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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

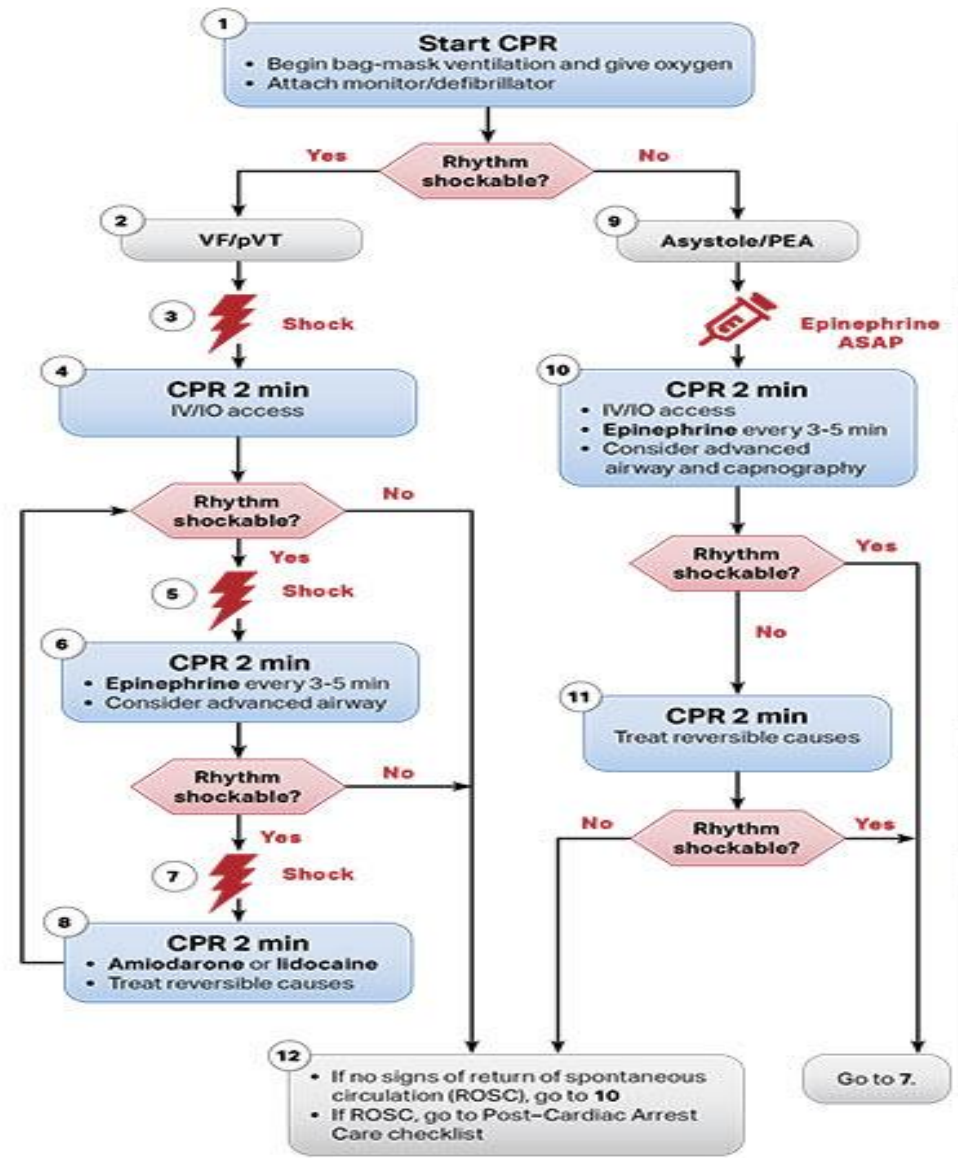
Medical Background:

- *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:

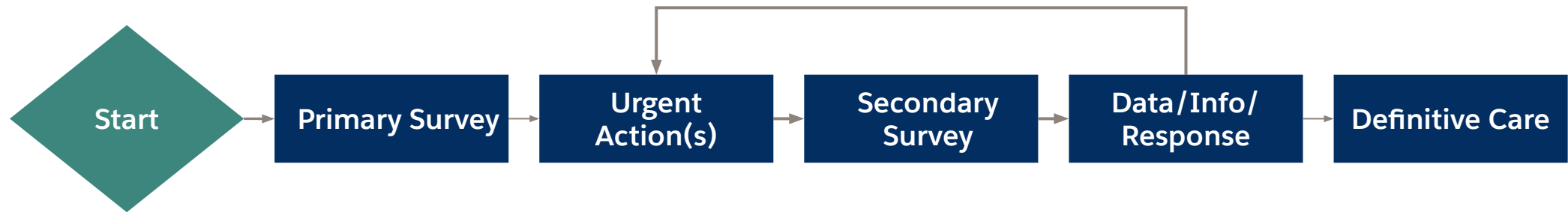
- *Common Example: ATLS Protocol, Stop the Bleeding*
- System to determine, rank, and treat the greatest threats to life
- Utilize limited information to make decisions of greatest impact
- Focus on solving the right problems at the right time

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)



Concept 2

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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

World Health Organization Surgery Checklist

Surgical Safety Checklist



Patient Safety
A World Alliance for Safer Health Care

Before induction of anaesthesia

(with at least nurse and anaesthetist)

Has the patient confirmed his/her identity, site, procedure, and consent?

Yes

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 (7ml/kg in children)?

No
 Yes, and two IVs/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?

Is essential imaging displayed?

Yes
 Not applicable

Before patient leaves operating room

(with nurse, anaesthetist and surgeon)

Nurse Verbally Confirms:

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

To Surgeon, Anaesthetist and Nurse:

What are the key concerns for recovery and management of this patient?

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In Conclusion

Key Takeaways

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Concept 1

Algorithm
Guided
Decisions

Concept 2

Rapid
Stabilization

Concept 3

Standardization
and Checklists



Thank You