
6	08/23/2000 15:45	Physician orders	MD completed admission orders including Abdominal angiogram, telemetry monitoring	
7	08/23/2000 16:20	Physician orders	RN signed off Orders	
8	08/24/2000 7:28	Vital Signs	Stable VS's and SpO2 = 93%	
9	08/24/2000 8:07	Assessment	Neuro's intact. No abnormal findings	
10	08/24/2000 9:08	Nursing comments	Amb. To BR, Tolerated Well	
11	08/24/2000 9:08	Nursing comments	Shower & Hygiene completed	
12	08/24/2000 11:21	Vital Signs	Stable VS's	
13	08/24/2000 11:22	Nursing Notes	SpO2 93%	
14	08/24/2000 11:22	Conversation w/ RN	Left floor between 11:22 and 11:40	No documentation of patient leaving floor by nursing or radiology transport
15	08/24/2000 12:02	Conversation w/ Rad Tech	Went to pick up patient, found blue, apenic	
16	08/24/2000 12:02	Conversation w/ Rad Tech	Went to find Radiologist and help ~ 3 minutes.	Forgot to do ABC's of CPR. ?? Is there a phone where patient waited ??
17	08/24/2000 12:07	Code Sheet	CPR began -	
18	08/24/2000 12:15	Code Sheet	Intubated	
19	08/24/2000 12:15	Progress notes	MD consults states CPR 20 minutes	
20	08/24/2000 12:25	Code Sheet	Code complete. 6 Shocks --> to covert	
21	08/24/2000 12:44	Rhythm Strips	1st post arrest rhythm strip documenting SR	
22	08/24/2000 11:40	Risk follow-up	Pre-angiogram introduction and assessment performed	No time documentation or event documentation since no charge generated
23	08/23/2000 16:00	Nursing comments	Initial Assessment, No pain, No arrythmia, Sinus Rhythm	
24	08/24/2000 11:22	Conversation w/ RN	RN follow-up: Angio Cardiac vs. AAA	Where in the report process was this missed?
25	08/24/2000 11:22	Conversation w/ RN	Taken off Telemetry.	Orders to remove tele?

- Enter Data from chart
- Don't try to correlate single data elements
- Put your comments / thoughts as you read it

Most SE reported by Risk Management

Usually conduct about 2 RCA / month

Facilitator usually just interview individuals

Combine with counseling

Action plan usually completed by 90 days
(JACHO require analysis done by 45 days)

Felt that it really help in making good changes

Steps in developing a sentinel event policy

- Define sentinel events
- Determine process of reporting
- Determine what warrant a RCA
- Determine management of sentinel events and preventive efforts
- Address confidentiality and legal aspect
- Educate staff

Adapted from Joint Commission

Confidentiality Protection

1. Protection from lawyers by three mechanism
   - Peer Review Act
   - Quality Act
   - Client/lawyer privilege

2. Information collected is not part of the medical record

3. Final report to CEO in presence of lawyer and Management take responsibility

QMH first case

71/Male

Severe cerebral dysfunction after overdosage of Midazolam

Interview 5 staff	- 9 hours
Chart review	- 3 hours
Prepare report	- 5 hours
Communication	- 2 hours
total	19 hours

Chronological Events

Lessons learnt:

- Must first obtain endorsement from leaders
- Preparation of staff for no blame culture
- Protection of data from HR and PRO.
- Interview is arrange by facilitator
- Related staff is willing to share
- Comfortable environment away from work place is important.
- Interview is done during office hours
- Confidentiality among his peers

Accidental air embolism during ventriculogram

Recommendations

- Orientation & training of newcomers (all grades) should be more structured
- Training outline with critical points
- Radiographer to prepare contrast as in QMH
- Procedure for check & label contrast
- Role of each nurse should be clearly delineated
- Enforce medication administration guidelines adherence
- Replace outdated equipment
- Establish succession plan
- Empower nurses to say “NO”

Action plan

Improvement strategies	Success criteria	Description of action	Interim action	Imple-mentation	Evalua-tion
Structured training & orientation	Documented competency as per package	Develop & implement structured training with critical points	Staffs assessed on rationale of check bubble. Enforce visual display of contrast at syringe before connecting.	Immediate 1Q 2007	3Q 2007
Enforce MAR guidelines	Documented compliance	All staff assessed	Big label 'LOADED" since Mar 2007. Double check contrast.	Immediate 1Q 2007	3Q 2007
Clear role delineation for all staff	Role & job description – clear without overlap	Review & revise job description	In progress.	2Q 2007	4Q 2007
Replace outdated equipment	New product should have warning to check bubbles with complete	Explore alternatives Procure most appropriate equipment	Alternatives identified & in the process of purchasing new equipment	2Q 2007	4Q 2007
Succession plan to train more staff in CC Lab	Rotate staff to CC Lab on regular basis	Develop programme to train more staff	In progress	2Q 2007	4Q 2007

"Experience is the best teacher but is also ….
the most expensive.
To minimize that expense …..we must communicate the lessons throughout the system … so that others are not force to learn through their own bitter experience"

JP Bagian
VHA center for Patient Safety

To get things done … we must be innovative

but…we must

also be safe

Thank You