



# Sentinel event reporting & root cause analysis

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# Sentinel event reporting

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- As part of a national agenda for safety, Health ministers agreed to measure and report a small number of rare occurrences
  - Assumption that examining very closely a small number of events, much could be learnt
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# Sentinel events

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- Procedures involving wrong patient or body part
  - Suicide of a patient in an in-patient unit
  - Retained instruments after surgery
  - Intravascular gas embolism causing death
  - Blood transfusion reaction from ABO incompatibility
  - Medication error leading to the death of patient
  - Maternal death from labour or delivery
  - A baby discharged to the wrong family
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# Sentinel event notifications South Australia 2003-2004

Procedures involving wrong patient or body part	0
Suicide of a patient in an in-patient unit	2
Retained instruments after surgery	0
Intravascular gas embolism causing death	1
Blood transfusion reaction from ABO incompatibility	1
Medication error leading to the death of patient	0
Maternal death from labour or delivery	1
A baby discharged to the wrong family	0

# Safety Assessment Code (SAC)

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- Method of assessing seriousness, or potential seriousness, along with the likelihood of recurrence of any event
  - Scale 1 to 4
  - Takes into account likelihood of event and consequences if it happening
  - SAC 1 can cause serious harm to patient
  - DoH requires to be notified of all SAC 1 events, and that these be investigated by the health service
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# SAC 1 events notifications 2003-4

Suspected suicide in the community	39
Clinical management	15
Obstetric – delivery	7
Medications	2
Pressure ulcer	1
Falls	1
Nutrition	1

# Comparison SA and NSW 2003-4

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	SA	NSW
Sentinel events	5	31
SAC 1 events	66	421

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# Event analysis

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- Root cause analysis:
    - Retrospective, structured process
    - Identify causal/contributing factors
    - Widely applied in industrial accidents, particularly low frequency (e.g. Three Mile Island, Columbia disaster)
    - Foundations in industrial psychology and human factors engineering
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# RCA

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- Aims to avoid culture of individual blame
  - Applied systematically, can identify common factors in seemingly unconnected events (e.g. multiple different events at changes of shifts)
  - Multidisciplinary, varied perspectives
  - Address system failures
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# RCA – methodological limitations

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- Essentially uncontrolled case studies
- Hindsight bias
- Testability of results (i.e. impossible to know if the root cause was the actual cause)
- Time-consuming, labour intensive

Wald & Shojanian 2001

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# RCA - usefulness

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- Important to recognise this is a qualitative technique
  - Qualitative methods best for:
    - Generating hypotheses
    - Richer understanding, not necessarily representative
    - For infrequent events, where frequency is a less useful metric
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# *Why bother?*

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“Most errors result from faulty systems rather than human error, e.g., poorly designed processes that put people in situations where errors are more likely to be made. Those people are in essence "set up" to make errors for which they are not truly responsible”.

U.S. National Patient Safety Foundation

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# Root cause analysis - needs

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- Strong support by upper management vital
  - Improvement focus, not assigning blame
  - Rigorous qualitative techniques
    - Triangulation on data collection
    - Iterative data analysis
    - Conceptual framework for categorisation
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# Management/clinician view

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- RCA is not yet universally embraced
  - Viewed as another regulatory requirement
  - Not value-added nor inexpensive
  - Resistance to performing RCA
  - Resistance to learning from findings
  - Lack of support for effective usage
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# *Does it work?*

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- Little systematic evaluation
  - Focus on surrogates
    - Incident reporting rates
    - Categories of errors identified
    - Recommended system changes
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# Published studies

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- Study in Texas
- Systematically applied RCA for ADEs
- 17 month follow-up
- No control site, no data on ADEs from previous year to study
- Relied on voluntary reports only
- Various changes in medication system
- 45% ↓ reported serious ADEs
  - (7.2 → 4.0 per 100,000 patient days)
- Small number deaths resulted in wide CIs

# RCA - Health vs other industries

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- Hirsch et al identify 3 key philosophical differences between views in other industries and health
    1. Emphasis on human error, issues of blame outside health
    2. Contributing versus causative factors
    3. Degree of efficacy of corrective actions
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# Blame/human error

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- "All sentinel events are the result of human errors that queue up in a particular sequence."

*compared with*

- Errors must be accepted as evidence of systems flaws, not character flaws"

(Leape, 1994, 1997).

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# Causative vs contributing factors

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- “Nearly ubiquitous underlying assumption that causative factors had to be:
  - necessary and sufficient,
  - necessary but not sufficient, or,
  - Irrelevant”.

OR

- "... a detailed examination of the causes of these accidents reveals the insidious concatenation of often relatively banal factors, hardly significant in themselves, but devastating in their combination"
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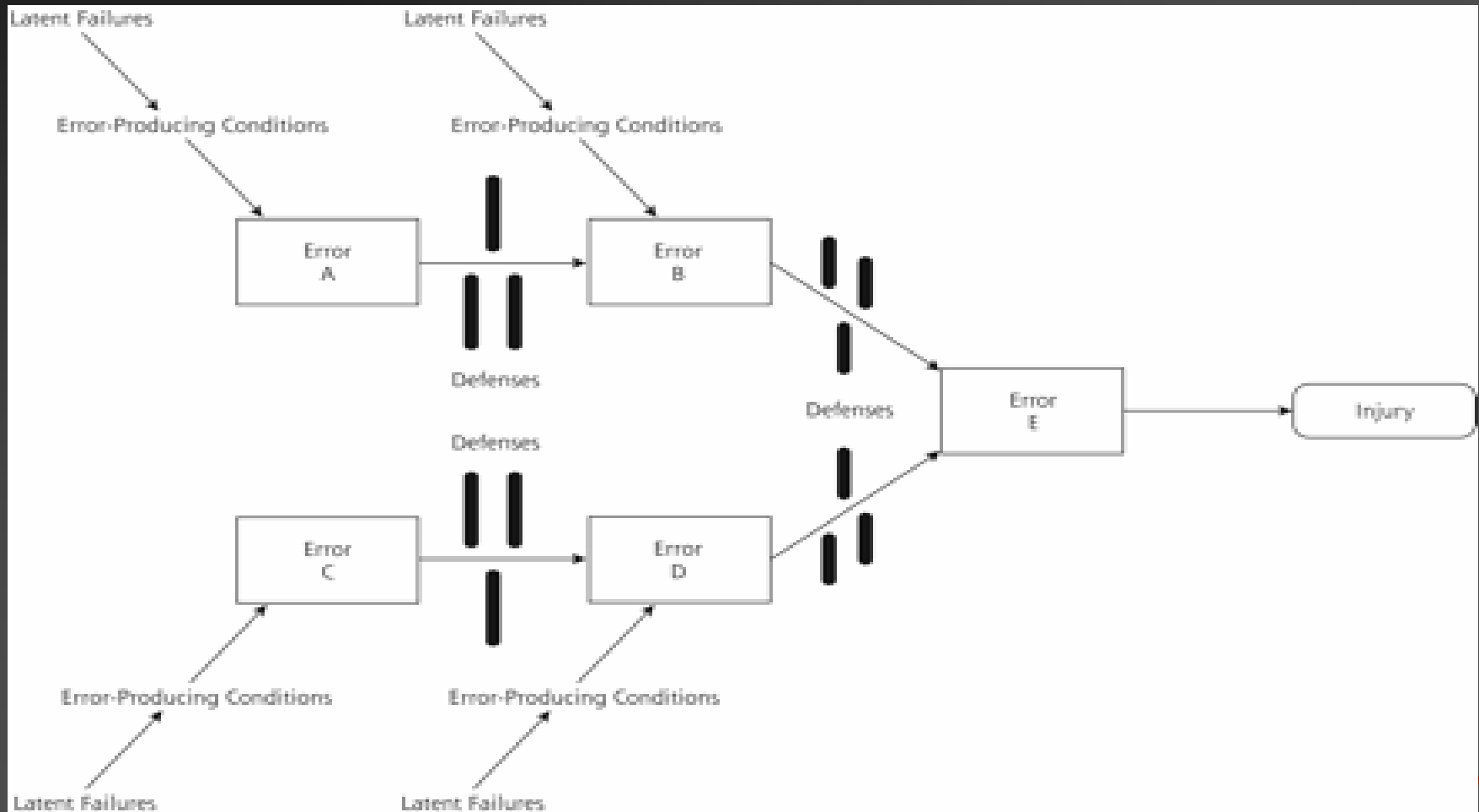
(Reason, 1994)

# Cascade analysis –

*“a string of mistakes”* (Woolf 2004)

- Most incidents not single error but a chain
- Eg “Wrong dose” is a “prescribing error”, but may occur from incorrect weight recorded in notes or missing lab result, etc
- Focus more on intermediary errors than just “root causes”
- Study in primary care in 6 countries:
  - 92% distal errors were of diagnosis/treatment
  - But 67% of these involved communication
  - Of these, 90% seemed remediable by IT systems

# Analytic construct to incorporate Reason's model of organizational accidents into the notion of cascades.

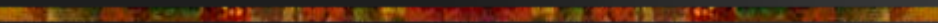


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- Assumption any “root cause” can either be “corrected” or is “non-correctable”
  - Partial solutions discounted
  - *Does the problem lie with the need for monitoring the results of corrective action?*
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*The best is the enemy of the good*



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- Sentinel events occur very infrequently, i.e. rate of occurrence is not a meaningful metric
  - Implies anything less than a complete correction can be viewed as a failure
  - “This perception belies, however, the underlying philosophy and guiding principles of continuous improvement; improvements are incremental and ongoing; perfection is targeted, but not attained”.

Hirsch et al 2004



# *“window on the system”*

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- RCA identifies correlates, enablers, facilitating factors for an event
    - (ie differential diagnosis)
  - Recommended changes inherently speculative
    - (ie experimental treatment)
  - Understanding performance
    - (educational tool / establish portfolio of better practices)
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# Positive RCA

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- Identify a successful outcome and retrospectively investigate what went right

Kazandjian 2002

- Potential as positive motivator
  - Identify portfolio of better/best practices
  - Easier to share this with other institutions
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# Suggestions

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- Sentinel event reporting useful if effective analysis then occurs
  - Staff training and institutional culture, especially executive support crucial
  - Focus should be on all contributory factors, not just the “root cause”
  - Measures will need to reflect this, i.e. processes are as important as “outcomes”
  - Most outcomes measures will be proxies for sentinel events anyway
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# National approach?

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- Resources available for background information gathering (eg literature reviews) are limited at institutional level
  - Experience/competence varies at institutional level
  - Most problems are systemic, even if the local microsystems specify the specific details
  - Suggests value in input from expert centres/panels
  - Especially for technical / equipment problems
  - Evidence-based approaches for cultural change / communication issues
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