quality improvement

# Quality improvement workshop

## Scottish Trauma Audit Group

- What's involved in quality improvement
- Agreeing on what to improve
- Testing commitment to the improvement
- Tracking how things work now
- Finding the causes of current problems
- Interpreting standards in measuring
- Selecting the right actions to achieve improvement

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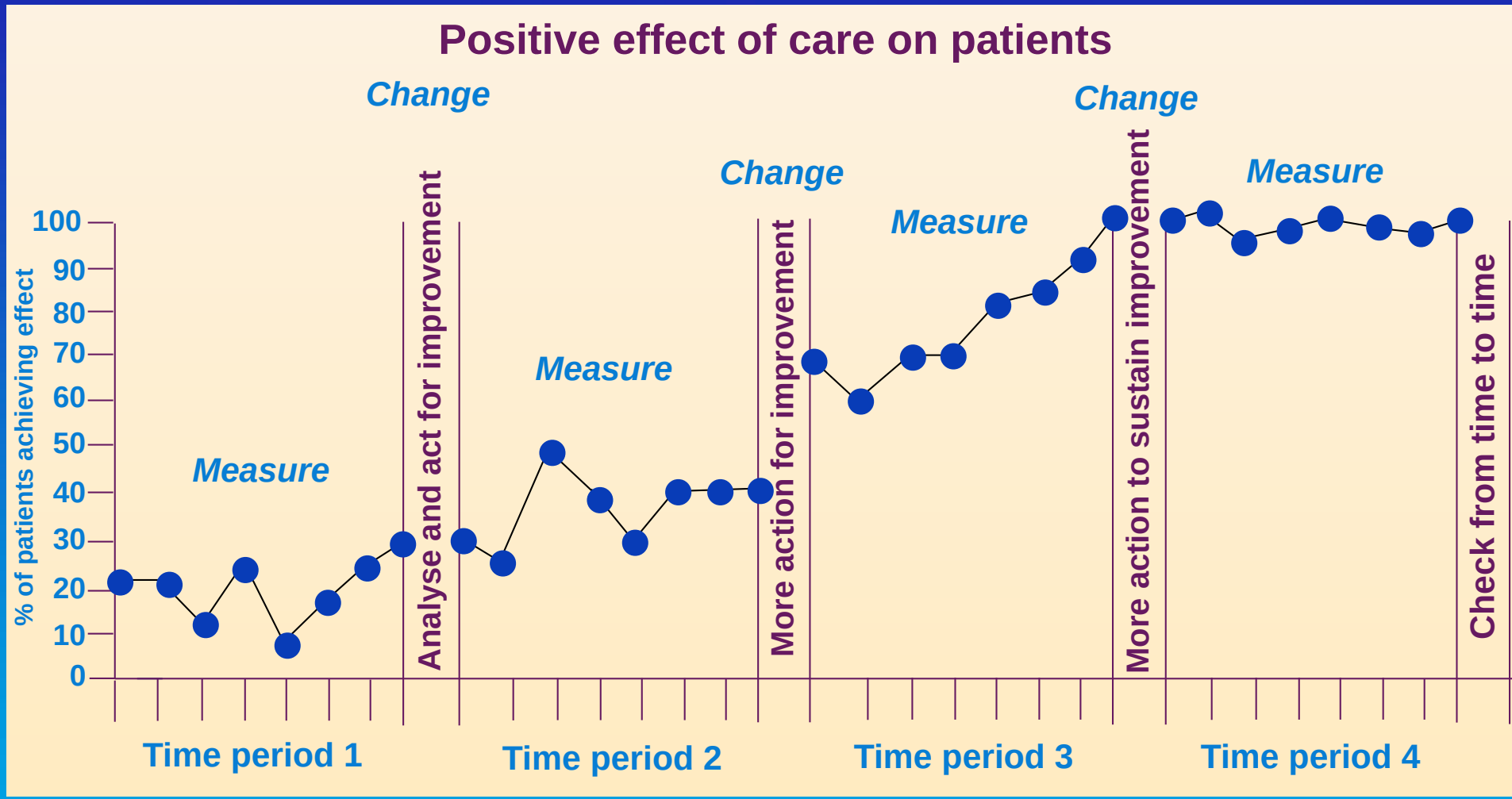
***Quality improvement*** **refers to systematic, data-guided activities designed to bring about immediate, positive changes in the delivery of health care in particular settings**

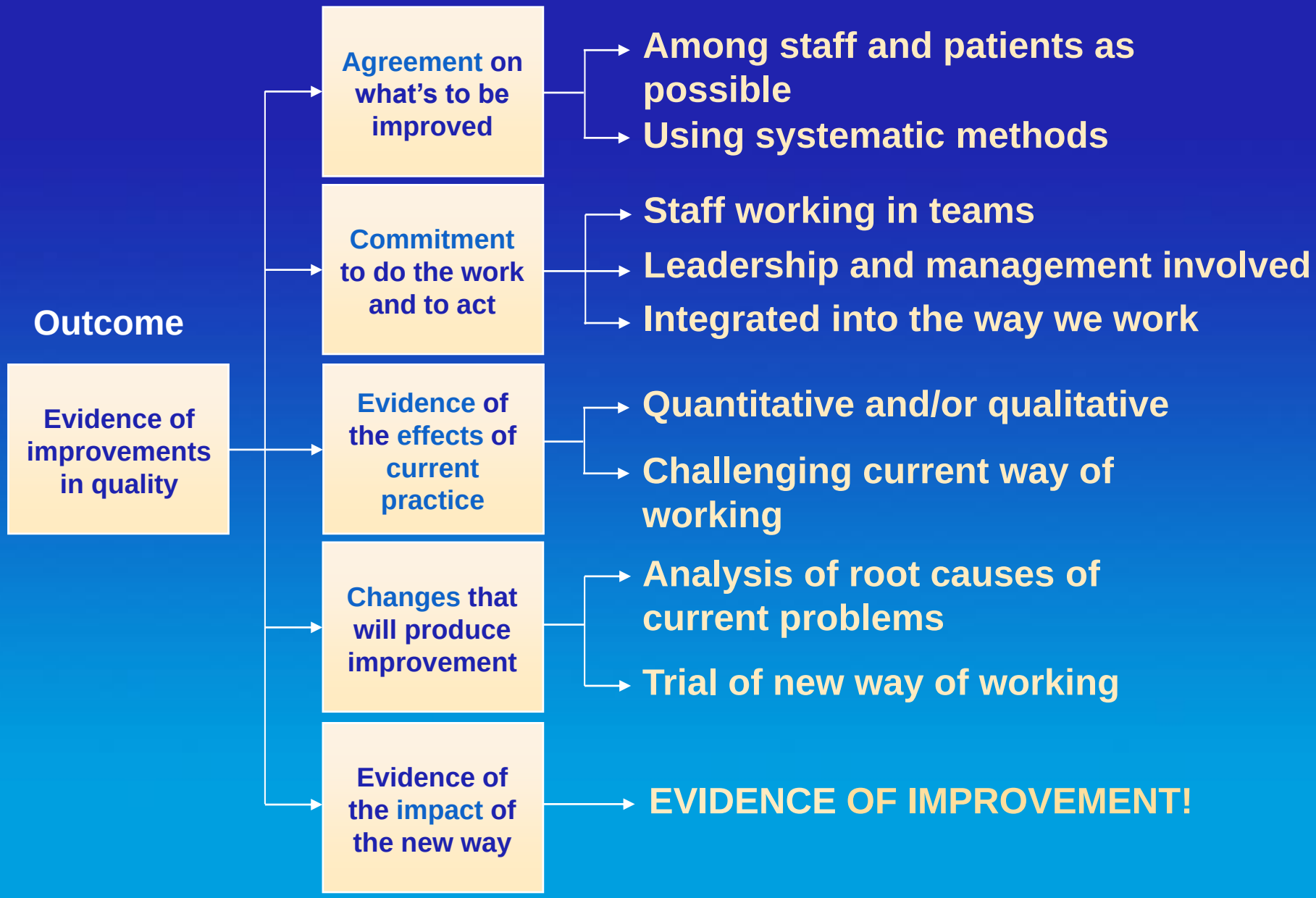
Lynn J, Baily MA, Bottrell M, Jennings B, Levine RH, Davidoff F, et al. The ethics of using quality improvement methods in healthcare *Ann Intern Med* 2007;146:666–73

***Improvement***

**is a statistically significant or clinically important effect of change in an aspect of quality (access to care, appropriateness, effectiveness, patient experience or timeliness)**

# Quality improvement process




Outcome
Evidence of improvements in quality
Agreement on what's to be improved
Among staff and patients as possible
Using systematic methods
Commitment to do the work and to act
Staff working in teams
Leadership and management involved
Integrated into the way we work
Evidence of the effects of current practice
Quantitative and/or qualitative
Challenging current way of working
Changes that will produce improvement
Analysis of root causes of current problems
Trial of new way of working
Evidence of the impact of the new way
EVIDENCE OF IMPROVEMENT!

# Stages in a quality improvement project

- **A**gree on something to improve
- **T**est commitment
- **E**stablish a baseline
- **A**nalyse how to and act to improve
- **M**easure again to show the effects

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# Agreeing on a quality improvement

- Agree on the **subject** of the improvement
- Agree on the **objective**
- Recognize the **stakeholders** who will be affected and need to be involved

# STAG KPIs

- Patient with a severe head injury undergoes a CT head scan within 60 minutes of arrival in ED
- Patient with a severe head injury who has a CT scan has a written report available within one hour of the CT scan
- Patient with an open long bone fracture receives IV antibiotics within three hours of first contact
- Patient with severe haemorrhage starts TXA within three hours of first contact
- Major trauma patient who survives to discharge is approached to be included in PROMs Trauma Programme

- Major trauma patient is pre-alerted to the ED
- EM consultant reviews major trauma patient within one hour of arrival
- Patient with severe head injury is transferred to hospital with neurosurgical ICU
- Patient with severe head injury is referred to neurological specialist

# How to reach consensus on what to improve — Use a list

| | |
|---|---|
| Put the list in rank order — highest number to most important improvement to achieve | *Nominal group process* |
| Rate the KPIs in relation to importance to trauma patients —<br>3 = critical<br>2 = important<br>1 = could be better but not important or critical | *Delphi process* |
| Vote on the KPIs — 3 votes you can use any way you wish, all votes for 1 KPI or split your votes | *Multivoting* |

# Agreeing on an improvement

- Consider the KPIs for major trauma patients
- Use ranking, rating or voting to select a KPI to work on to achieve an improvement

An *improvement objective* is a statement of what a team carrying out a quality improvement project intends to achieve by doing the work

# QI objective model

| Verb | + | Quality focus | + | Subject |
|---|---|---|---|---|
| The direction of the improvement to be achieved | | The feature of quality to be improved | | The specific care or service the work is about — the subject of the improvement |
| *Enables the QI project to be 'fit for purpose'* | | *Indicates what is to be measured* | | *Indicates patients or events the improvement is about* |

# Verbs for objectives

- Increase the number or percentage of patients who …
- Reduce the number or percentage of patients who …
- Ensure that patients receive …
- Change practice to …

# Features of quality

| Term | Meaning |
|---|---|
| *Acceptable* | Patient satisfaction with experience |
| *Accessible* | Ease of getting care |
| *Appropriate* | Right choice of care |
| *Effective* | Right process of care |
| *Efficacious* | Right outcome or benefit |
| *Efficient* | Least waste |
| *Safe* | Avoids harm |
| *Timely* | Right time |

# Stakeholders

## Those who …

- Use
- Know about
- Support
- Are affected by

# Agreeing on what to achieve and who to involve

- Formulate an objective
- Identify stakeholders and plan their involvement

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# Testing commitment

- Anticipate experience of working on the improvement
- Foresee others' reactions
- Consider possible difficulties
- Identify benefits (to be 'sold')
- Develop strategies for key issues

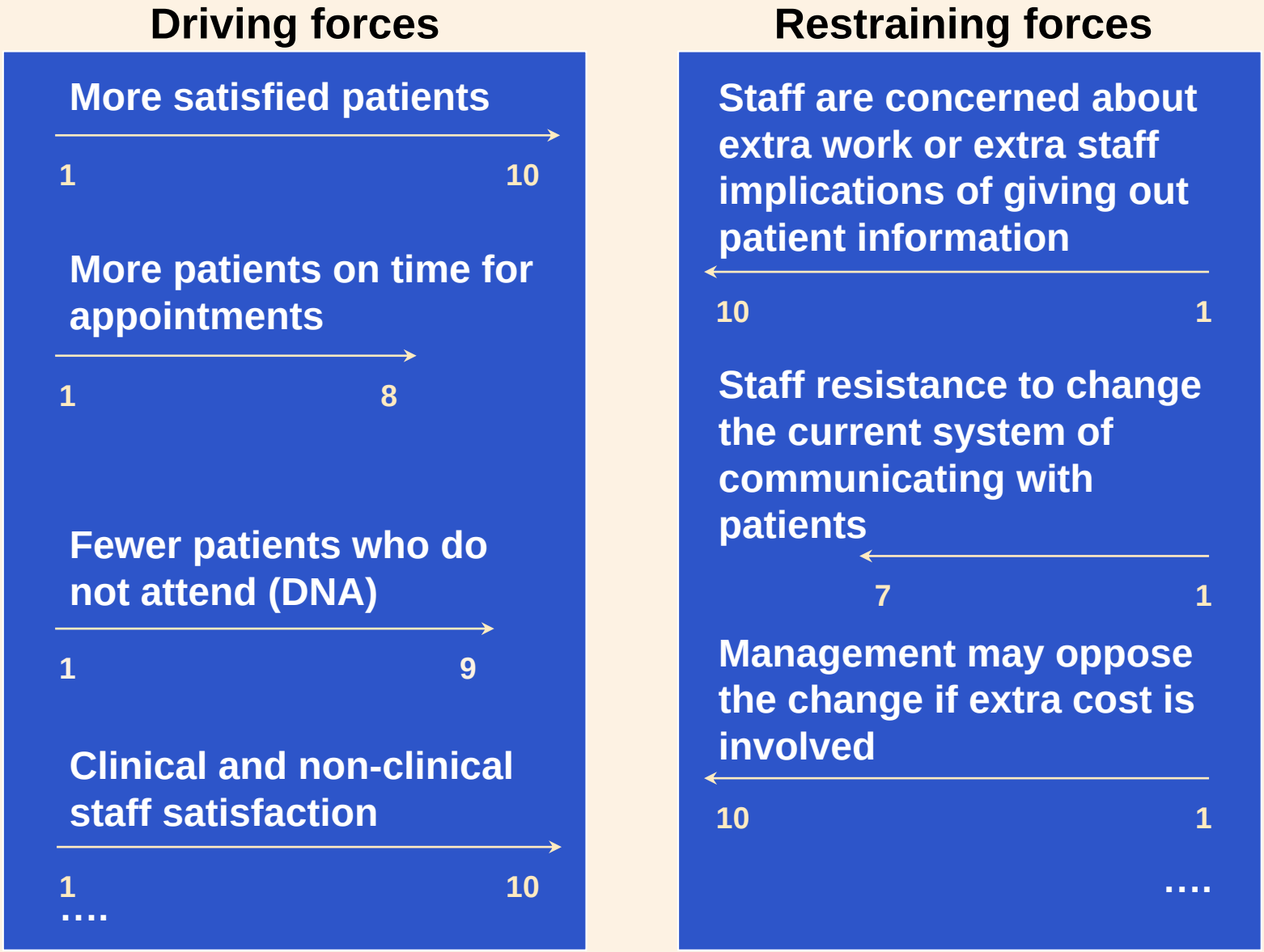
A *force-field analysis* is a way to identify the forces that may drive a situation toward or that may restrain a situation from reaching an end-point, either a desired or an undesired end-point, and rate the strength of the forces

# Force-field analysis

| | |
|---|---|
| *Purpose* | Identify positive and negative ‘forces’ |
| *Nature* | Managed |
| *Method* | Collect ideas by brainstorming<br>Consider relative strengths and weaknesses |

# Example: Force-field analysis

## Quality improvement objective: Patient information



# Testing commitment

**For your improvement objective, use —**

- **Force-field analysis**

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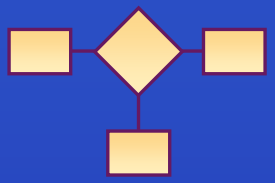
# Tracking how things work now

All work is carried out in a system of interwoven processes

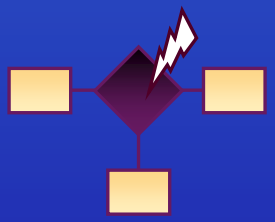
All processes have variation

Understanding and reducing variation are the keys to quality improvement

# Types of variation



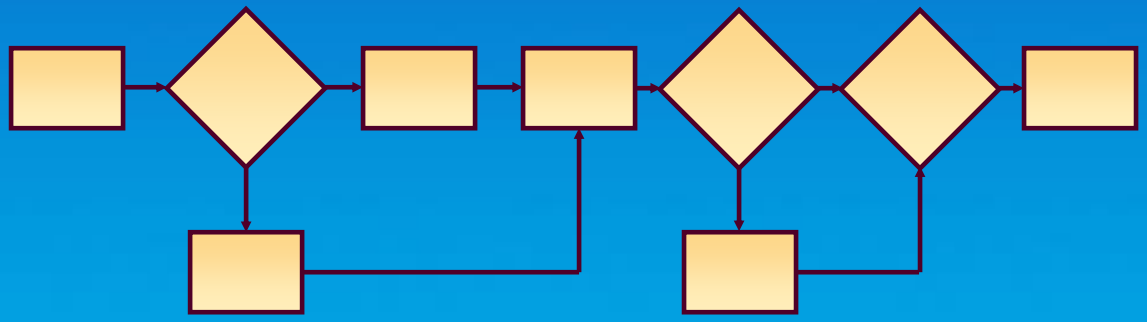
Common cause



Special cause

# *Common cause variation* is natural variation inherent in a process that —

- results from the way a process is usually carried out
- occurs in a random way — no one cause

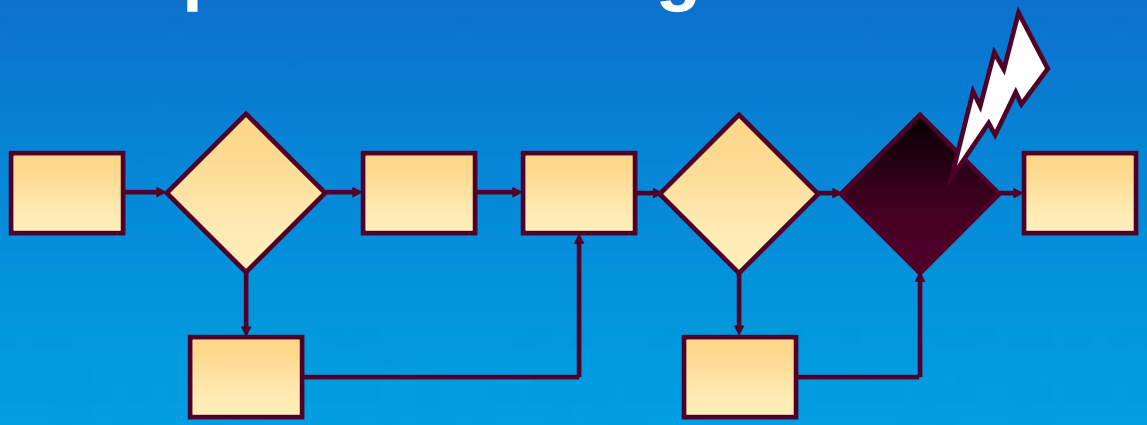


# A process with common cause variation —

- Is stable in a statistical way
- You know how well the current process works
- You can tell how the process will work in the future — unless the process is changed

# *Special cause variation* is unnatural variation in a process that —

- results from events or changes that are not inherent in the way a process is usually carried out
- has a special or assignable cause

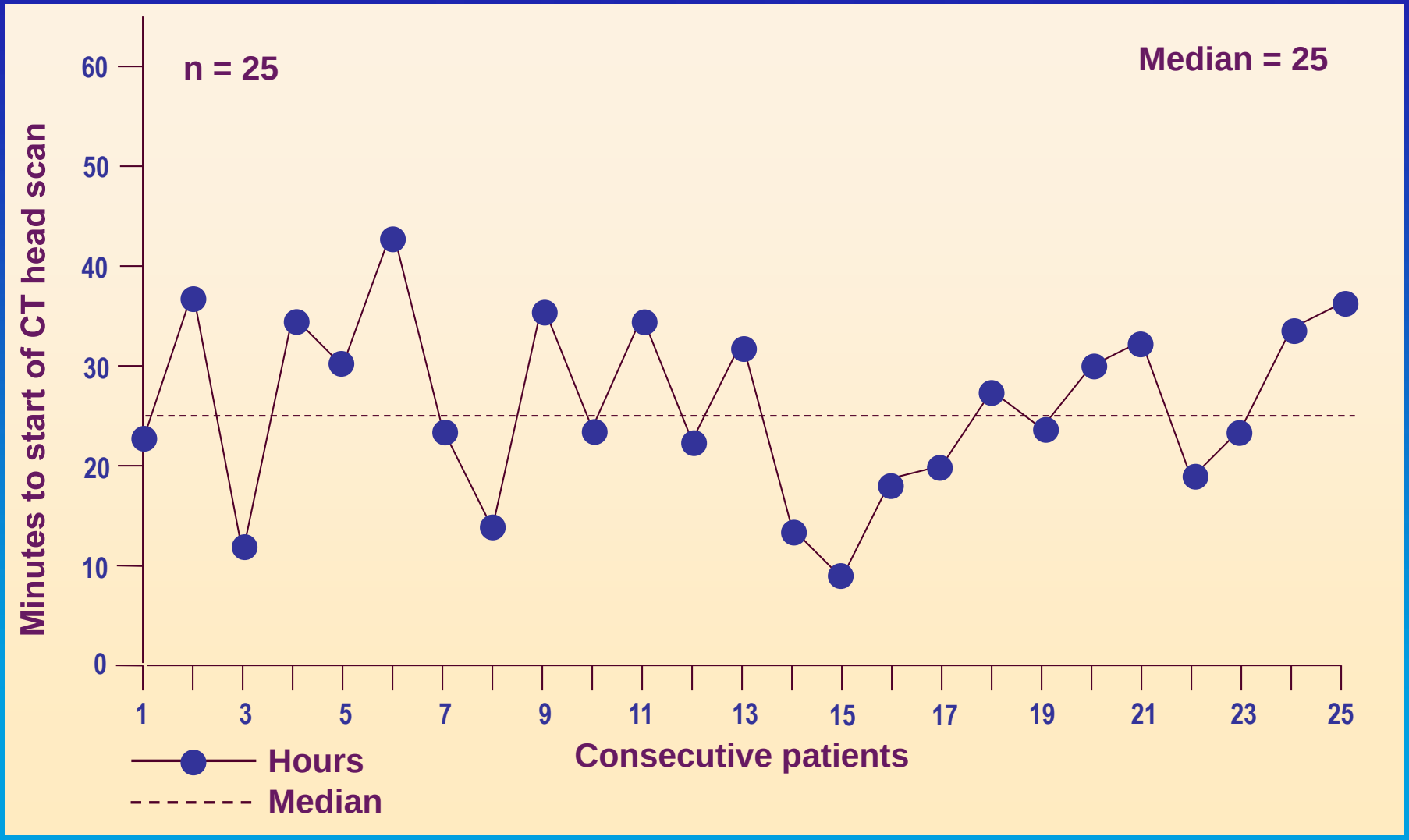


# A process with special cause variation —

- Is not stable in a statistical way
- You don’t know how well the current process works
- You can’t tell how the process will work in the future

A *run chart* is a display of data points in chronological order of the events represented by the data, that is, the data points are plotted in the order in which they occurred, for the purposes of finding the amount and type of variation

# Example: Run chart of time to CT head scan for patient with severe head injury



# Run chart

| | |
|---|---|
| *Purpose* | Help analysis of the amount and type of variation in a process or outcome |
| *Nature* | Statistical |
| *Process* | Collect 20 to 25 data points<br>Draw and label axes<br>Plot these data points in *chronological order*<br>Calculate the median<br>Analyse the chart<br>Decide if the amount and type of variation is acceptable<br>Decide on the type of action needed |

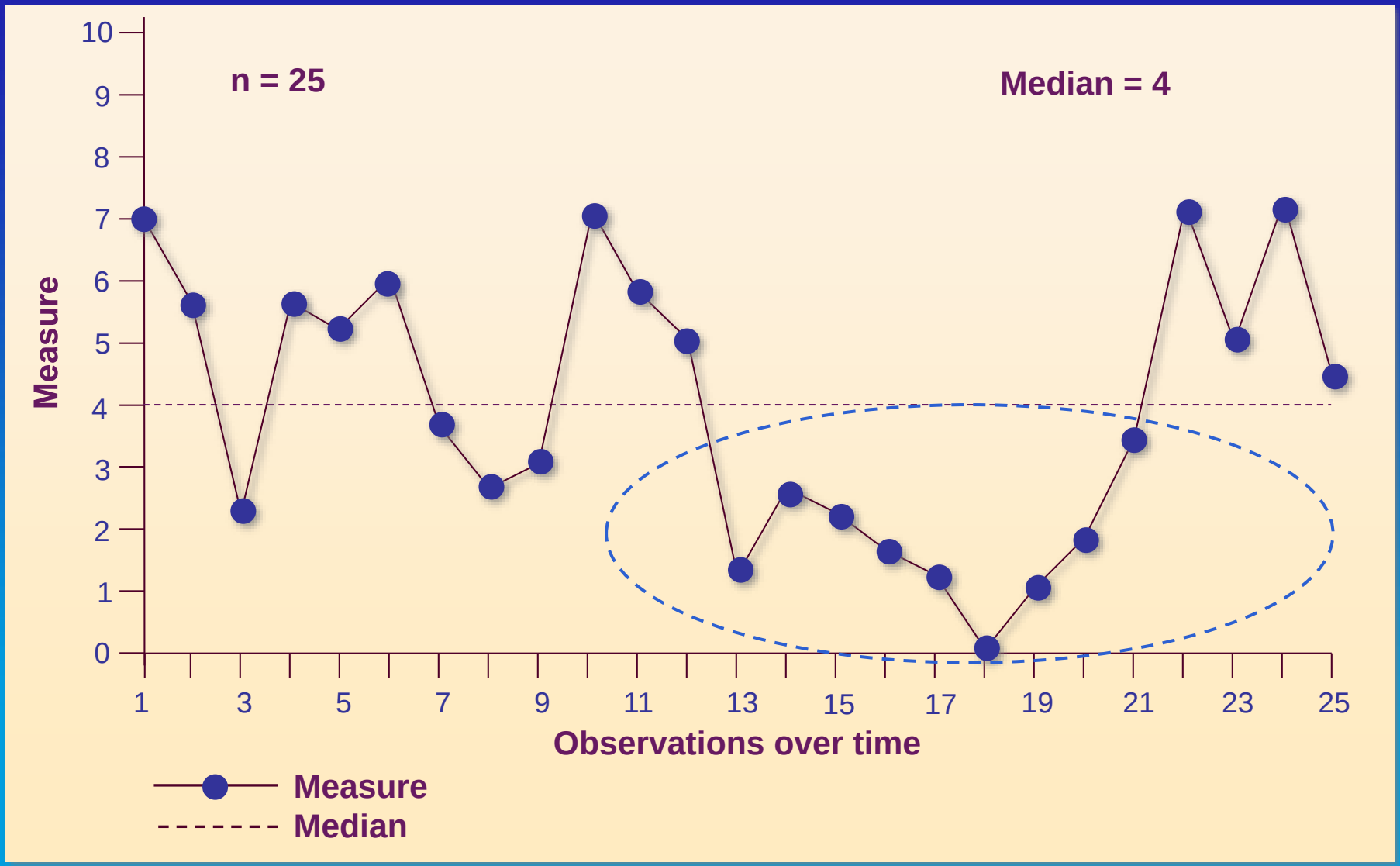
# Looking for patterns in a run chart

1. Apply rules to your run chart
   - Shift
   - Trend
   - Astronomical value
   - Repeating pattern
   - Zigzag

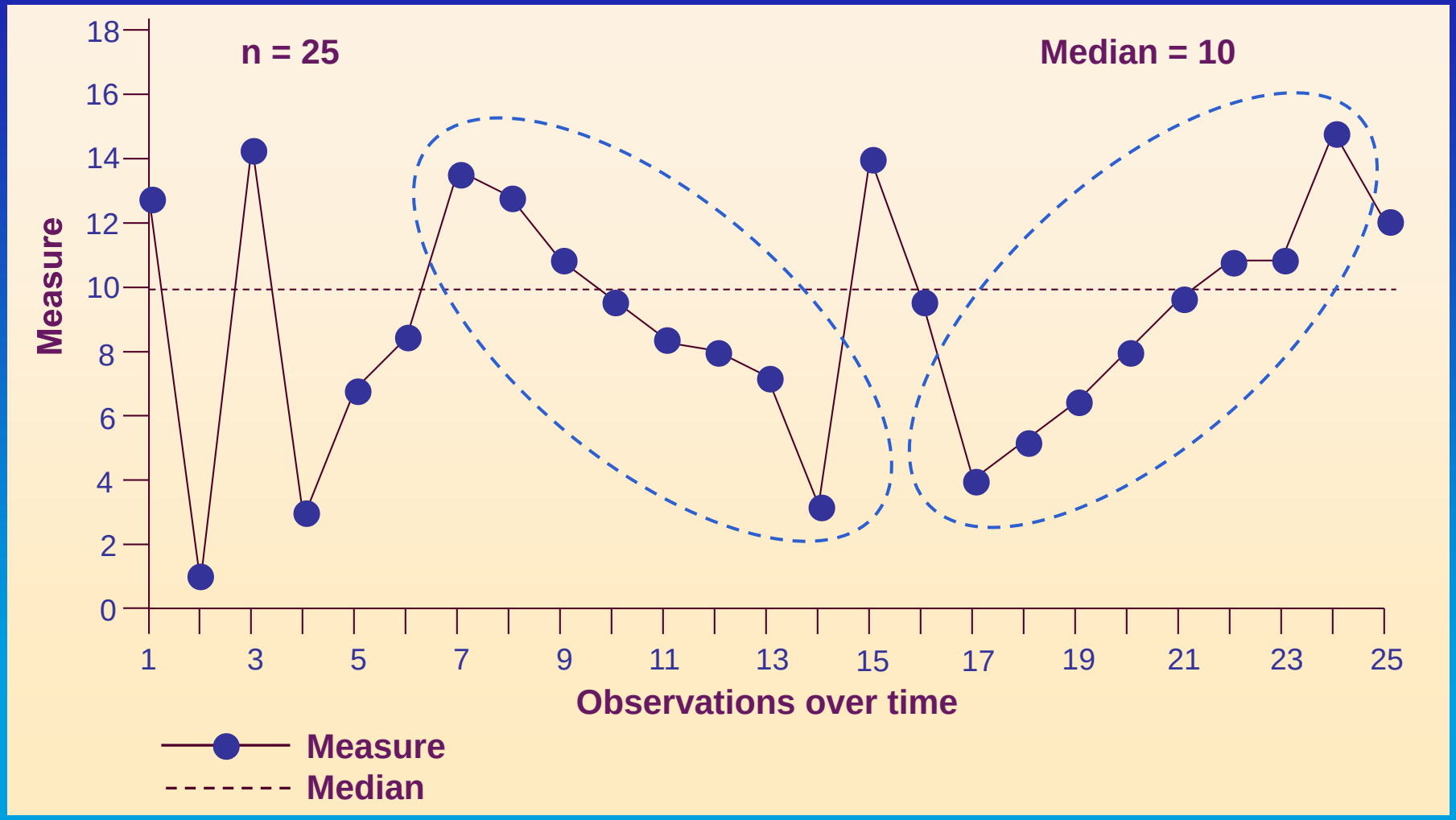
## 2 Apply rules to your run chart

| | | |
|---|---|---|
| A **rule appears** | = | **special** cause |
| A **rule doesn't appear** | = | **common** cause |

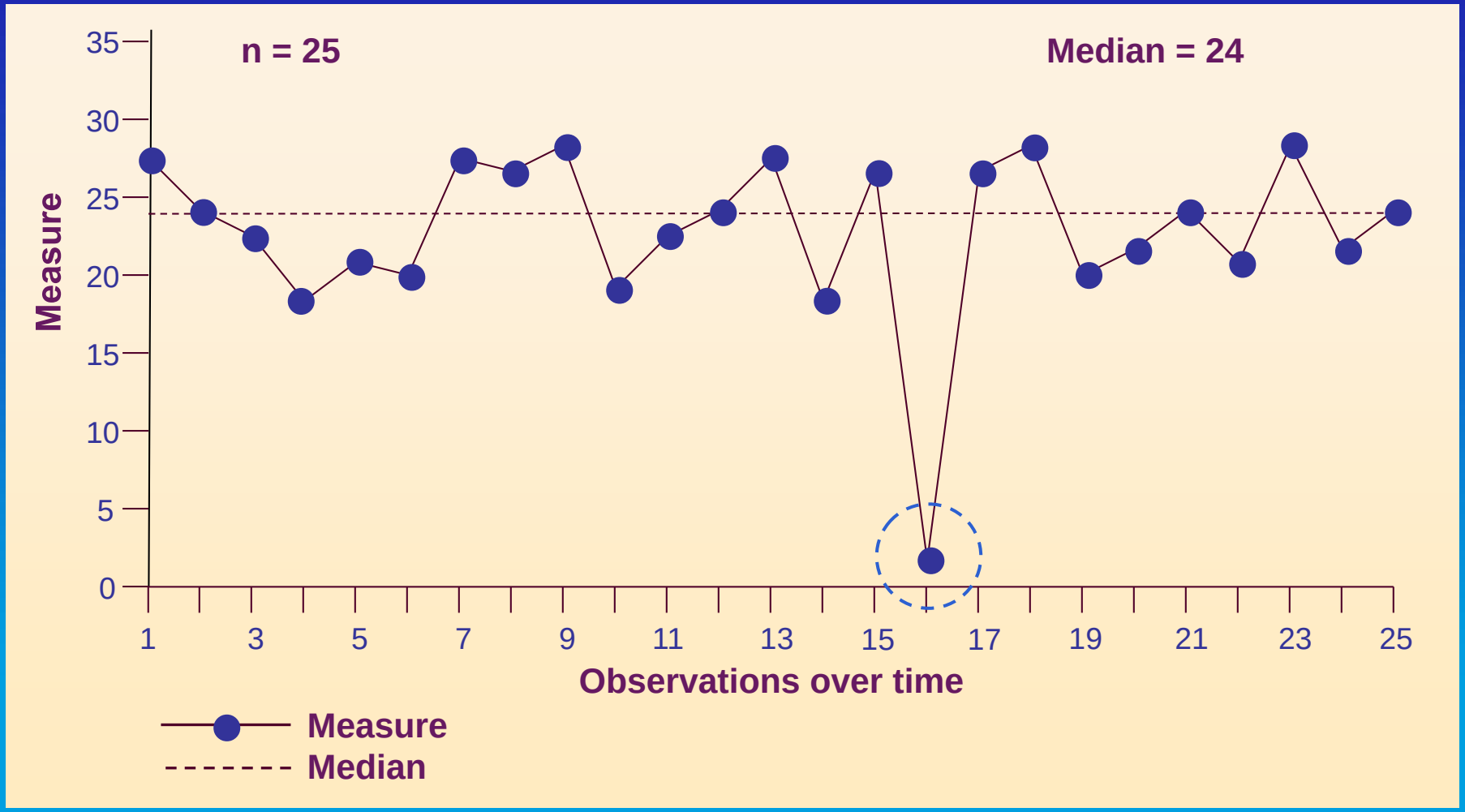
# Rule 1 — Shift (8 or more points above or below the centre line)



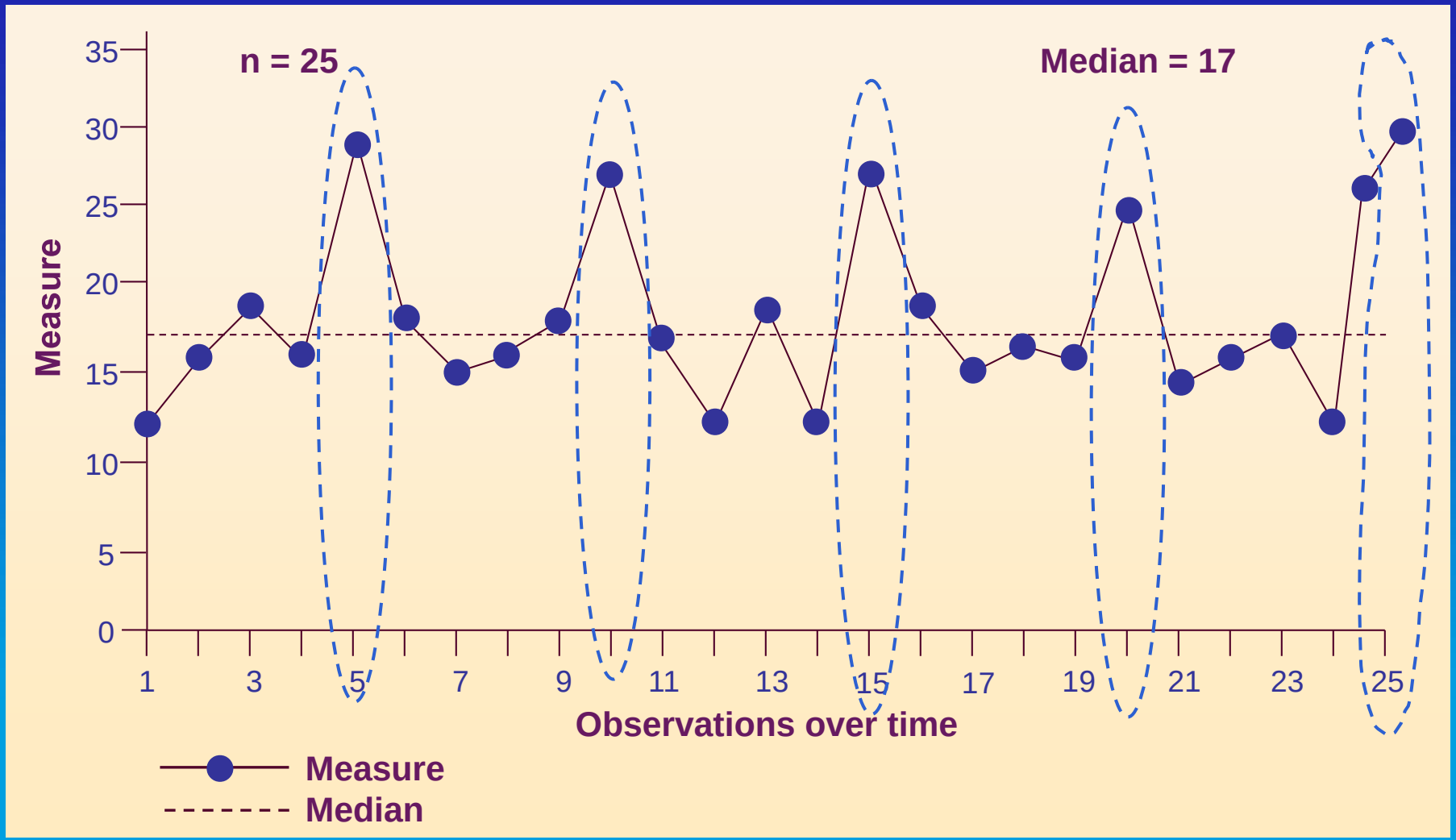
# Rule 2 — Trend (6 consecutive points all going up or down)



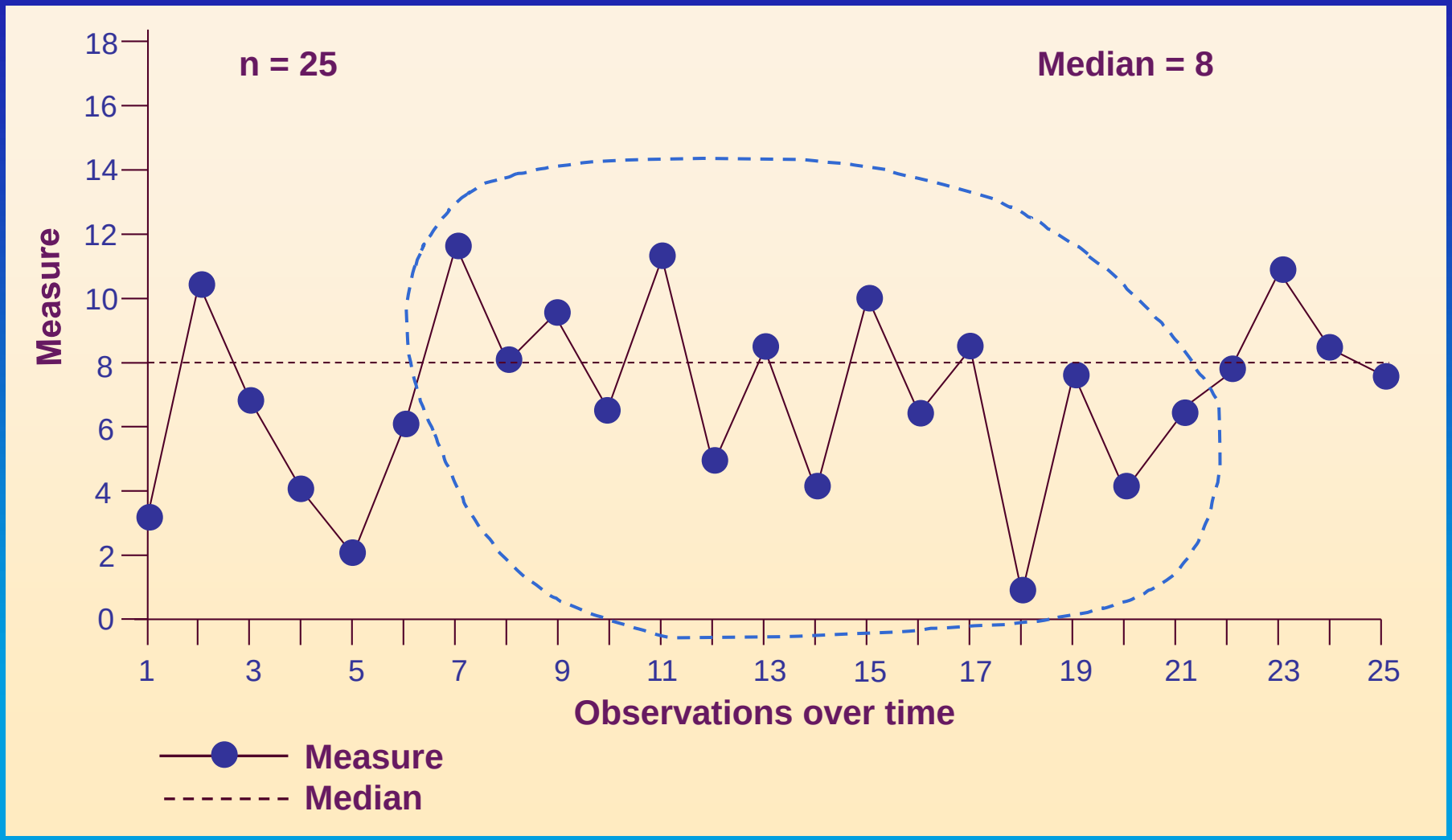
# Rule 3 — Astronomical value (a blatantly different point)



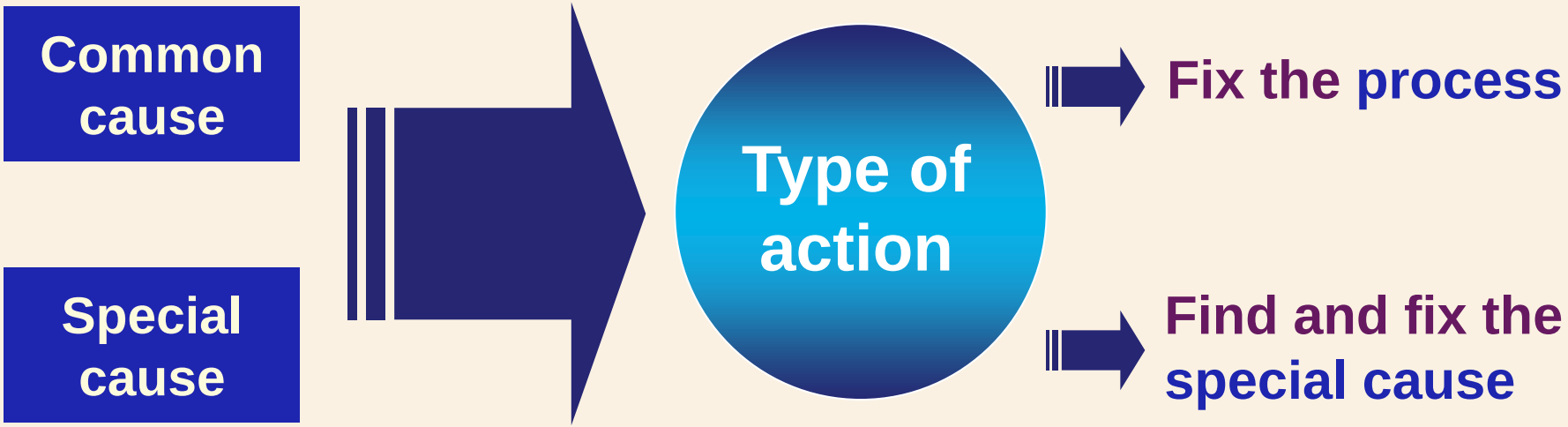
# Rule 4 — Repeating pattern (cyclic pattern in points)



# Rule 5 — Zigzag (14 consecutive points alternating up and down)



# How to anticipate the type of action needed



# Action for

**Common cause variation**

**Decide if the variation is acceptable, if not —**

- **Find out how the process works**
- **Decide on where and how the process needs to change**
- **Redesign the process**
- **Implement the redesign**
- **Measure the impact**

# Action for

**Special cause variation**

- Do not automatically change the process
- Determine when and why the special cause occurred
- Learn from the special cause
- Eliminate or reproduce the special cause
- Measure the impact

# Analysing run charts

**Decide —**

- **Common cause**
- **Special cause**

**Why?**

**Decide the approach to action**

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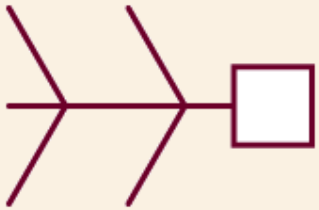
A *shortcoming* or problem in care is current actual practice that does not represent good practice or is not acceptable

A *cause* is the reason for the occurrence of the shortcoming in care

# Example — My local hospital's shortcomings based on clinical audit findings

| KPI | % of patients NOT meeting KPI |
|---|---|
| Major trauma patient pre-alerted | 28% |
| Major trauma patient seen by an ED consultant within one hour | 38% |
| Patient with a severe head injury has a CT head scan within one hour of arrival in ED | 59% |
| Patient with a severe head injury has a written report of CT head scan within one hour of scan | 62% |
| Patient with an open long bone fracture receives IV antibiotics within three hours of first contact | 12% |

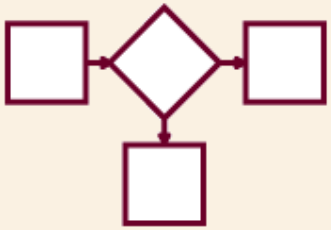
# Finding the causes — Use quality improvement tools!



Fishbone diagram

? ? ? ? ?

Ask ‘Why’ 5 times

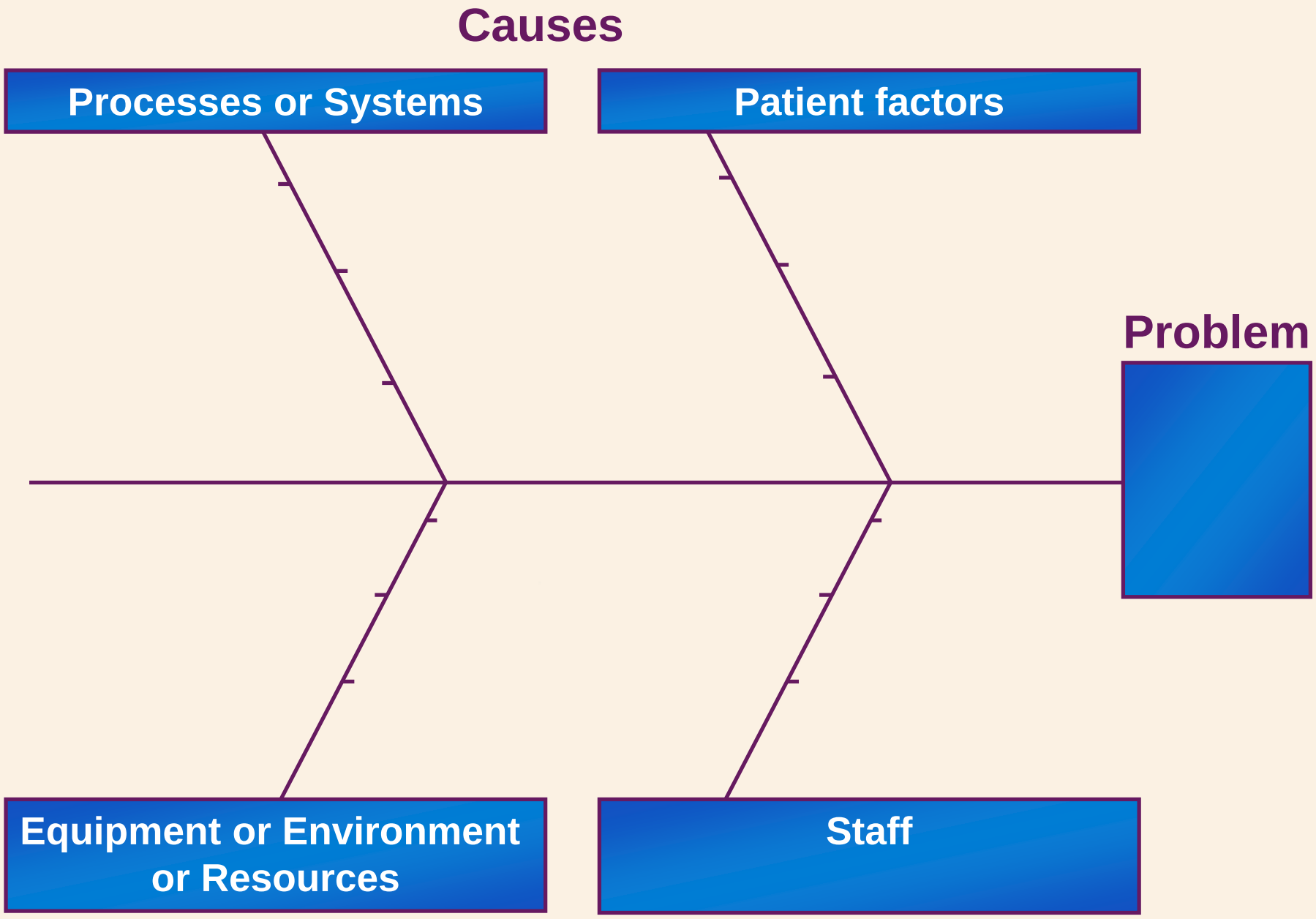


Analyse the process

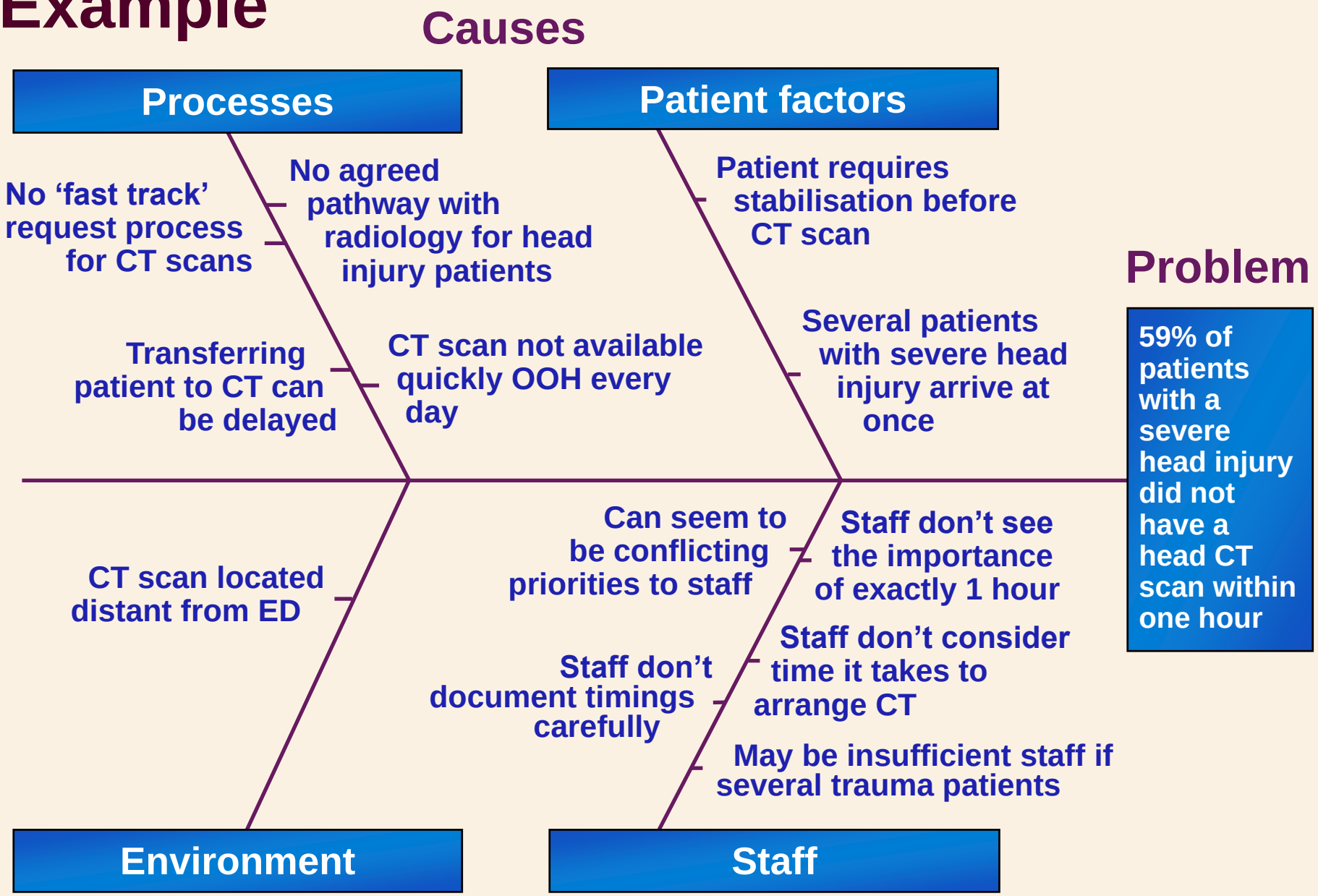
A *fishbone diagram* is a cause-and-effect diagram used to facilitate the identification of factors (causes) that are contributing to an outcome or result (effect)

# Fishbone diagram

| | |
|---|---|
| *Purpose* | Find possible causes of a problem |
| *Nature* | Generating and analysing ideas |
| *Process* | Draw a fish skeleton<br>Write the problem in the head of the fish<br>Label the spines<br>Brainstorm possible causes<br>Agree on the next steps |


Causes
Processes or Systems
Patient factors
Problem
Equipment or Environment or Resources
Staff

# Example


Causes
Processes
Patient factors
No ‘fast track’ request process for CT scans
No agreed pathway with radiology for head injury patients
Transferring patient to CT can be delayed
CT scan not available quickly OOH every day
Patient requires stabilisation before CT scan
Several patients with severe head injury arrive at once
Problem
59% of patients with a severe head injury did not have a head CT scan within one hour
CT scan located distant from ED
Can seem to be conflicting priorities to staff
Staff don’t see the importance of exactly 1 hour
Staff don’t consider time it takes to arrange CT
Staff don’t document timings carefully
May be insufficient staff if several trauma patients
Environment
Staff

*Asking why five times* is a tool for getting past the symptoms of a problem to identify its root cause by systematically analysing a cause-and effect chain backwards from the problem to what led to the problem

# Asking why 5 times

| | |
|---|---|
| *Purpose* | Find the root cause of a problem |
| *Nature* | Analysing links in a chain |
| *Process* | Write down the problem<br>Write ‘Why’ 5 times<br>Answer each ‘why’ in sequence<br>Keep asking until the team finds the root cause |

# Example: Consultant seeing major trauma patient in one hour

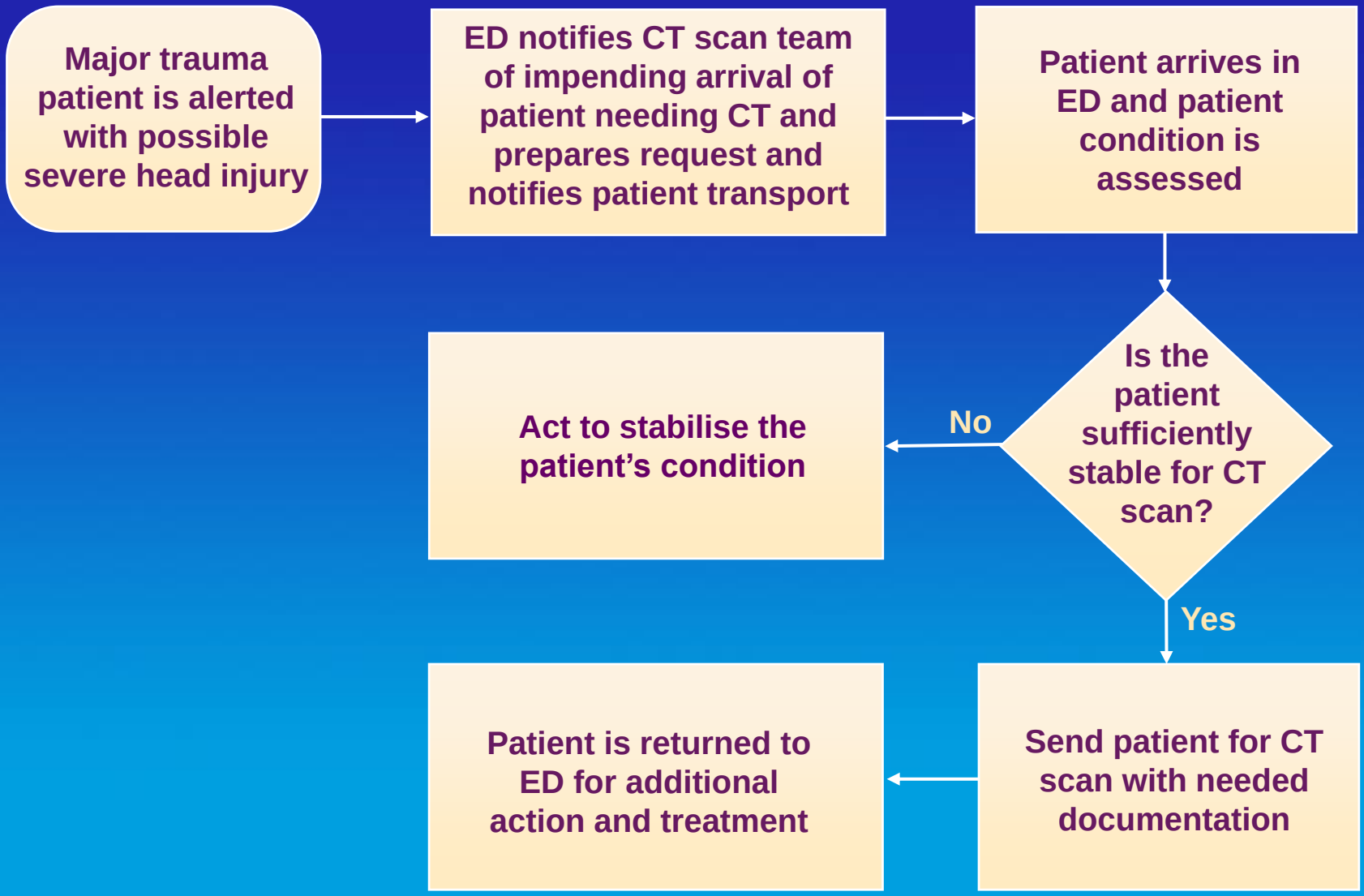
| | |
|---|---|
| *Problem:* | 38% of major trauma patients aren't seen by a consultant in one hour |
| *Why?* | Consultants don't see the importance of a consultant documenting seeing a major trauma patient in one hour |
| *Why?* | Consultants believe that Registrars are delivering the right care to major trauma patients and Registrars will be creating appropriate documentation of care |
| *Why?* | Consultants observe Registrars' care of major trauma patients and offer advice or direction, but don't think to document the time when they have seen the patient or their observations or directions |
| *Why?* | Consultants may be diverted to patients who can be dealt with quickly or to avoid breaches of target times |
| *Why?* | Consultants try to balance all the priorities facing the ED and don't give priority to documentation of their actions for major trauma patients |

A *process map* is a picture of a process that shows in sequence every major step or activity in the process and the relationships among the steps or activities

# Process map

| | |
|---|---|
| *Purpose* | Help a team understand how things work now |
| *Nature* | Drawing a picture of the way work is done |
| *Process* | Agree on what work to analyse — and where it starts and stops<br><br>Describe the steps and decisions in the work |

# Example: Detailed process map



# Finding causes of a problem

- Identify a problem related to trauma care in your hospital
- Use a fishbone diagram or asking why five times to find possible causes
- Draw a process map if the process is not entirely clear

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# A review of clinical audit measures

**Decide —**

- What
- How often
- Reasons for missing
- How to find


**... you're looking for**

**... should be there**

**... that are acceptable**

**... reliably**

# Measure model

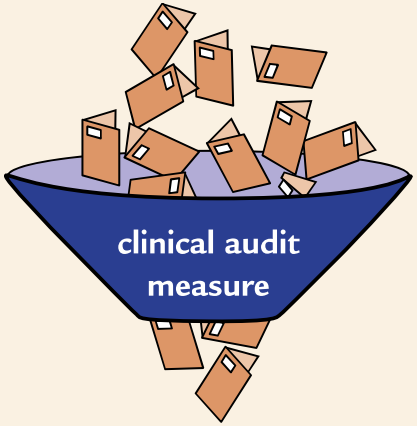
Evidence of quality of care or service + Standard + Exceptions + Definitions of terms and instructions for data collection

# Example: Consultant sees major trauma patient in one hour

| Evidence of quality of care or service | Screening standard | Exception | Definitions and instructions |
|---|---|---|---|
| Consultant sees major trauma patient within one hour of patient's arrival in ED | 100% of major trauma patients | None | One hour = 60 minutes<br>Arrival in ED is time recorded in ED record<br>Time seen by consultant is time recorded as seen by consultant in ED record |

# Standards

## Screening
**(prescriptive)**




**All-or-no-patients**

## Acceptable
**(benchmark or comparative)**

**What best practice services do**

## Target
**(threshold)**

**What we aim for**

# The jobs to translate clinical audit data to local improvements

1. Review the data and the cases in which the KPI was not met
2. Look for any *clinically acceptable* reason for cases not meeting KPIs
3. If there are NO clinically acceptable reasons for not meeting a KPI, make a list of the shortcomings or problems (KPIs not delivered as intended for patients)
4. Set priorities for improvement
5. Find the root causes of the shortcomings
6. Act to address the root causes

# What could be *clinically acceptable*

- Error in data capture
- Clinically acceptable exceptions to the KPI
  - Forgotten — Not transferring a patient who is not clinically stable
  - Complex — The patient has many problems to be managed
  - Rare — 10 major trauma victims all arrived within 3 minutes of each other

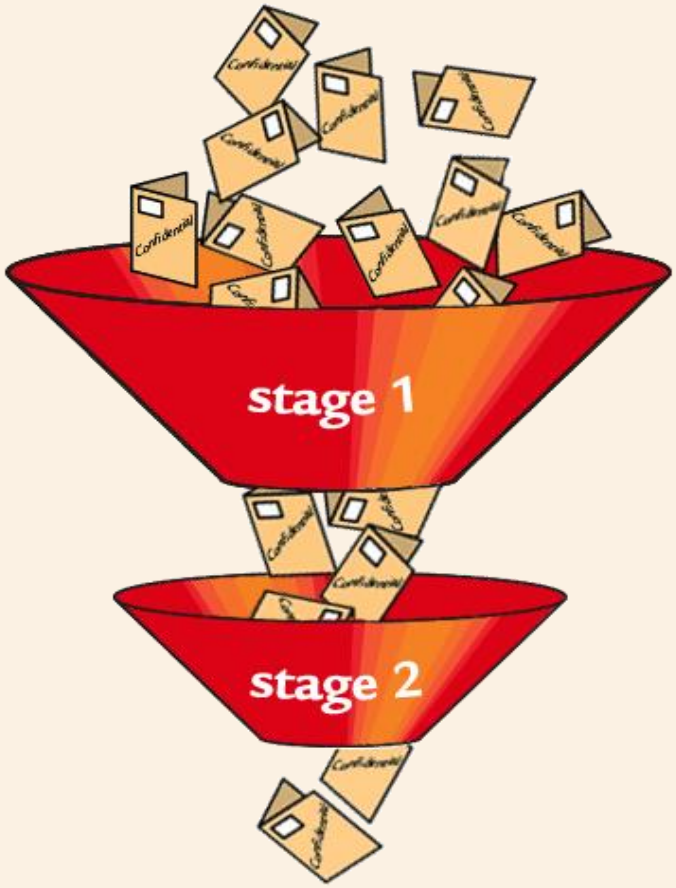
***Is there ANY clinical justification for any case that does not meet a KPI?***

# Two-stage approach to clinical audit

Use explicit KPIs to screen all cases

Use structured implicit review of flagged cases

Analyse problems to find causes




***Without the two stages, there is a threat to the validity of clinical audit data***

# Through PEER REVIEW, confirm the findings

| KPI | Preliminary N | % | N clinically justified | Final N | % |
|---|---|---|---|---|---|
| 1. The patient was pre-alerted | 82 | 84.5 | *4* | 86 | 88.7 |
| 2. The patient with a severe head injury had a CT head scan within one hour of arrival | 45 | 41.0 | *6* | 51 | 49.0 |
| 3. The patient was seen by an ED consultant in one hour | 58 | 59.8 | *16* | 74 | 76.3 |

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# Types of actions

| WEAK | STRONG |
| --- | --- |
| Raise staff awareness<br>Remind staff<br>Provide training<br>Write a new policy | Remove barriers to doing the work effectively<br>Redesigning the work<br>Monitor and feed back<br>Supervise<br>Use IT or technology |

Hughes D. Root cause analysis: bridging the gap between ideas and execution. *National Center for Patient Safety Topics in Patient Safety* 2006;6(5):1–2

The theory of change for improvement defines exactly what will be achieved through a change process and how the process will work to produce the intended improvement. The ‘theory’ explains ‘what’ is to be changed and ‘how’ and ‘why’ it works and under what conditions, that is, ‘when’ and ‘where’

# Theory asks —

**Was the action the right action?**

**Was the right action implemented the right way?**

# Success depends on —

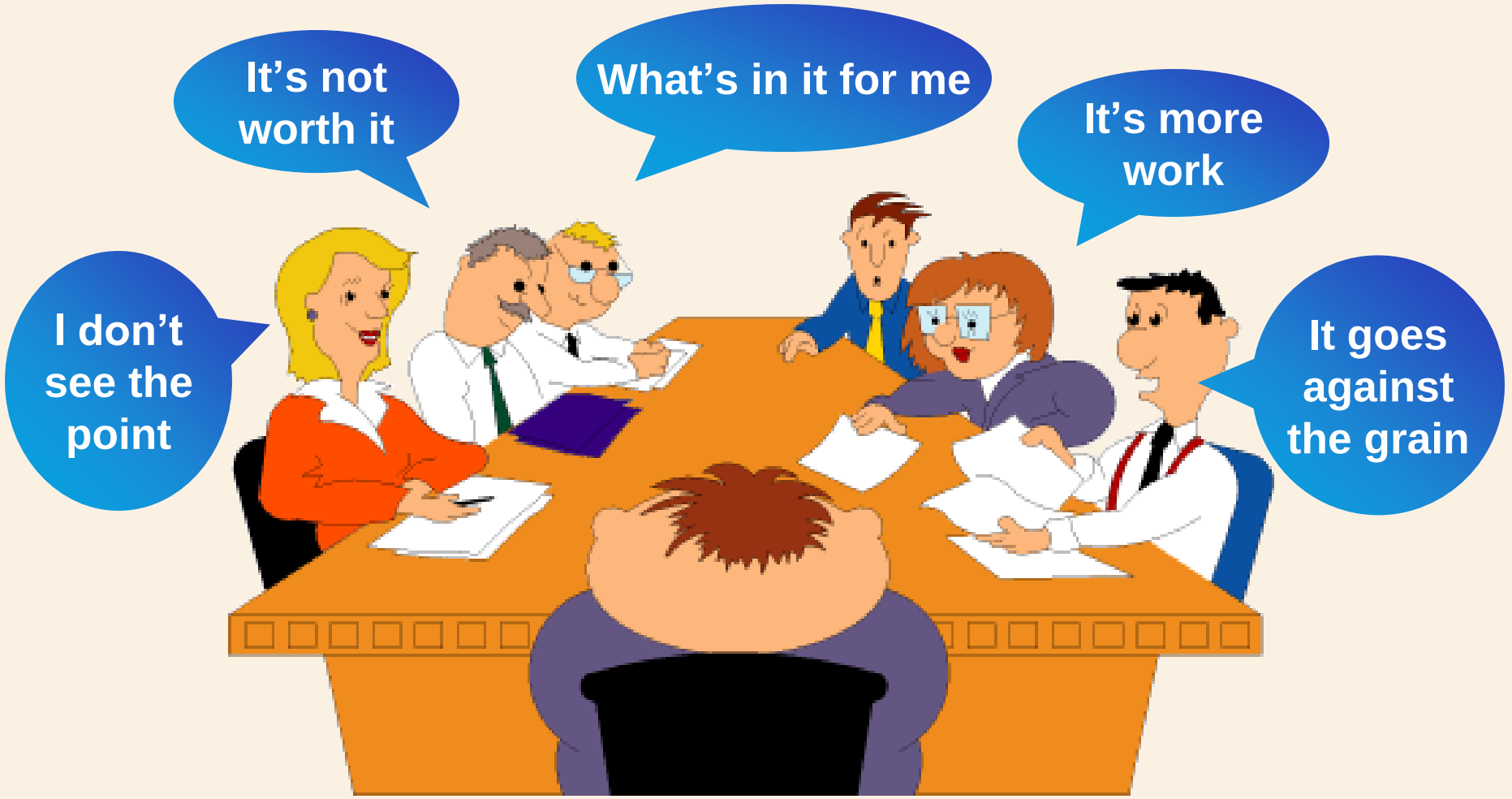
**Is there a cause-and-effect relationship between the action and the effect of action?**

**Choosing the right strategies**
► ***appropriate decision-making***

**Doing the right strategies the right way**
► ***effective implementation***

# What has to change? Individual professionals — Why don't they do what we expect them to do

# They don’t *want* to




***People don’t believe in the change***

# They *can't* do it — the organizational factor


***People don't have what it takes to make the change***

# To increase the uptake and sustainability of change by individual professionals, they need —

- Scientific evidence of what is the right or best way
- Belief in the evidence
- Good systems to implement the evidence

# Social —

- Information or communication from a credible source
- Teams of professionals working together
- Leadership
- Professional bodies support as relevant

# Organizational

- Teams are enabled to change things on their own
- Strategy, structure, culture, support
- Process redesign and implementation
- Systems approach
- Continuous learning as an organization

***The organization is active in supporting improvement***

# Financial

- Pay-for-performance or other targets
- Financial rewards or penalties
- Contractual arrangements
- Regulator influences

# Possible strategies

- Education
- Consensus-building
- Opinion leader
- Audit and feedback
- Patient feedback
- Reminder system
- Marketing
- Communication and media
- Professional linkages
- Role revision

Use as many strategies as possible

# Possible strategies

- Skill mix changes
- Clinical teams and processes
- Reorganization of services
- Continuity of care
- Workplace satisfaction
- Changes in structure
- IT systems
- Financial incentives
- Regulatory influences

Use as many strategies as possible

# A practical hint — setting priorities among actions using the Commercial Aviation Safety Team (CAST) model —

**Make a list of actions to address the shortcomings in the quality of patient care**

1. Use a 7–point scale to rate —
   - How effective will the action be in addressing the cause of the shortcoming in quality
   - How strongly do you believe that the action can be implemented in your organization
2. Multiply the ratings
3. Find and implement the priority actions (top priority = 49)

# Planning change to achieve an improvement

**Decide on —**

- **The exact improvement to be achieved**
- **Effective and feasible actions**
- **Implementation plan**
- **Evidence of success**

# Next steps

- Plan how you might use what you learned in today's workshop

quality improvement



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