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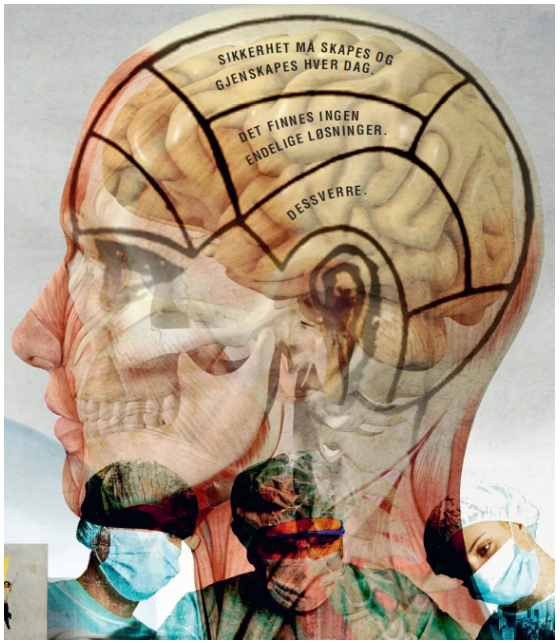
# "Resilience Engineering" i helsesektoren vil (!) give bedre Patientsikkerhed




## *Fra Sikkerhed-I til Sikkerhed-II*

Erik Hollnagel

# Safety-I – when nothing goes wrong

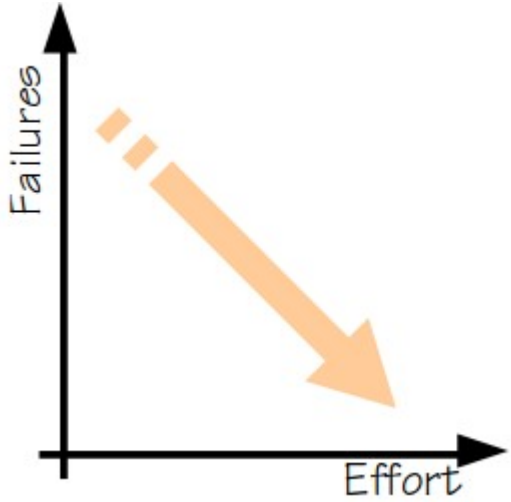
Safety is traditionally defined by its opposite – the lack of safety.

The lack of safety means that something goes wrong or can go wrong.

Safety-I focuses on situations where nothing goes wrong or can go wrong: the number of adverse outcomes (accidents/incidents/near misses) is as low as possible.

Safety-I requires the ability to prevent that something goes wrong. This is achieved by:

1. Find the causes of what goes wrong (RCA).
2. Eliminate causes, disable possible cause-effect links.
3. Measure results by many fewer things go wrong.



# Safety-I definitions - examples

Dansk Selskab for Patientsikkerhed

"Patientsikkerhed handler om at forebygge, at der sker fejl og skader - utilsigtede hændelser -, når patienter behandles eller på anden måde er i kontakt med sundhedsvæsenet.

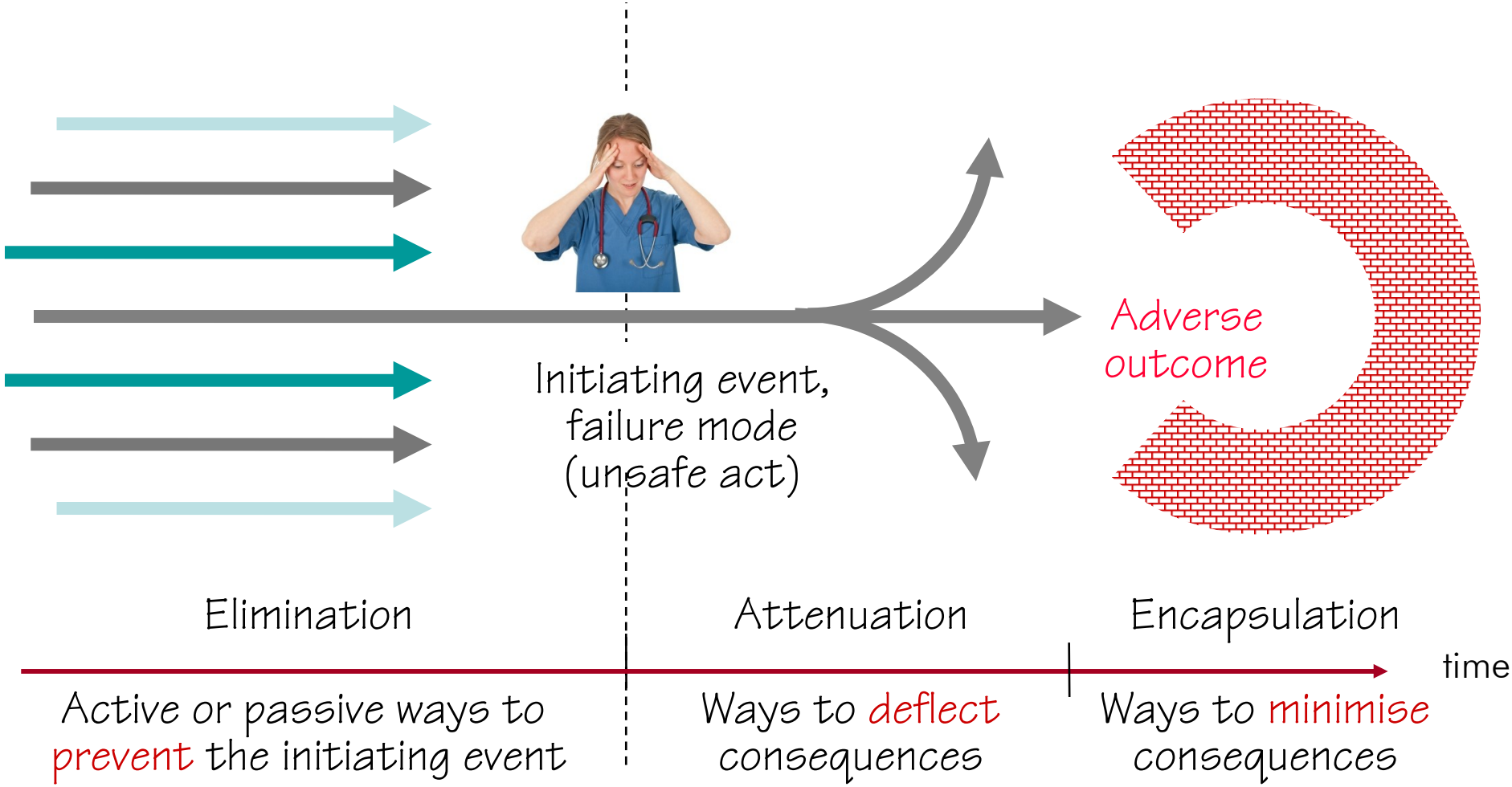
AHRQ Agency for Healthcare Research and Quality
Advancing Excellence in Health Care

Safety is defined as 'freedom from accidental injury,' which can be achieved by 'Avoiding injuries or harm to patients from care that is intended to help them.'

Patient safety is a discipline in the health care sector that applies safety science methods toward the goal of achieving a trustworthy system of health care delivery. Patient safety is also an attribute of health care systems; it minimizes the incidence and impact of, and maximizes recovery from, adverse events.

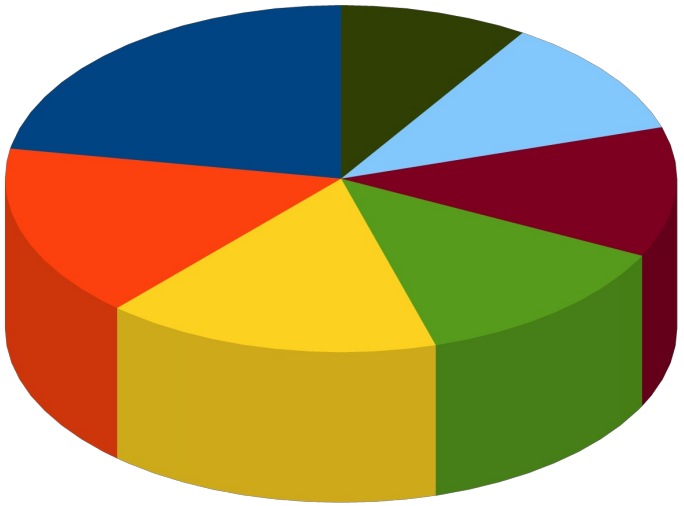
Emanuel et al. (2008). What exactly is patient safety?

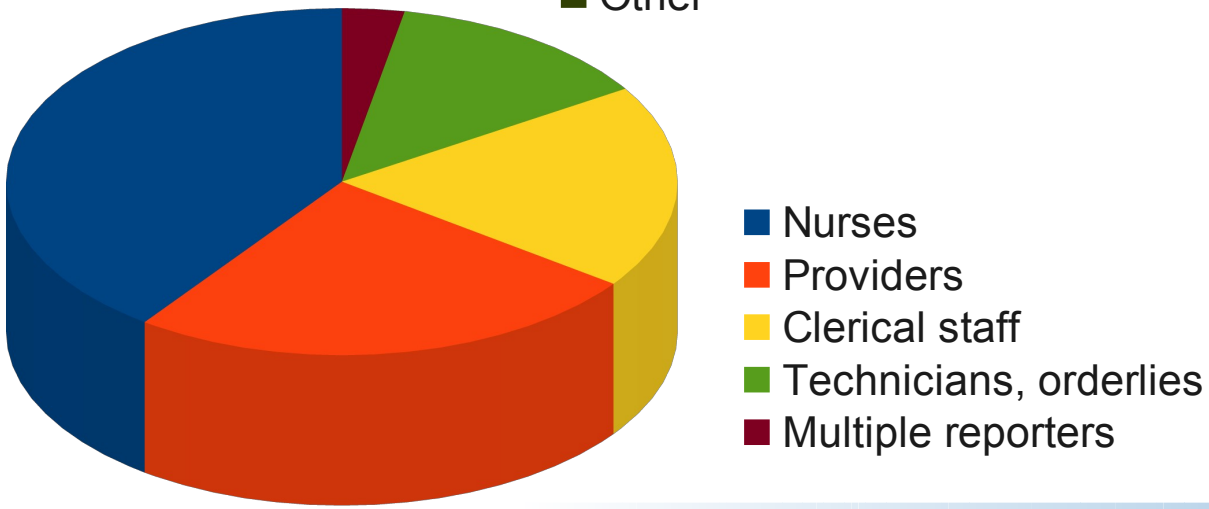
# Safety-I by prevention-protection



# The focus on errors

1.935 ED patients registered during a 7-day study period (2001).
Four hundred error reports;
5.5 errors / 100 work hours (same for all groups);
18 errors / 100 registered patients.



# From Safety-I to Safety-II



Sikkerhed er ikke blot fravær af risiko.

Health is 'a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity' (WHO, 1986).

"Safety" is the ability of a system to sustain required operations under both expected and unexpected conditions. (Hollnagel et al., 2011)

Sikkerhed må skabes og genskabes hver dag

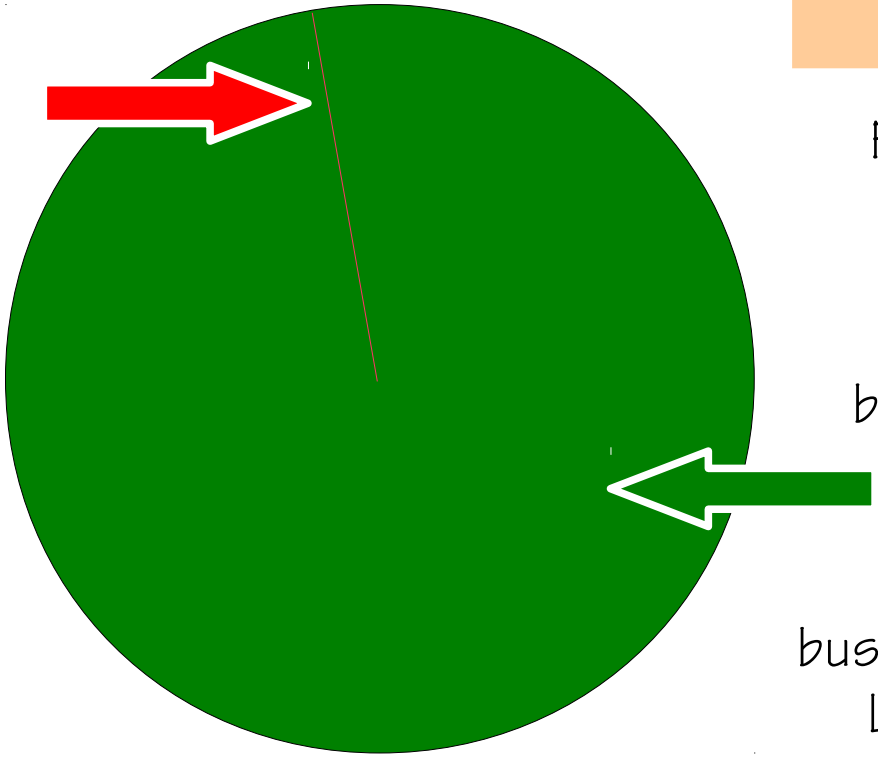
# Resilience: Why only look at failures?

Safety = Reduced number of adverse events.

Focus is on what goes wrong. Look for failures and malfunctions. Try to eliminate causes and improve barriers.

Safety and core business compete for resources. Learning only uses a fraction of the data available

$10^{-4}$ := 1 failure in 10.000 events



1 - $10^{-4}$ := 9.999 non-failures in 10.000 events

Safety = Ability to succeed under varying conditions.

Focus is on what goes right. Use that to understand everyday performance, to do better and to be safer.

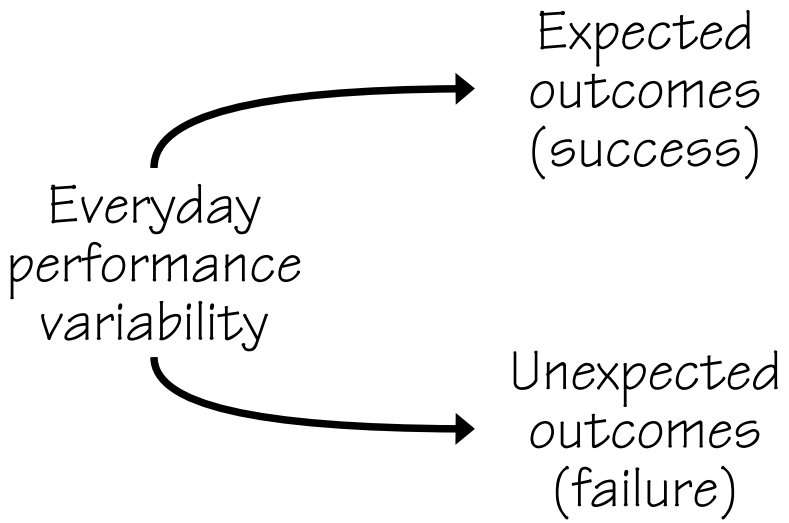
Safety and core business help each other. Learning uses most of the data available

# Safety-II when everything goes right

Safety-II is the ability to succeed under varying conditions.
(Risk is the likelihood that this does not happen, that people do not succeed.)
The emphasis is on how things go right, how they work in the first place.

Different outcomes ("normal" results vs. failures) are not distinct binary categories, but rather judgements of value.
Unexpected outcomes are not necessarily a consequence of unexpected processes.

Individuals and organisations must adjust to the current conditions in everything they do. Everyday performance must be variable in order for things o work.




The ETTO principle:
Efficiency-Thoroughness Trade-Off - Why things that go right sometimes go wrong.

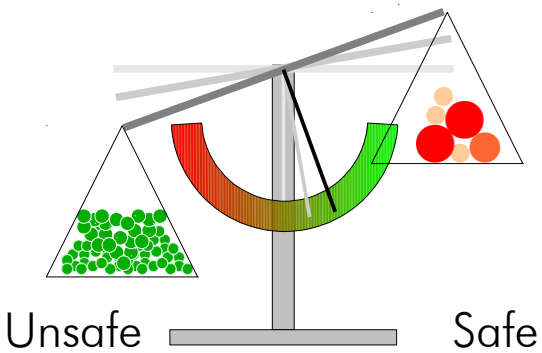
# Safety-I: Eliminate the negative

Negative outcomes (accidents, incidents) are relatively rare.

Their size (cost) is variable, but often large.

Because they are unusual, they attract attention

Reduce the number of things that go wrong




Negative outcomes are caused by failures and malfunctions.

Safety = Reduced number of adverse events.

Eliminate failures and malfunctions as far as possible.

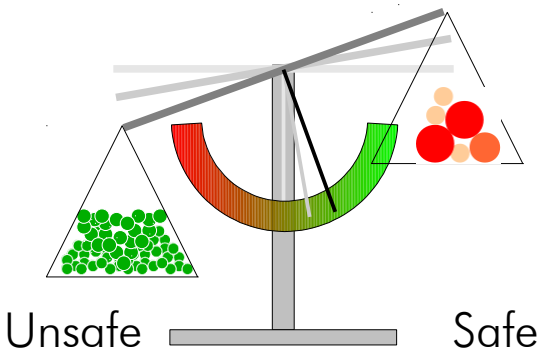
# Safety-II: Accentuate the positive

Improve resilience.

Safety = Ability to succeed under varying conditions.

All outcomes due to performance variability.

Increase the number of things that go right



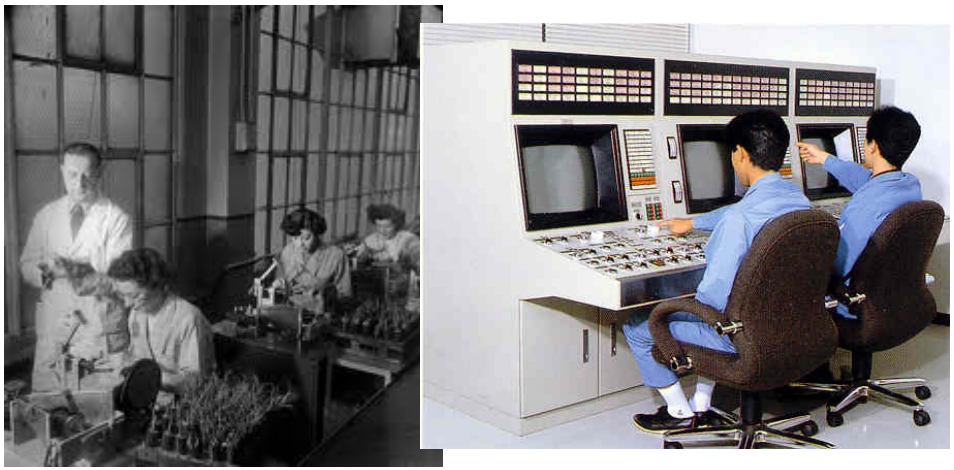

Positive outcomes (everyday activities) are the norm rather than the exception.

Their size (benefit) is small, but known and predictable.

Because they always happen, they are ignored or forgotten.

# Work as imagined – work as done

Work-as-imagined is what designers, managers, regulators, and authorities believe happens or should happen.



Safety-I: Failure is explained as a breakdown or malfunctioning of a system and/or its components (non-compliance, violations).

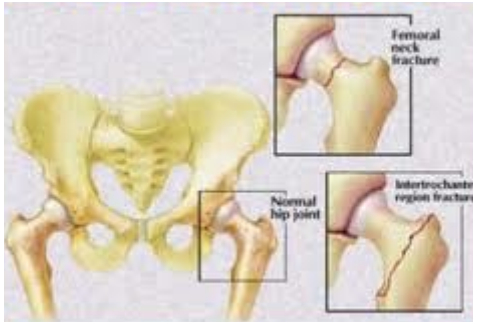
Work-as-done is what actually happens.

Safety-II: Individuals and organisations must adjust to the current conditions in everything they do. Performance must be variable in order for things o work.

# Work as imagined – follow the rules!

**Box 1: Professional bodies and national agencies who publish guidelines for anaesthetists**

- Association of Anaesthetists of Great Britain and Ireland
- Academy of Medical Royal Colleges
- Association of Cardiac Anaesthetists
- Association of Paediatric Anaesthetists
- British Association of Day Surgery
- *British National Formulary*
- British Pain Society
- Department of Health
- Difficult Airway Society
- European Society of Anaesthesiology
- Faculty of Pain Medicine
- General Medical Council
- Health and Safety Executive
- Intensive Care Society
- Medicines and Healthcare Products Regulation Authority
- National Patient Safety Agency
- National Institute for Health and Clinical Excellence
- Obstetric Anaesthetists Association
- Resuscitation Council (UK)
- Royal College of Anaesthetists
- Scottish Intercollegiate Guidelines Network

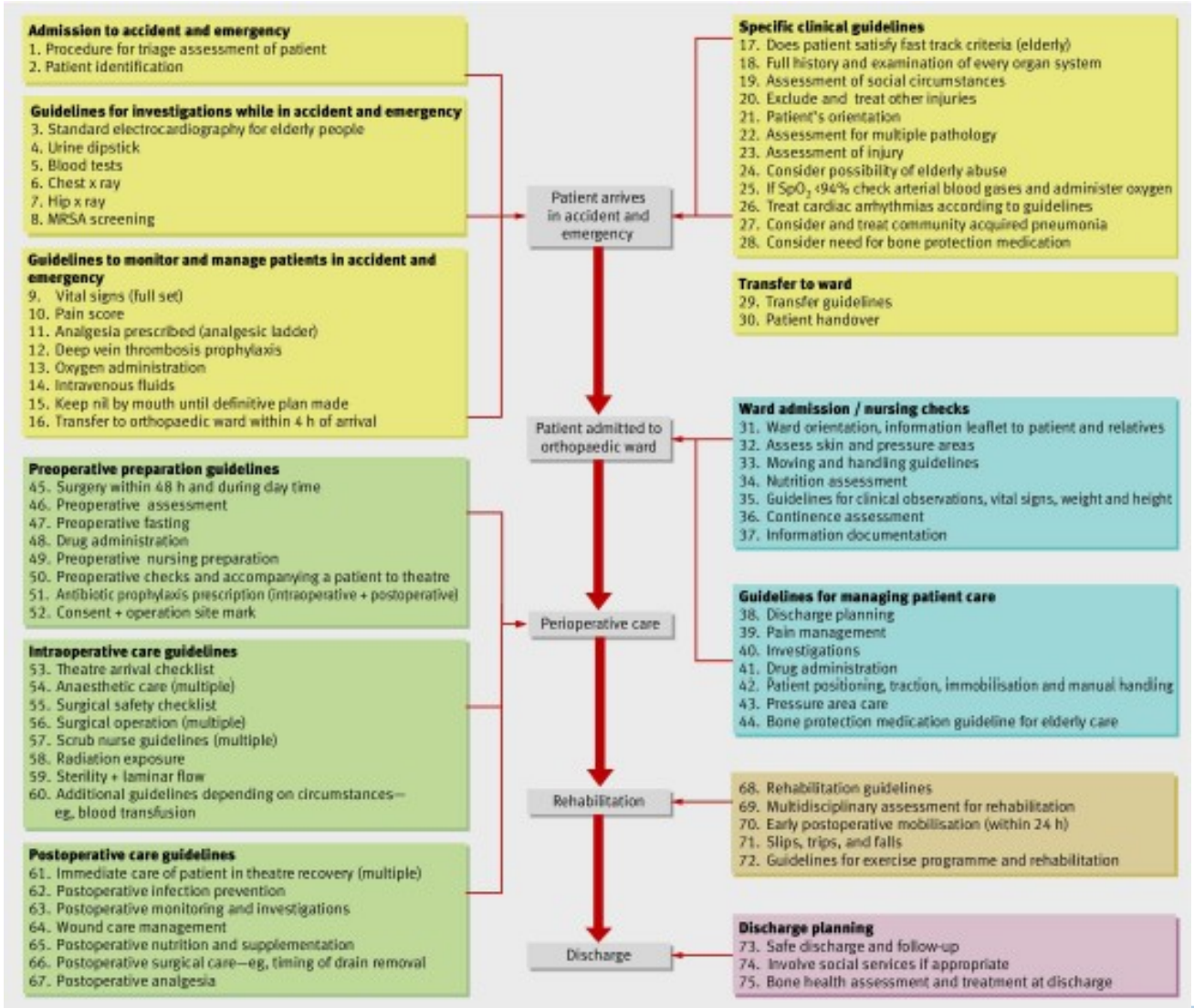



Emergency surgery on a fractured neck of femur involves app. 75 clinical guidelines and policies.

UK Government guideline on "Working Together to Safeguard Children" is 390 pages long!

Carthey et al (2011). Breaking the rules: understanding non-compliance with policies and guidelines. BMJ

# Typical patient journey




Carthey et al (2011). Breaking the rules: understanding non-compliance with policies and guidelines. BMJ

# ETTO - successes and failures

Things go right and things go wrong for the same reasons. Efficiency-thoroughness trade-offs are both normal and necessary.

It is taken for granted that things usually go right. This is therefore rarely analysed or investigated.

When things go wrong, and particularly if the consequences are serious, the event is investigated to find the cause.

An ETTO is always approximate, because of the very reasons that make it necessary (insufficient time and information!). But making an efficiency-thoroughness trade-off is never wrong in itself!

People are expected to be both efficient and thorough at the same time – or rather to be thorough, when with hindsight it was wrong to be efficient.

# Medication's 30-minute rule

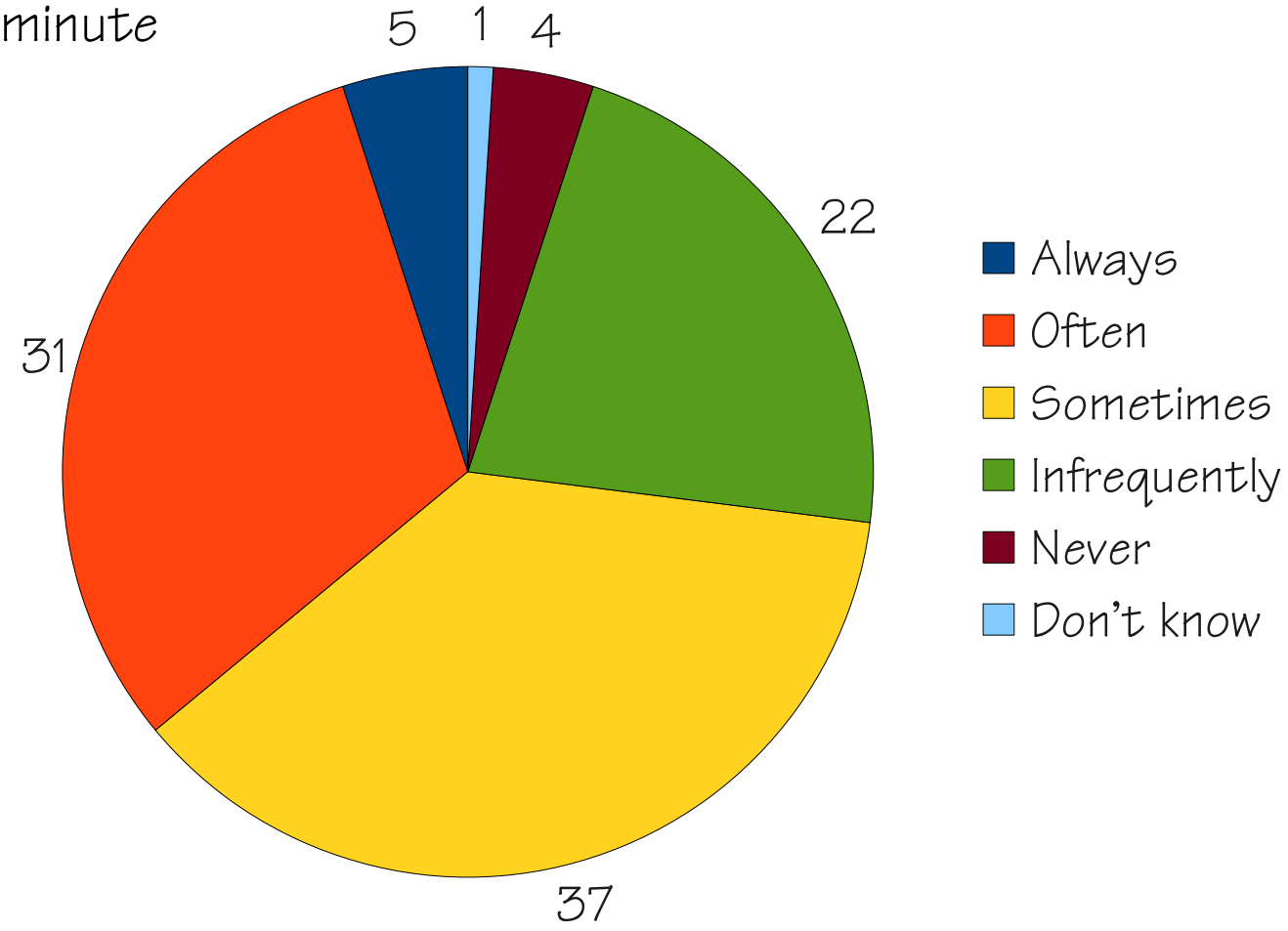
The "30-minute rule" is a requirement in the Centers for Medicare & Medicaid Services (CMS) Conditions of Participation Interpretive Guidelines to administer scheduled medications within 30 minutes before or after the scheduled time.

Responses from 17,500 front-line nurses (USA) showed that most nurses felt that the 30-minute rule was unsafe, unrealistic, impractical, and virtually impossible to follow. For 70% of the nurses, their organization enforces the 30-minute rule. Of these nurses, only 5% were always able to comply with the policy, while 59% were infrequently or only sometimes compliant.

For paper Medication Administration Record systems, nurses often initial the medication entry or document the drug as being administered at the scheduled time, not the actual time.
For eMAR systems, many nurses documented drug administration at the scheduled time, not the actual time.

# Reliability of drug administration

How often do you feel you are able to comply with the CMS 30-minute rule when administering scheduled medications to your patients?



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# 30-minute rule ETTOs

- Bypass pharmacy review of orders and borrowing medications or preparing IV solutions on the unit to facilitate on-time medication administration.
- Administer medications before conducting a physical assessment of the patient and/or checking vital signs, lab values, weight, and allergy status
- Rush to administer a new medication before the MAR entry has been verified
- Alter the drug administration schedule to the time the drug was actually administered to avoid late administration
- Provide any approved reason for late administration (e.g., patient request) regardless of accuracy
- Delay documenting drug administration until later in the day to save time
- Skip important double-checks to save time during drug administration
- Skip bar-code scanning because it is time consuming and results in documentation of late drug administration
- Scan medications at the correct time using the patients' charts / extra identification bracelets, lock the drugs in a cabinet, and dispense them when able
- Leave medications in the patient's room and ask patients to take them asap

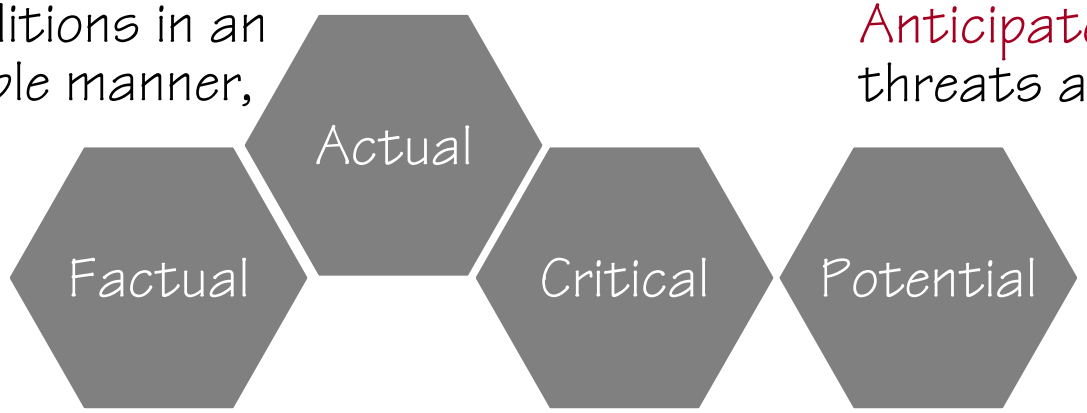
# Resilience and safety management

Resilience is the intrinsic ability of a system to adjust its functioning prior to, during, or following changes and disturbances, so that it can sustain required operations under both expected and unexpected conditions.

A practice of Resilience Engineering / Proactive Safety Management requires that all levels of the organisation are able to:

**Respond** to regular and irregular conditions in an effective, flexible manner,

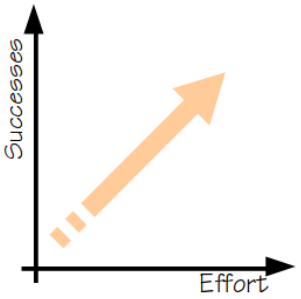
**Anticipate** long-term threats and opportunities




**Learn from past events**, understand correctly what happened and why

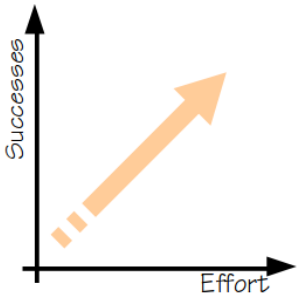
**Monitor** short-term developments and threats; revise risk models

# Safety-II (Resilience engineering)



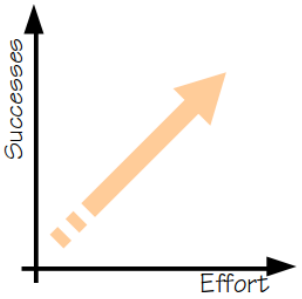

Respond

Know what to do, be able to do it.



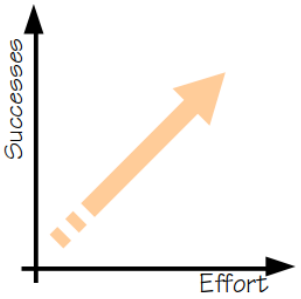

Monitor

Know what to look for




Learn

Know what has happened




Anticipate

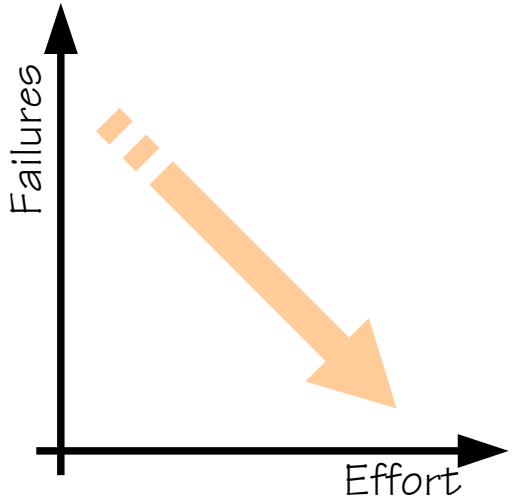
Know what to expect

The goal of Safety-II is to increase the number of things that go right, by enhancing the abilities to respond, monitor, learn, and anticipate.

# Conclusion: Two approaches to safety

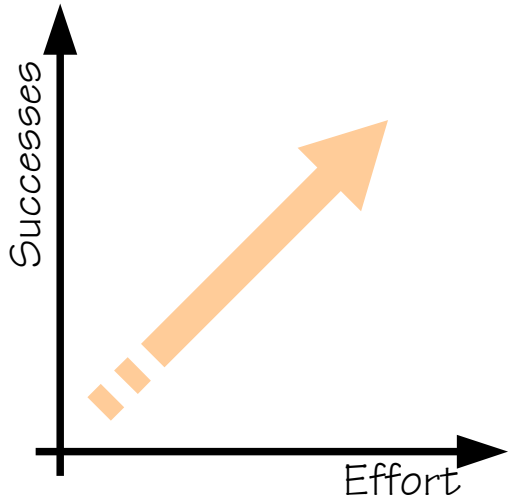
## Safety-I: Eliminate the negative

Efforts to maintain or improve safety. Focus on what can go wrong and result in adverse outcomes.
Many theories, models, and methods explain or predict how things can go wrong - with varying degrees of success.
Some also propose solutions, focusing M, T, and O issues – also with varying degrees of success.




## Safety-II / Resilience Engineering: Accentuate the positive

Efforts to maintain or improve safety. Focus on what goes right, as well as on what should have gone right.
Theories, models, and methods to describe how things go right, but sometimes fail, and how humans and organisations cope with internal and external intractability and unpredictability.



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