

# The Productive Operating Theatre

*Building teams for safer care™*

## ***Toolkit***

Version 1



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Item	Available	Unavailable	Total
1. <i>Chlorophyll a</i>	1.0	0.0	1.0
2. <i>Chlorophyll b</i>	1.0	0.0	1.0
3. <i>Chlorophyll c</i>	1.0	0.0	1.0
4. <i>Chlorophyll d</i>	1.0	0.0	1.0
5. <i>Chlorophyll e</i>	1.0	0.0	1.0
6. <i>Chlorophyll f</i>	1.0	0.0	1.0
7. <i>Chlorophyll g</i>	1.0	0.0	1.0
8. <i>Chlorophyll h</i>	1.0	0.0	1.0
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13. <i>Chlorophyll m</i>	1.0	0.0	1.0
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76. <i>Chlorophyll bx</i>	1.0	0.0	1.0
77. <i>Chlorophyll by</i>	1.		

# Theatre 4

## Anaesthetic







## Purpose of this guide

Tools are essential in helping you and your team implement The Productive Operating Theatre modules. They will enable you to really understand your current ways of working and help you to see where and how you can make improvements. Tools provide you with a different way of looking at the processes you are very familiar with, processes that you may carry out many times a day. The tools provide an opportunity to question how you do things and make improvements that will enable you to achieve your local vision and the overall aims of the programme:

- improving the patient experience and the outcomes of care
- increasing the safety and reliability of care
- improving team performance and staff wellbeing
- adding value and improving efficiency.



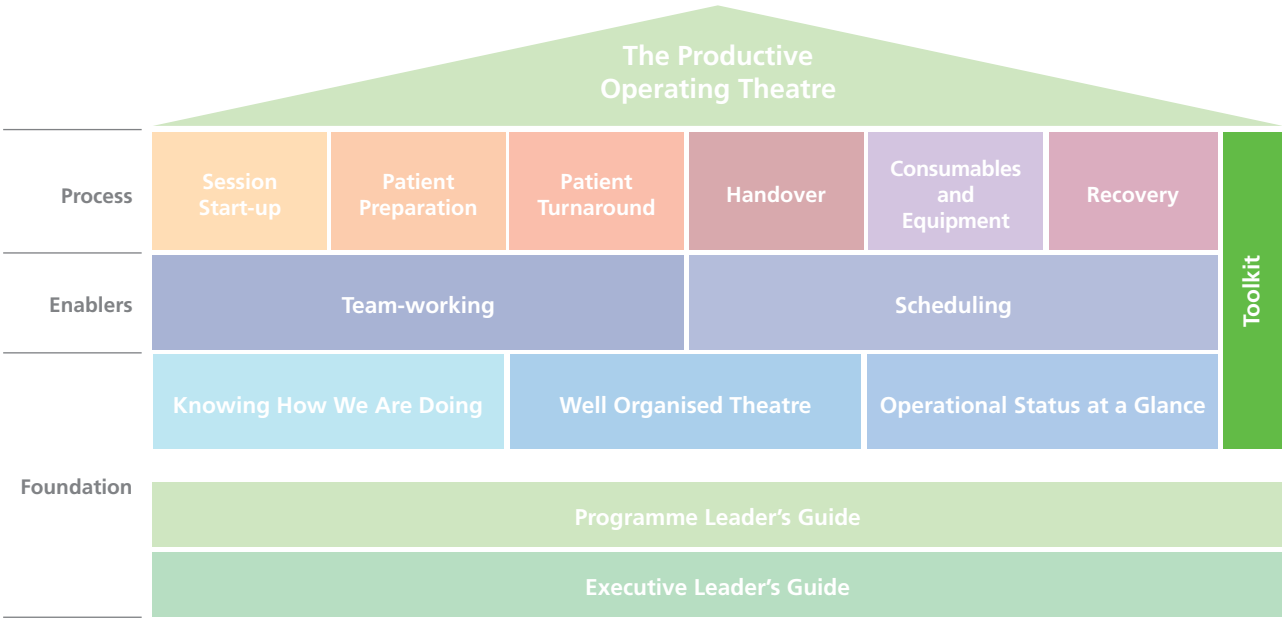
# What is the Toolkit?

A reference manual for all the tools referred to in The Productive Operating Theatre modules. Each tool is explained clearly and simply, making them easy for you and your teams to use.

The Toolkit has been designed to be used alongside all the modules to support their implementation. Keep this Toolkit to hand as you implement The Productive Operating Theatre. It can be very tempting to jump straight for the toolkit when starting the Productive Operating Theatre, however it has been designed to be used in conjunction with each module, not as a standalone project. Each module suggests when to use the different tools.

Some of the tools have templates associated with them; these are available to download from the web resources section of The Productive Operating Theatre website [www.institute.nhs.uk/theatres\\_resources](http://www.institute.nhs.uk/theatres_resources)

## These modules create The Productive Operating Theatre



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*5S numbers game*

*Process mapping*

*Cost / benefit analysis*

*Module action planner*

*Time benefit quantification*

*Quick changeover*

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*Glitch count*





# 1. Meetings

*Meetings*

1

*Dot voting*

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# Meetings

## A meeting is an important tool to generate discussion and ideas

### What is it?

A structured gathering of all relevant staff to discuss and set actions on specified subjects.

### Why do it?

- Discussing issues and agreeing potential solutions is often more effective with several key people.
- Staff coming together at regular intervals keeps everyone feeling involved and part of the team and also ensures ideas and actions are captured.
- It empowers the group to implement solutions and actions.
- It ensures actions are implemented and deadlines are not missed.

### When to use?

- To initiate a module.
- To support project teams implement modules.
- To review theatre measures.
- When issues are arising, and need to be discussed and resolved.
- To communicate with the multidisciplinary team.
- To track progress of actions.

### Materials required

- Flipchart.
- Marker pen.
- Other materials depending on the type of meeting, eg project plan, process map, analysis of measures for the measures review meetings.

***Tip:** When organising a meeting, make sure the environment is equipped to support the group's needs and book the room well in advance.*



## Meeting – top tips

### Preparation

- Understand the purpose of the meeting.
- Decide who needs to attend.
- Consider start and finish times of the meeting, is it too long, too short?
- Set an agenda; this will give you a structure to the meeting and allow you to apply appropriate timings.
- Circulate the agenda and any additional information required in plenty of time.
- It is sometime useful to send out meeting reminders with the agenda and actions from the previous meeting.
- Decide who will take notes.

### During the meeting

- Start the meeting on time, with an explanation of the objectives and agenda.
- Ensure everyone knows each other, do a round-robin of introductions.
- Review next steps / actions from the last meeting.
- Capture next steps / actions as they arise throughout the meeting on a flipchart.
- For every action, identified record the person responsible for the action and a deadline for completion.
- Pause, and ask for questions / clarification.
- Conduct a short meeting review, do a round robin to ensure all ideas, issues and questions have been addressed.
- Set date and time for the next meeting.

### After the meeting

- Ensure the actions are circulated to the group as soon as possible.

More detailed guidance and advice on how to make meetings productive and guidance on how to make email less of a burden, can be found by exploring the NHS Institute for Innovation and Improvement's Productive Leader programme. Visit [www.institute.nhs.uk/productiveleader](http://www.institute.nhs.uk/productiveleader)

## A productive meeting needs an effective agenda

Order the agenda according to the importance of the objectives

## Agenda Template

Meeting title and no:	Date:
Time:	Venue:

<b>Agenda No</b>	<b>Item description</b>	<b>Objectives/ Desired outcomes</b>	<b>Process</b>	<b>Item presenter</b>	<b>Time allocated per item</b>	<b>% Achieved</b>

<b>Next meeting title/no</b>	<b>Time</b>	<b>Date</b>	<b>Venue</b>	<b>Chair</b>

- Assign realistic timings to each item

- Assign presenters to each item

- At the end of the meeting review the extent to which the objectives have been achieved

Schedule breaks for meetings that last over an hour as the average adults attention span is only 40 minutes

The agenda template is available to download at [www.institute.nhs.uk/productiveleader](http://www.institute.nhs.uk/productiveleader) from the templates section.



# The role of the meeting chairperson

It is	It is NOT
<ul style="list-style-type: none"><li>• Agree an agenda – and ensure all topics are covered</li><li>• Set the context for discussion – and hear the opinions of others</li><li>• Encourage brainstorming to reach a collective decision</li><li>• Reflect on the experience of others, to bring in all points of view</li><li>• Ensure no meeting ends until next steps, with responsibilities and deadlines, are defined</li></ul>	<ul style="list-style-type: none"><li>• Discuss what seems interesting at that point</li><li>• State own opinions as context</li><li>• Decide oneself and then convince others</li><li>• Treat what they’ve seen as the right way to do things</li></ul>

*‘As the person chairing the meeting, if you appear to be unprepared it will reflect on the outcome of the meeting.’*

Claire Bradford – programme leader and theatre matron, Royal Devon and Exeter NHS Foundation Trust





# 2. *Dot voting*

*Meetings*

***Dot voting*** 2

*Audit planning*

*Waterfall diagram*

*Activity follow*

*Video waste walk*

*Interviews*

*Photographs*

*Video*

*5S numbers game*

*Process mapping*

*Cost / benefit analysis*

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*Quick changeover*

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*Spaghetti diagram*

*5 Why analysis*

*Calculating related incidents*

*Glitch count*



START/FINISH	①	29
TEAMWORKING	⑤	24
BREAKS		10
SAFETY		14
FLOW / SCHEDULING	②	25
DOCUMENTATION		9
EQUIPMENT	③	18
COMMUNICATION	④	22
PATIENT EXPERIENCE		15
COSTS		1
PROFIT		



# Dot voting

## What is it?

Dot voting is a quick and simple method of evaluating ideas and making team decisions. Each person receives a pre-determined number of dots, to allocate according to their individual preference, by sticking them to a list on a flipchart. This provides a clear, visual illustration of the groups views or preferences.

## Why do it?

It is a simple, but effective tool designed to help groups working together to prioritise a list of issues or ideas by simply voting.

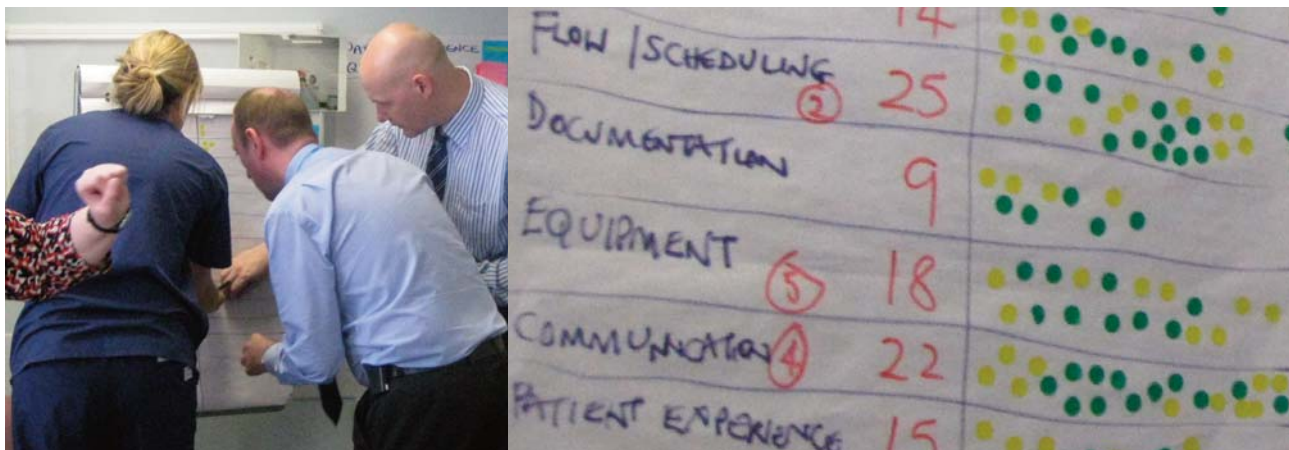
- It is a method of understanding a groups views very quickly.
- It ensures every member of the group has an equal voice.
- The outcome is clearly visible and communicated to all.

## When to use it?

Dot voting is an ideal tool to use when you have a list of issues or ideas that you need to prioritise or gain group consensus, eg at the visioning session, staff are asked to generate a list of things which contribute to creating the perfect operating list. Using this tool will help you and the group understand quickly which ideas the group feel will have the greatest impact on achieving this aim.

## Materials required

- Flipchart.
- Sticky dots or marker pens.



## Dot voting – the process

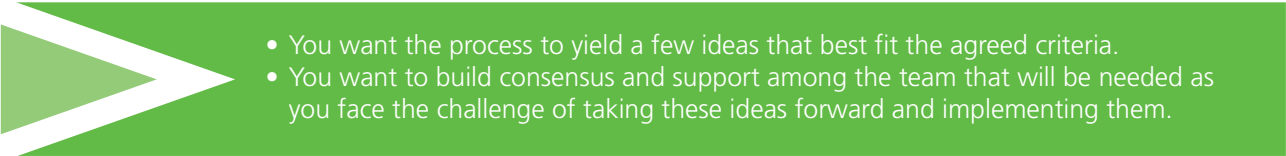
1. To use the tool, you will require flipcharts or wipe boards with the list of ideas that were generated. Clarify the ideas as needed as you write them down, and eliminate or combine duplicates. Make sure the ideas are written out clearly using bullet points.
2. Review the list of ideas to ensure that everyone understands each idea.
3. Agree on the number of ideas you would like to see come out of this harvesting process for further development. Stress that you will always have the full list to go back to later; no ideas are being thrown away.
4. Discuss and agree the criteria and method that you will use to select the ideas to take forward.
5. Give each person a number of votes roughly equal to twice as many ideas as you have agreed you want to see come out of this process. Votes can be coloured dots, small sticky notes, marks with coloured pens or anything that is small and will stick to the flipchart or wipe board easily.
6. Ask team members to place their votes next to the ideas that they feel best meet the agreed criteria or preference, ensuring everyone has had an opportunity to cast their votes. Allow each person to give an idea multiple votes. This allows them to express strong preference.
7. Identify, as a group, the ideas that received large numbers of votes.
8. If this does not yield the desired number of ideas, repeat the vote. But this time only consider ideas that got a small number of votes in the first round; disregard the rest. Continue this process until a consensus emerges.
9. If the first round yielded more items than were desired, discuss whether to take all the ideas forward, or which ones to hold back for now. You can utilise two lists of first and second stage challenges you are planning to include, this gives the team the confidence that issues will not be forgotten. Also remember to be clear on what is in and out of scope of the project and direct issues out of the theatre environment as appropriate.

## Variations on this tool

There are many different ways to use the basic concept of dot voting. You may have your own experience and a method you prefer. Do whatever works for you. Some popular variations, with tips, are given below.

- Assign each staff group a different colour dot so that you can see the spread of preferences. This can be helpful if you want to ensure the team see at least one of the ideas they support make it through for further development.
- Give each person fewer votes, but anticipate several rounds of voting as you eliminate items that received no (or few) votes each time. This takes longer, but can build better consensus.

**No matter how you do it, keep these goals in mind.**

- 
- You want the process to yield a few ideas that best fit the agreed criteria.
  - You want to build consensus and support among the team that will be needed as you face the challenge of taking these ideas forward and implementing them.



# ***3. Audit planning***

*Meetings*

*Dot voting*

*Audit planning*

**3**

*Waterfall diagram*

*Activity follow*

*Video waste walk*

*Interviews*

*Photographs*

*Video*

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*Spaghetti diagram*

*5 Why analysis*

*Calculating related incidents*

*Glitch count*



# Audit planning

## What is it?

The Audit Planner is a spreadsheet listing audits being undertaken in the operating theatre department. It provides:

- a visual representation clearly illustrating all the audits being undertaken
- the current status of each audit,
- the person responsible for completing the audit,
- a tool to communicate audit status to the wider theatre team.

## Why do it?

The Audit Planner is a useful tool to help:

- monitor and sustain improvements
- identify problem areas quickly so that immediate remedial action can be taken
- communicate the current status at a glance to the theatre team.

## When to use it?

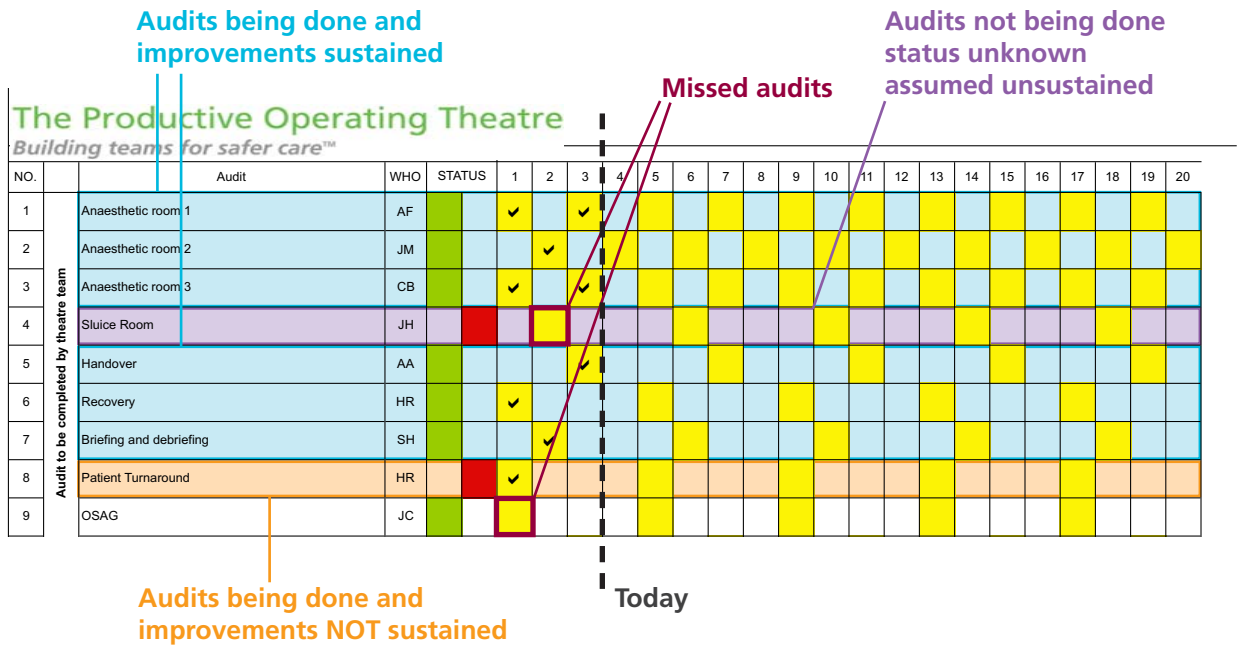
Use the Audit Planner to identify, at a glance, any problem areas where audits are not being done or the improvements being audited are not being sustained. The audit planner should be used continuously, even when change is being sustained, the audits continue

## Materials required

Audit Planning sheet available at [www.institute.nhs.uk/theatres\\_resources](http://www.institute.nhs.uk/theatres_resources)

Example of an Audit Planner

The example illustrates a typical selection of audits and how they can be planned and tracked to ensure they are being completed.





# 4. *Waterfall diagram*

*Meetings*

*Dot voting*

*Audit planning*

**Waterfall diagram**

4

*Activity follow*

*Video waste walk*

*Interviews*

*Photographs*

*Video*

*5S numbers game*

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*Spaghetti diagram*

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*Glitch count*

# Waterfall diagram

## What is it?

A diagram that shows the utilisation of time within a theatre session to identify periods when time is lost.

## Why do it?

The waterfall diagram can be used as a diagnostic tool to help you prioritise your improvement activities and the order in which you implement the Process modules. As you work through the modules repeat your waterfall diagram to monitor the impact and sustainability of the improvements.

## When to use?

Complete a water fall diagram before you begin the Process modules and before you carry out an activity follow. (Tool no. 5 Activity follow).

The waterfall can be created as a snapshot based on data collection from a single day, but is more informative when aggregated over several sessions to create a cumulative view over time, of a session in that theatre for or for a particular specialty.

## Materials required

- Theatre utilisation data
- Computer with excel spreadsheets
- Waterfall diagram template available at [www.institute.nhs.uk/theatres\\_resources](http://www.institute.nhs.uk/theatres_resources)



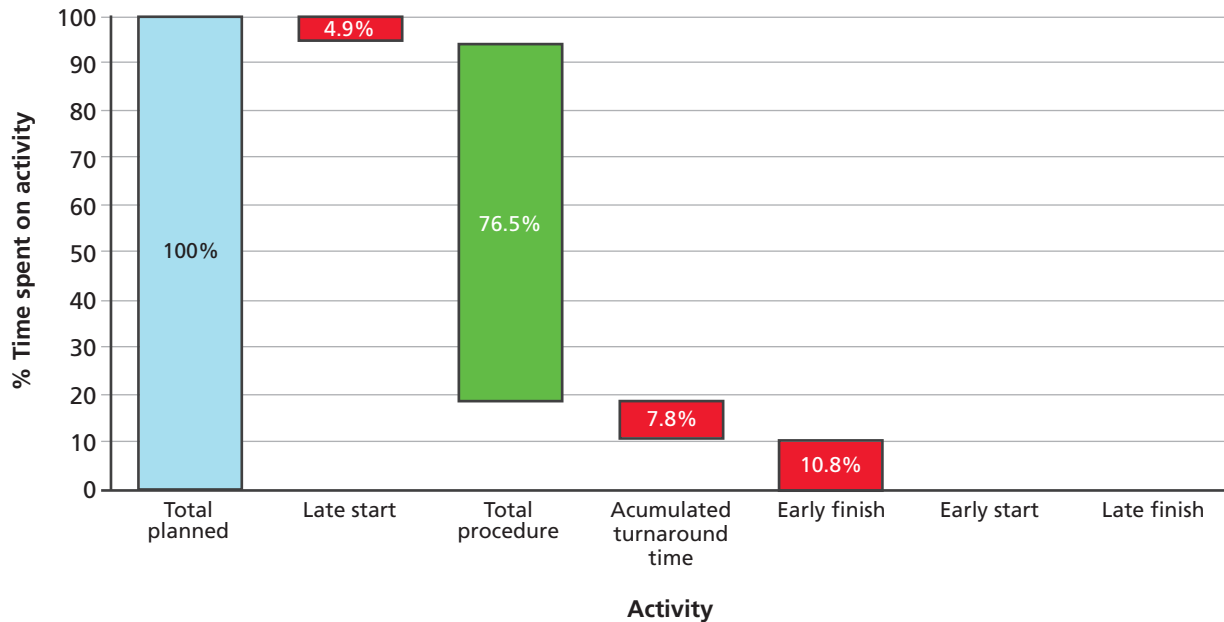
## Waterfall diagram - the process

1. Gather key theatre utilisation data for a targeted theatre / speciality such as:
  - start time
  - finish time
  - turnaround times.

It is likely that this information will be available from your theatre information system.

2. Using these pieces of information, as well as the planned start and finish times for the theatre session, create a theatre utilisation waterfall, calculating the direct procedure time in the theatre or ***touch time*** with the patient as the remaining section of the waterfall. A template to create a theatre utilisation waterfall is available at [www.institute.nhs.uk/theatres\\_resources](http://www.institute.nhs.uk/theatres_resources). All you have to do is type in your local data and a waterfall diagram will be automatically generated.

## Example waterfall diagram



- **The red sections** indicate those periods of lost time in theatre, considered non-value added.
- **The procedural time is marked green.** In the example above there is clearly scope for improvement and waste elimination within the procedural time, which can be tackled in due course. Often there are more obvious, quicker wins to be had by eliminating late starts, early finishes and lost turnaround time.
- The example utilisation waterfall indicates that most time has been lost due to an early finish. This would indicate that there may have been a cancellation, or that the list was poorly planned initially. Working through the Scheduling module will help address these issues.
- The next biggest loss is the cumulative turnaround time. This indicates that you should use Tool no. 15 Quick changeover to identify improvements in turnaround process between patients, to understand in greater detail, where the time is being lost.







# *5. Activity follow*

*Meetings*

*Dot voting*

*Audit planning*

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*Activity follow*

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*Interviews*

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# Activity follow

## What is it?

An activity follow is a one hour detailed recording of the activity of a member of staff including:

- activity, eg walking to find something
- location, eg main theatre store room.

These areas of information are captured every minute during the one hour.

## Why do it?

To understand how much time staff spend on value added activities during the theatres sessions.

## When to use?

During the Process modules to give you a better understanding of what is involved for the staff who carry out these processes. This detailed snapshot of activity will help you identify areas where you can focus your improvement efforts.

## Materials required

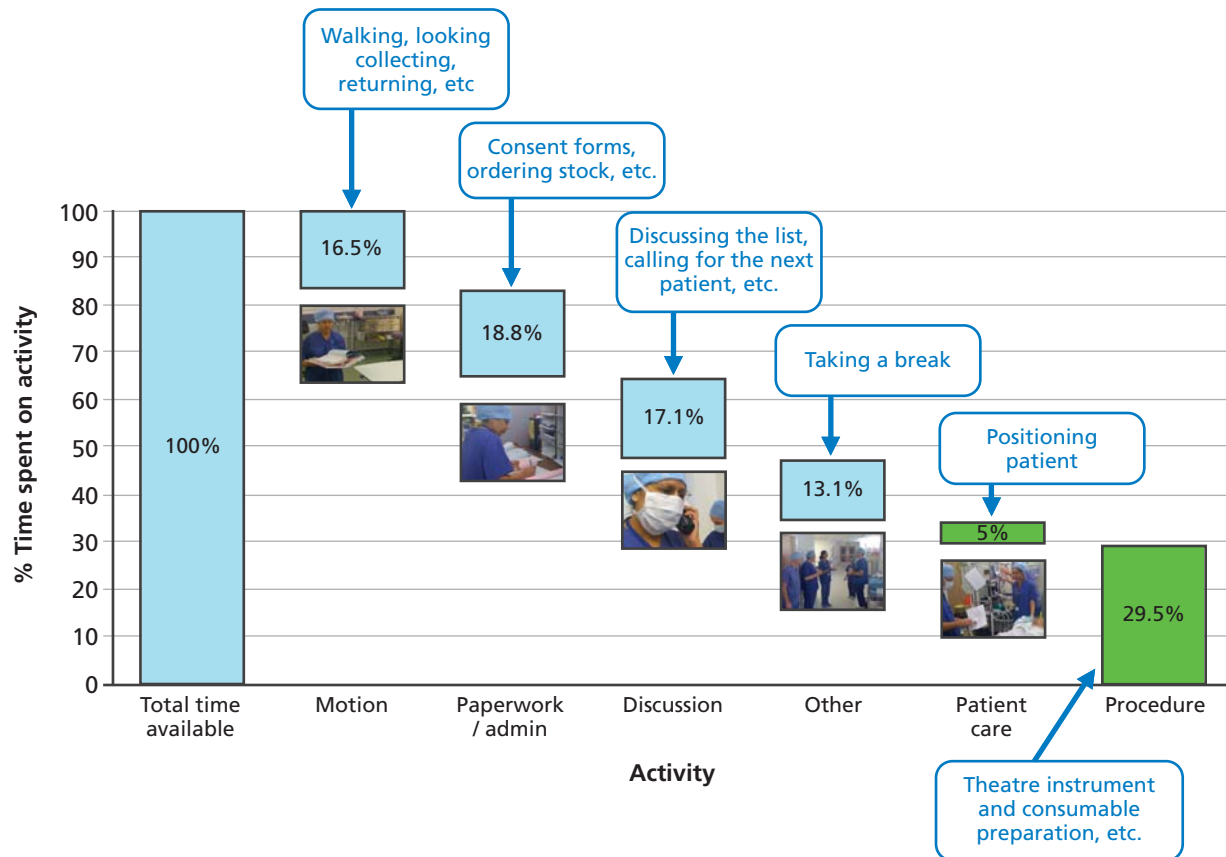
- Activity follow sheet - blank sheets are available at [www.institute.nhs.uk/theatres\\_resources](http://www.institute.nhs.uk/theatres_resources)
- Pencil with eraser on the end.
- A3 clipboard.
- Watch with a second hand.
- Pedometer (depending on the process).

## Activity Follow and value added time

Carrying out an activity follow will allow you to find out how much time your staff are spending on value added activities, eg our theatre sisters spend 34% of their time on direct procedural time.

**The Productive Operating Theatre** *Building Teams for Safer Care™*

[illegible]





## Activity follow – the process

### Preparation

1. Choose the process and function to follow and select the appropriate activity follow sheet from [www.institute.nhs.uk/theatres\\_resources](http://www.institute.nhs.uk/theatres_resources). Sheets are available for anaesthetists, surgeons, nurses and operating theatre practitioners and theatre assistants.

Complete Tool no. 4 Waterfall diagram to help you to identify which part of the day could provide opportunities for improvement and would therefore benefit from further analysis through an activity follow.

2. Choose a person to observe and ask their permission to conduct an activity follow. Make it clear to the person selected that activity follows are not time and motion studies and the person involved will not be judged individually.
3. The observer should be a member of theatre staff, not an outsider to the department.
4. They should wear a watch with a second hand or digital second count display. Try to avoid using a stop-watch.
5. If measuring distance travelled, clip a pedometer onto the staff member you are observing. The pedometer should not be clipped onto a pocket. It ideally should be clipped onto a trouser waist band or belt. Wherever the pedometer is mounted, ensure it is working by testing it with a quick walk around the theatre area.
6. Fill in the date, start time, theatre number, person, role, observer name and signature sections of the activity follow sheet.



## Conducting the activity follow

The activity follow sheet is split into two main parts:

- minutely observations – **highlighted in red in the example**
- interruption count – **highlighted in blue in the example.**

There is also an area to record general observations or comments.

### Part 1: Minutely observations

There are four sections that require observations to be recorded every minute, these are:

- activity
- value added / non-value added / non-value added but essential\*
- internal / external\*
- location.

(\*explained in detail in the following pages)

Each column in these sections represent one minute of the activity follow.

For each minute the observer selects the most accurate description of what the observed staff member is doing and records one dot for each of these four sections. **Remember only one choice per section.**

Record what the person being observed is doing exactly on the minute, not what they were doing just before or just after. It is important that the observation is taken right on the minute.

### Part 2: Interruption count

Interruptions are recorded every time they occur throughout the activity follow. Keep a tally of when a person is interrupted by someone and when the person being observed interrupts someone else.

Record each interruption and its reason using a **gate tally**.

### Distance travelled

Depending on the process you are following it may or may not be necessary to ask the person being observed to wear a pedometer to collect information about the distance they travel. Use your judgement as to whether this information will be of use to you.

Four sections require minutely observations to be recorded

**Activity Follow Sheet**  
Theatre Nurse/ Operating Department  
Practitioner

Date		Start time		Distance travelled	
Process				1ST Follow	2ND Follow
Person				Observer	
Role				Signature	

[illegible]

Person years interrupted		
Interruption Type	Tally	Sub total
Operating List		
patient status		
Advice		
location of equipment		
location of information		
Nard		
General Staff Query		
Patient		
Other		
Total		

Person interrupts someone else		
Interruption Type	tally	Sub total
Operating List		
Patient status		
Advice		
Location of equipment		
Location of information		
Ward		
General Staff Query		
Patient		
Other		
Total:		

Interruption count,  
recorded as they occur

## The Activity follow in action

### Three-minute snapshot



On the turn of minute one, the staff member was collecting paperwork for the incoming patient.



On the turn of minute two, the staff member was helping position the patient.



On the turn of minute three, the staff member was answering the phone in theatres, responding to an interruption.

Activity Follow Sheet													
Theatre Nurse/ Operating Department Practitioner													
		Activity description		Area		Hour start							
Call		Code & Reason		1	2	3	4	5	6	7	8	9	10
Motion	A	Waiting											
	B	Looking											
	C	Collecting	X										
	D	Retrieving											
	E	Waiting											
Admin/ paperwork	A	In Anaesthetics room											
	B	In Theatre											
	C	Nurse station											
	D	Computer											
	E	Other											
Discussion	A	Own script											
	B	Ext script											
	C	Medico											
	D	Telephone Chat											
	E	Telephone Str											
Other	F	Other											
	A	Nurse hand hygiene											
	B	Toilet (Self)											
	C	Break											
	D	Changing for theatre											
Patient care	E	Scrubs for theatre											
	F	Cleaning											
	A	Patient preparation											
	B	Speaking to patient											
	C	Anaesthetising patient											
Procedure	D	Patient positioning											
	E	Scrubbing											
	F	Reintubating											
	G	Radiating											
	H	Transferring patient											
I	A	Team brief											
	B	Theatre preparation											
	C	Consumable preparation											
	D	Instrument preparation											
	E	Patient location											
J	A	Anaesthetics											
	B	Subsides											
	C	Patient handover											
	D	Ward round											
	E	Team debrief											
Value added				1									
Non value added				1									
Non value added but necessary				1									
Internal				1	2	3	4	5	6	7	8	9	10
External				X									
				1	2	3	4	5	6	7	8	9	10
Location	A	Ward											
	B	Anaesthetic Rm											
	C	Theatre	X										
	D	Recovery											
	E	Coffee Rm											
Communal Area (Corridor)													

[illegible][illegible]

How much value added and procedural time?

Once the one hour observation sheet has been filled in, you can work out how much direct care time the observed staff member had.

To do this:

- count the number of dots in procedural and patient care sections.

Write the total for each individual line in the end column. Then create a total for patient care section and procedural and add the two together. For example:

- procedure total 13
- patient care total 8
- together 21.

Divide this figure by 60. Then multiply the answer by 100 to give the percentage procedural and patient care times the observed staff member had for the hour they were observed.

For example:

- $21 \div 60 = 0.35$
- $0.35 \times 100 = 35$



1 mark per minute column	Other	D	toilet (Self)																	
		C	Break																	
		E	Changing for theatre																	
		D	Scrubbing for theatre																	
		F	Cleaning																	
	Patient care	A	Patient preparation																	
		B	Speaking to patient																	
		C	Anaesthetising patient																	
		D	Patient positioning																	
		E	Scrubbing																	
		F	Recirculating																	
		G	Running																	
		H	Transferring patient																	
	Procedure	A	Team brief																	
		B	Theatre preparation																	
		C	Consumable preparation																	
		D	Instrument preparation																	
		E	Patient location																	
		F	Anaesthetics																	
G		Surgery																		
H		Patient handover																		
I		Ward round																		
J		Team debrief																		
1 mark per minute per column only	Value added				X	X			X											
	Non value added								X								X	X	X	
	Non value added but necessary													X						

## Value added and non-value added

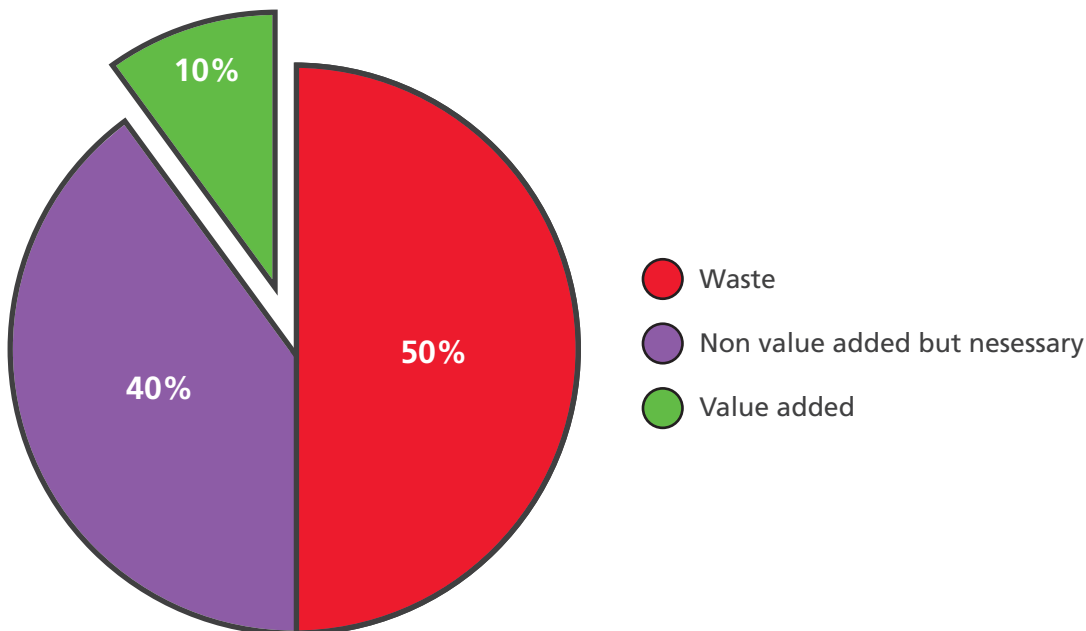
**Value added activities** are those that patients view as adding value to their care pathway.

There are two types of non-value adding activities:

- **pure waste (non-value added)** – needs to be eliminated as soon as possible
- **non-value adding, but necessary** – activities that are wasteful sometimes have to be carried out due to legal, clinical or technological factors. Changes in procedures, technology, law or governance or challenges to the way in which we meet these criteria can eliminate of these wastes.

Less than 10% value added is not unusual in organisations. Some processes may feature less than 1% value added content!

### Proportion of activities in average organisation





## Internal and external activities

### Time is precious and the clock is ticking

Any waste or unnecessary activity observed during your activity follow of a specific process could be contributing to delays and overruns. Some activities may be carried out during this time that hold up proceedings, when it may have been possible to do have done them outside of the process to reduce their impact on causing a delay.

During the activity follow, activities are classed as being internal or external to the process being observed. This helps you to identify those activities that could occur at a more appropriate time if delays are an issue.

### Internal activities

These are all activities which **must** happen during the *ticking clock* in order for the procedure to run safely according to methodology and schedule, eg anaesthetist incubating a patient.

### External activities

These are all activities which **could** be carried out outside of the *ticking clock* time, in order for the session to run more smoothly and efficiently, eg stocking-up consumables, laying-up surgical kits on trolleys.

# What else does the activity follow show?

07:08:00:00	%	Tot	Code & Reason	Cat	Sub total
			Waiting	A	15
			Looking	B	
			Collecting	C	
			Returning	D	
			Waiting	E	
			In Anaesthetics room	A	Admin/ paperwork
			In Theatre	B	
			Nurse station	C	
			Computer	D	
			Other	A	
			Own prompt	B	10
			Ex prompt	B	
			Meeting	C	
			Telephone Own	D	
			Telephone Ex	E	
			Other	F	10
			Nurse hand hygiene	A	
			Scrub (Self)	B	
			Break	C	
			Changing for theatre	D	
			Scrubbing for theatre	E	5
			Cleaning	F	
			Patient preparation	A	
			Speaking to patient	B	
			Anaesthetising patient	C	
			Patient positioning	D	Patient care
			Scrubbing	E	
			Recirculating	F	
			Running	G	
			Transferring patient	H	
			Team brief	A	7
			Theatre preparation	B	
			Consumable preparation	C	
			Instrument preparation	D	
			Patient location	E	
			Anaesthetics	F	Procedure
			Surgey	G	
			Patient handover	H	
			Ward round	I	
			Team brief	J	
07:08:00:00	%	Tot	Value added		

## High motion total

Is everything located conveniently for staff to do their jobs? Are they looking for things or information and going back and forward all the time? Consider the Well Organised Theatre and Consumables and Equipment modules

## High admin total

Are many forms duplicated? Are they easy to find? Is the correct admin launched at patient admission? Consider Operation Status at a Glance, Well Organised Theatre and Handover modules.

## High discussion total

Do staff have the information and equipment they need to do their jobs? Consider Operation Status at a Glance, Well Organised Theatre and Handover modules.

These totals tell you what tasks the staff member spends the most time doing. When choosing which Process modules to implement first, consider starting the modules that have the largest totals.

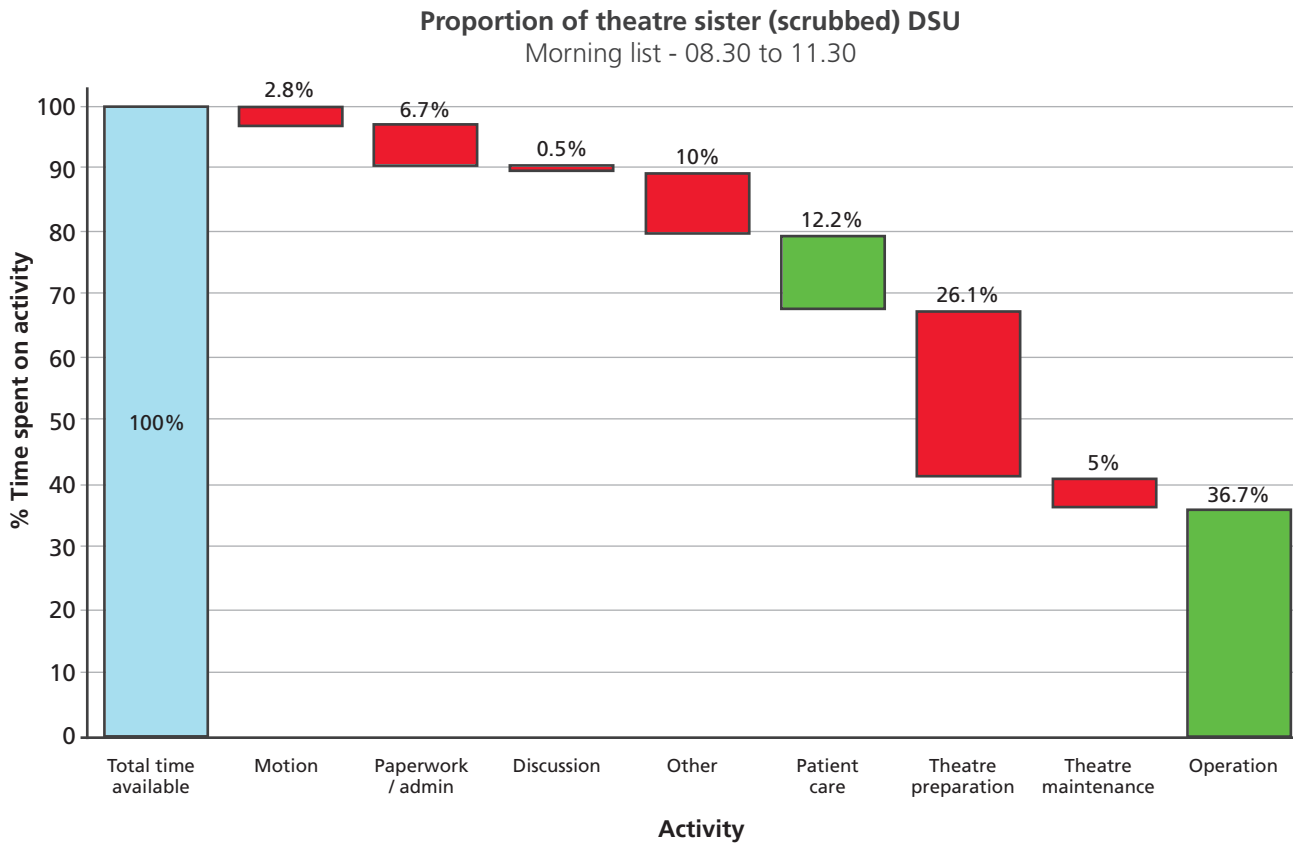
For example the ones the theatre staff spend the most time doing and the ones influenced by the theatre utilisation waterfall showing the big losses throughout the day. The totals in this section should add up to 60.

A large number of interruptions mean you should look at how easy it is to find items, equipment, people and information.

## What are the outputs?

The activity follow excel template available at [www.institute.nhs.uk/theatres\\_resources](http://www.institute.nhs.uk/theatres_resources) will automatically generate a value added / non-value added pie chart as well as an individual waterfall diagram for the hour's follow. Simply enter the number 1 in every cell where a dot was marked on the original paper copy, and the spreadsheet will do the rest!

The results of these charts can be used on the Knowing How We Are Doing measures progress review meetings to drive focus and improvement activity on those areas where the biggest losses and non-value added activities are seen.





# 6. *Video waste walk*







# Video waste walk

## What is it?

Using video to walk through the operating theatre department will help you to identify causes of waste, eg waste of space, equipment, consumables, resources and above all time (see seven wastes on the following page).

Value is defined as those activities that patients view as contributing directly to their care pathway. Any activity that does not add value to this is classified as waste.

## Why do it?

It is a simple way to identify areas for improvement, particularly 5S activities. It is much easier to recognise areas for improvement by watching a video as a team. Also, looking at a familiar area onscreen, removing yourself from the situation, forces you to see things from a different perspective.

## When to use it?

A video waste walk is essential to prepare for the Well Organised Theatre. It is worth doing a video waste walk as often as you can – it does not have to be the whole department each time, you may think about just focusing on one particular theatre suite. There is never a bad time to detect waste!

## Materials required

- A sharp eye!
- Notebook to take notes.
- Camcorder (digital or mini DV camcorder recommended) communication departments often have these cameras which you can borrow.
- Appropriate viewing screen and connection leads so that you can watch your footage back.

*'It is wise to film a video waste walk as early as possible during the start-up stage of the programme. This will be a very powerful tool when you play the video back to the staff.'*

Claire Bradford – programme leader and theatre matron, Royal Devon and Exeter NHS Foundation Trust

# There are seven types of waste

The seven wastes	Example
1. Defects and rework	Duplication of information during the different handover stages of a patients journey which maybe unnecessary
2. Motion	Equipment not returned to the correct place meaning that the next person who needs it has to walk around the department searching for it
3. Overproduction	Repeatedly asking patients the same questions
4. Transportation	An item is not stocked in your own anaesthetic room, resulting in staff walking to the main store room to collect the item every time it is required
5. Waiting	Waiting for a member of the team to arrive before you can begin a team brief
6. Inventory	Excess stock with no space to keep it and the potential for low use items in large supply to go out of date
7. Over-processing	Excess documentation

## Video waste walk – the process

1. Read the guidelines in Tool no. 9 Video and obtain the appropriate consent from anyone who may feature, however briefly, in a video waste walk of the operating theatre department.
2. Ask someone who does not spend much time in the department to walk with you, they will provide a fresh pair of eyes when looking at your department.
4. Ask yourself some common sense questions – do I see any space underutilised – are there too many consumables being stocked, is the stock storage unit too large, is there equipment sitting idle in the corridors?
5. Walk through the department with the video camera turned on. Look out for examples of the seven wastes (see page opposite), video from the perspective of the patient. Take your time, film up down and around, film staff and facilities. A video waste walk can take up to 25 minutes.
6. Watch the video back as a group - take guidance from Tool no. 9 Video. Before starting the video tell the group that they should be looking out for any evidence of the seven wastes or issues relating to the patient experience. Remind the group what the seven wastes are (see page opposite).
7. As the multidisciplinary team watch the video, ask them to write down any issues they see onto sticky notes.
8. Put the sticky notes onto a flipchart and, with the team, categorise them into the seven wastes. Include any miscellaneous ones into an 'other' category. You will find many environmental issues you pick up fit into this latter category.
9. Ask the team to generate ideas on how these things can be improved or resolved. These ideas should be listed against each of the seven wastes.
10. You should finish with a completed waste video sheet, either on a big flipchart or copied onto A4.
11. Copy identified solutions onto a cost / benefit sheet and prioritise ideas using the guidance in Tool no.12 Cost / benefit analysis.

## Example of a completed video waste walk sheet

A blank waste walk sheet can be found at [www.institute.nhs.uk/theatres\\_resources](http://www.institute.nhs.uk/theatres_resources)

Type of waste	Describe an example of this waste in your work environment	Describe your ideas about what could be done to reduce or eliminate it
<b>1. Defects and rework</b> Having to repeat things because errors were made at a previous stage in the process  <b>Example:</b> Repeating things because the correct information was not provided in the first place	Operation notes not completed, eg incomplete discharge summary, no TTO's prescribed, no information about outpatient appointment	Raise awareness of correct documentation and the implications of not completing them
<b>2. Motion</b> Unnecessary people movement, travel, walking and searching. Things not within reach, things that are not easily accessible  <b>Example:</b> Searching for essential equipment	Theatre assistant looking for a patient on the ward stated on the operating list, when the patient had been transferred to a different ward without telling theatres  Trying to find a team member to receive a patient for handover in the anaesthetic room  Staff returning to the ward from the anaesthetic room to collect essential documentation required during the handover that had been left on the ward  Looking for essential equipment and consumables eg an extra diathermy machine	Improve communication between the ward and theatres about changes made to the operating list, including patient location  Train additional team members to receive patients  Develop a checklist on what is required during the handover and add it to the sending for slip
<b>3. Overproduction</b> Producing more than what is needed or earlier than needed by the next step in the process  <b>Example:</b> Requesting tests that are not required	Repeating questions or information that are not relevant to that handover stage	Identify which pieces of information and questions are required at the different handover processes to make it more streamlined. Look at developing new handover template

Type of Waste	Please describe an example of this waste in your work environment	Please describe your ideas about what we can do to reduce or eliminate it
<b>4. Transport of products or materials</b> Moving materials unnecessarily <b>Example:</b> Moving notes around the organisation	Loaned instrumentation set arriving in the procurement department not directly to theatres  Consignment stock of implants not stored near the plastic theatre suite	Ensure deliveries can come directly to the department  Improve location of storage areas so that they are near the relevant theatre
<b>5. Unnecessary waiting</b> Staff unable to do their work because they are waiting for something such as people, equipment or information <b>Example:</b> Waiting for the full multi disciplinary team to arrive to start team briefing	Waiting to see patient to mark and consent  Patients waiting in the day room without ward staff knowing they have arrived  Waiting for results.  Waiting for the multidisciplinary team to arrive to commence the team brief  Waiting for equipment and instrumentation or implant to arrive	Staggered admission  Improve systems to collect information about when a patient has arrived eg develop a Patient Status at a Glance board to acknowledge and communicate patients arrival  Develop a reliable preassessment process  Set and communicate a time that briefing will start  Cover what is needed throughout the day in the team brief to avoid delays
<b>6. Stock inventory</b> Too much stock, work in progress or patients waiting in a queue <b>Example:</b> Excess stock in store rooms	Excessive consignment and non consignment stock  Old instrumentation sets still being stored	Do an inventory audit to identify required stock levels of equipment and consumables
<b>7. Over-processing</b> Performing unnecessary steps that do not add value <b>Example:</b> Repeatedly asking for the same information at different stages in the process	Repeating questions or information that are not relevant to that handover stage	Identify which pieces of information and questions are required at the different handover processes to make it more streamline. Look at developing new handover template.





# *7. Interviews*

*Meetings*

*Dot voting*

*Audit planning*

*Waterfall diagram*

*Activity follow*

*Video waste walk*

***Interviews***

**7**

*Photographs*

*Video*

*5S numbers game*

*Process mapping*

*Cost / benefit analysis*

*Module action planner*

*Time benefit quantification*

*Quick changeover*

*Timing processes*

*Spaghetti diagram*

*5 Why analysis*

*Calculating related incidents*

*Glitch count*

# Interviews

## What is it?

Talking to staff and patients to gain information, facts, opinions and ideas.

## Why do it?

You may think that you know what staff and patients think and feel but until you ask them, do you really know? Asking for their thoughts and experience will give a different perspective on the topic.

## When to use?

Before starting a module, to understand how staff and patients feel about:

- the way the process runs currently
- what needs to change
- the possibilities of change.

**After** implementing a module to understand how staff and patients feel about the new way:

- is it an improvement?
- are they excited and willing to participate?
- are there any issues?

## Materials required

- Notepad.
- Pen.
- Some people prefer to use a dictaphone but it is not essential.

**Tip:** Always carry a notebook, when you hear a useful comment write it down.

*'Talking and listening to staff and patients will be vital to the success of your programme, this is a joint service improvement journey.'*

Claire Bradford – programme leader and theatre matron, Royal Devon and Exeter NHS Foundation Trust

## Interviewing – top tips

1. Make sure the interviewee has sufficient time for the interview. The environment has to be right: private, and not too noisy to ensure the interviewee is comfortable when answering the questions.
2. Always have an interview guide prepared before you start talking – this is simply a list of questions to ask, and information you require.
3. When coming up with the questions, keep the interviewees' perspective in mind – how will they feel about that question, what are their priorities, are they in a position to answer your questions honestly.
4. Start the interview by explaining the purpose for the interview and what you will do with the information you gather.
5. Make it explicit as to whether what is said will be attributed back to the interviewee or not.
6. Before starting, ask if the interviewee has any questions.
7. Run through your questions list – but actively listen to the answers – sometimes they may take you down another path. Feel free to abandon your scripted questions if more valuable information is forthcoming.
8. Take notes or use a dictaphone – if using a dictaphone, make sure the interviewee is comfortable with this. Bear in mind that if you plan to use the recording for anything other than your notes you must gain consent from the person being interviewed.
9. Convert the notes to a formal record as soon as possible – this is essential to capture the detail of the interview.
10. Ideally, share the interview notes with the interviewee to make sure you have captured it correctly.
11. Use open questions, ie questions that don't inadvertently lead to pre-defined answers (see next page).
12. For more information about designing your service based on patient and staff experience see the NHS Institute's guide Experience Based Design [www.institute.nhs.uk/ebd](http://www.institute.nhs.uk/ebd)

## Using open questions

Informal conversations with staff, patients and stakeholders can be a valuable and efficient research method.

When you are working on a particular project you may be looking for specific feedback, usually this will influence the way that you ask your questions.

Open questions are questions that do not direct people to give particular answers and they do not make any assumptions.

Using open questions will help you to minimise your influence on your interviewee and gain a true picture of the current perception, rather than leading them towards a particular response.

For example, after running a project you might ask:

*'what do you think of the improvements in the operating theatre department?'*

This question is problematic in numerous ways.

1. It presumes that the person has noticed that some changes have been made.
2. It presumes that a project has produced improvements.
3. The framing of the question forces the person to answer in the positive. They could be seen as rude if they answer negatively.

An open version of the same question might be:

*'what is your experience of this programme?'*

No question is entirely open and you will always inject your own interests and motivations into a conversation. However if you can become aware of how you are directing the conversation you can gather more detailed and honest information.

Try to think about the category in which you want information. For example, staff satisfaction. You may want to think of a few open questions under this category such as:

- how long have you worked here?
- has it changed?
- what is it like to work here?
- how do you feel about your work?

You may find it useful to rephrase a question and ask it again if you think an interviewee has more to say on this subject.

If you are getting useful results and you want the interviewee to continue speaking in the same vein, you may find it useful to repeat back what they have just said to you. This can encourage them to keep speaking and often they will go deeper into their feelings on a particular issue.

For example:

*'I feel we could have gone much further with the improvements if we had involved more people.'*

*'If you had involved more people...?'*

*'If we had involved more people the project would have happened much more quickly... it seemed that people who weren't told about it at the beginning started to slow the whole thing down.'*

Practising these techniques can help you become more aware of the way you are asking questions and gaining more useful insights. You can also practice by listening to the way other people ask questions, or encouraging people to expand on what they have said.





# 8. *Photographs*

*Meetings*

*Dot voting*

*Audit planning*

*Waterfall diagram*

*Activity follow*

*Video waste walk*

*Interviews*

***Photographs***

**8**

*Video*

*5S numbers game*

*Process mapping*

*Cost / benefit analysis*

*Module action planner*

*Time benefit quantification*

*Quick changeover*

*Timing processes*

*Spaghetti diagram*

*5 Why analysis*

*Calculating related incidents*

*Glitch count*



# Theatre 4 Anaesthetic



# Photographs

## What is it?

Taking photographs is an excellent way to instantly collect data that also doubles as a presentation tool.

## Why do it?

- To demonstrate the difference before and after a change.
- It is a very good communications tool: 'a picture speaks a thousand words'.
- It captures perishable evidence such as events.
- To avoid hearsay.

## When to use?

Photographs should be used to capture:

- events (meetings and workshops)
- displays (Knowing How We Are Doing, Operational Status at a Glance and information boards)
- situations that change, eg anaesthetic room before and after 5S.

## Materials required

- A camera (ideally digital, with more than three megapixels). Communication departments often have cameras which you can borrow.



## Photographs – top tips

1. Use a digital camera – photos can then be transferred to a computer, emailed, printed, and included in presentations.
2. Ask staff and patients for permission to photograph them: get written consent, (see page opposite). If patients are unable to give informed consent assume you do not have their permission and do not photograph them.
3. Make sure the area being photographed is well lit.
4. Always keep your back to the light source.
5. Determine exactly what is needed in the photo.
6. Steady yourself, and the camera.
7. Allow a few seconds for the camera to focus.
8. If photographing text ensure you take photographs with and without the flash. Different surfaces react differently. Reactions to flash are not always evident when viewed on the camera screen
9. If using a digital camera (with a large memory), take two photographs every time – one as back-up.
10. When people are photographed, show the photograph to them before using it in a presentation / meeting.



## Written consent

**Under no circumstances should you take photographs or videos without the consent of those involved and your governance department's approval** (this should only be required once per programme).

Ask your communications department for your organisation's photography consent form.

Ensure one has been filled out by everyone involved in your photographs.

Be extra careful when photographing patients. If a patient is unable to give informed consent then assume that consent has not been given.

Ensure that you keep the photos, video and camera securely, ie in a locked cupboard and log the details on a list.



# 9. Video

Meetings

Dot voting

Audit planning

Waterfall diagram

Activity follow

Video waste walk

Interviews

Photographs

**Video**

9

5S numbers game

Process mapping

Cost / benefit analysis

Module action planner

Time benefit quantification

Quick changeover

Timing processes

Spaghetti diagram

5 Why analysis

Calculating related incidents

Glitch count

# Video

## What is it?

Using video is an excellent tool to collect data that doubles as a powerful presentation tool.

## Why do it?

- It's a very powerful communications tool.
- It captures 'perishable evidence' such as meetings and events.
- Allows you to view your department from a different perspective.
- Crucially video allows you to view real time events, processes and interactions.

## When to use?

Video should be used to capture:

- entire processes, eg patient handovers
- situations that change
- waste walks
- demonstrating the difference before and after a change.

## Materials required

- Camcorder (digital or mini DV camcorder recommended) communication departments often have these cameras which you can borrow.
- Appropriate viewing screen and connection leads so that you can watch your footage back.



**Tip:** Make sure the video is representative of real life, avoid the temptation of putting on a good show for the camera.

## Video – top tips

1. Practise using the camcorder before you record anything:
  - find out how to start and stop recording
  - practise how to hold the camera to avoid shaking and jerky movements.
2. Ask staff and patients for consent to video: get written consent. If patients are unable to give informed consent assume you do not have their permission and do not video them. Your governance or communications department can help you with this.
3. Give staff members at least one day's notice of the intention to video. You can do this by putting signs up in the changing areas and on your information boards, include it in your newsletter and mention it in your team meeting.
4. Choose someone who has used the camcorder before to do the recording if possible.
5. Make sure the camera is charged and that you have an empty tape / memory stick.
6. Ask staff to behave exactly how they would normally.
7. Try to stand back and film from a distance to allow staff to work unhindered, and aid the scope of what you capture on film (being mindful of getting consent). Be careful of the sound quality and try a test run before the actual recording starts.
8. Pick one member of staff to follow.
9. Before sharing the video with the multidisciplinary team, watch the video to make sure it has recorded properly, to resolve any technical playback problems and to begin to understand the issues presented by the video.

**Tip:** Watch the video with the team involved before sharing with a wider group of colleagues. Some of the video you capture could be sensitive.



# Watching the video back

## Involve all relevant staff

Follow simple ground rules:

- observe, do not judge or comment
- note everything you see
- it is OK to be uncomfortable if you are on the video, resist the temptation to defend yourself, this is an opportunity to see what can be improved and learn together as a team
- try to make sure it is effective but not too long (10 minutes max).



## Advanced tips for shooting video

After you have done a few trial run videos, consider some of the advanced tips below. They will help you produce better quality videos that are easier for the team to use.

### **Use the widest lens setting possible**

A wide lens means the camera is fully zoomed out. If you are holding the camera always use the widest lens setting that you can. This will minimise any shaking and make it much less apparent to the viewer. You will also get a cleaner and sharper image.

### **Avoid zooms**

Zooming in and out can be very distracting for the viewer. If you are holding the camera it is often better to physically move rather than zoom. In general you should find your shot and stick to it. If you do zoom (for instance, to show some detail or to emphasise something or to gently change the frame because there is something you want to include or exclude) do it deliberately and smoothly. In most cases it is best avoided.

### **Keep steady / hold the frame**

Avoid unnecessary movement – let the subject move rather than the camera. Be confident – keep the frame steady and allow action to come in and out of it rather than trying to follow everything. Don't cut or move to another shot too quickly – allow the action to unfold.

### **Don't make your shots too short**

Some video cameras take a little time to come to speed so never shoot less than five seconds and preferably at least 10. Those few extra seconds will also make editing much easier.

### **Try to avoid filming people against the light**

If you film someone against a window they will be a silhouette as video cameras do not cope very well with contrast. When you are doing an interview ensure you stand between the light source and the person.

### **Look at the overall frame, not just through the viewfinder**

Be aware of what is in the background of the shot. Good material can be rendered unusable if the activity or images in the background are distracting or inappropriate.

### **Compose the shot**

Mentally step back and look at it as a frame with objects positioned in it. Most people can recognise what a good shot is when they see it on a monitor or look at a photograph but the untrained eye can forget this when looking at the world through the camera viewfinder.



# *10. 5S numbers game*

<i>Meetings</i>	
<i>Dot voting</i>	
<i>Audit planning</i>	
<i>Waterfall diagram</i>	
<i>Activity follow</i>	
<i>Video waste walk</i>	
<i>Interviews</i>	
<i>Photographs</i>	
<i>Video</i>	
<b><i>5S numbers game</i></b>	<b>10</b>
<i>Process mapping</i>	
<i>Cost / benefit analysis</i>	
<i>Module action planner</i>	
<i>Time benefit quantification</i>	
<i>Quick changeover</i>	
<i>Timing processes</i>	
<i>Spaghetti diagram</i>	
<i>5 Why analysis</i>	
<i>Calculating related incidents</i>	
<i>Glitch count</i>	

# 5S numbers game

## What is it?

The 5S numbers game is a quick simple game to illustrate the concept and principles of 5S.

## Why do it?

The numbers game is an analogy of the workplace. Playing this game allows staff to experience first hand the significant improvement in efficiency applying 5S can achieve. By simulating the frustration of trying to complete a simple task in a disorganised workplace, and experiencing incremental improvements in efficiency throughout the game, staff will very quickly pick up the concept.

Playing the game with staff involved in 5S will provide them with a good understanding of what 5S is, why you are doing it, and how you will benefit from it.

## When to use?

Use the the 5S numbers game in the *Plan* phase of the Well Organised Theatre module, page 21, prior to initiating any 5S activity with staff who are not familiar with the concepts, and repeat when new staff join the team.

## Materials required

- Copies of 5S numbers sheets (one set per person). Available at [www.institute.nhs.uk/theatres\\_resources](http://www.institute.nhs.uk/theatres_resources)
- Pens.
- Stopwatch / timer.

## How to play

The game consists of seven quick rounds, lasting up to an hour in total.

### Preparation

The game works best when each person has their own set of each of the seven sheets to work through. They will also need a pen.

### Objective of the game

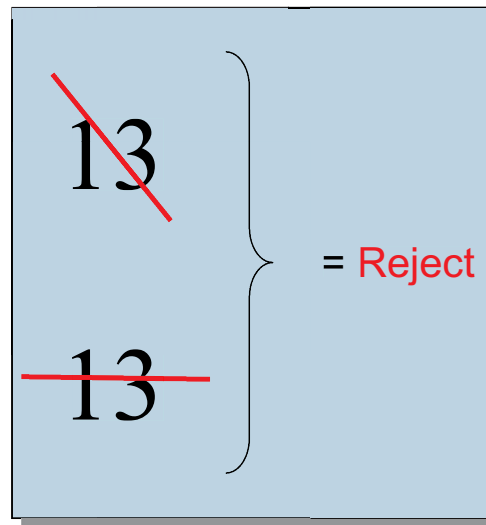
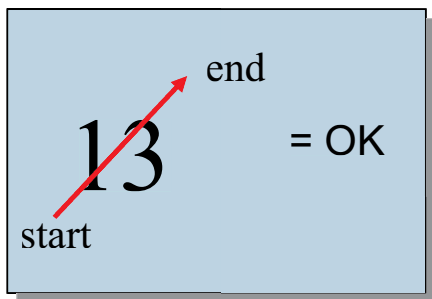
The objective in each round is to cross out the numbers 1-49 in order as quickly as possible, within the time allocated, whilst complying to the standard below. At the end of each round you will need to record how many everyone achieved. You may want to use a flipchart to do this.

### Playing the game

Hand out the sheets to each person. **Reiterate that it is important not to look at the sheets until asked to do so and to stop writing when time is up and that it is important not to skip ahead.**

Their task is to simply cross out the numbers on each sheet in numerical order as described in the visual standard. Crossing out from bottom left towards the top right hand corner. All others will be rejected.

### Visual Standard





## Round 1. The current workplace

The team are allowed **60 seconds** in the first round. Start the timer and ask them to turn over the page together. After 60 seconds, shout **Stop!**, and ask each person to shout out the last number they had crossed out, and record their scores on the flipchart.

Highlight the lowest scores on the flipchart. At this point ask questions to make time for staff to reflect; ask:

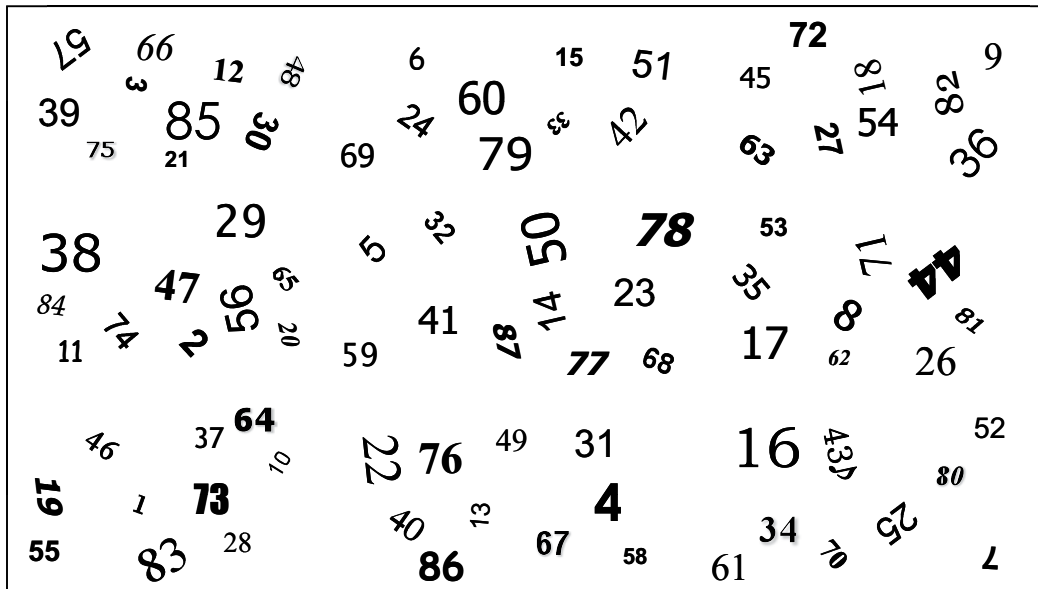
*'How did that feel?'*

*'What stopped you achieving a higher score?'*

## Round 1: The current workplace

Time allowed: 60 seconds

Goal: Cross out the numbers 1 - 49 in order



## Round 2. Sort

The team now have an opportunity to improve their scores. The numbers 50-90 are not required in this work area, so have been removed.

The team are allowed **50 seconds** in this round. Start the timer and instruct them to turn over the second sheet together. After 50 seconds, shout **Stop!**, and ask each person to shout out the last number they had crossed out, and record their scores on the flipchart.

Again, highlight the scores on the flipchart. At this point ask questions to make time for the team to reflect on this slightly improved workplace; ask:

*'How did that feel?'*

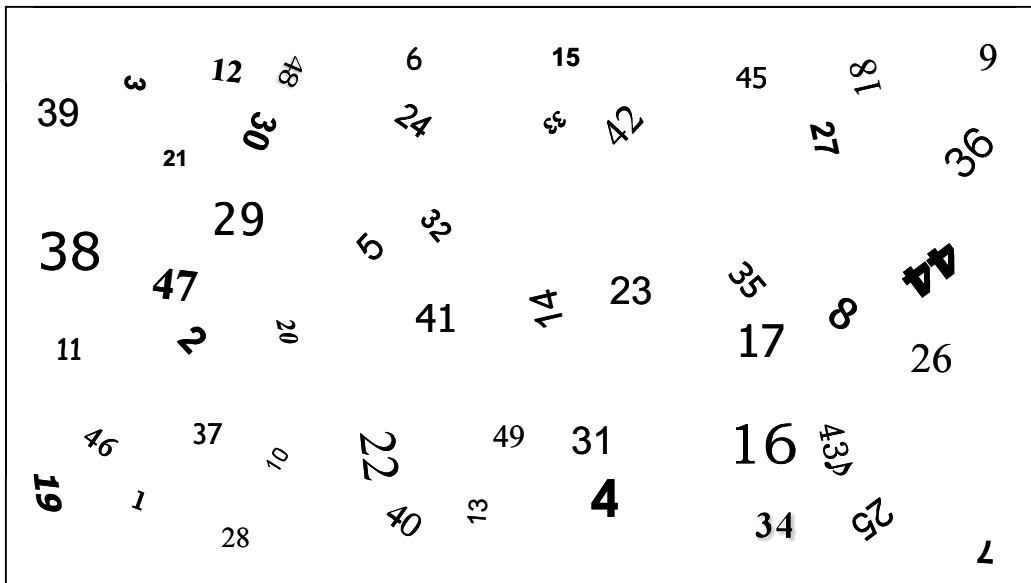
*'Did you score higher than the last round, if so why?'*

*'What stopped you achieving an even higher score?'*

### Round 2: Sort

Time allowed: 50 seconds

Goal: Cross out the numbers 1 - 49 in order



### Round 3. Set

The team have another chance to improve their scores. A new 3 x 3 shelving system has been installed in the workplace, organising equipment in a sequential order as follows:

The location of the remaining numbers, from 10-49, follows the same sequence. This will become very clear to the team once they begin this round.

3	6	9
2	5	8
1	4	7

The team are allowed **40 seconds** in this round. Start the timer and ask them to turn over the third sheet together. After 40 seconds, shout **Stop!**, and ask each person to shout out the last number they had crossed out, and record their scores. Again, ask questions to allow time for the team to reflect on this slightly improved workplace; ask:

*'How did that feel?'*

*'Did you score higher than the last round, if so why?'*

*'What stopped you achieving an even higher score?'*

### Round 3: Set

Time allowed: 40 seconds

Goal: Cross out the numbers 1 - 49 in order

39 3 12 48 21 30	6 15 24 3 42	45 81 9 27 36
38 29 47 20 11 2	5 3 41 14 23	35 44 17 8 26
46 37 10 19 1 28	22 49 31 40 13 4	16 43 34 25 7

## Round 4. Set

The team have another chance to improve their scores. The new 3 x 3 shelving system has been developed further in the workplace, organising equipment in a more systematic and sequential order.

The team are allowed only **20 seconds** in this round. Start the timer and ask them to turn over the fourth sheet together. After 20 seconds, shout **Stop!**, and ask each person to shout out the last number they had crossed out, and record their scores on the flipchart. Again, ask questions to allow time for the team to reflect on this slightly improved workplace; ask:

*'How did that feel?'*

*'Did you score higher than the last round, if so why?'*

*'What stopped you achieving an even higher score?'*

### Round 4: Set

Time allowed: 20 seconds

Goal: Cross out the numbers 1 - 49 in order

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
10	11	<b>12</b>	13	14	15	<b>16</b>	<b>17</b>	18
<b>19</b>	<b>20</b>	21	<b>22</b>	23	24	25	26	<b>27</b>
28	<b>29</b>	<b>30</b>	31	32	33	<b>34</b>	35	36
37	<b>38</b>	39	40	41	<b>42</b>	43	<b>44</b>	45
46	<b>47</b>	48	49					

## Round 5. Standardise

This is the final opportunity for the team to further improve their scores. The new 3 x 3 shelving unit has been standardised.

The team are allowed only **20 seconds** in this round. Start the timer and ask them to turn over the fifth sheet together. After 20 seconds, shout **Stop!**, and ask each person to shout out the last number they had crossed out, and record their scores on the flipchart. Again, ask questions to allow time for the team to reflect on this slightly improved workplace; ask:

*'How did that feel?'*

*'Did you score higher than the last round, if so why?'*

*'What stopped you achieving an even higher score?'*

Finally you may want to ask the team how they might **sustain** the improvements in the workplace.

### Round 5: Standardise

Time allowed: 20 seconds

Goal: Cross out the numbers 1 - 49 in order

1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18
19	20	21	22	23	24	25	26	27
28	29	30	31	32	33	34	35	36
37	38	39	40	41	42	43	44	45
46	47	48	49					

## Round 6. Find the missing number

The purpose of round 6 and 7 is to reinforce the improvement opportunity of 5S, using the workplace analogy of trying to find a piece of kit in the shelving system.

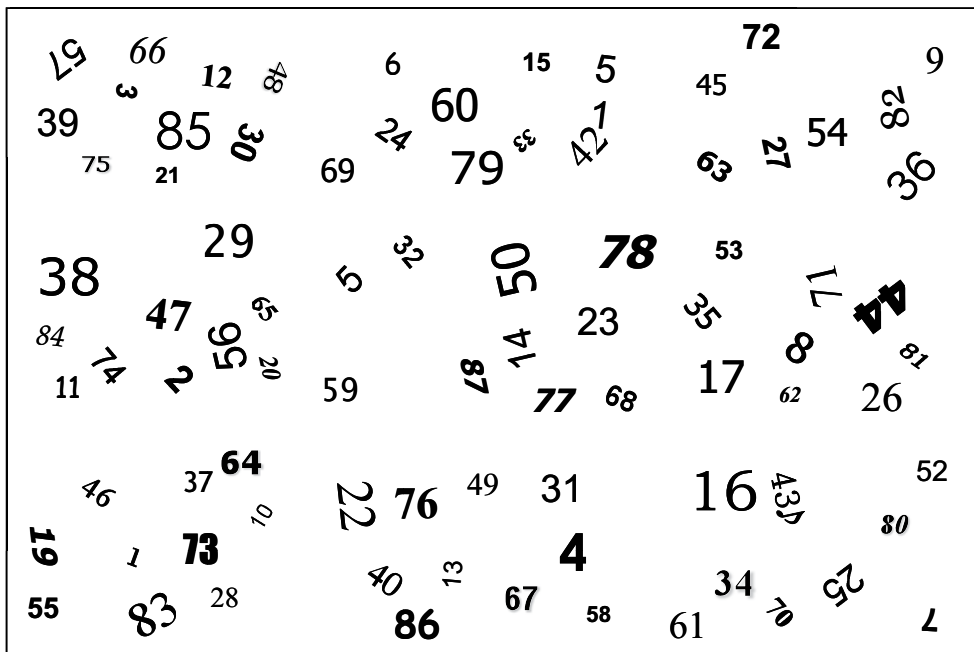
The team are allowed **60 seconds** to find the missing number. Start the timer and ask them to turn over the sixth sheet together. After 60 seconds, shout **Stop!**, and ask each person to shout out the missing numbers. Very few, if any will find the missing number.

Follow this up very quickly with the final round before reflections.

### Round 6: Find the missing numbers

Time allowed: 60 seconds

Goal: Identify missing numbers





# Round 7. Find the missing numbers

The team are allowed just **5 seconds** for this round. Start the timer and ask them to turn over the seventh sheet together. After 5 seconds, shout ***Stop!***, and ask each person to shout out the missing numbers. They will shout out the missing numbers 18 and 41.

Again, ask questions to allow time for staff to reflect on the difference between the two examples; ask:

*'How did that feel?'*

*'How do you think this could be applied in your operating theatres?'*

## Round 7: Find the missing numbers

Time allowed: 5 seconds

Goal: Identify missing numbers

	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17		19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40		42	43	44	45	46	47	48	49

## Key learning points



*The team have experienced a 5S in practice, they have seen a workplace change from its current disorganised state to a standardised workplace, and most importantly felt the benefits.*

The slides set are available at [www.institute.nhs.uk/theatres\\_resources](http://www.institute.nhs.uk/theatres_resources)



# *11. Process mapping*

<i>Meetings</i>	
<i>Dot voting</i>	
<i>Audit planning</i>	
<i>Waterfall diagram</i>	
<i>Activity follow</i>	
<i>Video waste walk</i>	
<i>Interviews</i>	
<i>Photographs</i>	
<i>Video</i>	
<i>5S numbers game</i>	
<b><i>Process mapping</i></b>	<b>11</b>
<i>Cost / benefit analysis</i>	
<i>Module action planner</i>	
<i>Time benefit quantification</i>	
<i>Quick changeover</i>	
<i>Timing processes</i>	
<i>Spaghetti diagram</i>	
<i>5 Why analysis</i>	
<i>Calculating related incidents</i>	
<i>Glitch count</i>	



The collage depicts a busy clinical environment where healthcare professionals are engaged in various tasks. Key elements include:

- Sticky Notes:** Numerous colorful sticky notes are placed on surfaces, containing handwritten notes such as "Check if any patient needs HDU", "Findings the team", "Equipment issues", "Skill mix", "Patient receiving analgesia", "Set up case for any problem in the area", "Check if any patient needs HDU", "Findings the team", "Equipment issues", "Skill mix", "Patient receiving analgesia", "Set up case for any problem in the area".
- Whiteboard:** A large whiteboard is visible, featuring handwritten notes and diagrams, including "Patient receiving analgesia", "Set up case for any problem in the area", "Check if any patient needs HDU", "Findings the team", "Equipment issues", "Skill mix", "Patient receiving analgesia", "Set up case for any problem in the area".
- Healthcare Professionals:** Several individuals in blue scrubs are shown working at desks, writing on whiteboards, and interacting with patients.
- Patient Care:** A patient is visible in the bottom right corner, receiving care from a healthcare professional.

# Process mapping

## What is it?

A tool to help you understand how a process currently works, identifying areas for improvement and developing and implementing a future state map.

## Why do it?

It is very easy to think that everyone involved in your operating theatre department has a common view of what is going on. This is often not the case. The value of getting everyone to agree on how things currently work and what the future should look like should not be underestimated.

Through process mapping the team will create a visual representation of a process detailing all the steps involved. This enables them to see any issues or areas where improvements could be made. It encourages and enables open debate stimulating staff to come up with ideas for potential improvements.

## When to use?

- When reviewing existing processes.
- To identify issues.
- To brainstorm solutions for the identified issue.
- To develop and communicate an improved process.

## Materials required

- Flipchart.
- Marker pen.
- Sticky notes of various colours (to differentiate between issues / process and potential solutions).
- Long piece of paper (a roll of brown packaging paper or wallpaper lining is ideal for this).

The Productive Operating Theatre process mapping originates from a technique used in industry. The aim of process mapping is to provide a framework in order to redesign processes where needed, so that each step of the process can deliver greater levels of value.

Value is defined as those activities that patients view as contributing directly to their care pathway. Any activity that does not add value to this is classified as waste.



## Process mapping – the process

### 1. Identify the process you are going to map and who should be involved

- Be clear about which process you are going to map:
  - define the start of the process (the first step)
  - define the end of the process (the last step).
- Decide who you should invite to get a broad perspective of the whole process. Consider which staff groups are involved in the relevant steps and invite representatives to the mapping session. Remember to include theatre staff, anaesthetists, surgeons, porters and administrators as they will all have knowledge of different steps in the process. Are colleagues from other departments involved in the process, eg wards? If so invite representatives along.
- Your process map will only be as comprehensive as the group you invite; there will be gaps if some staff groups aren't included.

### 2. Collect data and understand the process

- If possible video the process you are going to map from start to end before your process mapping session. (Tool no. 9 Video).
- If this is not possible then it is important that you visit the area where the process is carried out, observe and make notes about what actually happens.
- Try to gather any data that can be used to show the true picture of what happens.

### 3. Create the current state map

- Put a large roll of paper along a wall on which to create your map. You will use sticky notes that represent each step of your process on to the paper. Ensure you have enough paper to cover the entire process from start to end.
- Remind the group of the scope of the session, be clear about where you will start and end your process map. Write the name of the process you are mapping at the top of the paper.
- Start to map out your process sequentially, use one sticky note for each step.
- If watching the video, start / stop the video at each stage and add the time taken for each step and any time spent waiting to your map.
- Actively involve the group to identify waste or activities that should not be happening. Ask them to record these on sticky notes, a different colour to the main steps. Emphasise that this is not about blame, it is about highlighting areas that can be improved).
- Continue to do this until you have reached your end point. Finally ensure with the team that what you have created is a true representation of what actually happens.
- Add all of the waste / activities that should not be happening to the map under the relevant step.
- If any documentation is used within the process add it to your map or reference it.

#### 4. Analyse the current state map

Ask some key questions about the process:

- what waste is there (refer to Tool no. 6 Video waste walk for information about the seven wastes)?
- how many steps are there?
- how long does each step take?
- which steps can be removed?
- are there any bottlenecks (issues that obstruct the overall flow of the process)?
- how many handoffs are there? A handoff is where a patient's care transfers from one person or department to another. Are any of these unnecessary?
- is there duplication of work?
- how much rework or error correction is being carried out?
- are the right people and resources used in the right place?
- are the right steps included in the process in the right order?
- is the process set up to run in the most effective and efficient way?

#### 5. Look for areas of improvement

- Together as a group look for ideas or suggestions on how to improve the current state. Add these suggestions to a flipchart using sticky notes. All ideas, no matter how big or small, should be captured.
- Encourage the group to be creative and innovative with their suggestions. Further tools to help staff think creatively can be found in the NHS Institute for Innovation and Improvement's book Thinking Differently. Visit [www.institute.nhs.uk/thinkingdifferently](http://www.institute.nhs.uk/thinkingdifferently)

#### 6. Create a future state map

- At this point it is important to aim for the ideal process.
- Remove yourself from the constraints within your current process:
  - what would be the safest, most dignified process for the patient?
  - what would be the most effective process for the staff?
- Build your future state map in the same way as before only this time use a sticky note for each of your new steps. At each step write down the action needed to achieve it.
- Continue this method until you have reached your end point. Now you can cross reference back to your current state map to ensure the actions will eliminate all of the waste and activities that do not add value.

## Current state process map



## 7. Identify actions and create a plan

- Prioritise your actions by applying your action sticky notes from your future state map to the cost benefit matrix (Tool no.12 Cost / benefit analysis).
- Transfer the agreed actions to your module action planner (Tool no. 13 Module action planner) to allow timing and responsibilities to be assigned. The next stage is to create an implementation plan.

## 8. Implement the changes and confirm results

- Progress through the relevant module to support you in implementing the changes identified.
- Monitor your progress through the measures identified as part of Knowing How We Are Doing at your measures progress review meetings to understand impact of changes you make.
- Try to quantify improvements made where possible and collect quotes from staff / patients to help raise awareness and enthusiasm as you progress.
- Confirm your results and feed back to all involved in a timely way.

## 9. Future state = current state

Once you have created and implemented your future state map, you have effectively set a new standard and so the future state map now becomes the current state from which you can continually improve.

## Summary

Process maps allow processes to be broken down into smaller sizable chunks which can be analysed and understood at a glance by everybody.

Process maps help engage the attention of all participants, whereby their contribution and knowledge is fundamental in making the process maps correct.

Process maps help identify the current state of a process and when changes and modifications are made they can also illustrate the future state process with all the waste and inefficient processes removed.

It is vital to go through the process map methodology as the team will identify areas of improvement that may not be so obvious to one individual. It is also important to map the current process in the right level of detail.

*'It is really important to include the relevant groups of staff in your discussions, they are the ones that know the system the best, and are able to identify workable solutions.'*

Jules Shanbury – Productive Operating Theatre Facilitator, Royal Devon and Exeter NHS Foundation



# *12. Cost / benefit analysis*

*Meetings*

*Dot voting*

*Audit planning*

*Waterfall diagram*

*Activity follow*

*Video waste walk*

*Interviews*

*Photographs*

*Video*

*5S numbers game*

*Process mapping*

*Cost / benefit analysis*

**12**

*Module action planner*

*Time benefit quantification*

*Quick changeover*

*Timing processes*

*Spaghetti diagram*

*5 Why analysis*

*Calculating related incidents*

*Glitch count*





# Cost / benefit analysis

## What is it?

A tool to prioritise your issues and their potential solutions based on the costs to implement them and the benefits they will bring.

## Why do it?

- Usually there is not enough time or money to implement all solutions at once.
- It is important to understand the costs involved and whether the potential benefits of the change would justify the costs.
- It is useful to identify the improvements that are easier to implement and have more impact first.

## When to use?

- In any discussion that requires several issues to be tackled at once.
- After Tool no. 11 Process mapping and Tool no. 18 5 Why analysis.

## Materials required

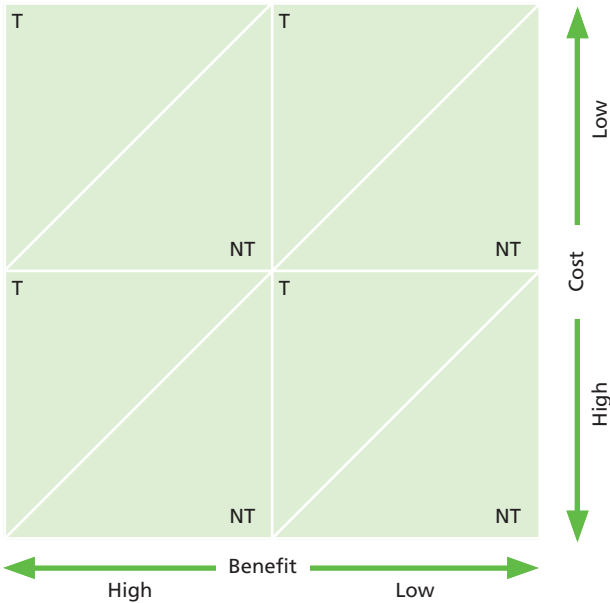
- Flipchart.
- Marker pen.
- Cost / benefit chart.

# The process

1

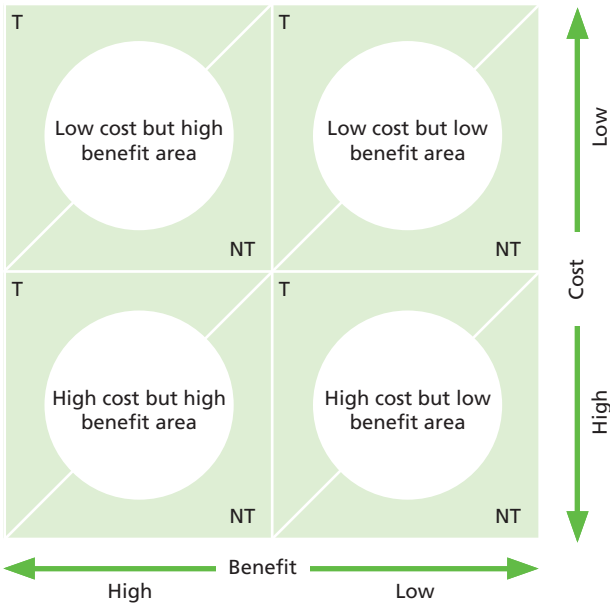
Make a copy onto new sticky notes of all of the *actions* identified when mapping your future state.

Copy out the grid onto a flipchart, making it as big as possible (as shown to the right).



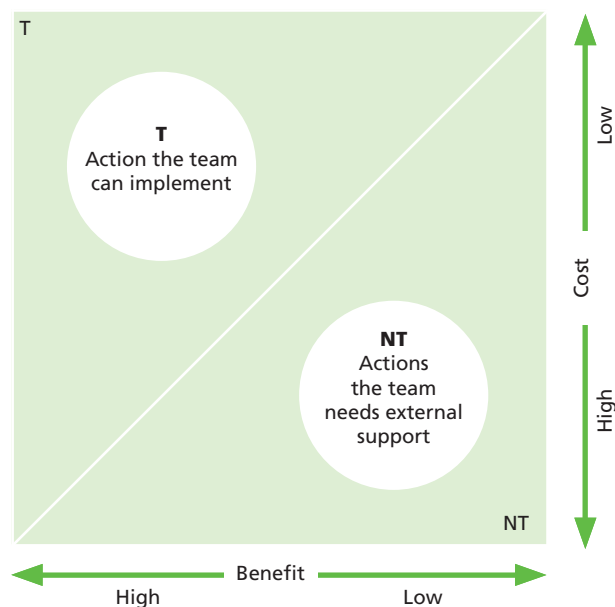
2

Ask the team to prioritise the issues by putting the sticky notes onto the relevant areas of the flipchart according to the cost / benefit of implementation.



## 3

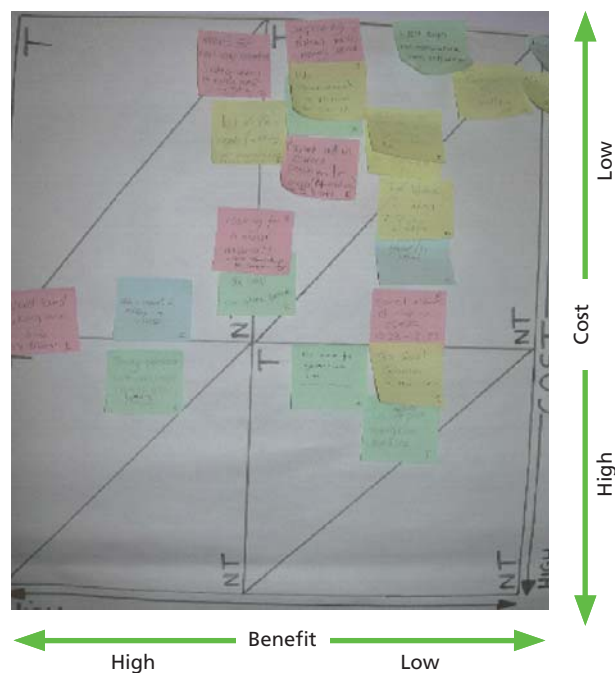
Each quarter of the sheet is sub-divided to split the actions up further to decide which actions can be solved by the theatre team and which need external support (T = team, NT = non-team).



## 4

Your finished sheet should look something like this.

To turn the output of your cost / benefit analysis into an action plan for implementation, use Tool 13 Module action planner.







# ***13. Module action planner***

*Meetings*

*Dot voting*

*Audit planning*

*Waterfall diagram*

*Activity follow*

*Video waste walk*

*Interviews*

*Photographs*

*Video*

*5S numbers game*

*Process mapping*

*Cost / benefit analysis*

*Module action planner*

**13**

*Time benefit quantification*

*Quick changeover*

*Timing processes*

*Spaghetti diagram*

*5 Why analysis*

*Calculating related incidents*

*Glitch count*





# Module action planner

**What is it?**

A sheet that helps clearly plan and track actions identified from the modules.

**Why do it?**

Documenting responsibilities and deadlines on the board ensures staff are visibly accountable for their actions, it is a great project management tool.

**When to use?**

Use this tool after a cost / benefit analysis has been completed and priorities are clear. You can also use it to monitor progress of each of the modules in line with your programme plan. This will help you to identify any issues.

**Materials required**

- Module action planner sheet [www.institute.nhs.uk/theatres\\_resources](http://www.institute.nhs.uk/theatres_resources)
- Marker pens.

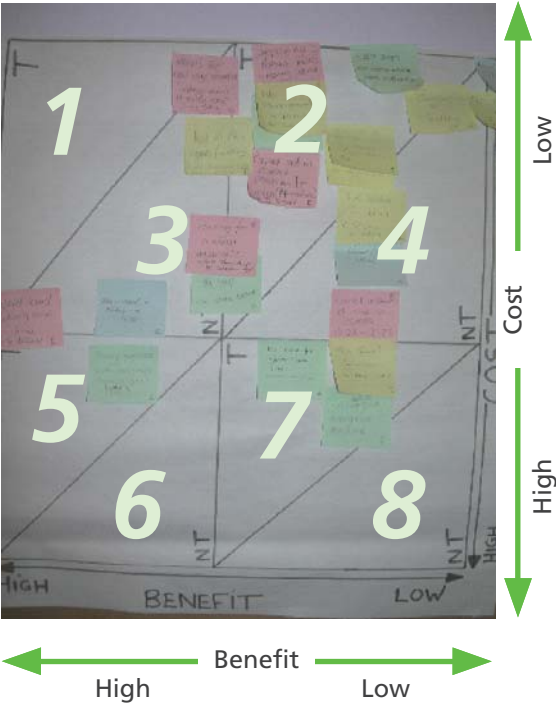


*'Giving individual staff, ownership and a timeline of the actions is vital to the success of each module'*

Claire Bradford – programme leader and theatre matron, Royal Devon and Exeter NHS Foundation Trust

# Using the completed cost / benefit analysis to produce your team's module action plan

The order you should tackle the issues on your cost / benefit analysis is depicted below. Issues in triangle one first, through to the issues in triangle eight last.



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Building teams for safer care

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and Improvement

## Module Action Planner

⊕ = Understood    ⊕ = Underway    ⊕ = Complete    ⊕ = Sustained

	Action	Who	When	Progress	Initial
1				⊕	
2				⊕	
3				⊕	
4				⊕	
5				⊕	
6				⊕	
7				⊕	
8				⊕	
9				⊕	
10				⊕	
11				⊕	
12				⊕	
13				⊕	
14				⊕	

Use your judgement to prioritise within each triangle and then list the actions.

**Tip:** To ensure every member of the group has an equal voice and to further enhance team participation use Tool no. 2 Dot voting to prioritise the actions.

## Module action planner sheet

Planning the implementation of your modules is vital. While it is important it is done in detail, planning does not have to be a complex, IT-heavy exercise. The Module action planner is a quick, easy tool that keeps the module implementation plan, clear and easy for everyone to see and contribute to.

**The Productive Operating Theatre**  
Building teams for safer care™

**NHS**  
Institute for Innovation and Improvement

### Module Action Planner

⊕ = Understood   ⊕ = Underway   ⊕ = Complete   ⊕ = Sustained

	Action	Who	When	Progress	Initial
1				⊕	
2				⊕	
3				⊕	
4				⊕	
5				⊕	
6				⊕	
7				⊕	
8				⊕	
9				⊕	
10				⊕	
11				⊕	
12				⊕	
13				⊕	
14				⊕	

1. List the actions in order of priority from the cost / benefit analysis.

2. Decide who is responsible for each action.

3. Agree a deadline.

4. Monitor status regularly – shade one quadrant each for:

- understood
- underway
- complete
- sustained.

## Top tips

1. You may want to draw out your own sheet on a flipchart or get some printed. Ideally A2 size makes the actions clear to everyone. The Module action planner sheet is available at [www.institute.nhs.uk/theatre\\_resources](http://www.institute.nhs.uk/theatre_resources)
2. Look at your list of issues from the cost / benefit analysis to ensure it is complete and nothing has been missed out.
3. Always fill in the 'who' column and the deadline.
4. Keep the sheet displayed in an area where everyone has access.
5. Ask the person responsible for the action to fill in the status column as the status changes.
6. For each action – fill in the circle of quadrants – start in the top left and work your way clockwise. One quadrant each for four status steps described on previous page.
7. Tackle actions for the biggest problems with the biggest impact and highest likelihood of resolution first.
8. Keep the list updated on a weekly basis – return to it periodically to assess progress.
9. Use it wherever you may find it useful in everyday theatre scenarios, and not just in project-related matters.
10. Ensure you update after each meeting and publish it in a timely manner to show progress or highlight potential issues.
11. Ensure you have regular update meetings involving all key staff.
12. Highlight progress and any potential issues to the steering group.

- ## Filling in your detailed module action planner sheet

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and Improvement*





# *14. Time benefit quantification*

*Meetings*

*Dot voting*

*Audit planning*

*Waterfall diagram*

*Activity follow*

*Video waste walk*

*Interviews*

*Photographs*

*Video*

*5S numbers game*

*Process mapping*

*Cost / benefit analysis*

*Module action planner*

***Time benefit quantification***      **14**

*Quick changeover*

*Timing processes*

*Spaghetti diagram*

*5 Why analysis*

*Calculating related incidents*

*Glitch count*

# Time benefit quantification

## **What is it?**

A method of demonstrating the cumulative impact of small time savings.

## **Why do it?**

It is important for staff to understand the time they can save as a result of their improvement activities, eg 5S. Also, illustrating the cumulative impact of releasing time in multiple areas provides staff with an opportunity to consider what they might do with the released time.

## **When to use it?**

Use the time benefit quantification when releasing small quantities of time in improvement activities. The example opposite is from a 5S activity which shows how a small time saving repeated many times a day, every day, becomes valuable over time.

This is a great example of how small saving can become significant over time.

## Time Saved when collecting stock from this anaesthetic store room

Prior to this room being 5s'd it took an average of **12** mins to collect the required stock. It now takes **7** mins!

Daily Saving = 10 mins

Weekly Saving = 50 mins

Monthly Saving = 3 hrs 30 mins

That is 42 hrs over the year

Almost 1.2 working week !!!





# *15. Quick changeover*

*Meetings*

*Dot voting*

*Audit planning*

*Waterfall diagram*

*Activity follow*

*Video waste walk*

*Interviews*

*Photographs*

*Video*

*5S numbers game*

*Process mapping*

*Cost / benefit analysis*

*Module action planner*

*Time benefit quantification*

*Quick changeover* 15

*Timing processes*

*Spaghetti diagram*

*5 Why analysis*

*Calculating related incidents*

*Glitch count*



# Quick changeover

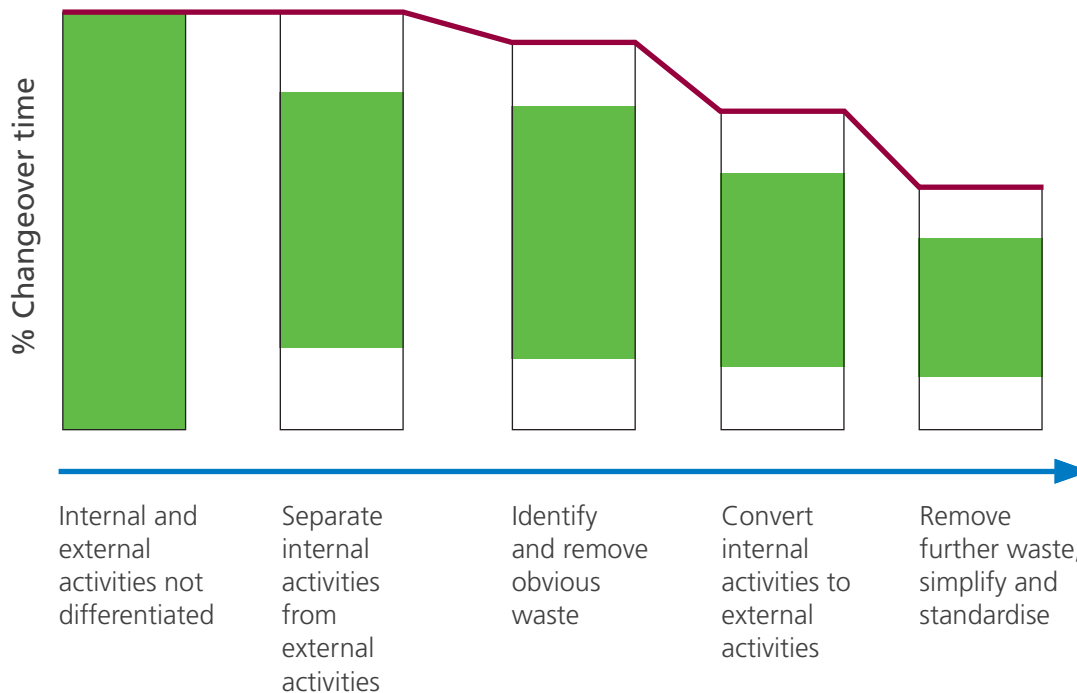
## What is it?

A mapping tool specifically designed to help analyse a changeover within a process, eg patient turnaround. It enables the team to map and review the critical steps involved in changeover processes, as this is often where valuable efficiencies can be gained. Effective changeovers result in safer and more effective care.

## Why do it?

To understand where improvements can be made and time saved in processes such as patient and theatre turnaround, patient handovers and other activities that rely on smooth work processes to support fast, efficient throughput.

Each step of the quick changeover method removes waste and improves efficiency, as shown in the diagram below.



**When to use it?**

Use this to support Process module work in Handover, Patient Turnaround, Session Start-up, Patient Preparation and Recovery.

**Materials required**

- Flipchart.
- Sticky notes.
- Marker pens.
- Camcorder (digital or mini DV camcorder recommended) communication departments often have these cameras which you can borrow.
- Appropriate viewing screen and connection leads so that you can watch your footage back.

**Background**

Quick changeover can be compared with changing a tyre, which most us have tried or at least seen once or twice. Some people need 15 minutes, some 20, some people are very fast and can change a tyre in 10 minutes. Compare this with a Formula 1 pit stop, where all 4 tyres are changed, and the petrol tank filled within a time period of 7-9 seconds! In a Formula 1 pit stop team you will find all the same characteristics that should be present in a quick changeover in theatres. The Quick changeover tool helps you and your team implement focussed improvements using the same principles used in a Formula 1 pit stop.

**Example – Formula 1 pit stop**

Standard changeover method	Quick changeover method
Manpower disorganised	Everyone knows their role
Searching for tools	Everything in its place
Jack individual corner (wheel change)	Lift front and back
Remove one wheel at a time	Remove all four simultaneously
Perform each task separately	Perform all tasks simultaneously
Not standardised	Practised, documented and timed

## Quick changeover – the process

### 1. Video and document the current state of the process

Video the current state (see Tool no. 9 Video), make sure you capture all the steps involved in the process, all the functions involved and the timing points at start and finish of the process involved.

Arrange a quiet room with a table, flipchart and free wall space to review the video.



## 2. List all activities on sticky notes

Have each member of the group note down the individual activities observed in the film on individual sticky notes. Cross reference this with the process timings undertaken, or use the running clock on the video to understand how long each of these activities takes.

Be quite specific and detailed about defining each short part of the process as you see it, this will make it easier to categorise and analyse at each step.

## 3. Separate internal and external activities

During the period of capture, the stopwatch is a ticking clock.

Any waste or unnecessary activity during this timed period could be a contributory factor to delays and overruns. Some activities may be carried out during this time that hold up proceedings. It may have been possible to do some of these steps outside of the *ticking clock*.

Internal activities

- These are all activities which **must** happen during the *ticking clock* in order for the procedure to run safely according to methodology and schedule, eg anaesthetist intubating patient.

External activities

- These are all activities which **could** be carried out outside of the *ticking clock* time, in order for the session to run more smoothly and efficiently, not taking up unnecessary time, eg stocking-up consumables, laying-up surgical kits on trolleys.



Work with the group using a simple flipchart template to analyse the activities and categorise them firstly into internal and external activities. Make an initial decision based on what is seen in the video – what do you actually see happening before and after the core *clock stopped* activities.

**4. Identify waste and value added**

Identify which activities are value-added, which are non value-added (waste) and which activities are non-value added but essential.

**5. Convert internal into external**

Identify how to eliminate waste. Look for opportunities to move internal activities and change them into external activities, ie what can be done before and after the clock is stopped.

**6. Sustain and continuously improve**

Use a quick changeover tracker spreadsheet to track the reduction in time needed for the changeover process. List the activities and their process timings using the left hand column and step 1 sections of the form. As you progress through the steps, replicate the times under the internal external, value added and non value-added columns, until by step 4 the residual activities of your new process will be listed in the internal and external columns.

The total of the times in the internal column gives you an indication of the predicted future process times to aim for when implementing the improved process.

Create a Standard Operating procedure to reinforce your new process design and use Tool no. 13 Module action planner to plan and track the individual actions you need to implement.

		Step 1	Step 2		Step 3		Step 4		
No	Activity	Current time	Internal?	External?	VA?	NVA?	Waste Countermeasure	Internal	External
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									









# ***16. Timing processes***

- Meetings*
- Dot voting*
- Audit planning*
- Waterfall diagram*
- Activity follow*
- Video waste walk*
- Interviews*
- Photographs*
- Video*
- 5S numbers game*
- Process mapping*
- Cost / benefit analysis*
- Module action planner*
- Time benefit quantification*
- Quick changeover*
- Timing processes*
- Spaghetti diagram*
- 5 Why analysis*
- Calculating related incidents*
- Glitch count*

4:16



# Timing processes

## What is it?

A simple way to record how long a process takes to complete so that you can analyse it before and after implementing a change. It is important in many modules in particular Well Organised Theatre, Session Start-up and Consumables and Equipment.

## Why do it?

To measure and illustrate released staff time that has been achieved by saving time in routine processes.

## When to use?

- Timing of processes before and after the changes is a simple and highly effective way to demonstrate time saved and whether the change was an improvement in terms of efficiency.
- You can use it for all Process modules.

## Materials required

- Pen.
- Timing process sheet (see overleaf) also available at [www.institute.nhs.uk/theatres\\_resources](http://www.institute.nhs.uk/theatres_resources)
- A stop-watch, watch or a clock that is easily visible in the area.

## The process

- Agree what the start and end of the process is:
  - choose the same start point every time, eg when the member of staff leaves the theatre suite to the point of collection of a patient from ward X
  - choose the same finish point every time, eg arriving back to the same anaesthetic room.
- Use a stop watch, watch or wall clock to time the whole process from start to finish.
- Time the process at different times of the day over a week, to get consistent results.
- Use the timing process sheet to record results.
- If you measure your process in minutes and seconds convert the time to seconds before working out the average and the range.

# Timing processes sheet

Process being timed:				Location:	
Start point:				Finish point	
No.	Date	Time of day	Time taken (min + seconds)	Time taken (seconds)	Comments
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
		Average			
		Range*			

\*the range is the difference between the longest time (X) and the shortest time (Y) taken: range = X-Y.

**Tip:** Remember, if you measure your process in minutes and seconds convert the time to seconds to work out the average and range.

## Timing processes example

- Calculate the average the times for collecting a patient from a particular ward.
- If timings are in minutes and seconds convert to seconds before calculating your range and average. Remember there are 60 seconds in a minute.
- Disregard times that may have been influenced by special circumstances.
- Discuss and understand why the special circumstances occurred, eg some patients are collected more promptly than others.

Process being timed: Collecting the patient from the ward				Location: Theatre 4	
Start point: When patient from ward 8 is called for				Finish point Patient arrives in anaesthetic room	
No.	Date	Time of day	Time taken (min + seconds)	Time taken (seconds)	Comments
1	21/09/2009	08:30	14 mins 20 secs		
2	21/09/2009	10:15	18 mins 20 secs		
3	21/09/2009	11:45	20 mins 3 secs		
4	21/09/2009	13:00	13 mins 25 secs		
5	21/09/2009	14:15	16 mins 54 secs		
6	21/09/2009	15:45	40 mins 52 secs		Patient had been transferred to a different ward, theatres not told
7					
8					
9					
10					
		Average	17 mins 04 secs	1024.4 seconds	
		Range*	4 mins 55 sec	295 seconds	

\*the range is the difference between the longest time (X) and the shortest time (Y) taken: range = X-Y.

Convert minutes to seconds for example:

14 minutes 20 seconds is 860 seconds (14 minutes x 60 ) + 20 = 860.





# *17. Spaghetti diagram*

*Meetings*

*Dot voting*

*Audit planning*

*Waterfall diagram*

*Activity follow*

*Video waste walk*

*Interviews*

*Photographs*

*Video*

*5S numbers game*

*Process mapping*

*Cost / benefit analysis*

*Module action planner*

*Time benefit quantification*

*Quick changeover*

*Timing processes*

*Spaghetti diagram*

**17**

*5 Why analysis*

*Calculating related incidents*

*Glitch count*

# Spaghetti diagram

## What is it?

- A tool to track the physical motion of people or material in a particular location.
- To track a person / material as it enters an area.
- To draw the path taken on the plan of the area.

## Why do it?

- It reveals where unnecessary motion is being caused due to the location of equipment and materials.

## When to use?

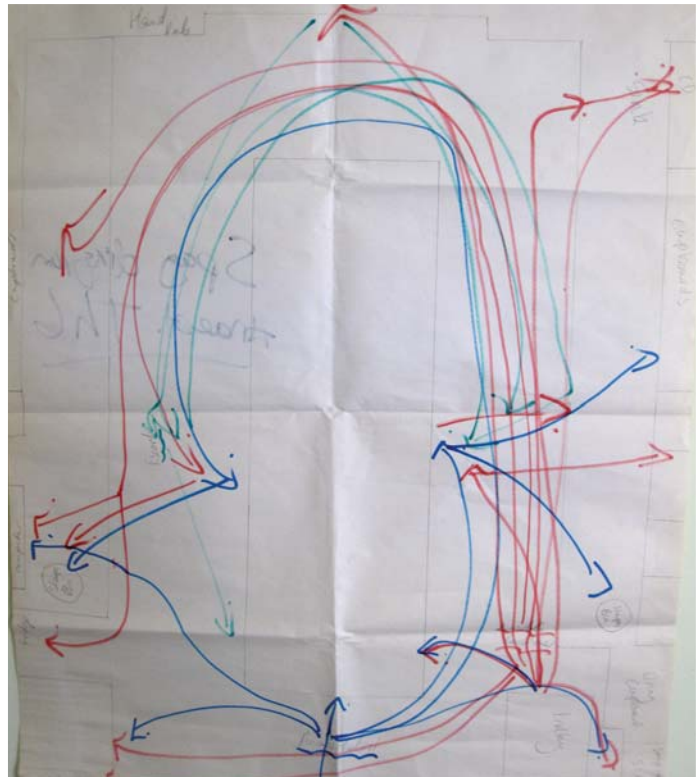
- After Tool no. 6 Video waste walk to reiterate the amount of motion.
- Before implementing the Well Organised Theatre module in a given area.
- Whenever you suspect a particular area of the theatre suite is not laid out properly, leading to excessive walking, or moving of equipment / materials.

## Materials required

- Plan of the relevant area (ask the facilities department for this).
- A board to hang the plan or a wall outside the relevant area.
- Some coloured pens so that different movements can be tracked individually.

## Spaghetti diagram – the process

1. Understand how the area is currently used, by using Tool no. 9 Video or by watching the particular area in use.
2. Importantly, time how long processes take in the current state.
3. Interviewing staff in order to understand their movement (see Tool no. 7 Interviews).
4. Obtain or create a copy of the plan for your department. If required use a photocopier to enlarge the area you are working on (room or larger area).
5. Plot the movement of the staff member onto the plan detailing typical movement for a staff member undertaking a process – in the example below, gathering equipment from an anaesthetic room (generated from videoing the process).
6. With your team, discuss how the area could be arranged and / or the process can be redesigned so that the movement is reduced and time saved.
7. Plot the newly designed process route onto the plan in a different colour.
8. Often the changes to process route will coincide with changes your team is making using the Well Organised Theatre module.
9. Quantify the time you could save by walking the new route and timing it.
10. Use Tool no. 14 Time benefit quantification to translate the time saving into a positive message to the wider theatre team.





# *18. 5 Why analysis*

*Meetings*

*Dot voting*

*Audit planning*

*Waterfall diagram*

*Activity follow*

*Video waste walk*

*Interviews*

*Photographs*

*Video*

*5S numbers game*

*Process mapping*

*Cost / benefit analysis*

*Module action planner*

*Time benefit quantification*

*Quick changeover*

*Timing processes*

*Spaghetti diagram*

*5 Why analysis*

**18**

*Calculating related incidents*

*Glitch count*





## 5 Why analysis

### What is it?

A simple tool to identify the root cause of a problem by repeatedly asking **why?**

### Why do it?

Addressing the root cause rather than the symptom provides a permanent and complete solution.

### When to use?

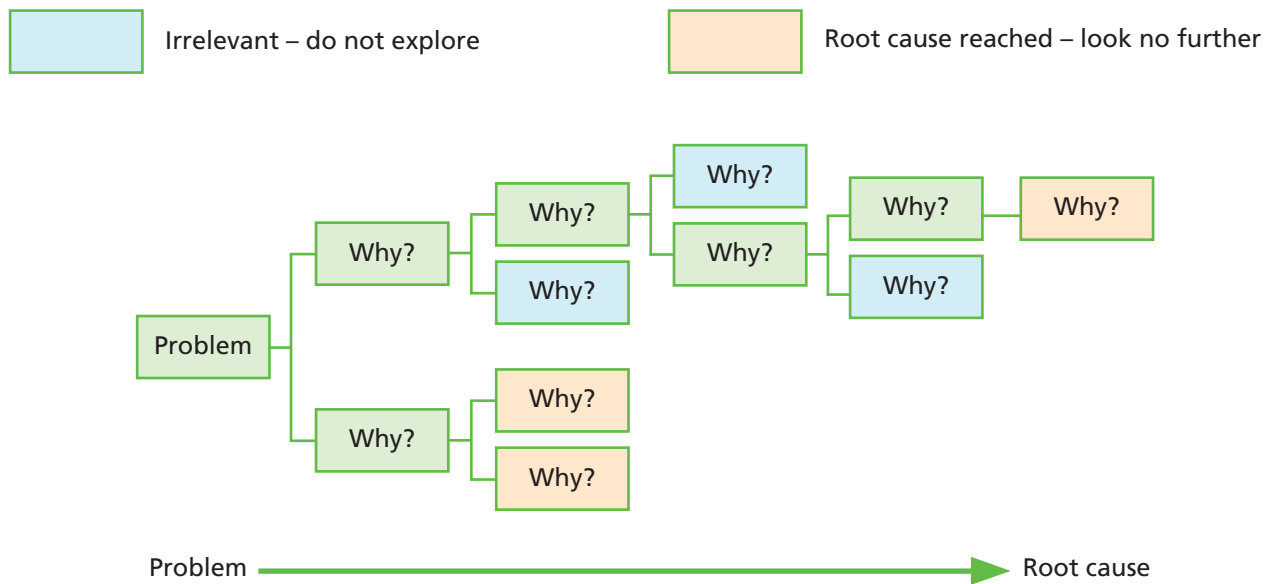
- To understand reasons for a poorly performing process, eg, start and finish times.
- To identify how processes can be improved.

### Material required

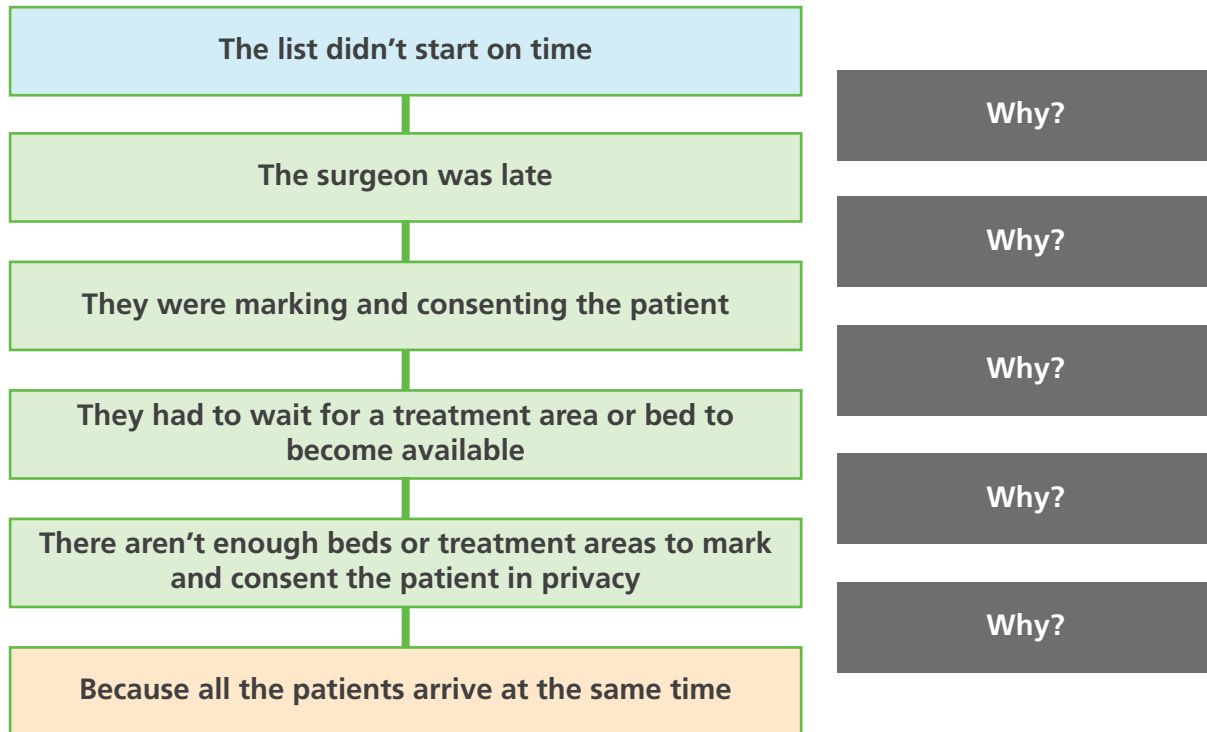
- Flipchart.
- Marker pen.

## Characteristics of good 5 Why analysis

- Start with a specific measurable problem.
- Draw a 'tree of solutions' giving multiple possible answers (branches) for each 'why'.
- Ignore the irrelevant branches and focus on the right ones based on impact.



## Statement of Problem







# *19. Calculating related incidents*

*Meetings*

*Dot voting*

*Audit planning*

*Waterfall diagram*

*Activity follow*

*Video waste walk*

*Interviews*

*Photographs*

*Video*

*5S numbers game*

*Process mapping*

*Cost / benefit analysis*

*Module action planner*

*Time benefit quantification*

*Quick changeover*

*Timing processes*

*Spaghetti diagram*

*5 Why analysis*

*Calculating related incidents*

*Glitch count*



# Calculating related incidents

## What is it?

A simple guide to using existing incident reports to understand how many incidents are related to a particular activity or process.

## Why do it?

- Reducing errors and incidents is a key measure for improving safety.
- Understanding how to analyse retrospective data is crucial to gaining a base line of where you are starting from prior to any improvements being implemented.

## When to use?

At the beginning of any change in a process, to establish a baseline of related incidents.

## Materials required

- Last three months' incident reports.
- Pen.
- Computer with spreadsheet software and someone with experience of using it (talk to your IT support if you need help).

## Calculating related incidents – the process

### How many errors are made?

- Look at clinical incidents data to understand how many are related to a process.
- Collect all clinical incident reports over a specified time period.
- Sort the incidents into those relating to this and other processes.
- Calculate the number of incidents per time period and demonstrate the output with graphs, eg a run chart for each area of information collected.
- Hold a discussion with staff:
  - to better understand risks associated with conducting the current process
  - whether there are more incidents which do not get reported?
  - how can we prevent these incidents, eg through a change in process.





# ***20. Glitch count***

*Meetings*  
*Dot voting*  
*Audit planning*  
*Waterfall diagram*  
*Activity follow*  
*Video waste walk*  
*Interviews*  
*Photographs*  
*Video*  
*5S numbers game*  
*Process mapping*  
*Cost / benefit analysis*  
*Module action planner*  
*Time benefit quantification*  
*Quick changeover*  
*Timing processes*  
*Spaghetti diagram*  
*5 Why analysis*  
*Calculating related incidents*

# Glitch counts

## What is it?

A glitch is a problem, issue or frustration that has a negative impact on the theatre list. A glitch count is a way of identifying and counting glitches on a daily basis in theatres.

## Why do it?

The glitch count can be used when a glitch is recurring such as a piece of equipment not working, or not being available. It helps staff to identify all the glitches, particularly the reoccurring ones in theatres, and identify the potential causes. The theatre teams are able to capture the number of times the glitch occurs, and for what specific reason.

## When to use?

This tool works best when it's built into the routine work in theatres. It is particularly useful when linked into the debrief at the end of each theatre session (see Team-working module). This will ensure all glitches are captured on an daily basis, allowing staff to record recurring glitches and importantly see problems disappearing as they are resolved.

Information on recurring glitches can be gathered to understand the underlying root cause. Use Tool no. 18 5 Why analysis to help you identify potential solutions. Once implemented, present back to the team during team debriefing and departmental meetings, and ensure the glitch count is continued to ensure the issue has been resolved.

Materials required

You will need a glitch count sheet and a marker pen. A good method of capturing glitches is on a wipe board in each theatre.

The results can then be presented back to staff in bar charts (pareto):

- how many issues have been resolved
- the number and causes for the glitches.

THEATRE DAILY GLITCHES – Version 1

DAY/DATE:

QUESTION	YES Please tick	NO Please tick	NO CODE
1. Did the list start on time?  Definition: 1 <sup>st</sup> patient on list in Anaesthetics Room with Anaesthetist at 8.30am.			a) Patient DNA b) Patient not ready c) Investigations not complete d) Notes missing e) Consent form not signed f) Patient not on appropriate ward and theatre not informed g) Staff not available to transport patients h) Anaesthetist not available in theatre i) Surgeon not available in theatre
2. Was equipment available and prepared?  Definition: All requested equipment available for at least the 1 <sup>st</sup> 2 operations.			a) Instrumentation contamination risk b) Instrumentation missing c) Used previous night d) Not available from HSDU e) Lost sets f) Disposable items opened & not used g) Sets opened for single instruments h) Opened in error
3. Was equipment easily located when requested?  Pis tally interruptions in box provided			a) Item out of stock in YOUR theatre b) Number of times staff had to leave theatre to locate equipment? Total c) Item out of stock in HSDU
4. List confirmed at _____  Did the list remain the same as originally agreed?			a) Patient DNA b) Patient not available c) Clinical reasons ie. complications d) Equipment not available e) Bed shortages f) Change of order by consultant g) Patient not 'starved' h) Change of procedure
5. Was there an appropriate skill mix of staff for the list?			a) Staff sickness b) Staff holiday c) Insufficient number of appropriately skilled staff for list
6. Was the theatre/theatre team free of interruptions?  Pis tally interruptions in box provided			a) Telephone calls – how many came into theatre incl to _____ Total b) Staff from other areas seeking equipment or advice – how many times? _____ Total c) Did staff have to leave theatre to assist elsewhere – how many people? _____ Total how many times? _____ Total

Glitch Type	Common Cause	Number
Staff Related	<ul style="list-style-type: none"><li>• Surgeon / Anaesthetist Late</li><li>• Understaffed</li><li>• Unanswered Bleep</li><li>• No Porter</li><li>• No Surgeon Available</li><li>• No Anaesthetist Available</li><li>• Staff from other Theatre seeking Equipment/Advice</li></ul>	
Patient Related	<ul style="list-style-type: none"><li>• Patient not Admitted</li><li>• Patient not Arrived</li><li>• Patient Location Unknown</li><li>• Patient waiting for Diagnostics</li><li>• Patient not Ready – Clinical Reasons</li><li>• Patient DNA</li></ul>	
Flow Related	<ul style="list-style-type: none"><li>• Recovery Full</li></ul>	
Time Related	<ul style="list-style-type: none"><li>• Late Start</li><li>• Late Finnish</li><li>• Waiting for Patient</li></ul>	
Documentation Related	<ul style="list-style-type: none"><li>• Site of Surgery not Documented</li><li>• Patient not consented</li><li>• Theatre List Incorrect/Incomplete</li><li>• Missing notes</li><li>• Documentation Not Complete</li><li>• List Order Changed on Day</li></ul>	
Theatre Related	<ul style="list-style-type: none"><li>• Disposable Items Opened and Not Used</li><li>• Missing / Unavailable Equipment</li><li>• Change to Standard Op</li></ul>	

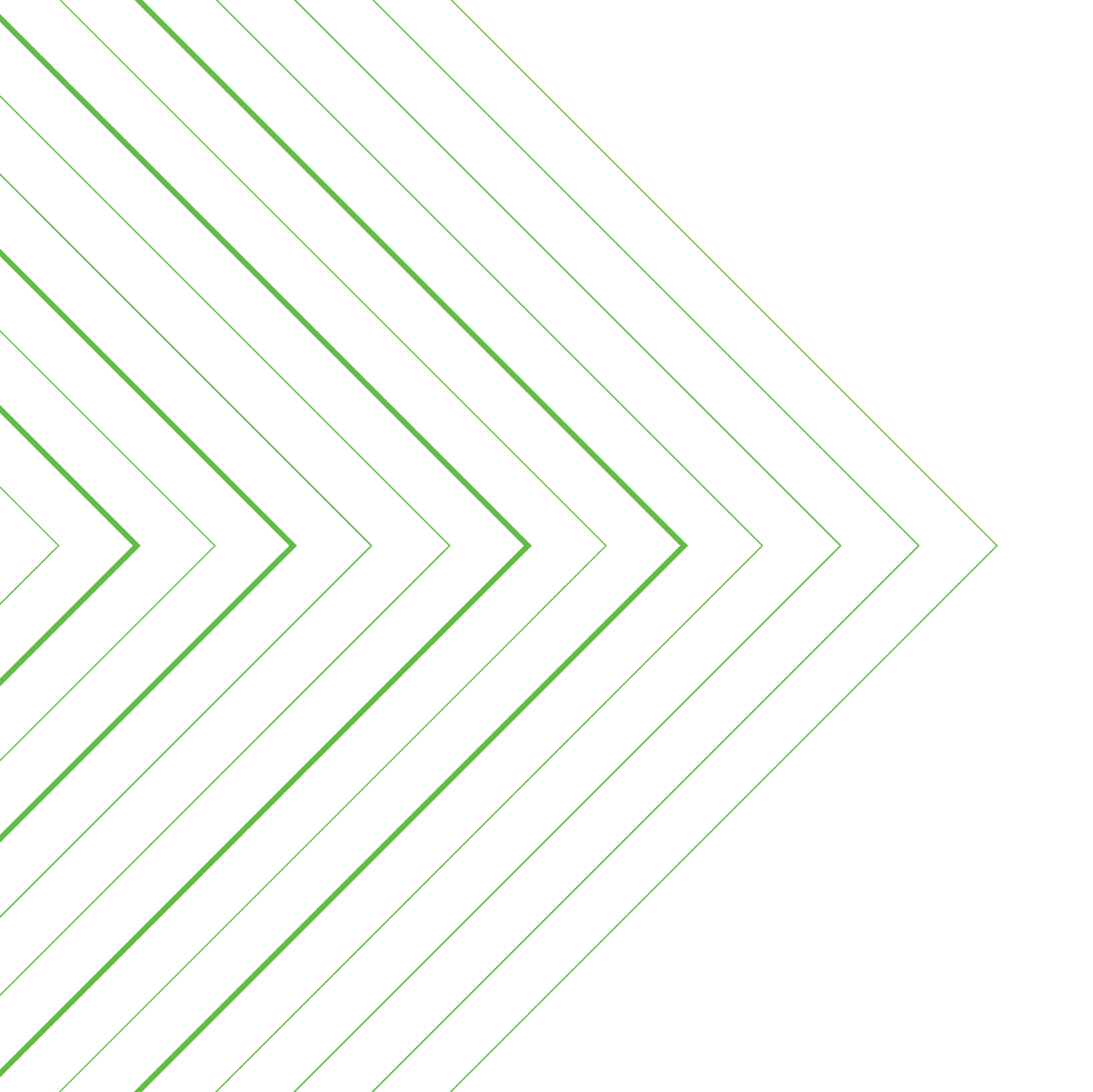
**Tip:** This tool works well with the 5 Why tool. Once the glitches have been identified, asking the 5 Why helps you to identify possible causes for the problem and provide a good starting point to resolving problems.



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For further information and to download the modules please visit [www.institute.nhs.uk/theatres](http://www.institute.nhs.uk/theatres)  
Contact The Productive Operating Theatre team [theatres@institute.nhs.uk](mailto:theatres@institute.nhs.uk)

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