Taking your event analyses & discussions to the next level
Cause mapping

Lauge Sokol-Hessner, MD, CPPS
Clinical Associate Professor of Medicine at the University of Washington & Harborview Medical Centers
QI Mentor, UW Medicine Center for Scholarship in Patient Care Quality and Safety
Associate Director, Collaborative for Accountability and Improvement (CAI)
Faculty Coach, PACT Collaborative
Pronouns: he/him/him

CAI Webinar Series

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Disclosures & housekeeping

- Lauge Sokol-Hessner, MD, CPPS has no relevant financial disclosures
- Any opinions shared are his own
- Please use Zoom for questions (not Slido)

Learning objectives

- Examine challenges with common approaches to event analysis & discussions
- Describe cause mapping and how it can help you take your organization's safety work to the next level
- Explore how you can get started with cause mapping

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Overview

- What is cause mapping?
- RCA^2 and its importance
- Comparing & contrasting cause maps to other methods
- Basic principles of cause mapping & examples
- Cause mapping challenges
- Next steps

NOTE: This is intended only as a brief overview of cause mapping. For professionals interested to use cause mapping, a complete course involves more in-depth exploration, examples, and practice.

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What is a cause map?

A diagram showing the cause-and-effect relationships among the factors that contributed to a safety event – **recommended as part of RCA[2]**
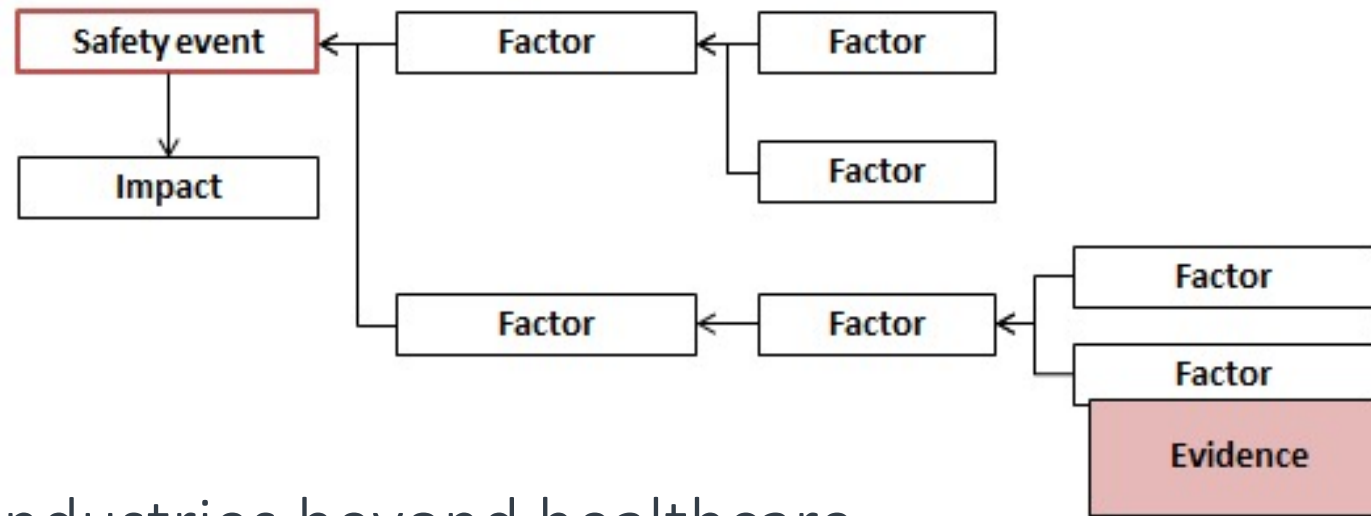
Used in many industries beyond healthcare

Energy, transportation, telecommunication, manufacturing

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Effect	←	Cause

Ice cream melted	←	*Why?*

Effect ← Cause

Ice cream melted ← Air temperature was warmer than the ice cream ← *Why?*
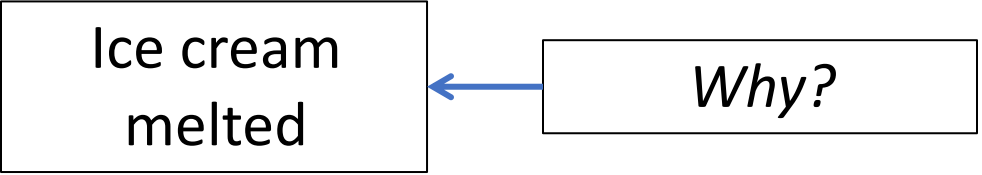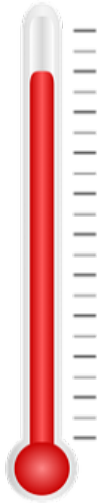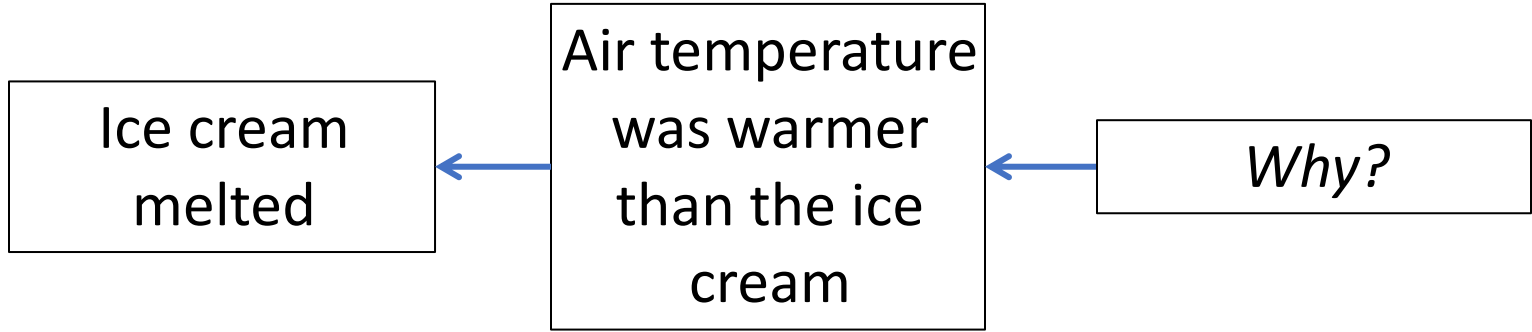
| Effect | ← | Cause |

| Ice cream melted | ← | Air temperature was warmer than the ice cream | ← | It was summer |

Ice cream fell to the ground and melted

Ice cream became dislodged

Sibling knocked the cone

AND

Air & ground temperatures are warmer than the ice cream

It's summer

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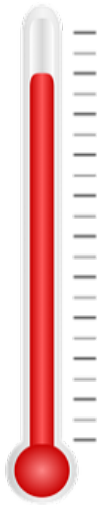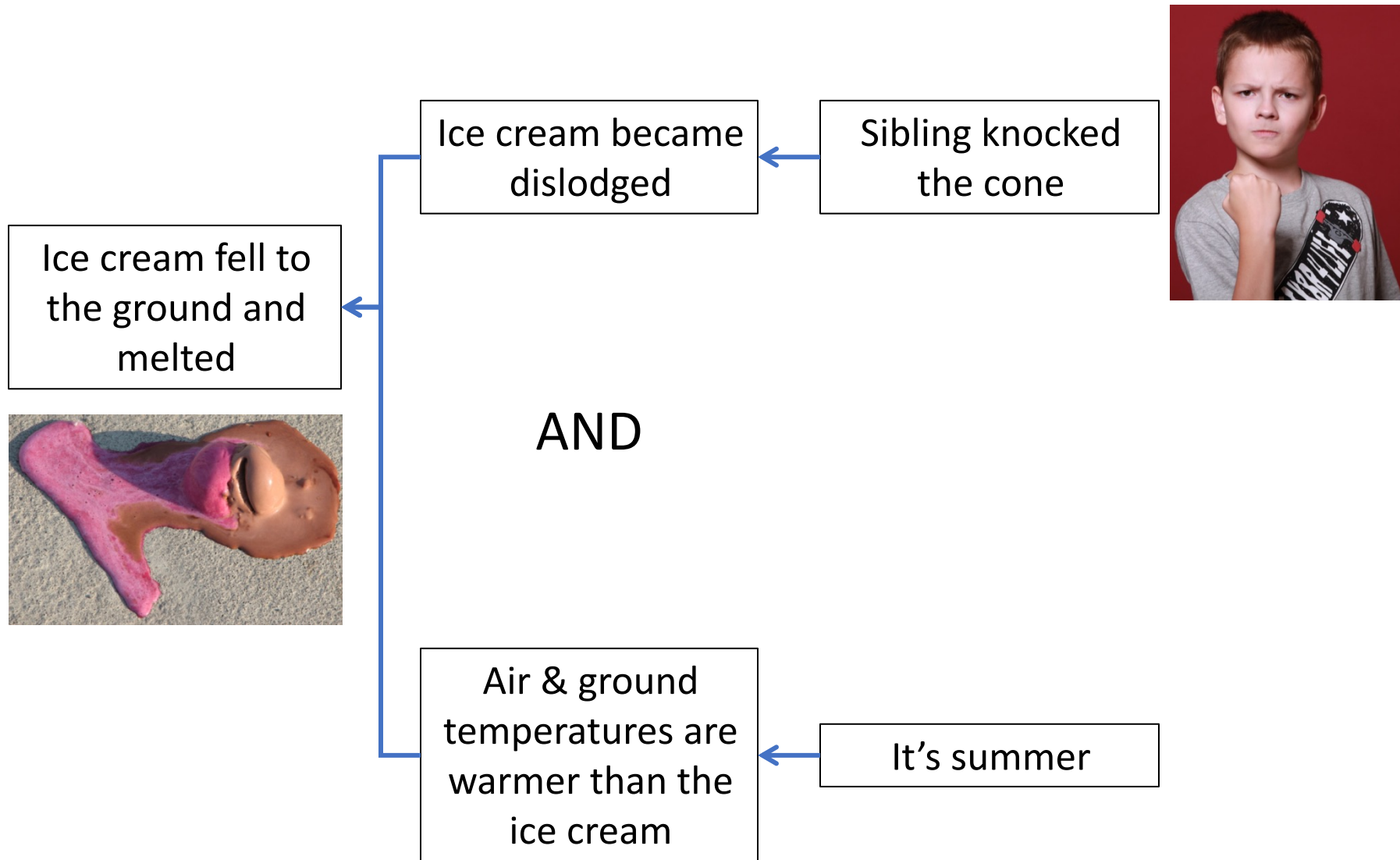
Cause maps are part of a comprehensive presentation

Page 1

Focused event timeline
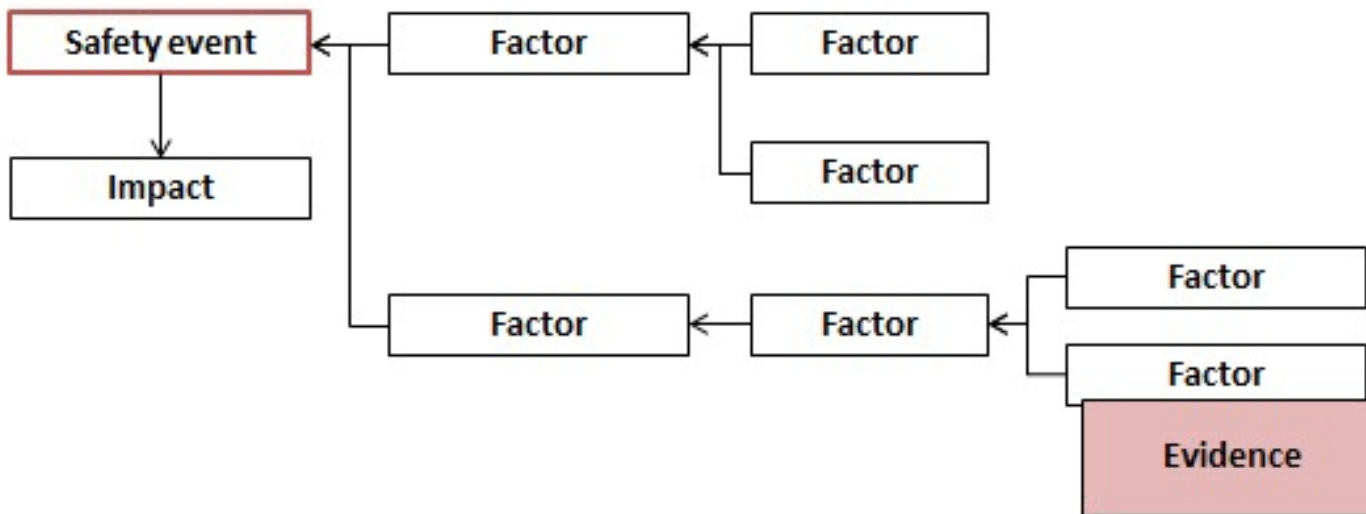
Page 2

Context

Relevance to other settings of care

Patient/family communication
  Key part of "CRP" processes

Patient outcome

Page 3

Corrective actions/responses to each contributing factor
- Type of action
- Strength
- Responsible parties

External reporting decisions

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What is RCA^2?
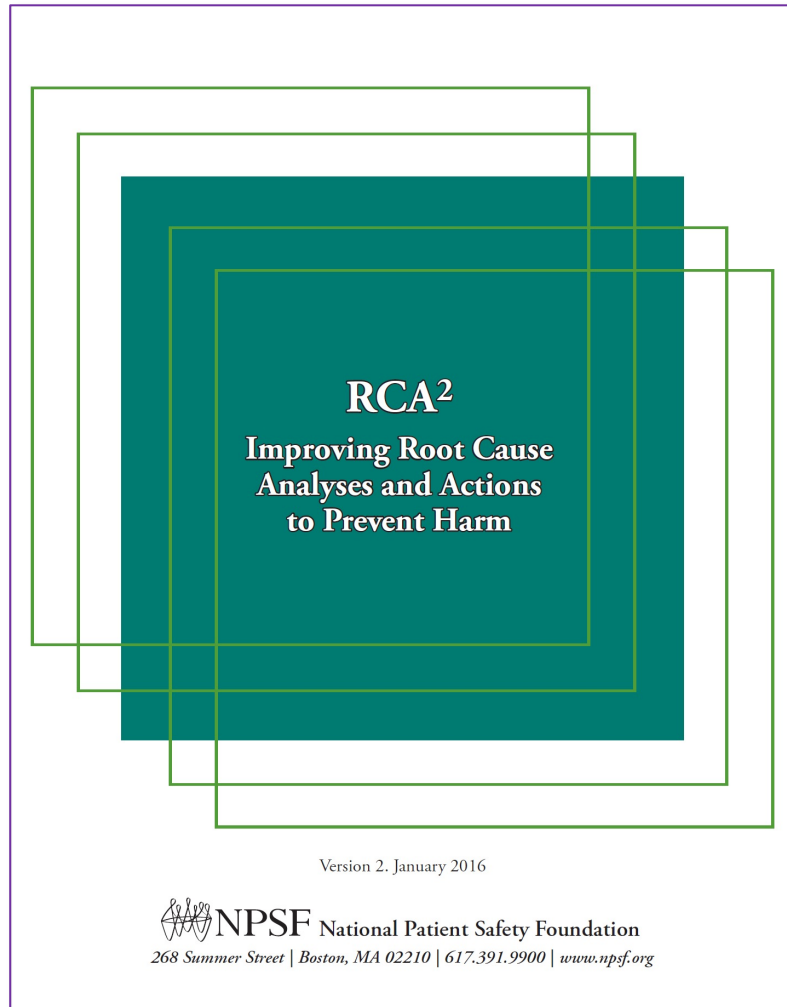
- Change **_from_** "root cause analysis" **_to_** "root cause analysis and action"

- Increasingly rigorous process

- Resource has detailed guidance & examples of how to use RCA^2

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Why use RCA^2?

Problems with historical approaches

- Unhealthy quest for "the" root cause
- Questionable quality of RCAs
  - Harms recur = corrective actions are insufficient
  - Low-quality analyses → vague causal analyses → ineffective corrective actions
- Political hijack
- "Analysis paralysis"
- Poorly designed or implemented risk controls
- Disaggregated analysis focused on single organizations and incidents
- Confusion about blame; diffusion of responsibility

How RCA^2 can help

- Appreciate multiple contributing factors
- Develop expertise, use a rigorous process, including cause mapping

- Shield processes from politics
- Shift from RCA to RCA^2
- Use strong system-based corrective actions
- Always consider events as signals of larger problems, consider them in context, focus on risk
- Just & fair culture, incr. accountability for systems

Modified from Peerally et al., "The problem with root cause analysis," BMJ Qual & Saf 2016

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RCA²

Events occur & are reported → **Subset undergo deep review & analysis** → **Findings shared & discussed** → **Opportunities identified Solutions designed, tested** → **Changes implemented**

Collaborative for Accountability and Improvement   From the Noun Project: Warning by Gregor Cresnar; Exclamation Mark by LAFS; process by Linda; metric by Nithinan Tatah; Survey by Path Lord; Medical Team by SHAHAREA; observe by la-fabrique-creative; interview by Justin Blake

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What's happening when we talk about events?

Findings shared & discussed

Build knowledge: awareness & learning
- That issue exists or is still happening
- Generate better/deeper understanding (e.g. for causes, impact, context, etc.)

Confidence in organizational processes & people
- Thorough process exists, is being followed, people are doing good work

Set the stage for change
- Sense of urgency/reason for action & generate change ideas

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RCA²

And they influence how we do this...

Events occur & are reported → Subset undergo deep review & analysis → Findings shared & discussed → Opportunities identified Solutions designed, tested → Changes implemented
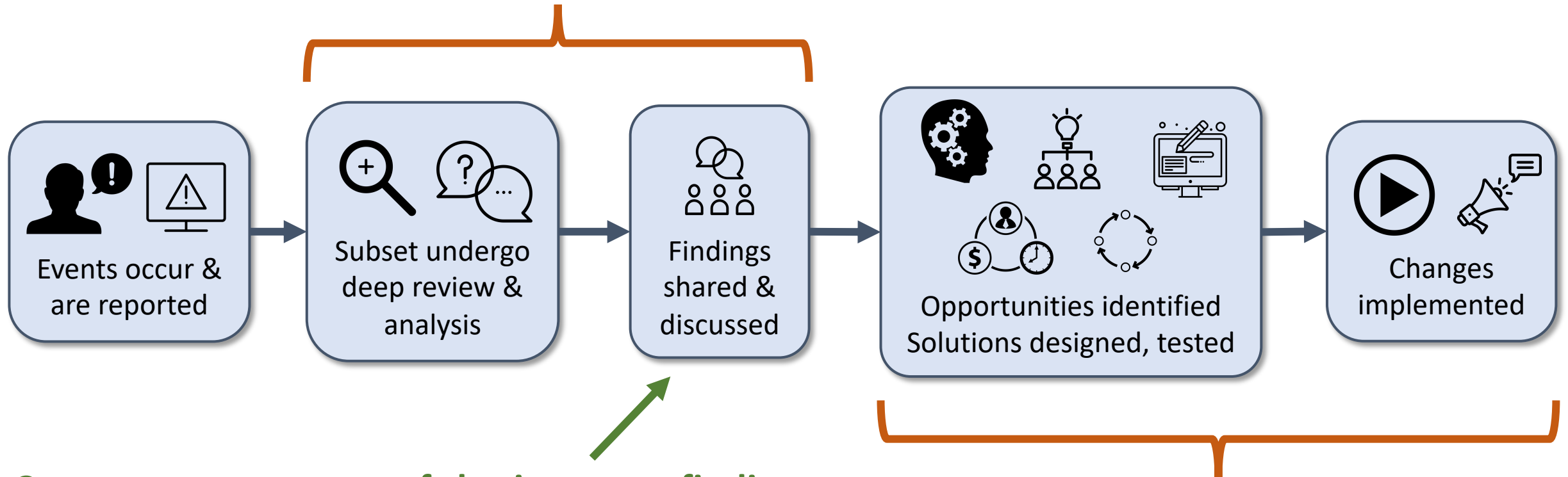
Cause maps are a way of sharing event findings

Build knowledge: awareness & learning
Confidence in organizational processes & people
Set the stage for change

...and they're key to the effectiveness of these steps

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Comparing and contrasting methods
of sharing findings from event analyses

Presentation method	Benefits	Drawbacks
Verbal description	Very little/no prep time	Difficult to follow Causality can be vague/unclear Cannot be easily shared
Written narrative	Relatively easy to prepare May include a timeline	Often visually overwhelming Causality can be vague/unclear
Fishbone diagram	Only moderate prep time Visually clear & 1-page	Usually lacks a timeline Causality can be vague/unclear
Cause map	1-page Can include a timeline Causality is explicit	Can be challenging to prepare

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Comparing and contrasting methods
of sharing findings from event analyses

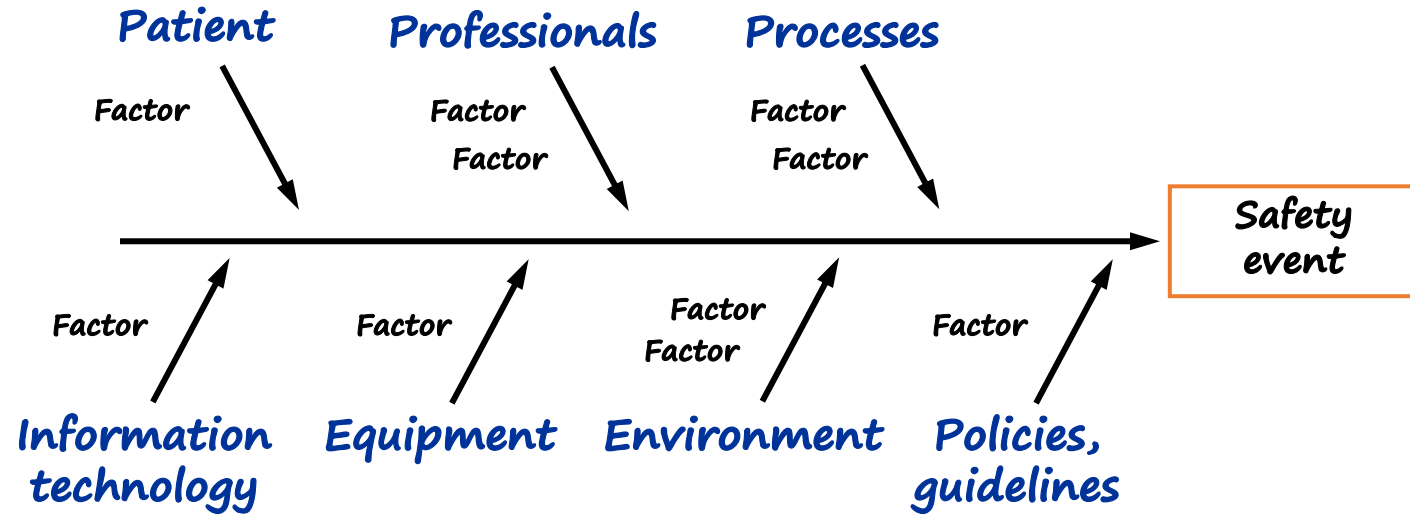| Presentation method	Benefits	Drawbacks
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Cause map	1-page Can include a timeline **Causality is explicit**	Can be challenging to prepare

Causality matters: If the true contributing factors are not identified, they won't be addressed, and problems will recur

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Fishbone

- Unclear causality
  Mix of actual & potential causes, and no evidence → speculation
- Categories over-generalize and over-simplify
- Underlying reasons go unexplored
- Unclear where to focus to prevent recurrence

Patient **Professionals** **Processes**

Factor   Factor   Factor
          Factor   Factor

Safety event

Factor   Factor   Factor   Factor
                    Factor

Information technology **Equipment** **Environment** **Policies, guidelines**

Cause map

- Clear & specific causality
- Relationships among factors more important than categories
- Asking "why" from L-to-R leads to "root causes"
- Clarifies whether just one vs. multiple failures are necessary
- Clear where to focus to prevent recurrence

Safety event ← **Factor** ← **Factor**
                                 Factor

Impact
On patient, family, care team, and organization

Factor ← **Factor** ← **Factor**
                          Factor
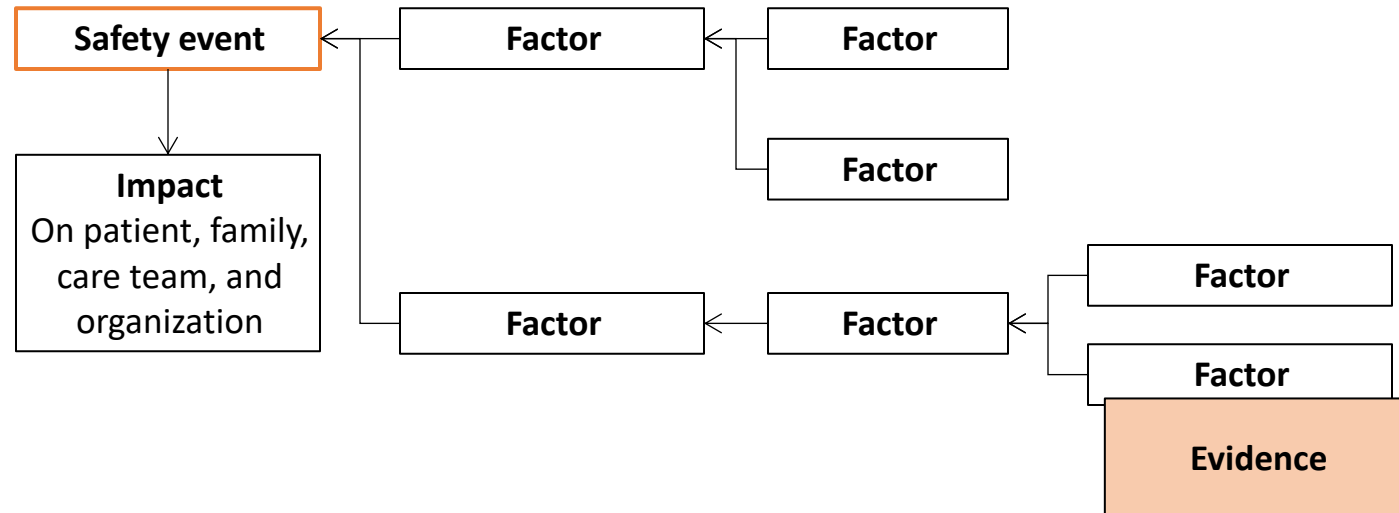   **Evidence**

Fishbone

- Unclear causality
  Mix of actual & potential causes, and no evidence → speculation
- Categories over-generalize and over-simplify
- Underlying reasons go unexplored
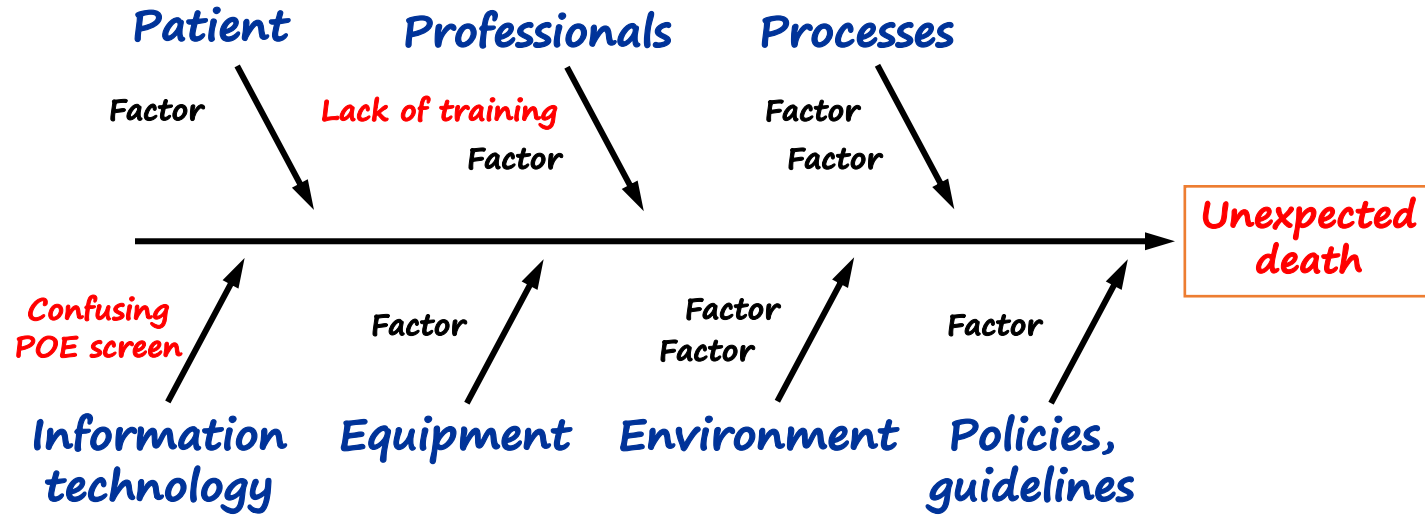- Unclear where to focus to prevent recurrence

Patient   **Professionals**   **Processes**

Factor   Lack of training   Factor
                Factor   Factor

Unexpected death

Confusing POE screen   Factor   Factor Factor   Factor

Information technology   **Equipment**   **Environment**   **Policies, guidelines**

Cause map

- Clear & specific causality
- Relationships among factors more important than categories
- Asking "why" from L-to-R leads to "root causes"
- Clarifies whether just one vs. multiple failures are necessary
- Clear where to focus to prevent recurrence

Unexpected death ← Factor ← Factor
                          Factor

Impact
On patient, family, BIDMC team, and BIDMC as an organization

Renal failure ← Wrong dose ← Confusing POE screen
                              Lack of training
                              Missed orientation

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Recap

What are cause maps?

Standardized way to share findings from event investigations

- Cause-and-effect relationships between event and underlying contributing factors
- **Packaged with….**
  - Focused timeline
  - Description of the event's impact
  - Context, relevance to other settings of care, **status of communication with patient/family**, and patient outcome
  - Corrective actions, mapped to specific underlying contributing factors, with assigned responsibility

Recap

Overarching goals

- Promote & guide **constructive conversations**
- **Improve awareness & understanding**
- **Make care safer**

Why use cause maps?

- **Visual diagram** orients & guides audience, easily shared
- More **rigor and specificity** than alternatives
  - Unpacking cause-and-effect relationships clarifies what occurred, why, and what should have happened → **focuses attention**
- Better clarity about causes → **more targeted corrective actions → more likely to prevent similar events from recurring**
- Facilitates aggregation of findings to identify **thematic areas of risk**

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3 phases of event analysis

1. **Reviewing what happened and why**
   - Both what happened & what *should have* happened
     - Not what *could have happened* or *might happen* in the future
   - Keep asking "why" (e.g. "5 whys")
   - Pre-requisite to cause mapping
   - Output: detailed timeline & clarity re: relevant standards of care
     - If standard was not met or process not followed, then as much clarity as possible about why
2. **Cause mapping**
   - Showing what happened & why (i.e. the contributing factors)
3. **Coding for aggregation and corrective action tracking**
   - Complex topic for another day

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Basic parts of a cause map

```
┌──────────────┐      ┌──────────────────┐      ┌────────┐
│    Event     │◄─────│ Clinical situation│◄─────│  Why?  │
└──────────────┘      └──────────────────┘      └────────┘
        ▲
        │
        │            ┌──────────────────┐
        └────────────│ Response to the clinical │
                     │      situation    │
                     └──────────────────┘
```

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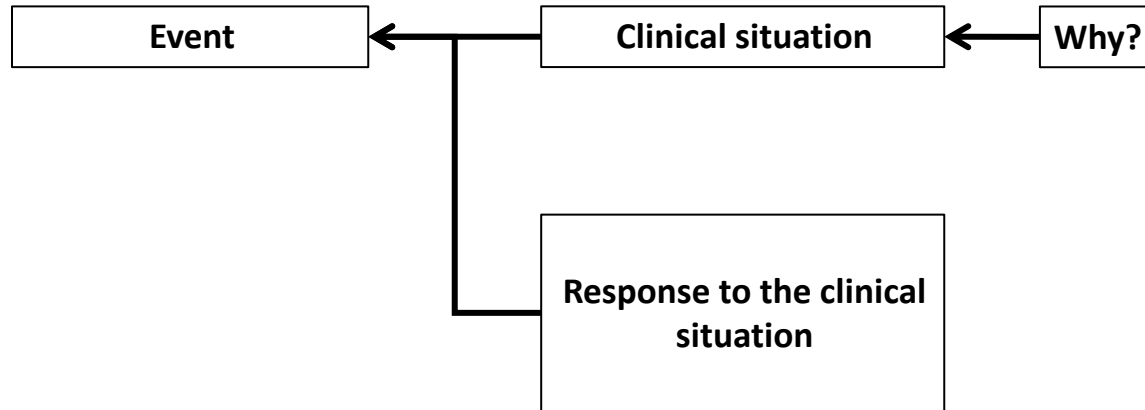
Case

An inpatient who has aspiration pneumonia suffers *another* aspiration event and is transferred to the ICU. There is concern about the care they received immediately after their most recent aspiration event.

| Event | ← | Clinical situation | ← | Why? |

Response to the clinical situation

| Patient required transfer to the ICU | ← | Inpatient with aspiration pneumonia aspirated again | ← | Dysphagia from recent stroke |

Response to the aspiration event

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Basic parts of a cause map

```
┌──────────────┐      ┌──────────────────┐      ┌────────┐
│    Event     │◄─────│ Clinical situation │◄─────│  Why?  │
└──────────────┘      └──────────────────┘      └────────┘
```

```
                                          ┌────────────────────────┐
                                          │   What should have     │
                                          │      happened          │
                                          │ "Standard of care" or  │
                                          │   "best practice"      │
                                          └────────────────────────┘
┌──────────────────────────────┐
│           Problem            │                   AND
│  Response to the clinical     │◄──
│  Deviation: wrong, incorrect, │    ┌────────────────────────┐   ┌────────┐
│  missed, delayed, late, over, │◄───│ What actually happened │◄──│  Why?  │
│  under, too much, not enough  │    └────────────────────────┘   └────────┘
└──────────────────────────────┘
```

Definitions

"**Event**": an objective bad thing that happened to a patient

"**Problem**": a response to a clinical situation described using a negative adjective

- Act of *omission* = not doing something that should have been done
- Act of *commission* = doing something wrong

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Key Takeaway

We **cannot** call something a "problem" unless we agree on what *would <u>not</u>* have been a problem

In other words, we can only call it a…

- Delay
- Incorrect
- Wrong
- Insufficient
- Excessive
- Etc…

To the right of "problems" shown on cause maps, juxtapose what *should have* happened vs. what *did* happen

…if we can show a difference between what did happen and what would have been…

- Timely
- Correct
- Right
- Sufficient
- Reasonable
- Etc…

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Case

Imagine a patient is given the **wrong** treatment

Unpack it... hone in on the word "wrong"... ask:
- *What would have been the **right** treatment?*
- *How do we know what would have been right?*
  - *Written document or source?*
  - *Consensus?*
  - *Expert opinion?*

Then: "why didn't they get the right treatment?"
- *What were all the factors that played a role?*
  (if unsure, do more investigation... don't finalize the map until <u>after</u> a full investigation)

Figuring out what *should have* happened

Reviews often focus on **"best practice"**
- Aspirational
- Emerging, not yet widespread

But medicolegal processes rely on **"standard-of-care"**
- What an average clinician would do in the same situation/context
- Often different (and a lower expectation) as compared with "best practice"

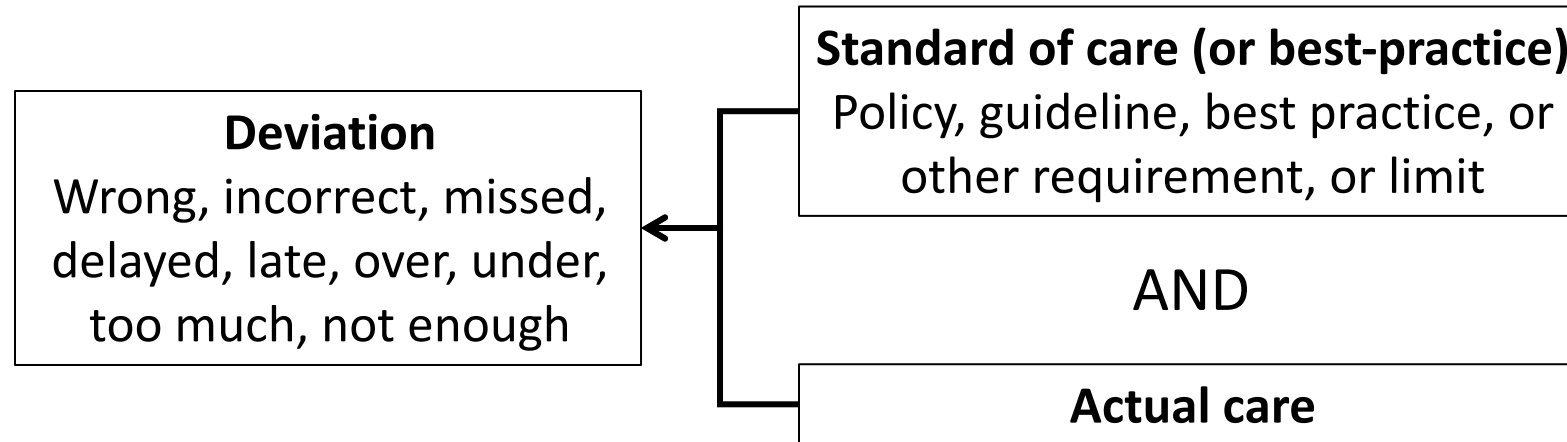**Take away:** both are important, depends on context, be transparent

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Fundamental cause-and-effect relationships in healthcare

- Deviation
  - Wrong [medication, dose, procedure, etc.]
  - Missed [diagnosis, treatment, etc.]
  - Incorrect [technique, etc.]
  - Delayed [diagnosis, treatment, etc.]
- Degree of consequence
  - Got worse
- Unclear causality

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Deviation schema

Deviation
Wrong, incorrect, missed, delayed, late, over, under, too much, not enough

Standard of care (or best-practice)
Policy, guideline, best practice, or other requirement, or limit
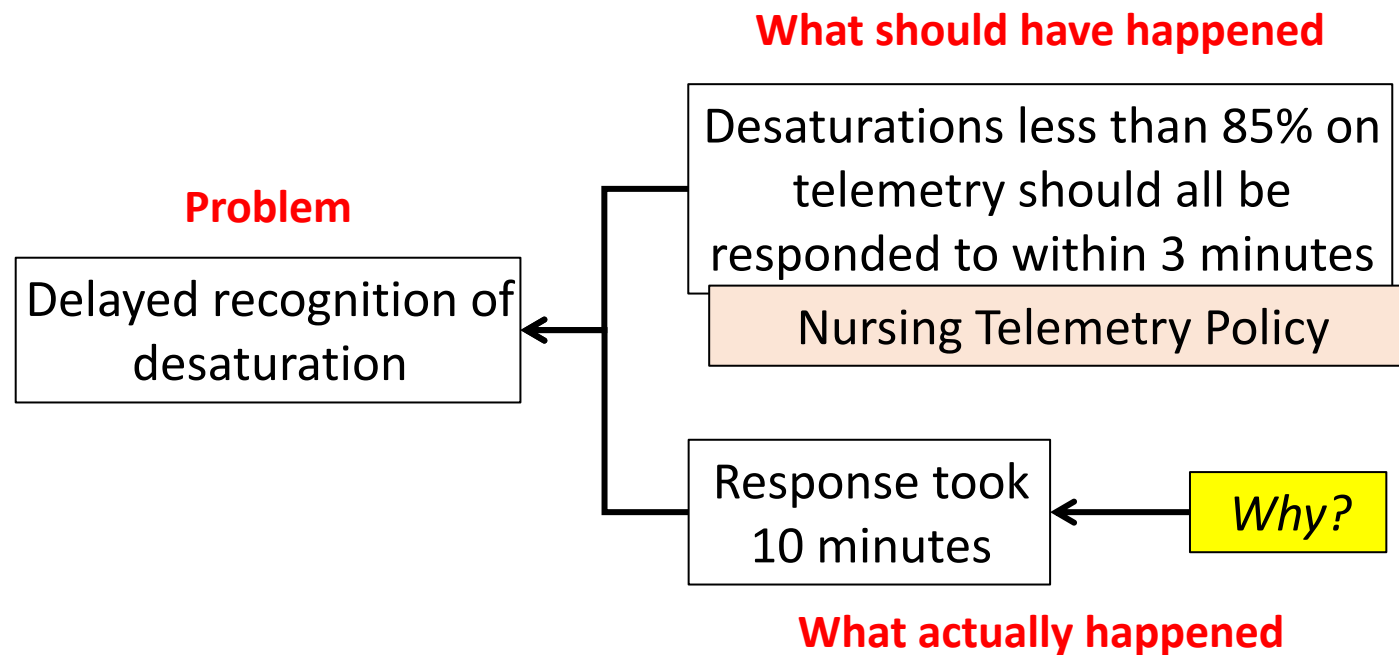
AND

Actual care

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Case

An inpatient's oxygen saturation drops to 83%, but it takes 10 minutes before this is recognized and supplementation oxygen is provided.

What should have happened

Problem

Delayed recognition of desaturation

Desaturations less than 85% on telemetry should all be responded to within 3 minutes

Nursing Telemetry Policy

Response took 10 minutes
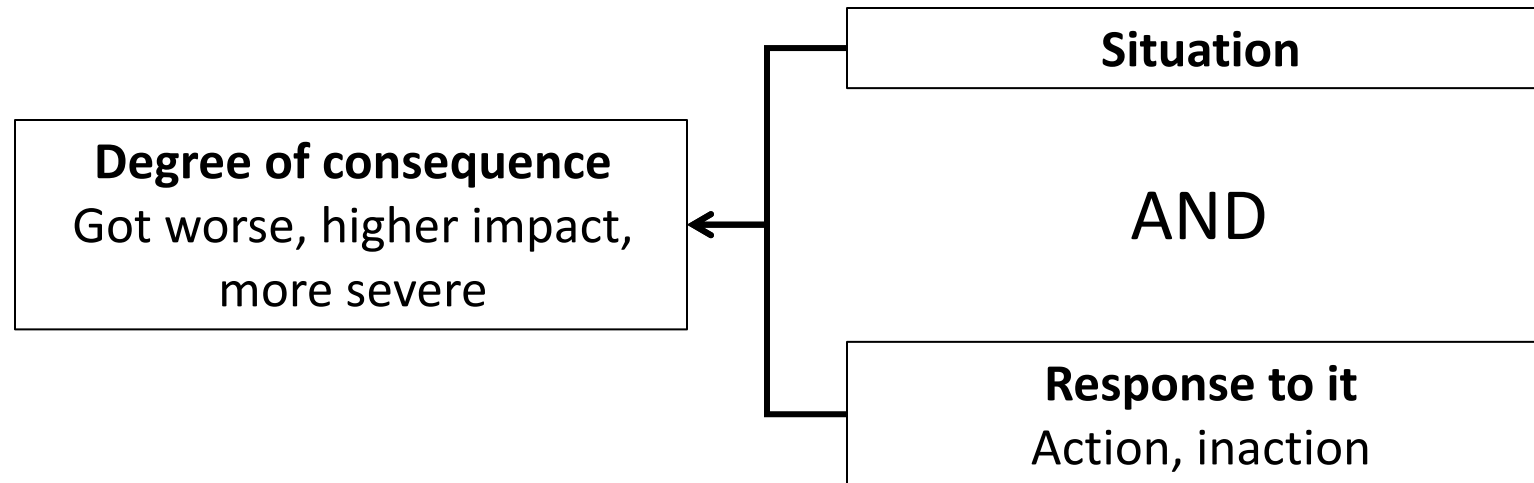
Why?

What actually happened

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Fundamental cause-and-effect relationships in healthcare

- Deviation
  - Wrong [medication, dose, procedure, etc.]
  - Missed [diagnosis, treatment, etc.]
  - Incorrect [technique, etc.]
  - Delayed [diagnosis, treatment, etc.]
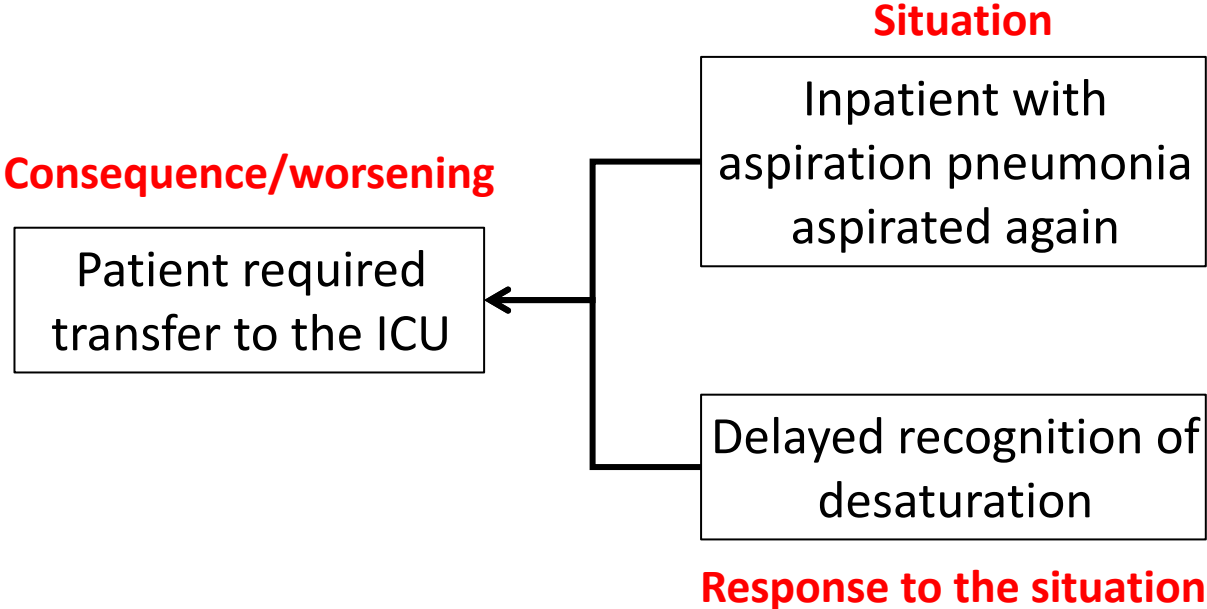- Degree of consequence
  - Got worse
- Unclear causality

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Degree of consequence schema

```
                                           ┌──────────────────────┐
                                           │      Situation       │
                                           └──────────────────────┘
┌──────────────────────────┐
│  Degree of consequence   │ ◄───
│ Got worse, higher impact,│          AND
│       more severe        │
└──────────────────────────┘
                                           ┌──────────────────────┐
                                           │    Response to it    │
                                           │    Action, inaction  │
                                           └──────────────────────┘
```

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Case

The inpatient who suffered the desaturation event had already suffered an aspiration pneumonia, and after their desaturation, they required transfer to the ICU.
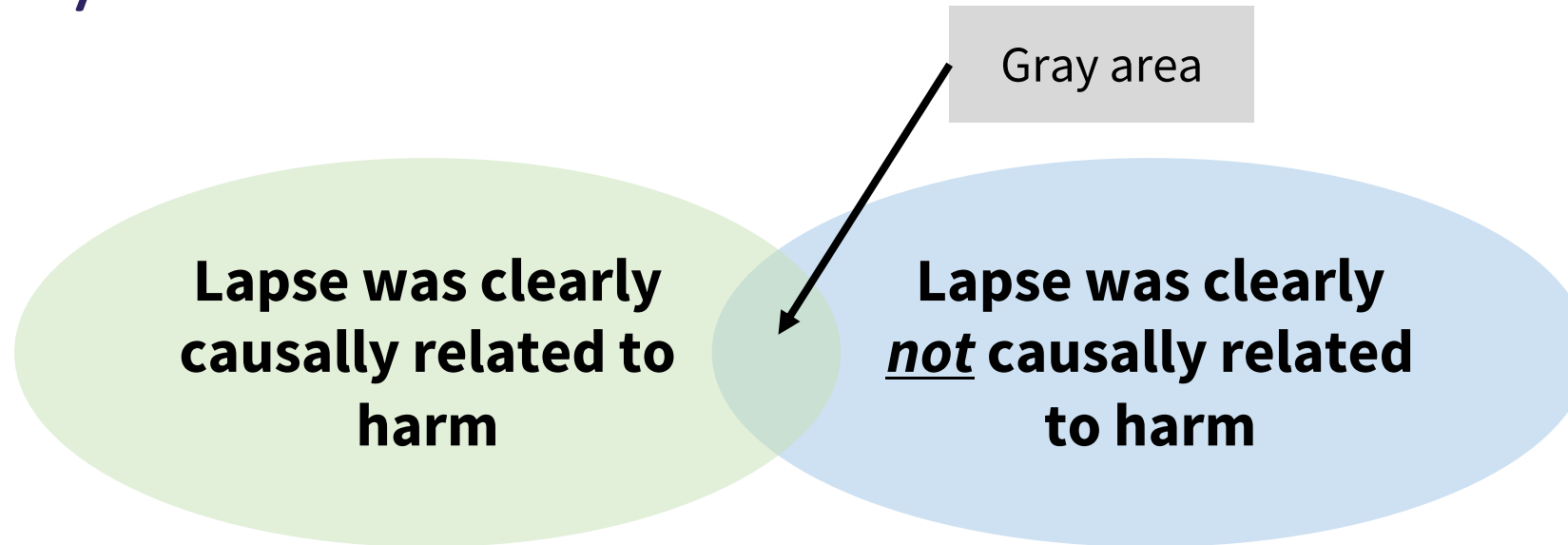
Situation

Consequence/worsening

Patient required transfer to the ICU	←	Inpatient with aspiration pneumonia aspirated again
		Delayed recognition of desaturation

Response to the situation

Fundamental cause-and-effect relationships in healthcare

- Deviation
  - Wrong [medication, dose, procedure, etc.]
  - Missed [diagnosis, treatment, etc.]
  - Incorrect [technique, etc.]
  - Delayed [diagnosis, treatment, etc.]
- Degree of consequence
  - Got worse
- Unclear causality

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Causality

Gray area

Lapse was clearly causally related to harm

Lapse was clearly _not_ causally related to harm

If the lapse hadn't occurred, would the outcome have been different? How did the lapse change things, if at all? Did they get sicker because of the lapse? Or would they have gotten sick even without the lapse?

Tension: "we can't know for sure"   ↔   We need to move forward
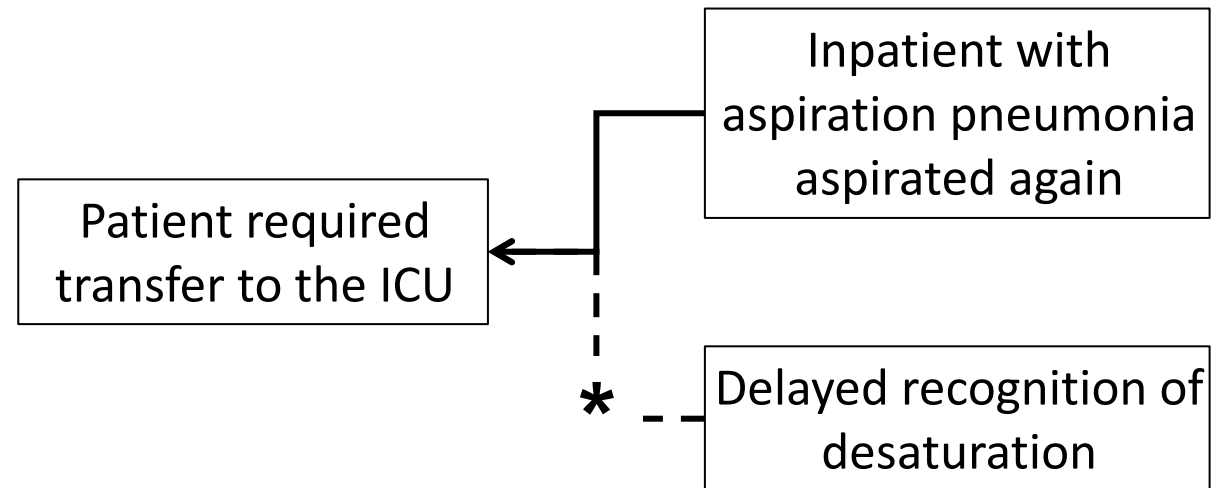
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Showing uncertainty about causality
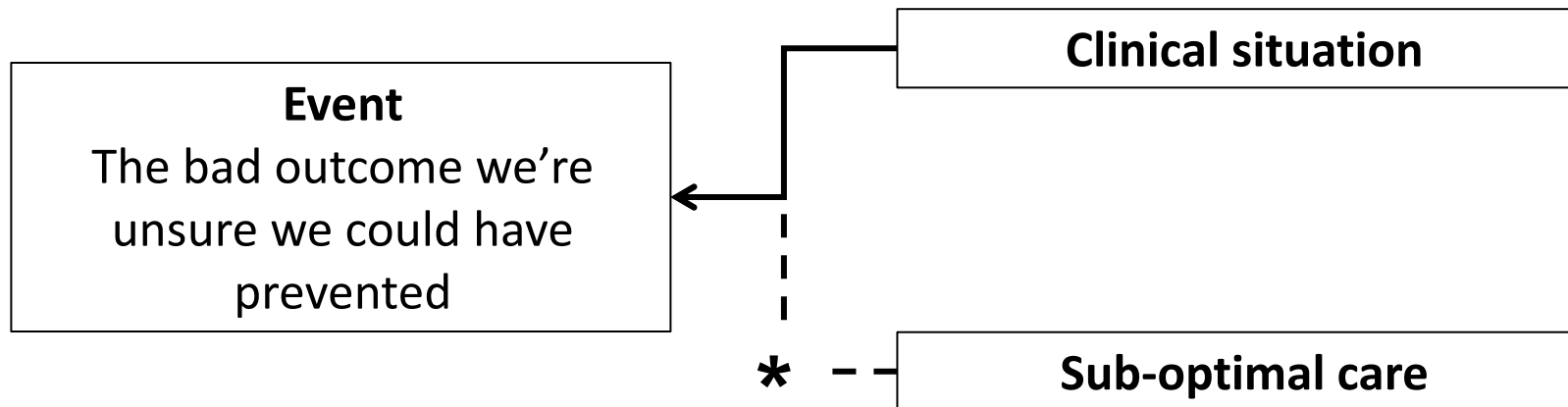
* *Dotted lines indicate unclear causality*

Sub-optimal care: [succinct description about why it's unclear if sub-optimal care is causally related to the event]

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Case

Inpatient with aspiration pneumonia aspirated again

Patient required transfer to the ICU

Delayed recognition of desaturation

* Dotted line indicates unclear causality

Even if there hadn't been a delay in the recognition of the desaturation, it's very likely the patient would have required transfer to the ICU.
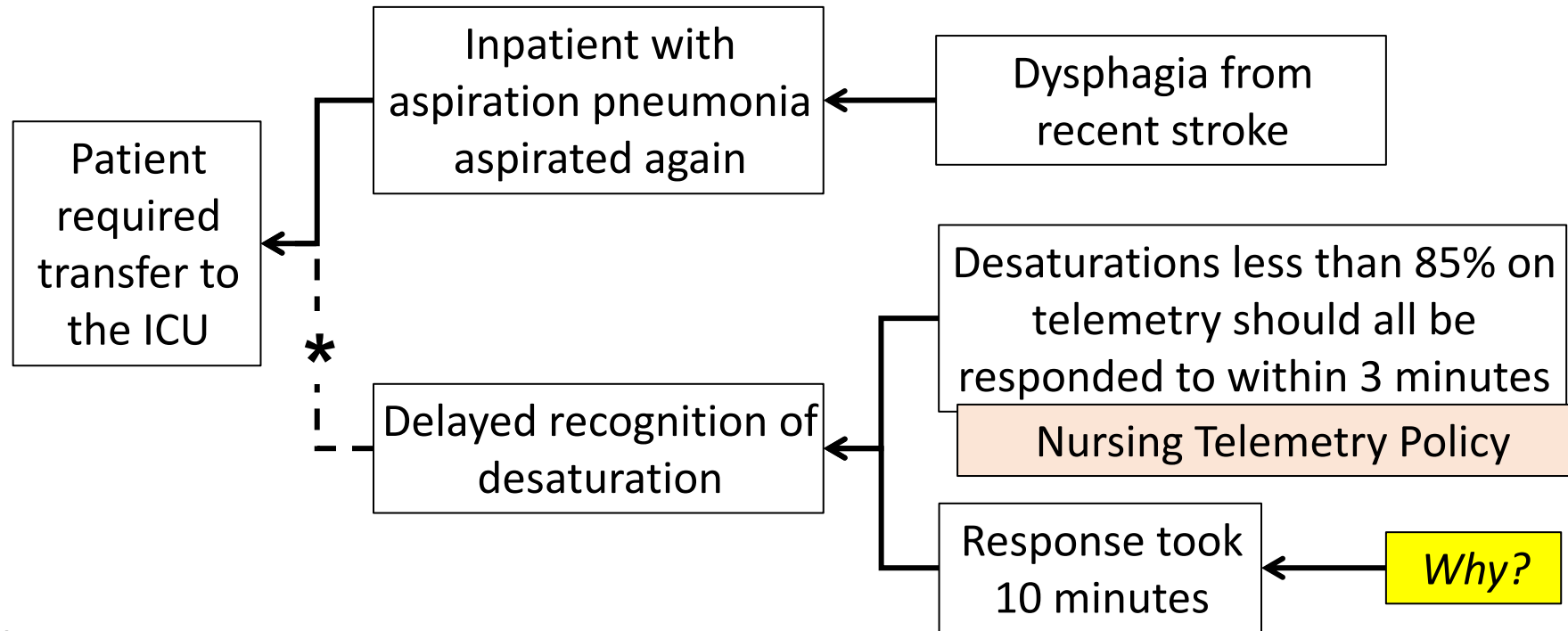
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5 "rules of causation"

1. Clearly show the "cause and effect" relationships

2. Use specific, accurate descriptors rather than negative, vague

3. Human errors must have at least one preceding cause

4. Violations of procedure are not root causes, and must have at least one preceding cause

5. Failure to act is only causal when there is a pre-existing duty to act

NOTE: In a cause mapping course, each rule is explored in depth with examples

Notes: Originally developed by the Federal Aviation Administration (FAA) in 1999. Adapted for healthcare by the Department of Veterans Affairs in 2001. Reprinted in "RCA^2: Improving Root Cause Analyses and Actions to Prevent Harm," January 2016, available at ihi.org.

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Putting it all together

Patient required transfer to the ICU

Inpatient with aspiration pneumonia aspirated again

Dysphagia from recent stroke

Delayed recognition of desaturation

Desaturations less than 85% on telemetry should all be responded to within 3 minutes

Nursing Telemetry Policy
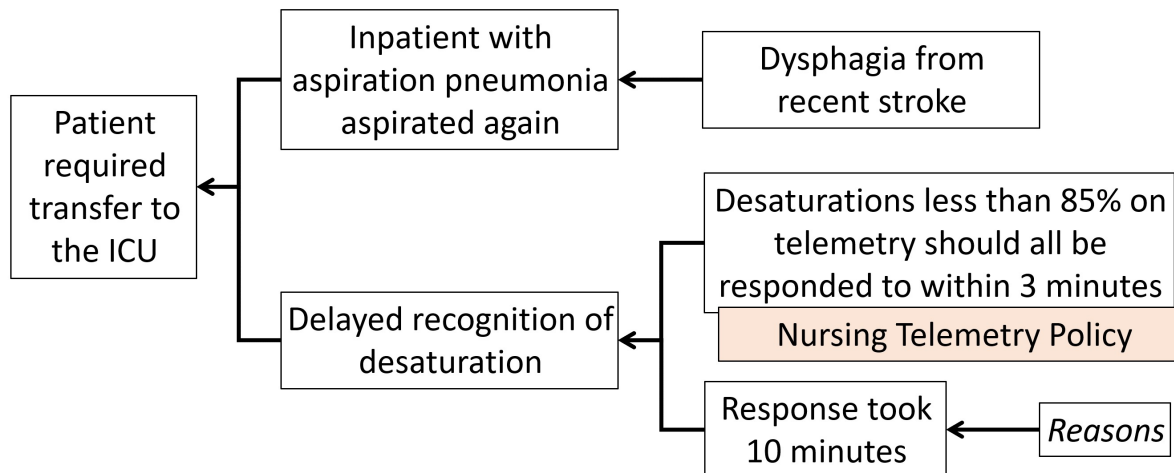
Response took 10 minutes

Why?

* Dotted line indicates unclear causality

Even if there hadn't been a delay in the recognition of the desaturation,
it's very likely the patient would have required transfer to the ICU.

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"Cause map package"

Page 1

Focused event timeline

Inpatient with aspiration pneumonia aspirated again ← Dysphagia from recent stroke

Patient required transfer to the ICU ←

Desaturations less than 85% on telemetry should all be responded to within 3 minutes

Nursing Telemetry Policy

Delayed recognition of desaturation ←

Response took 10 minutes ← *Reasons*

Page 2

Context

Relevance to other settings of care

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   Key part of "CRP" processes

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Cause map challenges

What is difficult about cause maps?

- Figuring out cause-and-effect relationships
- What should have happened isn't always clear, and consensus can be elusive
  - *Arguably these are critical conversations* → *standardization*
- Managing uncertainty
- Keeping maps succinct
- All the above takes time
- *Science* & *art;* a form of *storytelling*
  - Be mindful about problem framing and highlights

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Next steps

Keep the overarching goals in mind

- Promote & guide *constructive conversations*
- *Improve awareness & understanding*
- *Make care safer*

Cause maps are one of <u>many tools</u> to help achieve these goals

May not be right for your organization nor for every situation

Ask whether your organization might benefit from using cause maps

Consider introducing cause maps to a small number of engaged patient safety leaders

Teach the basics of cause mapping (or seek out a course)

Try out a cause map in an upcoming event review meeting – how does the conversation change?

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Thank you for your attention

—

lauge@uw.edu

Collaborative for Accountability and Improvement

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