When Systems Flatline
Enhancing Incident Response with Learnings from the Medical Field

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How Did We Get Here?

Why Medicine is Relevant to SRE

From Auxiliary Systems to Critical Systems

• As technology adoption has increased, systems have gone from nice to have to necessary to have

• Critical systems across industries (medicine, energy, technology, etc) share overarching characteristics, particularly related to incident response
No Silver Bullets

Appropriate Use Cases and Considerations

Key Considerations
• Organizational dynamics and the myth of the one size fits all solution
• Works best inside an existing incident management framework
• Always remember that this enables building foundations, not ceilings
Concept 1
Algorithm Guided Decisions

Medical Background:
• Common Example: ACLS Algorithm
• Critical situations are bucketed into general situations guided by algorithms
• Approach enables faster, standardized response
• Algorithms are not runbooks and enable dynamic decisions

SRE Application:
• Bucket possible types of situations and generalized solutions to enable flexible response
• Standardize to simplify communication, roles, and decision points to reduce TTR
• Possible examples: switch failures, load balancer issues, storage failover, etc
Example Advanced Cardiac Life Support Algorithm

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Concept 2
Rapid Stabilization

Medical Background:
- **Common Example: ATLS Protocol, Stop the Bleeding**
- System to determine, rank, and treat the greatest threats to life
- Utilize limited information to make decisions of greatest impact
- Focus on solving the right problems at the right time

SRE Application:
- Shift from “figuring out the why” to “minimizing the impact”
- “Mindset of the Recessionist” to rapidly stop damage and stabilize systems
- Possible examples: chaotic bridges, multiple red herrings or conflicting priorities
Simplified Overview of ATLS
(Advanced Trauma Life Support)
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Concept 3
Standardization and Checklists

Medical Background:
• Common Example: WHO Surgical Checklist
• Improve patient safety and reduce errors through standardization
• Reduce preventable sources of error
• Prevent “crossed wires” across multiple teams

SRE Application:
• Reduce cognitive load during critical and chaotic moments
• Prevent errors or misses due to factors like tiredness or communication gaps
• Possible examples: protocol to start a bridge, change freezes, sending communications
# Surgical Safety Checklist

**Before induction of anaesthesia**
(with at least nurse and anaesthetist)

- Has the patient confirmed his/her identity, site, procedure, and consent?  
  - Yes  
  - Not applicable

- Is the site marked?  
  - Yes  
  - Not applicable

- Is the anaesthesia machine and medication check complete?  
  - Yes

- Is the pulse oximeter on the patient and functioning?  
  - Yes

- Does the patient have a:  
  - Known allergy?  
    - No  
    - Yes
  - Difficult airway or aspiration risk?  
    - No  
    - Yes, and equipment/assistance available

- Risk of >500ml blood loss (100ml/kg in children)?  
  - No  
  - Yes, and two IV/central access and fluids planned

**Before skin incision**
(with nurse, anaesthetist and surgeon)

- Confirm all team members have introduced themselves by name and role.
- Confirm the patient’s name, procedure, and where the incision will be made.

- Has antibiotic prophylaxis been given within the last 60 minutes?  
  - Yes  
  - Not applicable

**Anticipated Critical Events**

- To Surgeon:
  - What are the critical or non-routine steps?  
  - How long will the case take?  
  - What is the anticipated blood loss?

- To Anaesthetist:
  - Are there any patient-specific concerns?

- To Nursing Team:
  - Has sterility (including indicator results) been confirmed?  
  - Are there equipment issues or any concerns?

**Before patient leaves operating room**
(with nurse, anaesthetist and surgeon)

- Is essential imaging displayed?  
  - Yes  
  - Not applicable

- Nurse Verbally Confirms:  
  - The name of the procedure  
  - Completion of instrument, sponge and needle counts  
  - Specimen labelling (must specimen labels aloud, including patient name)  
  - Whether there are any equipment problems to be addressed

*https://www.who.int/teams/integrated-health-services/patient-safety/research/safe-surgery/tool-and-resources*
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In Conclusion

Key Takeaways

Concept 1
Algorithm Guided Decisions

Concept 2
Rapid Stabilization

Concept 3
Standardization and Checklists
Thank You