



# operating theatres

## **a bulletin for health bodies**

This bulletin is written for managers and non-executive directors of NHS trusts.

It explores some of the common problems we have encountered during our ongoing audits of operating theatres. It also provides examples of good practice and effective improvement strategies that many trusts have implemented following our visits.

# CONTENTS

Introduction	1
Information	2
Case study 1: absence of information and standards	2
Case study 2: integrating information	3
Case study 3: the wrong information	3
Performance	6
Case study 4: losing fewer sessions	7
Case study 5: making better use of available time	8
Case study 6: making best use of staff	8
Case study 7: benefits of better planning	9
Getting Better	10
Case study 8: improving efficiency	10
Case study 9: reducing clinical risk	10
Case study 10: involving staff	11
Closing Up	12
Further Work	13
To Find Out More About District Audit	13

# INTRODUCTION

Operating theatres play a central part in the modern NHS. For many, the image of the skilled and dedicated team of surgical staff working to save a child injured in a traffic accident, or replacing the hip of an elderly patient, define our health service. The operating theatre is often also portrayed as being at the leading edge of medical science. Advances in technology and the expertise of surgeons make it possible to achieve good outcomes with conditions that were considered inoperable not long ago. Over three million operations are performed in an average year in theatres in England and Wales. Staff costs amount to over half a billion pounds per year – and (because of the way costs are accounted for) this figure excludes possibly as much again for the surgeons and anaesthetists who use these theatres. The stakes are high in every way.

Yet, as the use of hospitals in Northern Europe for UK citizens awaiting operations highlights, all is not well in our operating theatres. In fact, despite all of the money and effort that have been put in to making them run like ‘well-oiled machines’, many are still less effective than they should be. Whether we compare their performance with one another, or with established national standards, there is variation that is hard to explain.

The causes of these inefficiencies fall into two broad categories. Some are what we call ‘hospital-wide’ problems. These can only be resolved if other people or departments make a change to the way they work. Whilst we would raise these issues in the context of individual audits, they fall outside the scope of this bulletin.

The second type we call ‘theatre practicalities’, and it is this type we focus on in this bulletin. These problems could be resolved by addressing faults in the arrangements immediately before, during and after operations take place.

Both categories of problem can be resolved by hospital managers – if they have the information, the resources and the inclination needed to take the required action. Our experience in going back to hospitals for a second or third time to look at their operating theatres is that it is always possible to achieve improvements in performance.

The NHS Plan has major implications for operating theatres and the way they are run. There is little doubt that until all trusts have the same quality of information about their operating theatres as the best do, the positive impact of the NHS Plan will be diminished. Work on standards is also needed ahead of the Plan – there are remarkably few national standards in place to guide managers in what to expect from their operating theatres. This makes it more difficult to challenge those whose practices may be having a negative effect on theatre efficiency.

This short report summarises District Audit’s reviews of operating theatre efficiency during the past three years. We have visited 70 trusts in that period, and whilst what follows does not reflect practices at every hospital in England and Wales, it does provide a sufficiently clear picture for publication to be justified at this time. Our aims are to highlight the common problems encountered by operating theatre managers, and to use examples of good practice to illustrate how some trusts have overcome them.

There are three main sections to the report:

**Information** – what do you need to know to run operating theatres?

**Performance** – what did we find in our reviews?

**Getting Better** – what are the best performers doing right?

The report ends with details of further work planned this year by the Audit Commission and the Modernisation Agency.

# INFORMATION

Timely, relevant and accurate information is essential for the efficient running of an operating theatre. Unfortunately, poor management information on the use of theatre resources is widespread.

During our reviews we discovered trusts that have spent significant sums of money on apparently sophisticated computerised systems, but relatively few are able to produce the reliable information needed to assist both strategic planning and routine management of theatres. In many cases, the emphasis seems to have been on developing IT systems rather than on identifying and capturing the information needed to plan and run an efficient operating theatre.

## Case study 1: absence of information and standards

One trust was unable to provide us with any accurate information on why theatre staff and users frequently failed to keep to regular session start and finish times. Session late starts and over-runs were commonplace. Anecdotal evidence, supported by direct observation, suggested that problems arose from:

- a manual, poorly maintained management information system
- no agreed start and finish times for theatre sessions
- no separate emergency theatre session, leading to interruptions in routine lists
- over-ambitious, poor list planning
- a lack of commitment by theatre staff and theatre users to ensure they arrived on time
- poor shift rostering, using too many part-time staff
- delays due to external factors such as patients, equipment and supplies not being delivered to theatre on time.

An improved, computerised management information system has been introduced and is now highlighting non-compliance with recently agreed standards, helping theatre managers to tackle the poor performance of specific specialties or staff members.

## INFORMATION FOR PLANNING

Information on historical theatre utilisation is necessary for day-to-day management, but accurate information is also needed to plan for future theatre workloads, correcting for previous under-use. Theatre information systems need to be able to capture how much of the available physical theatre capacity is used during the daytime, evening and weekend, and then to calculate whether there is scope to carry out more operations.

**Case study 2: integrating information**

Good patient care relies on good management of theatre lists. Direct access to information systems for medical secretaries helps to bring this about.

In one trust, the theatre information system was not integrated into all theatres and did not cover all specialties. This meant that some specialties had to keep manual records and physically transport paper-based forms to the theatres for staff to input to the system. This inevitably led to a greater number of errors, leading in turn to inefficient use of theatre time.

The appointment of additional medical staff, service restructuring, trust mergers and so on can also have a significant impact on the volume of theatre work undertaken in certain specialties. Trusts need to have accurate information to ensure that allocated theatre resources match changes in workload patterns.

**INFORMATION FOR RESOURCING**

Expenditure on theatre staff typically accounts for some 60 to 70% of a theatre budget. At some trusts, staff numbers are based on historical information and may not reflect current and planned changes in service delivery. A robust management information system will help to determine the most appropriate staffing levels and shift patterns, but care must be taken to maintain staff numbers and shift patterns that are both practical and manageable.

**INFORMATION ON PERFORMANCE**

Our audits show that relatively few trusts have defined and agreed performance measures for their theatres. Few routinely produce enough summary information on theatre activity to allow a review of performance at senior management or board level. Even where information is produced, many theatre information systems are unreliable in terms of data quality, with the result that trust managers and directors are sometimes unaware of how good or poor their theatre performance actually is.

**Case study 3: the wrong information**

At one trust, operating theatre utilisation of 99% was reported to the trust board and 96.7% to the theatre users' group over a number of years. Our work showed that, over a three-month period, only 66% to 81% of allocated sessions were used and poor timekeeping meant that only 82% of available operating time was used.

## WHAT INFORMATION DO YOU NEED?

As a minimum, we suggest that the information below should be routinely produced and used to monitor theatre performance. The information will carry additional weight if current performance is compared with agreed standards or by reviewing the trend over time, or

both. Whenever possible data should be analysed by consultant, by specialty and trust-wide.

Trusts should also be clear about who receives, and who is expected to act on, theatre performance information. In the best cases, managers and user groups work together to tackle problems.

What information do you need?	
Performance measure	Yardstick
Ratio of actual session hours used to planned hours	Compare with Bevan Report's 90%*
Ratio of number of sessions held to number planned	Compare with a local standard
Average number of cases per used hour	Assess trend, eg last quarter
Number of cancelled operations as percentage of original list	Compare with a local standard
Net operating hours starting or finishing late or early	Compare with a local standard
Percentage of operations cancelled by the hospital on the day for non-clinical reasons where patients were offered another date within 28 days	Compare with NHS Plan targets
Percentage of operations cancelled by the hospital on the day for non-clinical reasons who were treated within 28 days	Compare with NHS Plan targets
Scheduled emergency sessions	
Numbers of emergency cases per scheduled hour	Assess trend, eg last quarter
Ratio of actual session hours used to planned hours	Compare with a local standard
Out-of-hours work	
Percentage of all cases that are undertaken out of hours	Assess trend, eg last quarter
Percentage of emergency cases that are National Confidential Enquiry into Perioperative Deaths (NCEPOD) category 1	Analyse by period, eg 00:00 – 08:00
Time distribution of emergency cases – numbers by hour	Assess trend, eg monthly
Planning	
Numbers of elective inpatient theatre cases per 1000 elective inpatient finished consultant episodes (FCEs), by specialty	Assess trend, eg last quarter. Adjust for utilisation below 90%. Use to plan sessions based on expected FCEs in next period
Numbers of elective day case theatre cases per 1000 day case FCEs	Adjust for utilisation below 90%. Use to plan sessions based on expected FCEs in next period
Numbers of emergency theatre cases per 1000 emergency FCEs	Apply ratio to expected emergency FCEs

\* *The management and utilisation of operating departments, Peter Gilroy Bevan, 1989*

## WHAT SHOULD YOU DO?

Existing theatre information systems should be critically examined and updated or replaced where they need to be. But sophisticated software packages are not necessary to provide robust information. A relatively simple spreadsheet or database, rigorously managed and maintained, can be used to great effect to record, monitor and report on key performance measures.

Review your theatre information system	
<i>If you are not sure how useful your operating theatre information system actually is, use this checklist as a starting point. If any of your answers are "no", then there is scope for improvement.</i>	
Is the same information system used for all theatres in the trust?	
Is data entry concurrent with a patient's operation?	
Is data complete, accurate and does it have credibility with theatre users?	
Does the system include information about planned sessions and those operations that were cancelled?	
Does the system regularly produce summary theatre activity and performance information?	
Does the system review how much of the available physical theatre capacity is used during the day, evening, night and weekend?	
Is any management information copied to managers who have the power to act on it and, if necessary, change working practices to improve performance?	
Where relevant, does the system analyse information down to specialty and consultant?	

Review your theatre information system (contd.)	
Does the system compare actual performance with agreed local or national standards and calculate and highlight variances?	
Do managers and clinicians have clear views on how the information is to be used to address management and clinical issues?	
Is there a regular assessment of system users' training needs with action being taken to implement appropriate training programmes?	
Does the system incorporate prompts or validation checks to improve the quality of data entry?	
Is the system audited at least once each year to check the accuracy, completeness and relevance of the data recorded and produced?	
Is management information produced in a form that can be cross-linked to other information on patient activity to allow more accurate planning of theatre sessions?	

# PERFORMANCE

Trusts need to take all possible steps to ensure sessions are fully utilised. To make best use of the surgeons, anaesthetists, nurses and other staff involved, trust managers need to ensure that:

- few sessions are cancelled
- best use is made of the available operating time in sessions that run
- staffing is appropriate for the cases being performed
- the number of sessions timetabled to each specialty is appropriate to achieve the anticipated throughput.

## CANCELLED SESSIONS

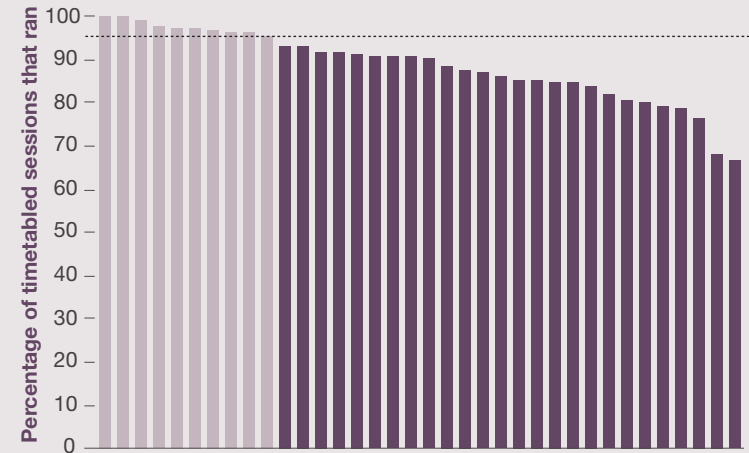
Our operating theatre audits show that on average trusts cancel (and cannot re-use) about 10% of their available sessions.

However, with good management, cancelled sessions can be reduced to 5% or less of those scheduled. But if appropriate systems are not in place, it is not uncommon for one in six of timetabled sessions to be wasted – often due to short-notice annual leave.

This could have a significant financial impact for trusts, with the NHS Plan requirement to offer patients a choice – including private treatment – if their operations are cancelled.

Chart 1: theatre utilisation

Only 10 trusts in our database actually ran at least 95% of their planned sessions



Source: District Audit database of operating theatres within trusts

**Case study 4: losing fewer sessions**

A trust in Trent Region is able to manage its cancelled sessions to just 3% by holding weekly meetings, attended by directorate business managers (including anaesthetics) and theatre team leaders. Prospective cancelled sessions over the next four weeks are discussed and arrangements agreed for alternative cover. Where no cover is available, the reasons for cancellation are recorded.

**MAKING THE MOST OF AVAILABLE TIME**

To make the most of sessions that do take place, managers need to ensure that sessions start and finish as close to the scheduled time as possible, and that there are few gaps between cases. This needs careful co-ordination of surgeons, anaesthetists, theatre nurses, ward nurses, porters and patients.

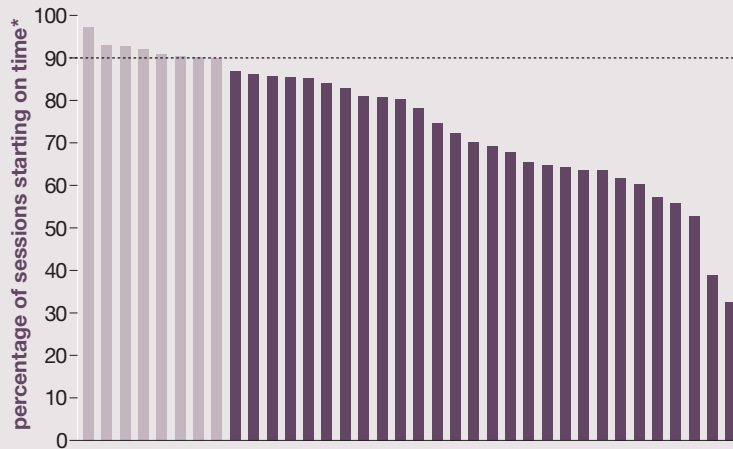
Even in cases where trusts have operating theatre information, headline figures can give false comfort. For example, it is possible to achieve high utilisation rates (perhaps even 100% of available time) by overrunning sessions. But this has knock-on consequences for following sessions, even leading to some cases on the next list being cancelled.

To achieve high utilisation trusts need to ensure that:

- the first patient is ready for anaesthesia to start promptly
- patient flows to and from theatre run smoothly
- elective operating lists are constructed in a way that makes the most of the operating time available
- sessions finish close to the scheduled time.

**Chart 2: wasted theatre time**

**In the best run operating theatres, 90% or more sessions start on time**



\*within 15 minutes of schedule

Source: District Audit database of operating theatres within trusts

#### Case study 5: making better use of available time

One trust in the north east had 3,500 planned sessions per year across seven theatre suites. Overall, 96% went ahead, but time utilisation within those sessions was poor. Just seven of the 20 specialties met or exceeded the target of 90% utilisation, with nine specialties falling below 75% and four falling below 50%.

Our analysis highlighted this poor performance and reported that if time utilisation in each specialty was raised to at least 85%, then 685 more elective procedures could be carried out each year, reducing waiting lists.

Theatre time utilisation has improved since our review and is now above 85% overall.

#### Case study 6: making best use of staff

A trust in the south east has invested in a formal programme of education and training for its theatre staff, leading to the development of a highly qualified, multi-skilled workforce. This enables the trust to have greater flexibility in the way it staffs theatre sessions and allows staff to pursue a broader range of skills. The trust has seen positive results from this – it has high staff retention and low staff sickness levels.

Another trust has introduced a theatre staffing strategy that features:

- new generic grades for all theatre staff
- clear definition of roles, responsibilities and competencies
- specialty team principles and practices
- individual performance review.

## FLEXIBLE STAFFING

Traditionally, operating department assistants and nurses were in separate teams with separate management. Over time, the roles became blurred and the Bevan Report in 1989 recommended merging the roles under a unified grade to introduce greater flexibility.

Some trusts now have a common grade and pay spine with a high percentage of staff skilled in a number of roles (multi-skilling) to work with surgeons, anaesthetists and in recovery. The benefits of multi-skilling are:

- it reduces costs because it creates a larger pool of staff who can provide cover
- it reduces session cancellations because staff can cross over to perform other roles as needed
- it brings all the benefits of team working.

## IMPROVED PLANNING

Theatre resources are often allocated on a historical basis, with extra sessions squeezed in when new consultants are appointed. Theatre time allocation can bear little relation to the need associated with the procedure being performed, or to the number of cases being dealt with by individual surgeons in their allocated time slots. This can lead to over-utilisation in some specialties and poor utilisation in others. Trusts need to regularly review the theatre timetable using data on actual performance to ensure that theatre time is used to the full.

### Case study 7: benefits of better planning

At one recently merged trust we found both under- and over-use of sessions. Some specialties had cancellation rates of 10, 20 and 30%, compared to the good practice level of 5% observed elsewhere. At the same trust, we identified other specialties that persistently overran sessions by 25%. We devised, and agreed with the trust, a reallocation of sessions that would lead to more efficient utilisation and allow more operations to be performed.

## GETTING BETTER

Over the 10 years that we have been involved in auditing operating theatres, we have encountered many examples of good practice. This section contains a number of examples of areas where we have:

- identified existing good practice
- made recommendations for improvement that trusts have since gone on to implement
- identified areas for trust improvement leading to increased numbers of operations or cost savings through better use of existing resources.

### THEATRE ACTIVITY

Using established performance standards and others based on observed good practice, District Audit has identified many trusts that could improve their performance by reducing cancellations and increasing the utilisation of held sessions.

#### Case study 8: improving efficiency

At one trust in the north west of England, we identified the potential for a further 3,000 operations per year – this equates to around 12 operating theatre sessions a week and unproductive annual staff costs of £450,000.

At another trust we identified the potential for a further 3,600 operations per year, equating to unproductive staff costs of £320,000. These improvements could be achieved by raising the numbers treated to the standards achieved by other trusts.

Our recommendations helped to increase theatre utilisation at a further trust from 83% in 1993 to 97% in 1997.

One reason for lists finishing early is when operations are cancelled. At one Midlands trust, cancellations due to a lack of beds (ordinary, not critical care beds) was a significant problem, which seemed worse in Urology, where a lack of liaison between surgeons led to overbooking. Operations had to be cancelled at short notice because there were no beds for patients after they left theatre. The trust took action following our report, and made the admissions manager responsible for making up lists on behalf of the four urologists. This ensured beds were not double-booked and addressed the source of half of the trust's total cancelled sessions.

### REDUCING CLINICAL RISK

At a trust in the south of England, we identified a potential clinical risk where non-emergency operations were being carried out after midnight, against NCEPOD guidance. This is a time when there is less access to experienced staff and support, so clinical risk is greater. As a result of our recommendations, the trust now has a prioritisation scheme based on NCEPOD scoring, and has incorporated this into a new list-booking protocol – reducing clinical risk.

#### Case study 9: reducing clinical risk

A Midlands trust we visited has appointed a trauma co-ordinator whose role is to attend ward rounds, assist in the compilation of lists, and co-ordinate investigations and procedures. This co-ordination of trauma operations reduces clinical risk because it ensures the most appropriate care is given to patients from assessment through to post-operative care.

## CLINICAL SELF-REGULATION

Whilst managers may be ultimately responsible for the performance of operating theatres, user groups can act as a powerful force for change. However, trusts should ensure that these are properly organised, involve the right people, and have the information and influence they need to make a difference.

### Case study 10: involving staff

One trust had a theatre user group, but there were mixed views on its effectiveness. Meetings were held outside normal working hours and attendance was invariably poor; many meetings were cancelled due to a lack of participants.

In an effort to provide more focus and improve attendance, the group was reformed with a selection of executive directors, clinical directors and senior directorate managers. While the group functioned for some time with this composition, a lack of user input was hampering communication and hindering the resolution of theatre problems.

We recommended that the group's membership should include theatre staff and users, not just directors and managers, and that the meetings should be held during the working day whenever possible, with staff given time to attend.

- planned versus actual start and finish times
- patient cancellations with reasons
- reasons for early starts and finishes.

The trust can now hold informed discussions with theatre users leading to an improvement in utilisation of the theatres.

## IMPROVING INFORMATION

We advised a trust in the Midlands to take a serious look at the quality, quantity, production and recipients of its management information. The trust needed to decide what to report, how to report it, when and to whom to report. The trust has tackled this problem head on and, nine months later, among other indicators, can now summarise by consultant and speciality:

## CLOSING UP

For positive change to take place in the way operating theatres work, several factors must come together.

**First:** an impetus for change. There is little doubt that this exists at national policy level. Trust boards should regularly ask themselves the question *could we improve the efficiency of our operating theatres?*

**Second:** good quality information. Without this, managers will not even know that there are efficiency improvements to be had, and our experience is that many trusts do not look beyond an encouraging set of headline figures, regardless of how unsound they may be.

**Third:** awareness of what is possible. This can come from a variety of sources. National standards are a good starting point, but it is often better to see things working in practice in other trusts. A good proxy for this can be a 'critical friend', like a specialist performance auditor. Our specialists have first-hand experience of how trusts manage their operating theatres and access to our national network, enabling them to spread best practice nationwide.

District Audit will continue to shine a light into the arrangements for operating theatre provision – especially as we have found that improvement is not a once-and-for-all thing. Trust reconfiguration can have a dramatic effect on operating theatre performance; changes in workload patterns can also mean that previously effective theatres suddenly start to show a decline in performance.

Despite these challenges and the pressure from the requirements of the NHS Plan, we remain optimistic about the prospects for improvement in operating theatre performance. Our reviews have shown that, with the right approach, improvement is always achievable. There are plenty of examples of excellent quality in the management of operating theatres in the NHS, and we hope this short report will act as a stimulus for those where performance is not yet as good as it could be to focus on this crucial area of work.

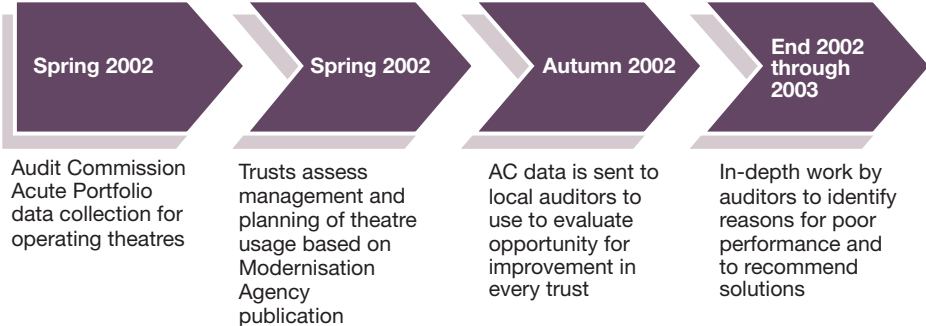
# FURTHER WORK

This year the Audit Commission has included operating theatres as one of four topics in its Acute Portfolio. For the first time, the four topics (beds, operating theatres, outpatients and patient waits and flows) are linked – highlighting the integrated nature of the services under review. The acute portfolio process begins with a major data collection exercise this spring. The data will be analysed and provided to auditors, who will investigate further where the information indicates there may be opportunities for improvement.

The NHS Modernisation Agency has collected good practice on managing cancelled operations from several sources, including District Audit, in its publication *Tackling Cancelled Operations*. A diagnostic tool has been developed alongside this guidance together with the self-help steps trusts should take to improve performance in this area.

# TO FIND OUT MORE ABOUT DISTRICT AUDIT

This bulletin has given a brief flavour of our work and findings in operating theatres. If you would like more information about anything you have read in this bulletin, please contact your District Auditor, local audit manager, or our Business Development Directorate on 0121 224 1114.





DISTRICT AUDIT

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