Management of Serious Incidents in NSW Health Root Cause Analysis

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Clinical Excellence Commission

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NSW Health
Clinical Excellence Commission

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The Clinical Excellence Commission promotes and supports best practice clinical care, safety and quality across the NSW health system by:

- conducting high-level analysis and reviews that identifies risks and opportunities for improvement
- providing expert support, advice, tools and information
- working collaboratively with patients, clinicians, managers, health service partners and the broader community.

This presentation will provide an overview of:

- NSW Health incident management process
- Human factors and systems approach
- Serious incident investigation- Root Cause Analysis (RCA)
- Lessons learnt

What is a clinical incident

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- Any unplanned event resulting in injury. This includes near misses
- All clinical incidents are notified in the NSW Health Incident Information Management System (IIMS)

NSW Health Activity 2015

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- 1,839,000 patient admissions for around 6,527,000 bed days each year. A further 2,700,000 non-admitted ED presentations and many more people treated in the community. ALOS = 3.5 days.
- 170,000 clinical incidents (all =225000) and 13,000 complaints reported annually. Of these around 520 were classified as “serious” (SAC1) each year
- Up to 425 patient deaths were associated with these SAC1s

NSW All Incident Notifications 2007-2015

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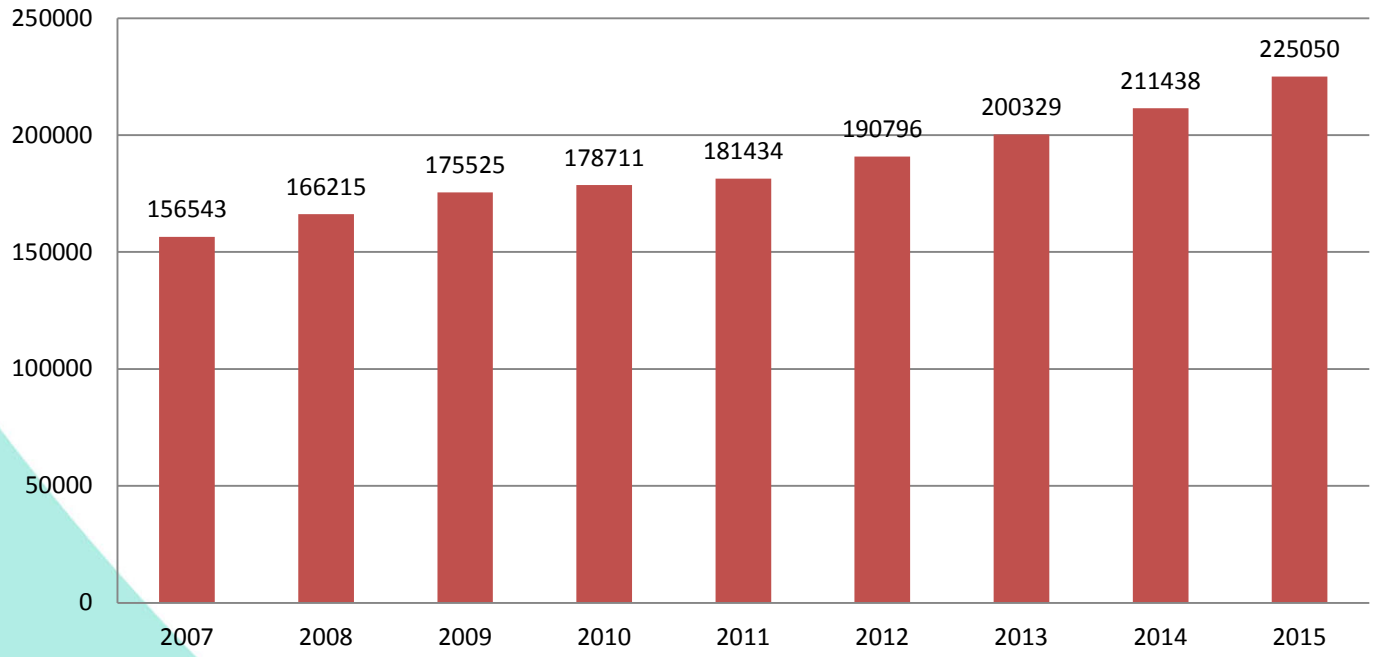

IIMS Clinical Incident Monthly Notifications 2005 – 2015 (includes up to Sept 2015 2015)

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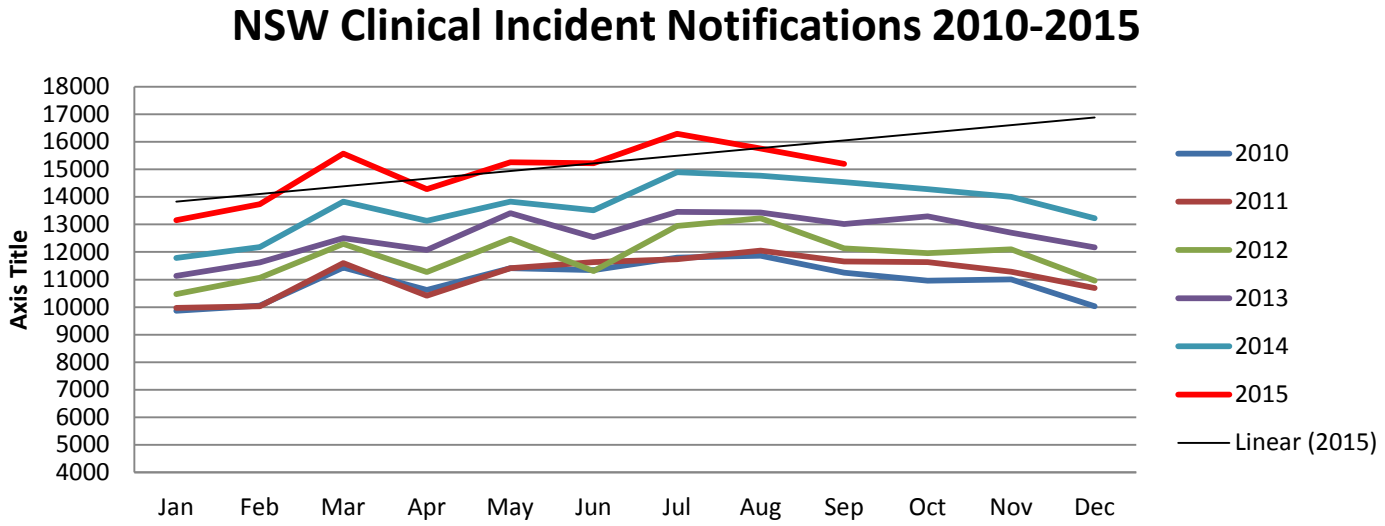

Increased reporting rate of 5% each year

Clinical incidents notified in IIMS by Actual SAC rating, January 2011 - June 2015

SAC Rating	2011		2012		2013		2014		2015
	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun
SAC 1*	269	309	290	308	306	302	252	262	238
SAC 2	1,269	1,411	1,258	1,378	1,285	1,261	1,401	1,424	1,342
SAC 3	29,059	30,688	30,355	32,675	33,849	34,524	36,007	39,343	39,462
SAC 4	32,869	34,775	36,085	37,212	37,652	40,264	39,213	41,899	42,831
No SAC Allocated	2,994	3,752	3,619	3,595	2,079	2,884	3,034	1,998	2,926
TOTAL	**66,460**	**70,935**	**71,607**	**75,168**	**75,171**	**79,235**	**79,907**	**84,926**	**86,799**

Caution is advised if using IIMS reporting counts or rates as the single source of benchmarking data for a project or program, as many variables influence incident reporting. Lower rates of reporting are not a reliable indicator of safer care. Qualitative, rather than quantitative, interpretation of the data is therefore recommended

Clinical incident notifications compared with episodes of inpatient care Jan to June 2015

SAC rating	Number	Per 1,000 bed days
SAC 1	238	0.06
SAC 2	1,342	0.36
SAC 3	39,462	10.63
SAC 4	42,831	11.53
No SAC allocated	2,926	0.79
Total	86,799	23.37

NSW Incident Management Policy

Provides direction and framework for reporting, managing and investigating incidents in clinical settings.

Defines the levels of responsibility for:

- All staff
- Managers
- LHD executive
- CEC
- Ministry

Incident Management Policy (cont)

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The Policy is based on these principles:

- Openness about failures
- Obligation to act – to remedy
- Accountability – limits are clearly set
- Just culture – individuals are treated fairly
- Appropriate prioritisation of action

Relevant NSW policy for RCA

Incident Management PD2014_004

Open Disclosure Policy PD2014_028

Open Disclosure Handbook

(Management of a complaint or concern about a clinician – policy & guideline PD2006_007 & GL 2006_002)

Legislation: Division 6C section 20 of the Health Administration Act 1982

Severity Assessment Code (SAC)

- A numerical score predominantly based on consequence.
- Prime purpose is to direct level of investigation
- Determine the consequence and likelihood
- A SAC is to be applied to all incidents

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6.2 Appendix B – Severity Assessment Code (SAC) May 2011

STEP 1 Consequences Table (For notification, consider the actual consequence or outcome using this table as a guide. The examples listed here are not exhaustive.)

		Action Required				
		Serious	**Major**	**Moderate**	**Minor**	**Minimum**
CLINICAL CONSEQUENCE	Patient	Patients with **Death** unrelated to the natural course of the illness and differing from the immediate expected outcome of the patient management or: ▪ **Suspected suicide**[5] ▪ **Suspected homicide**[6] ▪ **Unexpected intra-partum stillbirth** or any of the following: **The Sentinel Events** ▪ Procedures involving the incorrect patient or body part resulting in death or major permanent loss of function ▪ Suspected suicide of a patient in an inpatient unit ▪ Retained instruments or other material after surgery requiring re-operation or further surgical procedure ▪ Medication error leading to the death of a patient reasonably believed to be due to incorrect administration of drugs ▪ Intravascular gas embolism resulting in death or neurological damage ▪ Haemolytic blood transfusion reaction resulting from ABO incompatibility ▪ Maternal death or serious morbidity associated with labour and delivery ▪ Infant discharged to the incorrect family	Patients suffering a **Major permanent loss of function (sensory, motor, physiologic or psychological)** unrelated to the natural course of the illness and differing from the expected outcome of patient management or any of the following: ▪ Suffering significant disfigurement as a result of the incident ▪ Patient at significant risk due to being absent against medical advice ▪ Threatened or actual physical or verbal assault of patient requiring external or police intervention	Patients with **Permanent reduction in bodily functioning (sensory, motor, physiologic, or psychological)** unrelated to the natural course of the illness and differing from the expected outcome of patient management or any of the following: ▪ Increased length of stay as a result of the incident ▪ Surgical intervention required as a result of the incident	Patients requiring **Increased level of care including:** ▪ **Review and evaluation** ▪ **Additional investigations** ▪ **Referral to another clinician**	Patients with **No injury or increased level of care or length of stay**

Categories	
Frequent	Is expected to occur again either immediately or within a short period of time (likely to occur most weeks or months)
Likely	Will probably occur in most circumstances (several times a year)
Possible	Possibly will recur – might occur at some time (may happen every 1 to 2 years)
Unlikely	Possibly will recur – could occur at some time in 2 to 5 years
Rare	Unlikely to recur – may occur only in exceptional circumstances (may happen every 5 to 30 years)

All SAC 1 and sentinel events require a RIB

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CE may determine that a lower SAC requires RIB and RCA

1	**Extreme** risk – immediate action required – Reportable Incident Brief (RIB) for all SAC 1 incidents must be forwarded to the MoH within 24 hours. A Privileged Root Cause Analysis (RCA) investigation must be undertaken for all Clinical SAC 1 incidents with a report being submitted to the MoH.
2	**High** risk – need to notify senior management. Detailed investigation required. Ongoing monitoring of trended aggregated incident data may also identify and prioritise issues requiring a practice improvement project.
3	**Medium** risk – management responsibility must be specified – Aggregate data then undertake a practice improvement project. **Exception** – all financial losses must be reported to senior management.
4	**Low** risks – manage by routine procedures – Aggregate data then undertake a practice improvement project.
NB – An incident that rates a SAC 2, 3 or 4 should only be reported to the MoH if there is the potential for media interest or requires direct notification under existing MoH legislative reporting requirements or NSW MoH Policy Directive.	

STEP 3 SAC Matrix

		CONSEQUENCE				
		Serious	Major	Moderate	Minor	Minimum
LIKELIHOOD	Frequent	1	1	2	3	3
	Likely	1	1	2	3	4
	Possible	1	2	2	3	4
	Unlikely	1	2	3	4	4
	Rare	2	3	3	4	4

Every incident assessed against the Severity Assessment Code Matrix should be scored separately for both their actual and potential consequence or outcome

NSW Health Process For Reporting Adverse And National Sentinel Events

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- Process is guided by NSW Health PD2014_004 Incident management system
- Reportable Incident Brief (RIB)- Is the method for reporting defined health care incidents to the MoH. The RIB process encompasses clinical and corporate incidents.
- All clinical RIBs are referred to the NSW Health Clinical Risk Action Group (CRAG)-responsible for examining and monitoring serious clinical incidents
- Clinical RIBs and the work of CRAG is subject to special privilege under Section 23 of the Health Administration Act 1982

Following clinical incidents require prompt advice to MoH as RIB

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Clinical Incidents

- Death of patient unrelated to natural cause of illness and differing from immediate expected outcome
- Suspected suicide of MH Client within 7 days contact with service- or if concern care management a contributor
- Suspected homicide committed by MH Client last contact within 6 months or concern care management a contributor
- Unexpected intra-partum stillbirth
- The CE has discretion to appoint a RCA team to investigate any clinical incident of a lesser severity than SAC 1

National Sentinel Events Require a RIB

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National Sentinel Events include

- Procedures involving wrong patient of body part resulting in death or major permanent loss of function
- Suspected suicide of mental health patient (inpt or within 7 days contact)
- Retained instrument or other material after surgery requiring reoperation of further surgical procedure
- Medication error leading to death believed to be due to incorrect administration of drugs
- Intravascular gas embolism resulting in death or neurological damage
- Haemolytic blood transfusion reaction from ABO incompatibility
- Maternal death or serious morbidity associated with labour or delivery
- Infant discharged to wrong family

Investigation of adverse events and NSEs in NSW

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- All SAC1 Clinical incidents and NSEs must have investigation via the RCA methodology.
- The CE can commission RCA for lower SAC incidents as they deem appropriate
- The final RCA reports are due to MOH within 70 days of incident notification in the IIMS.
- All RCA reports are reviewed by the CEC RCA Review Subcommittees & report state-wide system issues and trends to the CRAG.

What is Root Cause Analysis (RCA) In the NSW Health context

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RCA is

A method used to investigate and analyse incidents to identify the root causes and factors that contributed to the incident and to recommend actions to prevent a similar occurrence. The process is covered under Statutory Privilege

What is a root cause?

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A root cause is *an initiating cause of a causal chain which leads to an outcome or effect of interest. Commonly, root cause is used to describe the depth in the causal chain where an intervention could reasonably be implemented to change performance and prevent an undesirable outcome.*

First understanding system approach and human factors. What is meant by “human factors”?

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Human factors concerns people

An area of study about people (abilities, characteristics, and limitations), the design of equipment they use, environments in which they function, jobs they perform, and their relationships with other people.

Modified from *Definitions of Human Factors and Ergonomics.* Educational Resources. Human Factors and Ergonomics Society.
http://www.hfes.org/Web/EducationalResources/HFEdefinitionsmain.html

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This includes

- **Communication and interaction** between individuals, teams and services
- **Culture**, including support and supervision - “the way we do things here”
- **The structures and “rules”** of the organisation
- **Interactions with physical and virtual environments and equipment**, including EMR, medical devices & other technologies
- **Other influences we bring with us** – values, personal conditions, experiences, stressors, knowledge, skills, personality and attitudes

Are you a boiled Frog

Loss of situational awareness

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If you drop a frog into a pot of hot water, it will of course frantically try to clamber out. But if you place it gently in a pot of tepid water and turn the heat on low, it will float there quite placidly and go with the flow. As the water gradually heats up, the frog will sink into a tranquil stupor, and before long, it will unresistingly allow itself to be boiled to death.

Unknowingly falling into poor culture, “the way we do things around here”. Loss of insight- situational awareness. Are you a boiled frog. Do you work in a hot pond!

Why consider human factors?

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Awareness of human factors can help you to:

- Understand how complex systems influence the decisions and actions of health care staff
- Improve your understanding about influences on communication and teamwork between staff
- Work to improve the design of health care processes to facilitate timely and effective assessment and treatment of patients
- Understand how the selection and use equipment - diagnostic and therapeutic – can contribute to incidents
- Identify where things went wrong – **or could go wrong**

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Health care is a complex socio-technical system where there is a significant risk of harm (i.e. a high risk industry).

We have a highly-skilled workforce and great intentions……. but often fail to recognise that clinicians of all disciplines, their managers and supporting service staff are human.

If awareness of human factors is missing, care is more likely to be ineffective and/or unsafe…situational awareness

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"Most accidents are attributed to human error, but in almost all cases the human error was a direct result of poor design."

Donald A Norman, The Design of Everyday Things

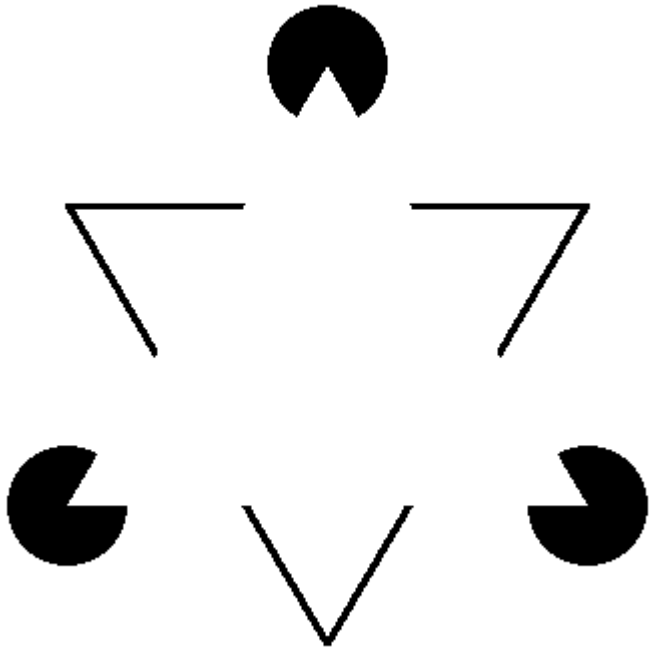
In health, 'design' extends to structures and processes - which may enable or fail to trap errors before they have consequences

Perception

- Perception is a combination of:
  - Input from physical senses
  - Cognitive processes in interpreting those senses

- We don’t necessarily **experience** the world as it is

How many triangles?



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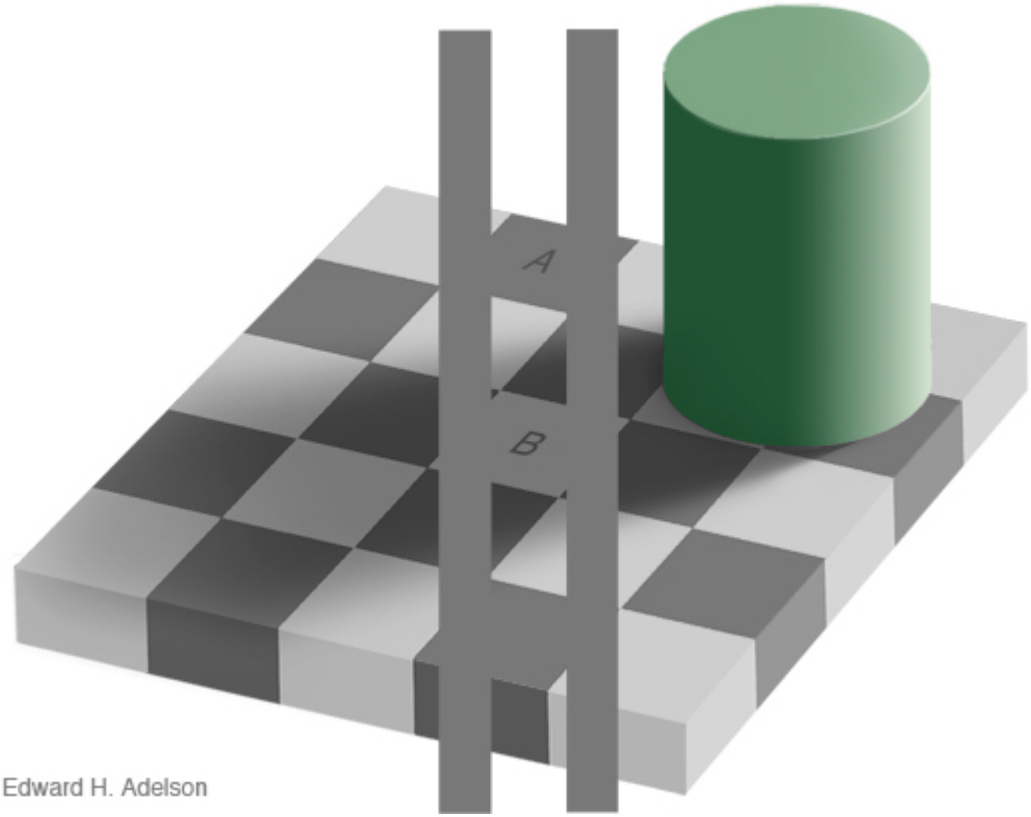

Edward H. Adelson

Auditory illusions

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Medicine or candy?

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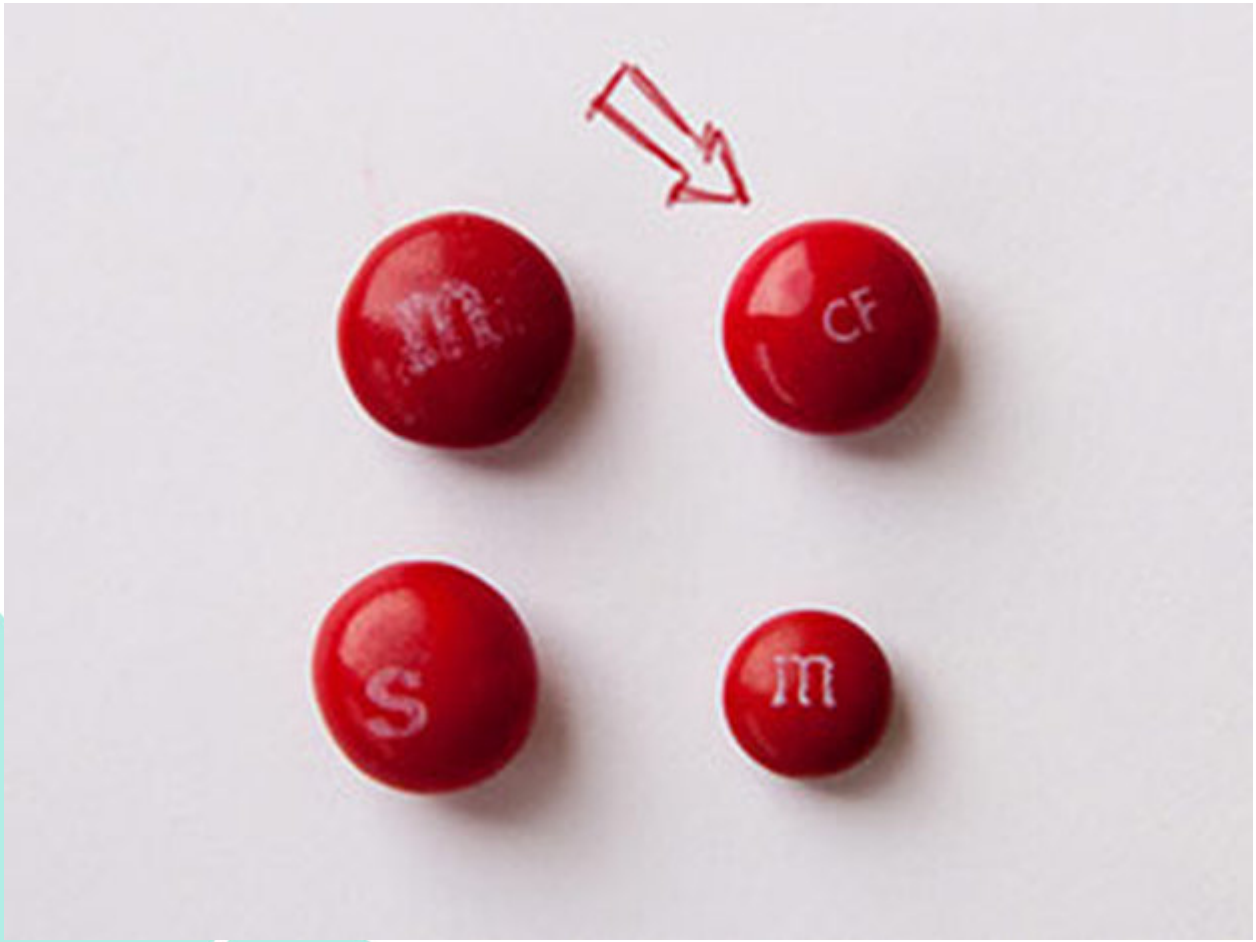

Automated retrieval

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Look alike Packaging

Same medication – different strength

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2mg/ml

10mg/ml

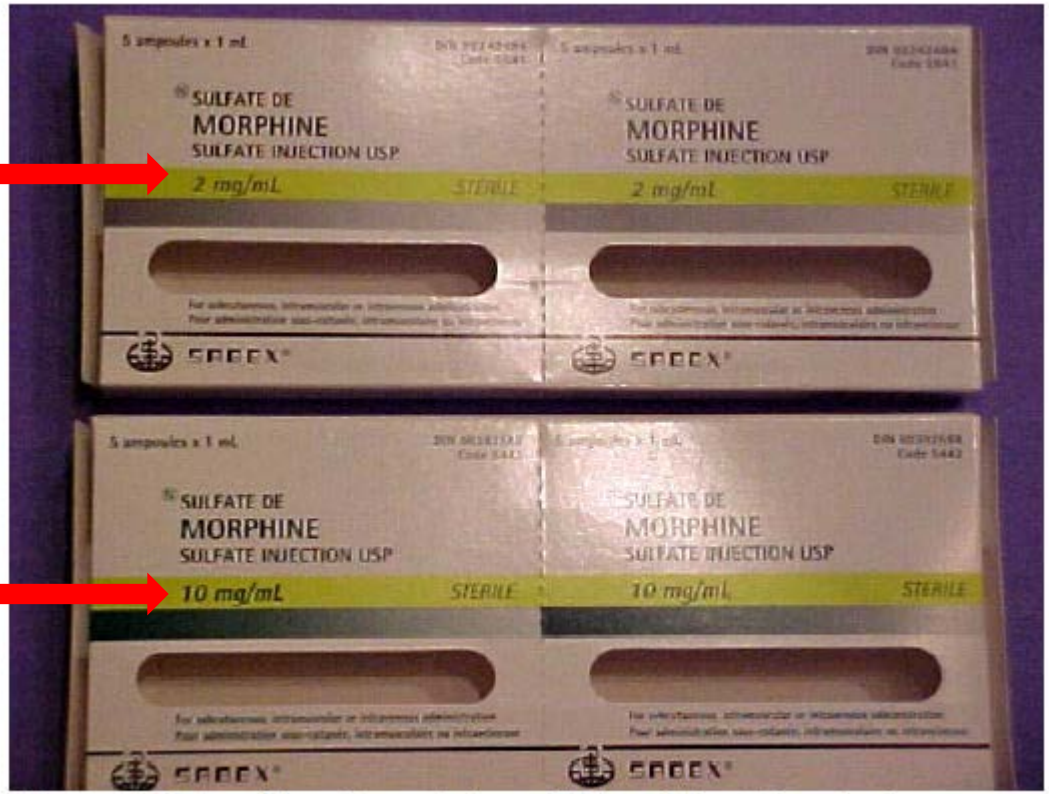

Figure 1. Morphine 2 mg/mL and Morphine 10mg/mL ampoule packaging.

From ISMP Canada Safety Bulletin Vol 4, Issue 11, November 2004

Environmental challenges

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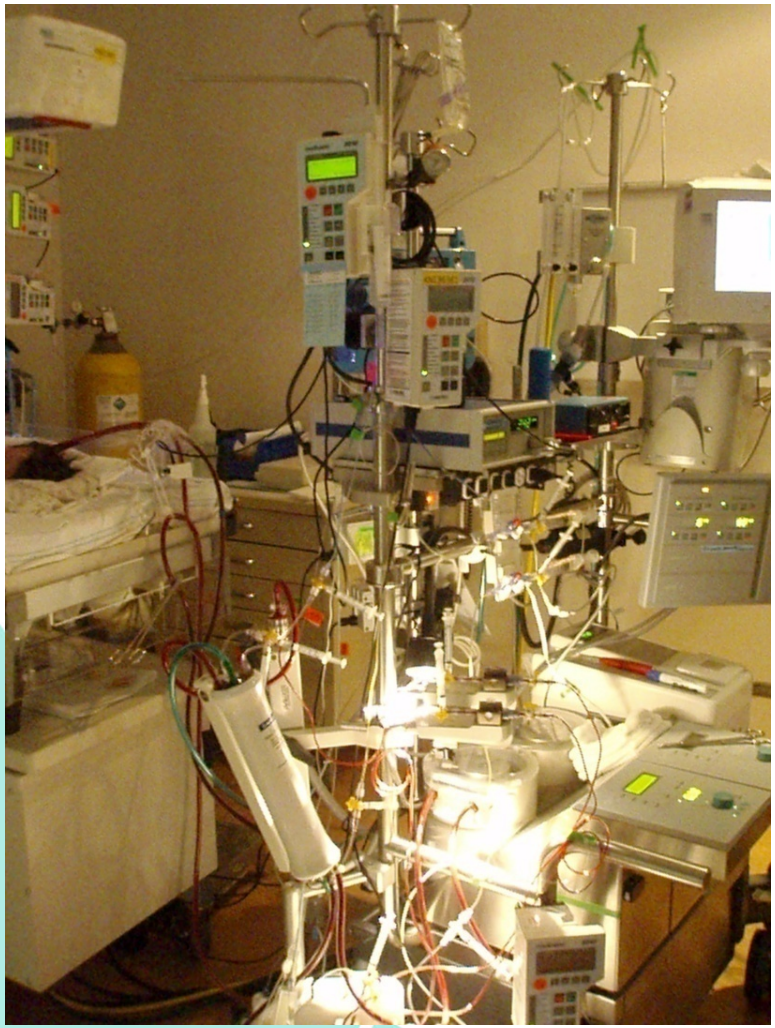

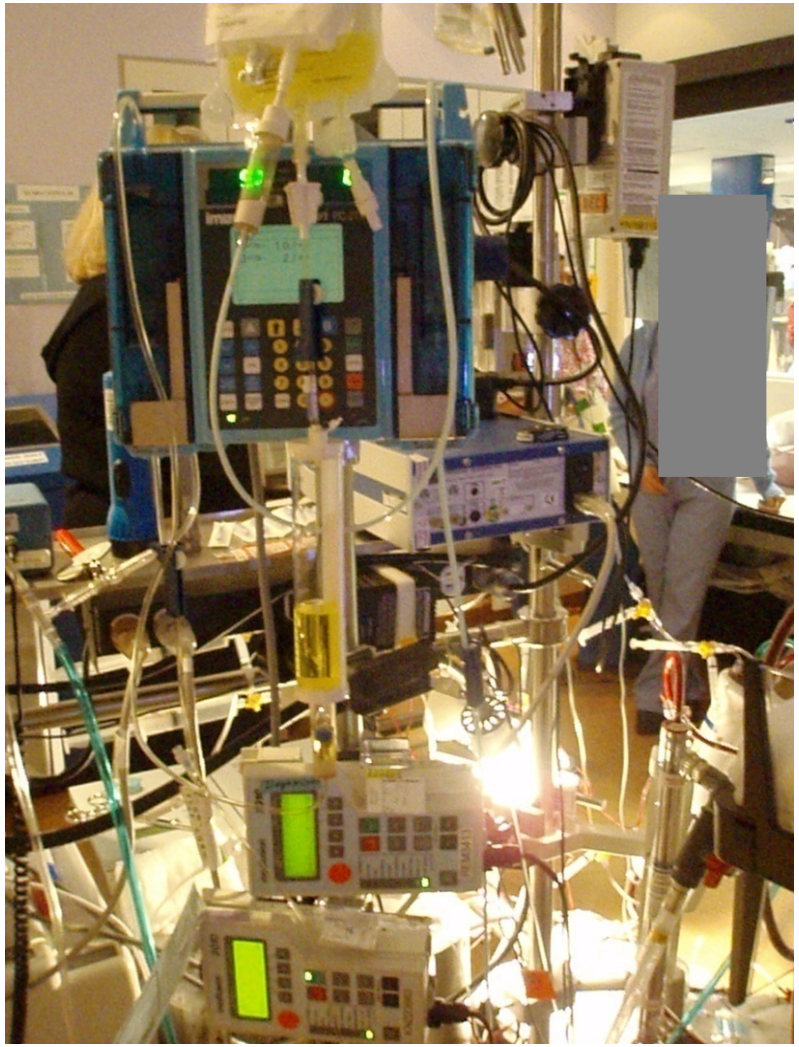

RCA is a privileged process. What does this mean?

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- The privilege provided under Division 6C of the *Health Administration Act 1982*, applies to:
- a. Any document prepared
- b. Any communications, whether written or verbal, between RCA team members and any other person (e.g. clinicians involved in the incident).
- Where the document is prepared, or the communications are made, for the dominant purpose of the conduct of the investigation by the RCA team.

Privilege WILL NOT apply to documents or communication created before a RCA team has been commissioned.

Privilege

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1. RCA team members cannot be compelled to produce or give evidence

2. RCA team members acting in good faith for the purposes of the RCA team's function are protected from personal liability, including actions for defamation.

3. Any person who creates a document or makes communications (written or verbal) for the RCA team cannot be compelled to produce or give evidence of the document or communication (staff interviewed experts who gave opinion)

4. *The final RCA report cannot be adduced or admitted as evidence in any proceedings (including coronial or professional practice proceedings)*

The legislation also establishes tight confidentiality requirements, making it an offence for a team member to disclose any information obtained during the investigation, unless it is for a purpose that is part of the RCA process.

20N Restrictions on RCA teams

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(1) A RCA team cannot investigate competence of an individual providing services.

(2) A RCA report must not disclose:

- the name or address of an individual who is a provider or recipient of services unless the individual has consented in writing to that disclosure, or
- as far as is practicable, any other material that identifies, or may lead to the identification of, such an individual.

(3) A RCA team is to have regard to the rules of natural justice in so far as they are relevant to the functions of a RCA team.

Appointment and Membership of the RCA team

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1. The **CE appoints** membership of the RCA team.
2. Some members are to have **fundamental knowledge** of the care processes in the area where the incident occurred.
3. **No member directly involved** in the incident or care of the patient.
4. Where possible one member is **external** to the LHD or Health Service.
5. Members should **not have personal or non-professional connection** with any clinician involved in the incident.
6. A **direct line manager should not be a member** of a RCA team investigating an incident involving their department
7. Persons involved in overseeing the quality of the RCA process should be appointed members of the RCA Team for **consultation (DCG).** This will ensure they are covered by statutory privilege.
8. A RCA team investigating suspected suicide/or homicide should include a senior mental health clinician who is **independent** of the facility involved.

Core steps in the RCA process

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Three meeting process designed to:

- Gather all relevant information (interviews, review of notes etc, expert advice)
- Compare it with what should/could have been done differently (policy, guidelines, expert & management perspectives)
- Work out why things happened as they did (analysis of causation)
- Make realistic recommendations to strengthen systems & reduce the risk of recurrence

Core elements of the RCA process

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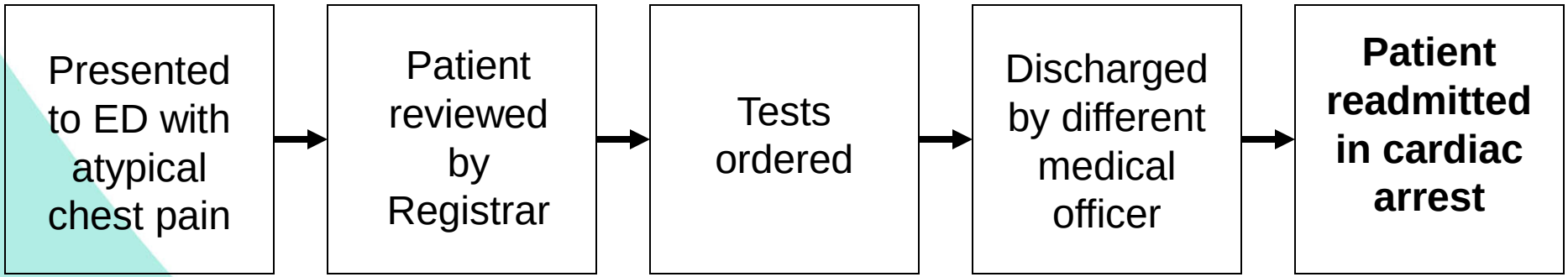
- Based on the actual sequence of events for an incident
- Identifies key decision/action/inaction points
- Looks for underlying causes, which explain why staff did/didn't act as they did
- Informed by speaking with staff involved in the patient's care and/or incident. Utilises operational knowledge and observation
- About system and human interfaces

Simple flow diagram



Identify what we know and what we don't know

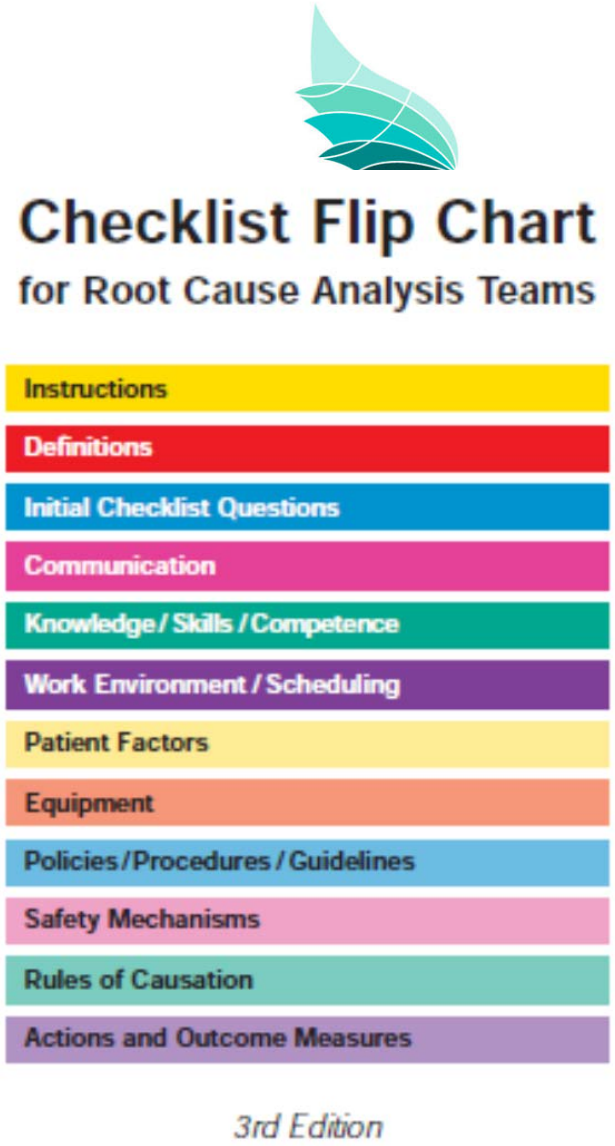
- Review relevant information (incident report, medical record etc)
- Brainstorm key questions
- Use checklist flipchart as a further prompt

Cont…

- Brainstorm key questions
  - At each flow chart box, in turn, ask:
    - What don't we know about what happened; before, during and after this event?
  - Phrase your questions in terms of how, what or why

Checklist flipcharts

- Following brainstorm, use checklist flipchart to prompt identification of:
  - system and process issues
  - people you may need to talk with
  - other background information that may need to be collected



Initial checklist questions

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- **Were there issues related to patient assessment in this event?** – if yes, go to the ***communication*** questions.

- **Were there issues related to staff training or staff competency a factor in this event?** – if yes, go to the ***knowledge / skills / competence*** questions.

- **Was equipment (or the use or lack of use of equipment) involved in this event in any way?** – if yes, go to the ***environment / equipment and knowledge / skills / competence*** questions.

Checklist questions cont...

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- **Was a lack of information or misinterpretation of information a factor in this event?** – if yes, go to ***communication*** questions.
- **Was communication a factor in this event?** – if yes, go to ***communication*** questions.
- **Were appropriate Policies / Procedures or guidelines – or lack thereof - a factor in this event?** – if yes, go to ***policies / procedures and guidelines*** questions.

Checklist questions cont...

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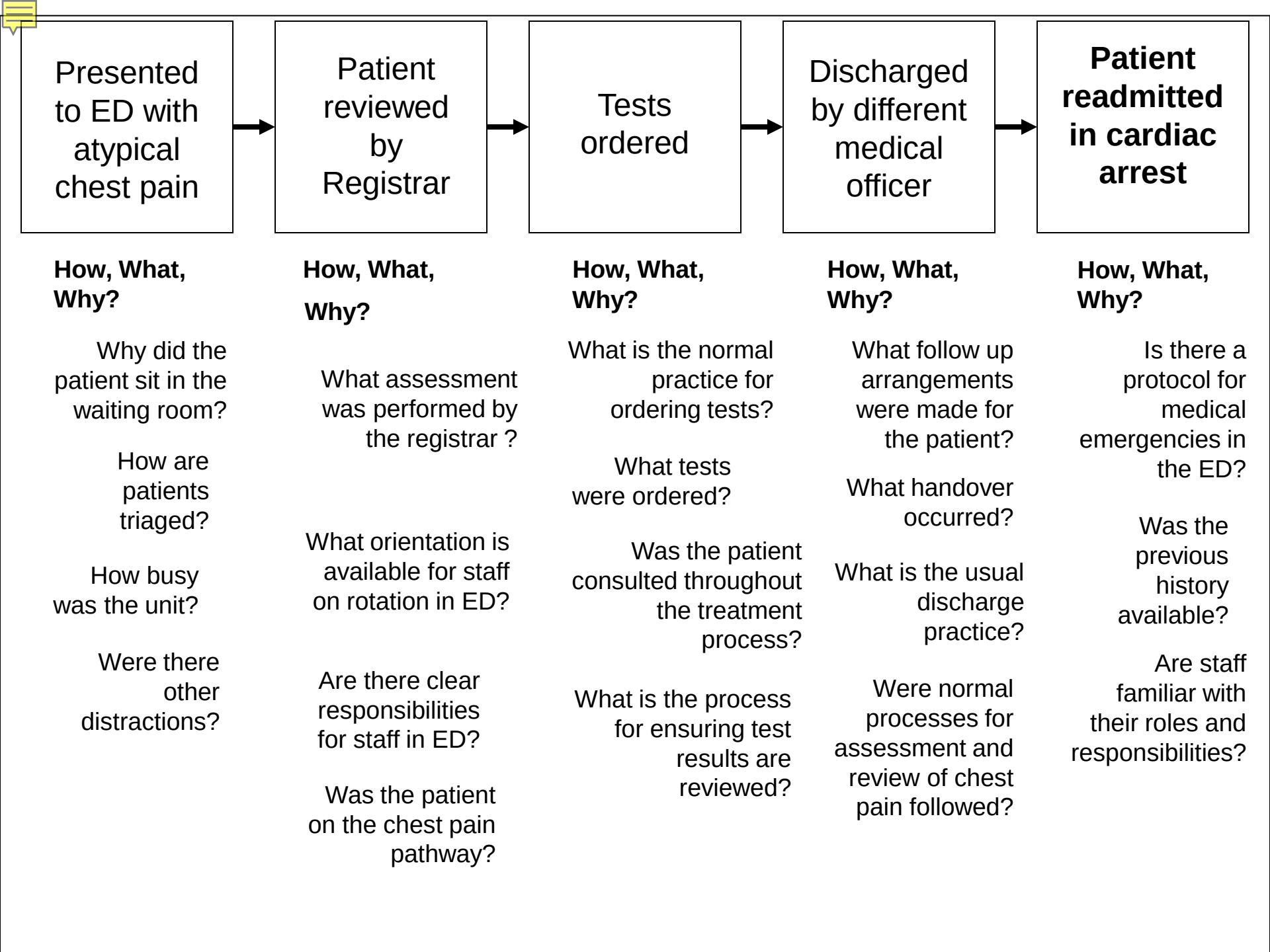
- **Was the failure of a safety mechanism or barrier designed to protect the patient, staff, equipment, or environment a factor in this event?** – if yes, go to the ***safety mechanism*** questions.

- **Were specific patient issues a factor in this event?** – if yes, go to the ***patient factors*** questions


Presented to ED with atypical chest pain
Patient reviewed by Registrar
Tests ordered
Discharged by different medical officer
Patient readmitted in cardiac arrest
How, What, Why?
Why did the patient sit in the waiting room?
How are patients triaged?
How busy was the unit?
Were there other distractions?
How, What, Why?
What assessment was performed by the registrar ?
What orientation is available for staff on rotation in ED?
Are there clear responsibilities for staff in ED?
Was the patient on the chest pain pathway?
How, What, Why?
What is the normal practice for ordering tests?
What tests were ordered?
Was the patient consulted throughout the treatment process?
What is the process for ensuring test results are reviewed?
How, What, Why?
What follow up arrangements were made for the patient?
What handover occurred?
What is the usual discharge practice?
Were normal processes for assessment and review of chest pain followed?
How, What, Why?
Is there a protocol for medical emergencies in the ED?
Was the previous history available?
Are staff familiar with their roles and responsibilities?

Decide who can provide additional information about key events- Information gathering

- Identify whom you need to talk with – include all those who may shed light
- Identify relevant information from other sources – eg policies, literature review etc
- These tasks need to be assigned for individual team members

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Step 2 of the RCA process

Final flow diagram

Objectives

1. Develop the final detailed flow diagram
2. Identify relevant actions and/or inactions at each point of the detailed flow diagram
3. Determine the most significant points where barriers might interrupt the flow of events

Final detailed flow diagram

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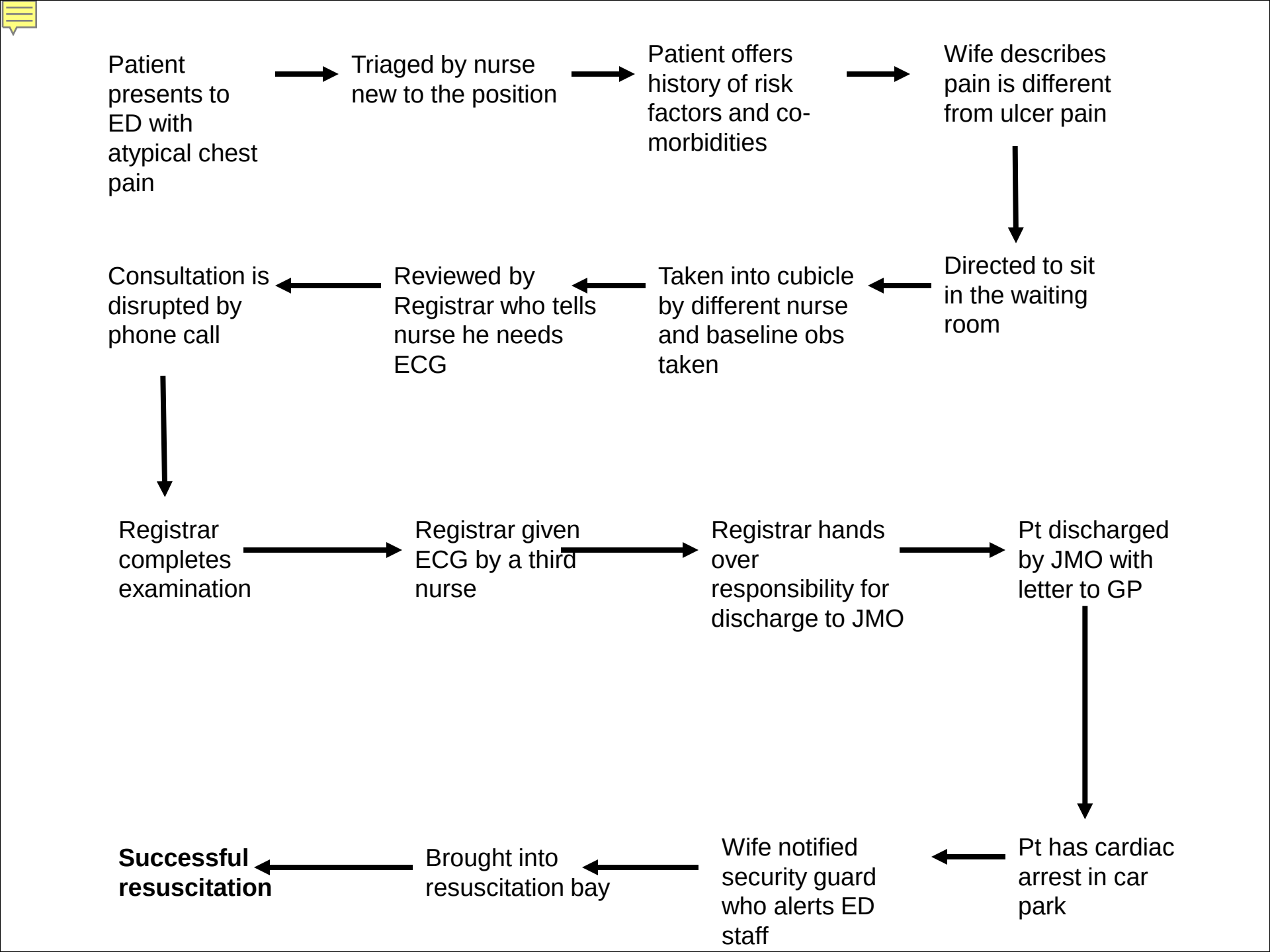
- Team members present information gathered
- The team builds on the initial simple flow diagram by adding all intermediate steps *(teasing out process)*
- It should be possible to identify a specific theoretical time for each event


Patient presents to ED with atypical chest pain
Triaged by nurse new to the position
Patient offers history of risk factors and co-morbidities
Wife describes pain is different from ulcer pain
Directed to sit in the waiting room
Taken into cubicle by different nurse and baseline obs taken
Reviewed by Registrar who tells nurse he needs ECG
Consultation is disrupted by phone call
Registrar completes examination
Registrar given ECG by a third nurse
Registrar hands over responsibility for discharge to JMO
Pt discharged by JMO with letter to GP
Pt has cardiac arrest in car park
Wife notified security guard who alerts ED staff
Brought into resuscitation bay
Successful resuscitation

Identify actions / inactions

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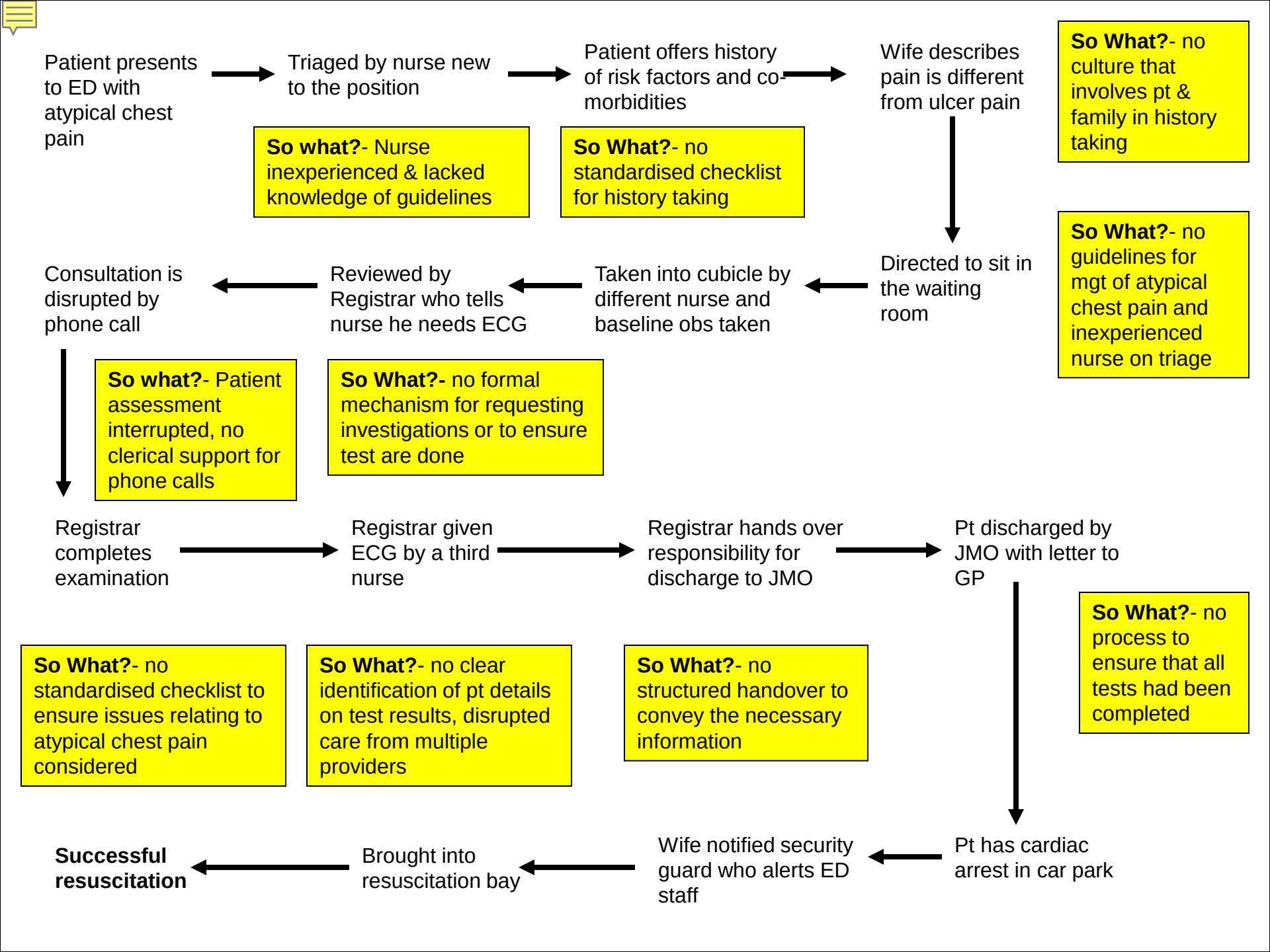
- At each step ask “so what….?”, “what if….?” or “what is the significance of each piece of information in relation to system vulnerabilities?”
  - e.g. “nurse triages patient”

    significance is – junior nurse is not trained in triage
- These may be actions or inactions
- There may be multiple factors at each step


Patient presents to ED with atypical chest pain
Triaged by nurse new to the position
Patient offers history of risk factors and co-morbidities
Wife describes pain is different from ulcer pain
So What?- no culture that involves pt & family in history taking
So what?- Nurse inexperienced & lacked knowledge of guidelines
So What?- no standardised checklist for history taking
Directed to sit in the waiting room
So What?- no guidelines for mgt of atypical chest pain and inexperienced nurse on triage
Taken into cubicle by different nurse and baseline obs taken
Reviewed by Registrar who tells nurse he needs ECG
Consultation is disrupted by phone call
So what?- Patient assessment interrupted, no clerical support for phone calls
So What?- no formal mechanism for requesting investigations or to ensure test are done
Registrar completes examination
Registrar given ECG by a third nurse
Registrar hands over responsibility for discharge to JMO
Pt discharged by JMO with letter to GP
So What?- no process to ensure that all tests had been completed
So What?- no structured handover to convey the necessary information
So What?- no clear identification of pt details on test results, disrupted care from multiple providers
So What?- no standardised checklist to ensure issues relating to atypical chest pain considered
Pt has cardiac arrest in car park
Wife notified security guard who alerts ED staff
Brought into resuscitation bay
Successful resuscitation

Determine barrier points

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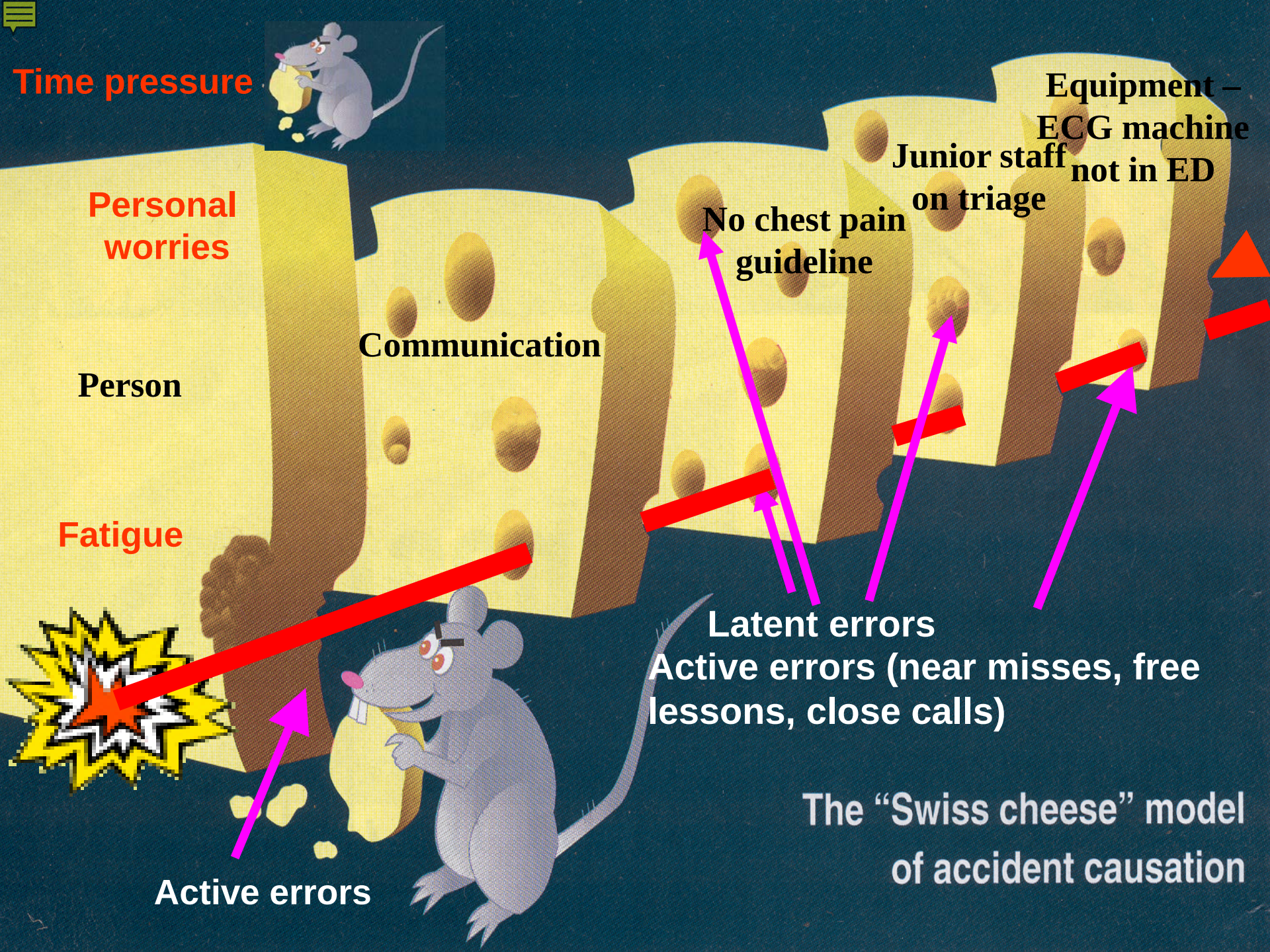
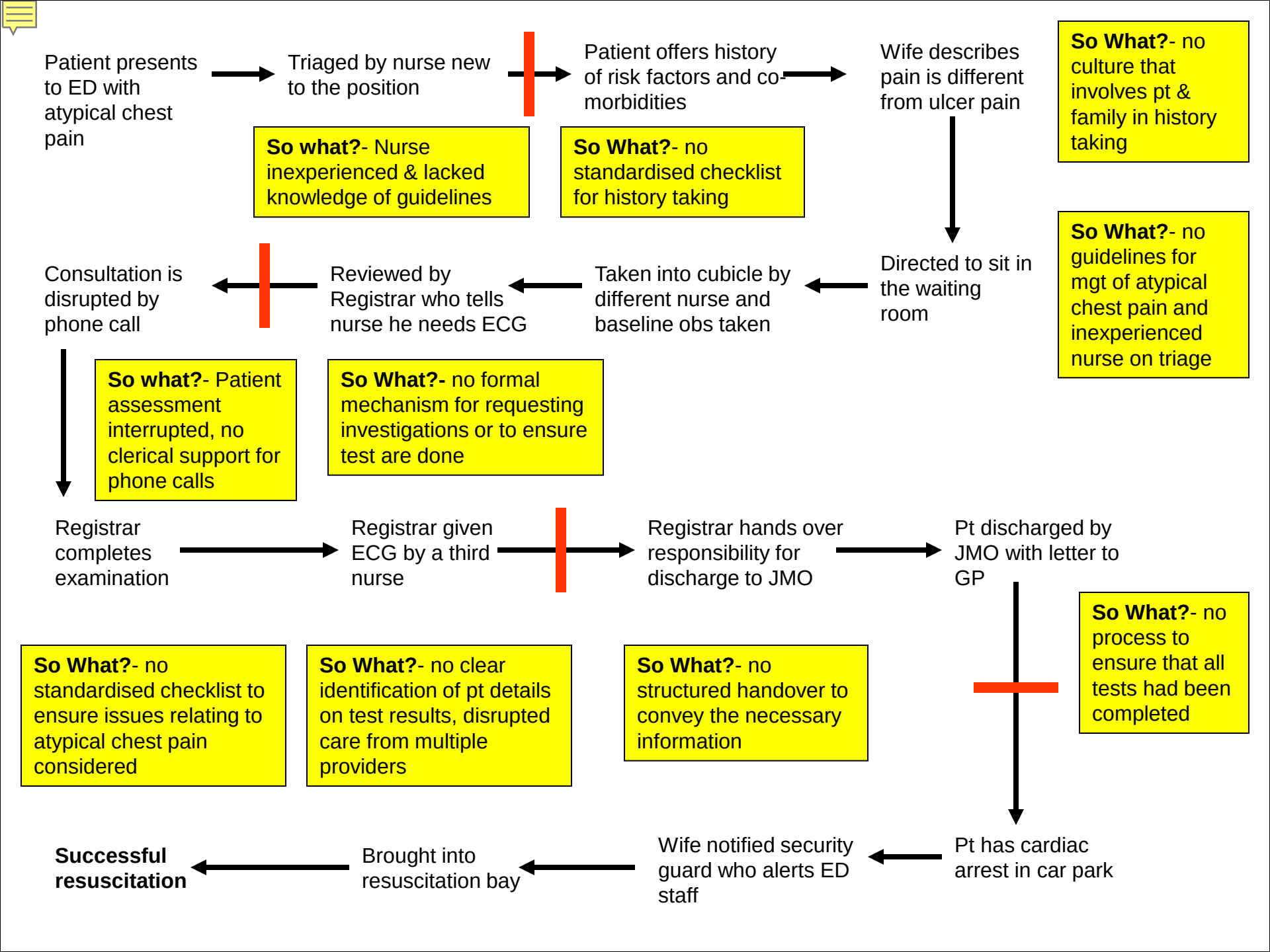
- Looking at the actions and inactions at each step:
  - decide the key points where barriers may have been *most* effective in preventing the adverse outcome
  - draw red lines to represent each barrier


Time pressure
Personal worries
Person
Fatigue
Communication
No chest pain guideline
Junior staff on triage
Equipment – ECG machine not in ED
Latent errors
Active errors (near misses, free lessons, close calls)
Active errors
The "Swiss cheese" model of accident causation


Patient presents to ED with atypical chest pain
Triaged by nurse new to the position
Patient offers history of risk factors and co-morbidities
Wife describes pain is different from ulcer pain
So What?- no culture that involves pt & family in history taking
So what?- Nurse inexperienced & lacked knowledge of guidelines
So What?- no standardised checklist for history taking
Directed to sit in the waiting room
So What?- no guidelines for mgt of atypical chest pain and inexperienced nurse on triage
Taken into cubicle by different nurse and baseline obs taken
Reviewed by Registrar who tells nurse he needs ECG
Consultation is disrupted by phone call
So what?- Patient assessment interrupted, no clerical support for phone calls
So What?- no formal mechanism for requesting investigations or to ensure test are done
Registrar completes examination
Registrar given ECG by a third nurse
Registrar hands over responsibility for discharge to JMO
Pt discharged by JMO with letter to GP
So What?- no process to ensure that all tests had been completed
So What?- no structured handover to convey the necessary information
So What?- no clear identification of pt details on test results, disrupted care from multiple providers
So What?- no standardised checklist to ensure issues relating to atypical chest pain considered
Pt has cardiac arrest in car park
Wife notified security guard who alerts ED staff
Brought into resuscitation bay
Successful resuscitation

Identifying the primary cause

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- **CHANGE** (event or action that happens at a point of time – Triggers, momentary and fleeting (registrar instructed JMO to refer patient to GP)

- **INACTION** – (didn't happen, may have prevented the action) – Failure to stop. Only significant and causal if it occurred after the change but before the outcome (JMO did not review the results before discharge)

- **CONDITION** (exists over time) – Sets the scene, operates over time (handover mechanisms between doctors)

Cause and effect diagram

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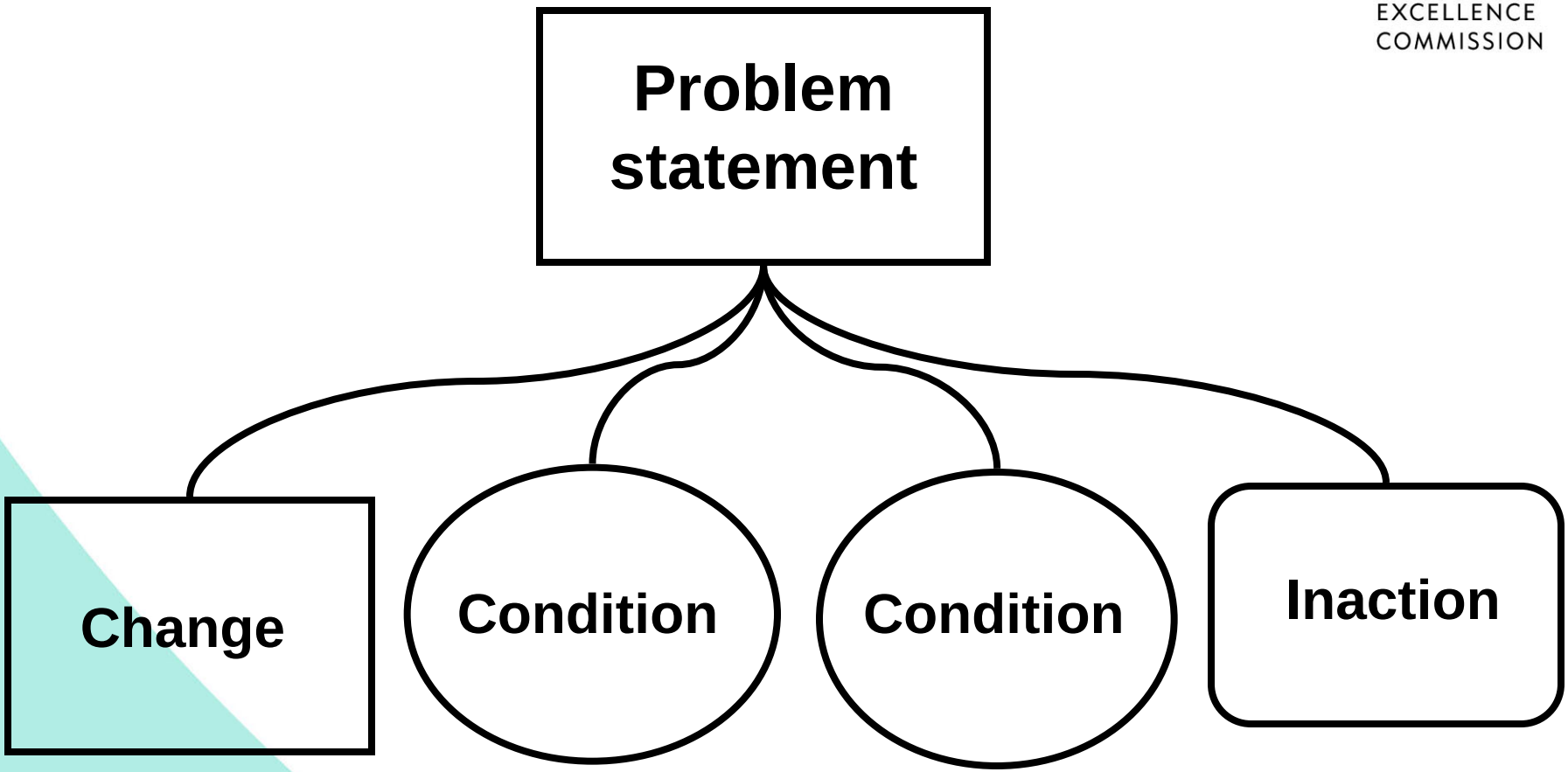
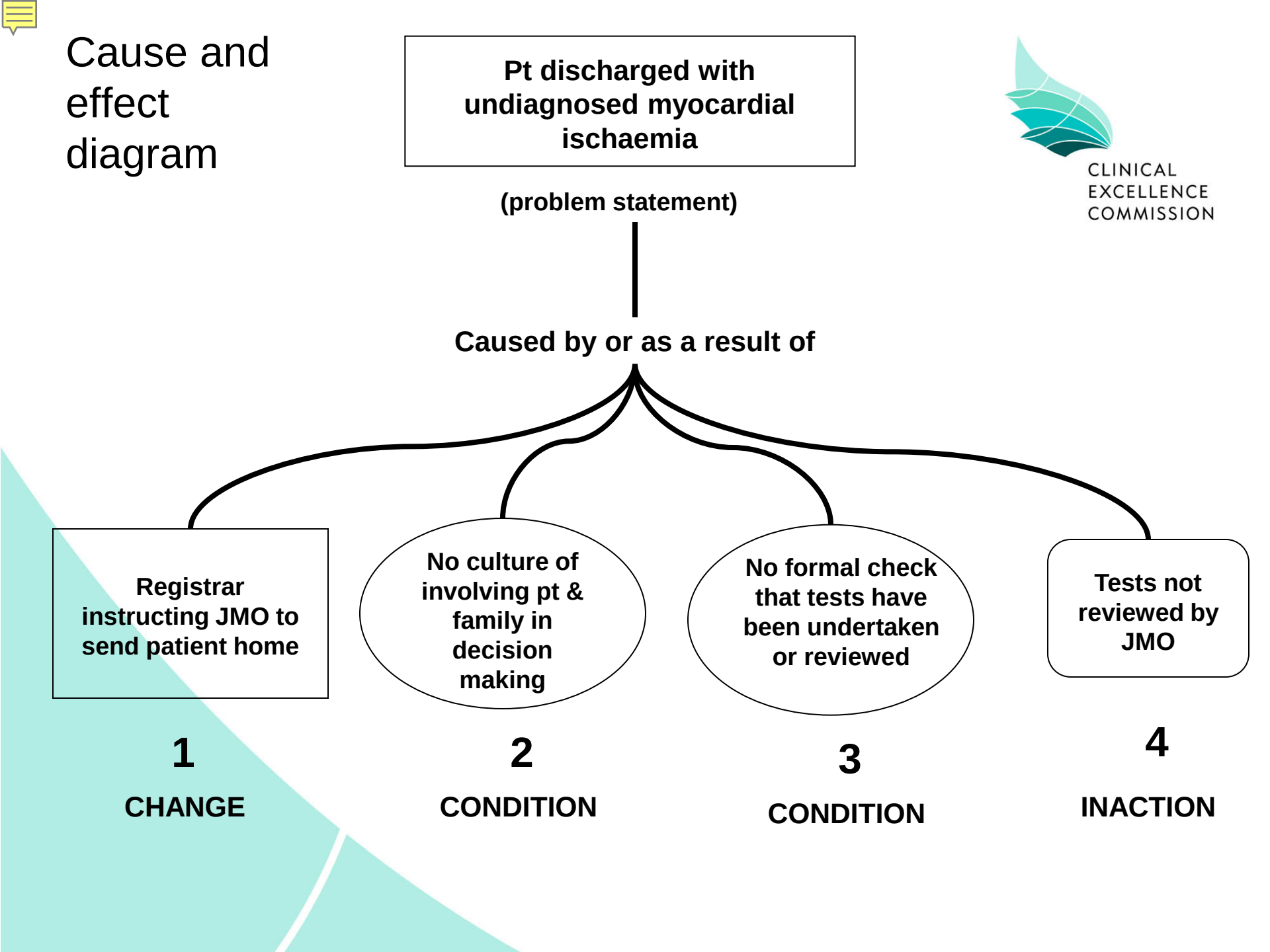


Cause and effect diagram



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The RCA report contains

A chronology of events as agreed by the RCA team (Incident Description section). We need to tell the true story

A concise summary of the team's findings in relation to each of the key points investigated. Don't repeat the chronology in this section.

Sub-headings are really helpful

It also helps the sign-off process to include events/conditions which may be expected but the team found didn't contribute to the event.

Does not include

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Names or initials of patients or staff involved – or anything else which makes their identity obvious – even if not about performance

Direct quotes attributed to people interviewed

Names/positions of RCA team members

Conjecture or allegations

The final report

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- The Investigation Team provides a copy of the Final Report to the CE. The final report is now no longer privileged
- The CE reviews the report and **recommendations for consideration and endorsement** before the Report is submitted to the Ministry.
- The CE is able to seek clarification from the RCA Team if the rationale for any recommendation is unclear. This communication is covered under privilege
- If the CE does not agree with any of the recommendations then this is documented as addendum to the final report with the reason/s why and the proposed alternative action.
- The CE is to ensure that any relevant final internal and external professional conduct/practice notification requirements as outlined in legislation and relevant policies is attended to
- CE Submits the report to MOH

Who reads RCA reports?

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Staff involved in incident

Ministers for health/mental health

NUMs, DONs

Corporate Services Managers

NSW Health

Chief Executive

CEC

Hospital Executives

LHD executive team

Quality & Safety Committee

Patients and families

Director General

Clinical Council

Coroner

RCA Review Committees

Service Managers

And whomever they pass it on to….

CEC RCA Review Committees

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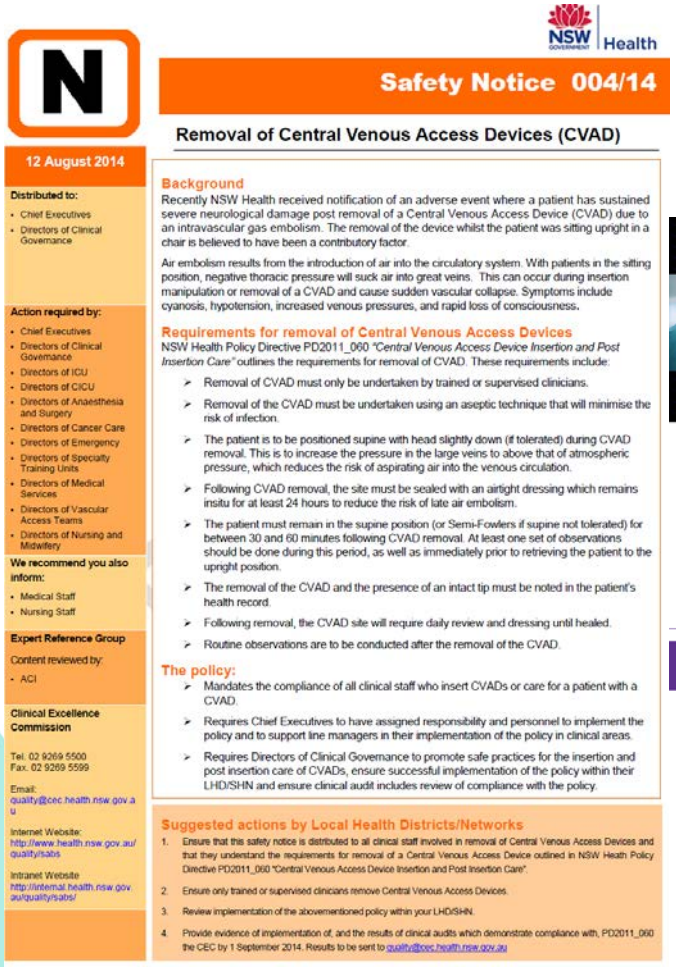
- General Clinical
- Mental Health
- Children and Young Persons
- Maternal and Perinatal

CEC RCA committees are subcommittees of CRAG and covered under privilege



NSW Health

Safety Notice 004/14

Removal of Central Venous Access Devices (CVAD)

12 August 2014

Distributed to:
- Chief Executives
- Directors of Clinical Governance

Action required by:
- Chief Executives
- Directors of Clinical Governance
- Directors of ICU
- Directors of CICU
- Directors of Anaesthesia and Surgery
- Directors of Cancer Care
- Directors of Emergency
- Directors of Specialty Training Units
- Directors of Medical Services
- Directors of Vascular Access Teams
- Directors of Nursing and Midwifery

We recommend you also inform:
- Medical Staff
- Nursing Staff

Expert Reference Group

Content reviewed by:
- ACI

Clinical Excellence Commission

Tel. 02 9269 5500
Fax. 02 9269 5599

Email: quality@cec.health.nsw.gov.au

Internet Website: http://www.health.nsw.gov.au/quality/sabs

Intranet Website http://internal.health.nsw.gov.au/quality/sabs/

Background

Recently NSW Health received notification of an adverse event where a patient has sustained severe neurological damage post removal of a Central Venous Access Device (CVAD) due to an intravascular gas embolism. The removal of the device whilst the patient was sitting upright in a chair is believed to have been a contributory factor.

Air embolism results from the introduction of air into the circulatory system. With patients in the sitting position, negative thoracic pressure will suck air into great veins. This can occur during insertion manipulation or removal of a CVAD and cause sudden vascular collapse. Symptoms include cyanosis, hypotension, increased venous pressures, and rapid loss of consciousness.

Requirements for removal of Central Venous Access Devices

NSW Health Policy Directive PD2011_060 *"Central Venous Access Device Insertion and Post Insertion Care"* outlines the requirements for removal of CVAD. These requirements include:

- Removal of CVAD must only be undertaken by trained or supervised clinicians.
- Removal of the CVAD must be undertaken using an aseptic technique that will minimise the risk of infection.
- The patient is to be positioned supine with head slightly down (if tolerated) during CVAD removal. This is to increase the pressure in the large veins to above that of atmospheric pressure, which reduces the risk of aspirating air into the venous circulation.
- Following CVAD removal, the site must be sealed with an airtight dressing which remains insitu for at least 24 hours to reduce the risk of late air embolism.
- The patient must remain in the supine position (or Semi-Fowlers if supine not tolerated) for between 30 and 60 minutes following CVAD removal. At least one set of observations should be done during this period, as well as immediately prior to retrieving the patient to the upright position.
- The removal of the CVAD and the presence of an intact tip must be noted in the patient's health record.
- Following removal, the CVAD site will require daily review and dressing until healed.
- Routine observations are to be conducted after the removal of the CVAD.

The policy:

- Mandates the compliance of all clinical staff who insert CVADs or care for a patient with a CVAD.
- Requires Chief Executives to have assigned responsibility and personnel to implement the policy and to support line managers in their implementation of the policy in clinical areas.
- Requires Directors of Clinical Governance to promote safe practices for the insertion and post insertion care of CVADs, ensure successful implementation of the policy within their LHD/SHN and ensure clinical audit includes review of compliance with the policy.

Suggested actions by Local Health Districts/Networks

1. Ensure that this safety notice is distributed to all clinical staff involved in removal of Central Venous Access Devices and that they understand the requirements for removal of a Central Venous Access Device outlined in NSW Heath Policy Directive PD2011_060 "Central Venous Access Device Insertion and Post Insertion Care".
2. Ensure only trained or supervised clinicians remove Central Venous Access Devices.
3. Review implementation of the abovementioned policy within your LHD/SHN.
4. Provide evidence of implementation of, and the results of clinical audits which demonstrate compliance with, PD2011_060 the CEC by 1 September 2014. Results to be sent to quality@cec.health.nsw.gov.au

PATIENT SAFETY WATCH

EDITION 2/12: Central Venous Access Devi... (CVAD) Removal

WHAT SHOULD YOU DO

Ensure LHD and facility policies and procedures, and individual requirements of *Central Venous Access Device Insertion and Po*

- CVADS are always removed by trained or supervised clinician
- The patient is positioned supine with head slightly down (if tole
- Following removal, the site is sealed with an airtight dressing v
- Patients remain in supine position (or Semi-Fowlers) for 30 - 6 set of observations is performed during this period, as well as i patient to the upright position. Routine observations are ongoir
- Ensure catheter tip is intact on removal and send for culture, a is suspected. Those actions are recorded

CASE 1

THE INCIDENT

A 65 YEAR OLD MAN had been an inpatient with complicated pancreatitis resulting in a partial pancreatectomy. He had a central venous access device in place. It was noted during the intensivist's routine rounds that the central line site appeared inflamed. He directed staff to remove the CVAD and to send the tip and a swab of the site for bacterial culture. Not long after the round, a physiotherapist assisted the patient with mobilising and sitting out in a recliner chair.

Nursing staff prepared to remove the CVAD and equipment was set up prior to laying the patient flat in the recliner. The patient then held his breath and the line was removed quickly with light pressure applied with gauze, and the removed CVAD was held over the sterile field so
second nurse
occurring as a
The piece of g
difficult becau
was then sat u

Within minute
became short
saturations dr
mask was app
he was laid
improved to 96

Approximately
episode, the
chest X ray an
of collapse

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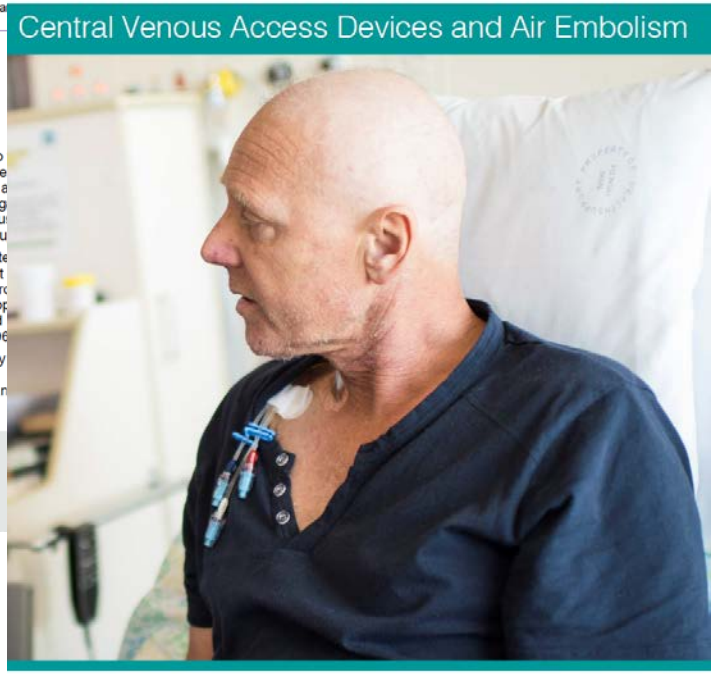
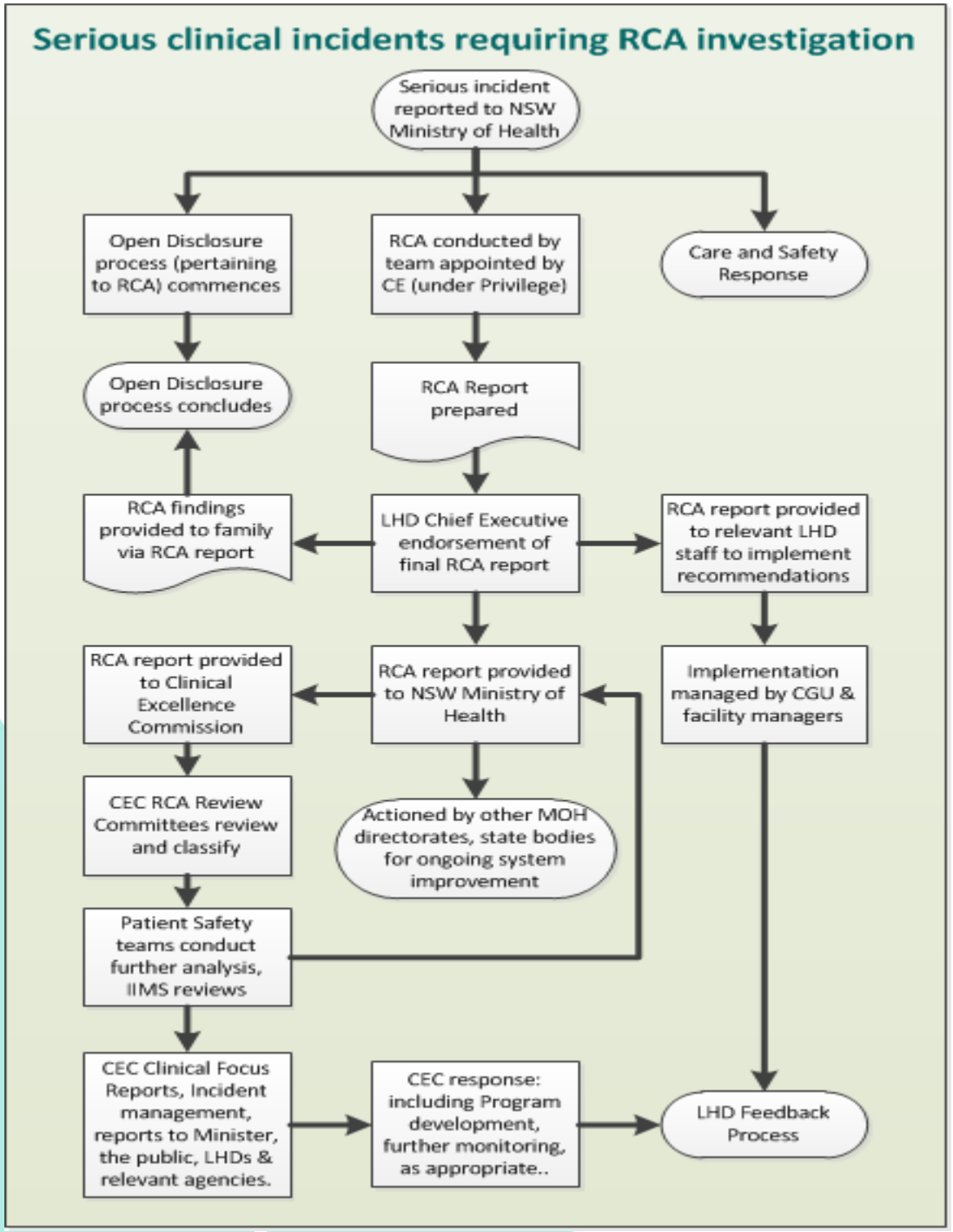
CLINICAL FOCUS REPORT



Central Venous Access Devices and Air Embolism

Sharing and Applying Lessons

Patient safety
looking • learning • acting®



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Where does RCA fit?

What we have learned from reviewing all RCAs?

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- RCA review process does work
- Aggregated data is very powerful
- Clinician input is essential at all levels
- Value is in the narrative
- Solutions need to target the system at a number of levels
- Relies on team's gathering the right information about the work of health care

IIMS & RCA 10 years in quality and safety in health care CEC with LHD Collaboration

CLINICAL EXCELLENCE COMMISSION

- Grown from:
  - 4 programs in 2004/5 (12 staff)
  - 30 programs/initiatives in 2016 (100+ staff)