



THEATRE EFFICIENCY

Safety, quality of care and optimal use of resources

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To be reviewed by 2008

1. Summary

- Good administrative systems and organisation are essential to ensure theatre efficiency.
- Staffing levels must match clinical activity.
- The operational layout of theatres should be such that the flow of patients through the system is facilitated.
- A pre-operative preparation area can improve theatre efficiency.
- Fully resourced, dedicated daytime emergency and trauma lists are essential.
- Operating lists should begin and end at agreed times.
- All day operating lists may improve efficiency.
- Up-to-date, clear information about operating lists must be available and any changes agreed.
- An adequately-staffed recovery unit must remain open during all periods of activity.
- High dependency and intensive care units should have clearly defined admission and discharge policies.

2. Introduction

- The key elements in the efficient use of operating theatres are: effective management and good communication, trained staff, appropriate facilities, equipment, and operational layout.
- Good utilisation depends on a complex interaction between the availability of personnel and resources and on the attitudes and good practice of all staff involved.
- Efficiency in theatre is inevitably influenced by a huge range of surrounding resources such as pre-operative planning and assessment, beds, theatre sterile supply unit (TSSU) capacity and staffing levels in other disciplines.
- A good system of planning and scheduling in theatre will enable more work, including emergencies, to be carried out at a reasonable time, improve the patient and carer experience, and improve employee satisfaction and morale.

3. The Patients' Perspective

Anaesthetists, as all clinicians, are particularly concerned with safety, efficiency and good practice. It is important to note and respond to the concerns of patients. Data from 'Had an operation?' the NHS Modernisation Agency's Theatre Project pilot questionnaire to patients, show that patients principally want short waiting times and to have the operation on the agreed date. They would also like the following:-

- Choice of dates for operation
- Choice of transport to theatre where clinically appropriate
- Provision of a new date immediately if an operation is cancelled
- Provision of written documentation to explain procedure and process
- Staff to greet and introduce themselves to patient and explain what they are doing
- Adequate time to read consent forms and opportunity to ask questions
- Privacy for discussions with medical and nursing staff
- Information about treatment of any postoperative pain and sickness, anticipated progress and what to expect following discharge home
- A name to contact if they experience any problems following discharge ^[1]

4. Planning the Patients' Pathway.

- A significant non-clinical reason for cancellation of elective surgery is the unavailability of beds ^[1]. In-patient surgical beds often become available later in the morning as patients are discharged and can be utilised if patients are either admitted to a pre-operative unit or transferred to a discharge lounge post-operatively.
- Efficiency can be improved by admitting all patients to a pre-operative preparation area on the day of surgery ^[2]. This can be integrated with pre-operative assessment and day case recovery areas adjacent to theatres to provide an efficient use of space and skilled staff, and facilitate transport to and from theatre.
- These units should be designed with due regard to the patients' perspective in section 3 e.g. privacy.
- If there are no beds, patients should be contacted by telephone in good time to prevent an unnecessary journey and the patient must be offered another binding date within a maximum of the next 28 days ^[3].

5. Theatre Design and Operational Layout.

- As surgical and anaesthetic procedures become more complex, operating theatres need to be larger and multi-purpose to accommodate specialist equipment such as imaging.
- The operational layout of theatres should be such that the flow of patients through the system is facilitated. Delays can happen at any point in the process and can be minimised with good communication and transport systems.
- There should be good internal communication and IT systems within the theatre complex to facilitate contact and appropriate supervision.

6. Theatre Management Structure

- There should be a single **Director of Theatre Services** with full budgetary authority, adequate sessional allowance, accountability, information systems, and administrative and secretarial support.
- The director should be a senior member of staff ^[4], with a clear understanding and experience of working in operating theatres and ability to take a broad view across various specialties.
- Where budgets are devolved to specialist services or departments in the trust, robust mechanisms must be in place to ensure accountability and safe running of the theatres services as a whole.
- Day-to-day running of theatres should be in the hands of a **Theatre Manager**, a senior nurse or ODP who works within the theatre complex, has no conflict of duties and is directly accountable to the Director of Theatre Services.
- The theatre manager should be responsible for maintaining communication with staff groups, and ensuring competent staffing and suitable equipping of all theatres.
- There should be a system for planning theatre activity to allow the theatre manager to allocate staff efficiently, and to respond safely and flexibly to changes in routine. This will involve close co-operation with surgeons and anaesthetists.
- The theatre manager should develop local policies to ensure that planned surgical activity in printed or electronic form is clearly posted, well in advance and in all appropriate locations. It should include starting time, running order, the names of the operating surgeon and anaesthetist, and the consultant surgeon and anaesthetist in charge.
- Policies should be developed for dealing effectively with changes in published operating lists.
- Departments of Anaesthesia and Surgery should have an identified consultant, usually the 'rotamaker', who is responsible for ensuring that all operating lists are staffed with a suitably trained clinician and that, where possible, medical staff are reallocated to cover for absence.
- Where surgical activity is carried out in widespread locations within the hospital or trust, it is important that close co-operation, at medical, nursing, ancillary and managerial level, exists between all theatre areas.
- The theatre management team should regularly audit utilisation, cancellations, list overruns and late starts. (See sections 8, 11 and 12).
- **Theatre User Groups** provide an opportunity for communication between staff and management and can be useful both to promulgate new ideas, agree strategy and to report on the effectiveness of current policy.

7. Staffing

- Departments of anaesthesia should provide a system for staffing that works locally and is acceptable to staff ^[4]. The following comments may be equally applicable to surgical staff.
- Clinical Directors must ensure that departmental staffing matches clinical activity, is sufficient to cover elective and emergency operating lists, and to deal with the unexpected. Departments should therefore **not** plan to run to 100% capacity.
- Fixed sessions of variable content facilitate cover for absences, although unavoidable absence at short notice remains a problem. Consideration should be given to including at least one such session in job plans.
- If cross-cover within the department is used, it is important that the anaesthetist has the appropriate range of skills ^[5].
- A robust system of booking leave must exist within the department of anaesthesia to enable the 'rotamaker' to plan ahead.
- Booking arrangements in the outpatient clinic should anticipate problems such as pre-arranged holidays.
- During normal working hours, an identified consultant anaesthetist should be available in the complex to support trainees and the theatre management team.
- Anaesthetists and surgeons must have dedicated skilled assistance. Many hospitals are currently experiencing severe shortages of suitably-trained staff due to high workload, low pay and poor morale. Hospital management must be made aware of these problems and be asked to facilitate local pay or benefit agreements.
- Being made to feel a valuable part of the team, working in a well managed, efficient theatre will improve morale and increase staff retention.
- Adequate orientation time should be made available for all agency and locum staff.
- Adequate staffing must be provided to cover the tasks of data entry (see section 12) and transcription of operative notes.

8. Operating List management

- Close communication and co-ordination between the pre-operative area and theatre using agreed procedures is essential.
- A receptionist and/or theatre manager should liaise closely with ward and transport staff. Electronic links sending for and identifying patients may be used.
- Up-to-date information about operating lists must be available and all personnel informed of any changes as soon as they are decided.
- In theatre, a suitably staffed and equipped holding area for patients will assist with the smooth running of the lists.
- Patients must be ready for theatre when they are sent for and theatres should liaise closely with the ward and bed manager at all times, particularly if the order of the operating list has been changed.
- The incidence and reason for all cancellations, delays and overruns should be logged and reviewed by the theatre management team. A 'Cancelled Operations Toolkit' is available from the Modernisation Agency Theatre Programme ^[1].
- Policies on, for example, fasting, anticoagulation, shaving, dentures, jewellery, appropriate underwear and removal of make-up should be developed, applied and audited.
- Unsedated patients can walk to theatre with a patient escort. Otherwise patients need to be transported on a bed, trolley or wheelchair.
- Units should develop policies to decide what level of training is appropriate for patient escorts
- It is important that sufficient transfer staff are available during all operating times and that they are based in theatre with no other conflicting duties. Consideration should be given to a flexible system in which staff from other areas of theatre provide transfer assistance when possible.
- All personnel involved in transfer of patients, including medical staff, should receive instruction in moving and handling.
- There must be a documented system of identification and handover of the patient.
- Multiple checks can increase patient anxiety and cause confusion and should be reduced to a safe minimum.
- As well as wristband identification, it is important that, where possible, patients identify themselves actively e.g. state their name and date of birth. This also applies to confirmation of 'side' of operation.

- There is little evidence to show that inside and outside trolleys reduce infection or that taking beds into theatre increases it, providing the bed linen is changed prior to transfer ^[6]. Providing the bed or transfer trolley can tip and is of adjustable height, patients can be transferred directly to the anaesthetic room.
- The recovery unit must be suitably staffed and equipped, be of sufficient capacity and remain open during all periods of activity. Shift patterns should pay attention to the peaks of activity occurring mid morning and afternoon and the later start and finish to the normal working day compared to theatres.
- High dependency and intensive care units should have agreed admission and discharge policies to prevent blockage of beds. A lead clinician in Critical Care, using established guidelines and ensuring proper communication between staff groups, can provide a vital role ^[7]. A system of booking elective admissions should be in place although a check of bed availability must be made before proceeding with anaesthesia for elective surgery ^[8].

9. Effective Utilisation of Theatre Time for Elective Surgery

- It is important that all lists begin and end at times agreed and adhered to by all theatre users. The advantages of this include:-
 - Anaesthetists will have time to visit patients pre-operatively before the agreed start of the operating list.
 - Timely preparation of patients for theatre.
 - Increased ability to match staff to workload in theatres and recovery units.
 - Staff can take meal breaks, reducing fatigue
 - A reduction in the need for overtime
 - A prompt start in the afternoon with less chance of overrun into the evening.
 - Realistic scheduling of meetings, professional and other commitments ^[9].
- The start of a theatre session is defined as, ‘when the anaesthetist takes charge of the (first) patient in preparation for anaesthesia’ and the end as, ‘when the anaesthetist has finished handing the (last) patient over to recovery staff and is free to start another task’ ^[10].
- It is important that lists are scheduled in such a way that surgical and anaesthetic time is synchronised. For example, infectious patients should be put on the end of the list to avoid delays caused by contamination of the theatre; patients requiring only local anaesthesia administered by the surgeon and no monitoring by an anaesthetist, at the beginning or the end of the list. Pooling of such patients onto one list may enable the anaesthetist to be reallocated.
- Realistic scheduling of procedures will avoid cancellation of operations. Potentially long operations should be identified and planned in such a way that it is possible to complete them within the time available.
- Computerised collection of data on operating times of individual surgeons and anaesthetists for different procedures makes it relatively easy to predict probable overruns and automatically flag this up to the medical secretary or scheduling clerk who can alert the surgeon to rearrange the list.
- Operating lists may over-run due to unforeseen circumstances; dealing with this should not involve the use of the emergency team.
- All-day lists using the same theatre team, including surgeon and anaesthetist can be particularly efficient and should be encouraged. There should be provision

for meal and comfort breaks, however, and overall operating time should not be in excess of the number of planned sessions.

- Scheduled evening lists have been implemented in some trusts with mixed success. ^[11].
- Day surgery lists increase overall efficiency and usually have a high utilisation time. Effective utilisation is increased by the provision of purpose-built self-contained and autonomous premises ^[12].
- It is both unreasonable and unfair to rely on the anaesthetist to instigate curtailment of overrunning lists by cancellation of scheduled cases. A culture of good time keeping within the operating theatre, encouraged and enforced by the theatre manager, will facilitate such decisions.

10. Trauma and emergency surgery

- Reports continue to highlight the problems which arise with ‘out-of-hours’ surgery ^[4,5].
- Only cases that cannot be delayed for good clinical reasons should be operated on at night e.g. after 21.00.
- One reason for cancellation of elective operations continues to be inadequate provision of theatres and staff during the day for emergency cases ^[1].
- Provision of exclusive daytime emergency and trauma lists or an additional third evening session in dedicated, fully-staffed, suitably-equipped and conveniently-situated operating theatres, will enable as many as 80% of all emergencies to be dealt with during the normal working day ^[13].
- The benefits of organising emergency work during the day and evening include a reduced requirement to provide resident theatre staffing after the late shift and a reduction in sleep disturbance for on-call anaesthetists and surgeons.
- **Emergency lists should be organised and staffed by senior anaesthetists and surgeons working to a fixed sessional pattern with no other commitment to routine work or outpatient clinics ^[4,14]; this is pivotal to the success and efficient running of such lists These lists should not normally be used for non-emergency surgery**
- 'Consultant anaesthetists, surgeons and hospital managers should together plan the administration and management of emergency admissions and procedures. In order to avoid queuing for theatre space it may be necessary to nominate an arbitrator in theatres who would decide the relative priority of theatre cases ' ^[15].
- Many patients requiring immediate emergency admission can be scheduled for surgery early on the next day. Less urgent cases can be discharged home with written instructions to return suitably fasted the next morning, possibly to a day unit, for scheduled surgery.
- Good communication enables clinical decisions to be made rapidly, more operations to be carried out safely in a given time, senior presence for the sickest and most complex cases, and a high standard of care.
- The emergency anaesthetist must be given time to assess emergency patients. It may be more efficient for another anaesthetist to see the patients as part of his or her duties and liaise with the emergency anaesthetist.
- A full plan of action must be recorded in the patient's records and initiated pre-operatively.

- Many elderly patients scheduled for trauma surgery are cancelled at short notice because of inadequate preparation for theatre. Inexperienced surgical trainees often fail to understand the increased challenge to anaesthetists posed by elderly patients, who often have multiple and complex medical problems.
- Pre-operative assessment in the elderly will benefit from a team approach involving cross-specialty advice from anaesthetists, surgeons and physicians ^[16,17].

11. Cancellation/Postponement of Surgery

- It is deeply distressing to a patient to have an operation postponed on the day of surgery and economically wasteful both for the patient and the NHS.
- Many cancellations could be avoided with good pre-operative assessment, effective bed management and better communication between patient and hospital, and between staff groups within the hospital.
- Data from the nine pilot sites of the NHS Theatre Project ^[1] show a variety of reasons for cancellation of surgery at short notice, [Appendices 1 and 2].
- The management team should undertake a regular review of all cancellations.

11.1 Dealing with the patient whose operation has to be postponed for non-clinical reasons:

- Local procedures should be developed for dealing with cancellation of surgery at short notice. A senior member of the team should visit the patient as soon as possible after the decision is made and offer an appropriate apology and an explanation. 'The patient must be offered another binding date within a maximum of the next 28 days or funding provided for treatment at the time and hospital of the patient's choice' ^[3].
- The patient should be provided with something to eat and drink as soon as possible, access to a telephone and offered help with arrangements for transport home if appropriate.
- There should be full documentation of the reasons for cancellation, the explanation given and any action taken in the patient's record.

11.2 Dealing with the patient whose operation is cancelled for clinical reasons:

- It may be necessary to cancel an operation because of a new or inadequately-treated medical condition, or exacerbation of chronic illness.
- Most pre-existing medical conditions should be detected and treated following screening and/or in the pre-operative assessment visit, providing pre-assessment is carried out within two weeks of admission ^[18].
- In the event of the system failing, the patient deserves an appropriate apology and an explanation.
- It is unacceptable to cancel surgery without arranging suitable referral or treatment. It is the responsibility of the clinician to document exactly what investigations and/or treatment are required and the responsibility of the pre-operative assessment team to ensure that this is carried out.
- A review of the reason for failure of the system should be carried out.

12. Data Collection and Audit

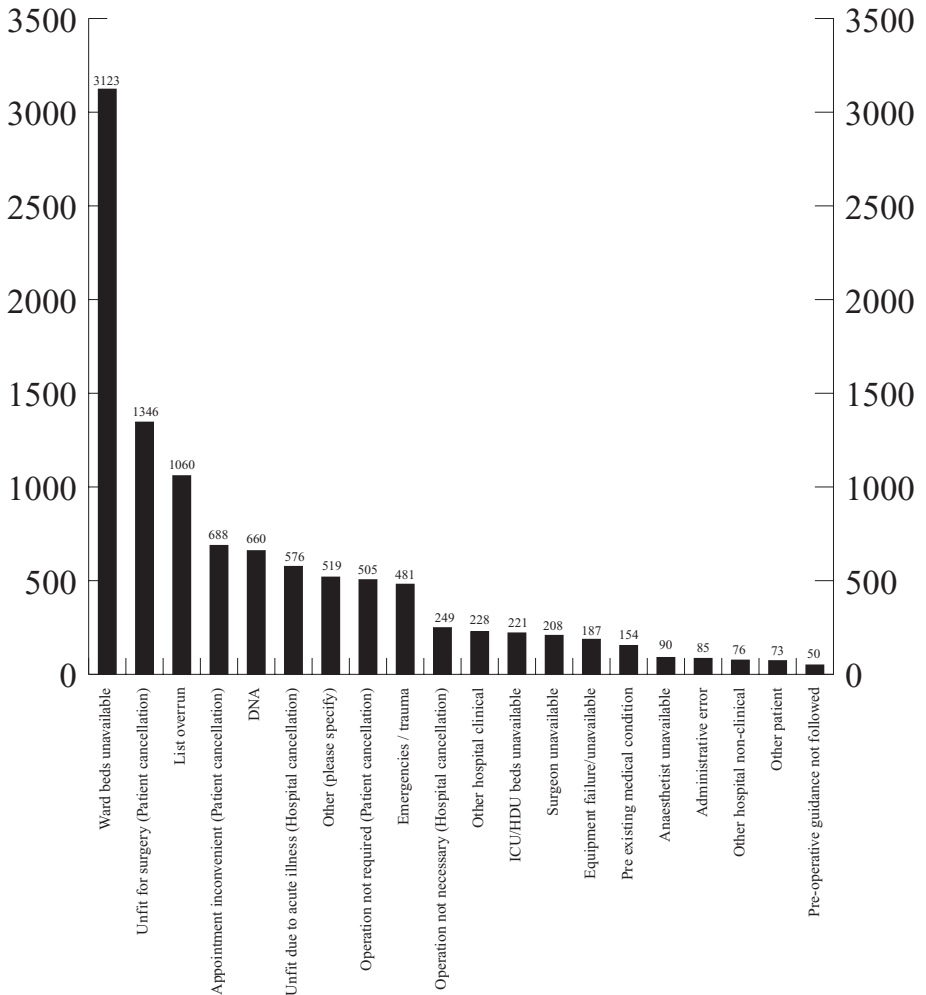
- The NHS is undergoing a widespread modernisation plan that includes improved use of information technology.
- Hospital Episode Statistics (HES), a division of the Department of Health, collects data on patient episodes, including operations. These data are quite crude and currently give little information about the anaesthetic.
- From April 2004, HES will record considerably more data on operations, including the type of anaesthetic, identity of the anaesthetist, ASA grade and NCEPOD code. Some trusts may have difficulty providing this information, and it is important that local managers understand its importance.
- At the time of writing, an AAGBI working party that includes members of HES, the NHS Information Authority (NHSIA), the Society for Computing and Technology in Anaesthesia (SCATA) and the RCA is working collaboratively to produce a suitable and useful dataset for anaesthesia.
- There will be local issues about collecting appropriate information and anaesthetists should be involved in specifying these systems. This will normally be done through the procurement process for Electronic Patient Records (EPR).
- Data should only be collected once, and in real time rather than by retrospective entry. Data collected as part of the clinical process will improve reliability. Anaesthetists must be aware of the security and patient confidentiality issues relating to systems they use.
- Good data collection systems in operating theatres are crucial to the increased efficiency of theatre utilisation. Records should be kept of operation, anaesthetic, recovery and transfer times (key stages in the patient's journey), any equipment shortages, reasons for cancellation and critical incidents. This will enable effective audit of the problems and stimulate change required to improve efficiency. This activity will require time and staffing (see sections 7,8 and 11).
- Electronic booking of patients for most operations is planned by 2004. This will result in change to the organisation of patient care. Anaesthetists must be involved in developing these changes, such as organised pre-operative assessment. During the lifetime of this document, it is anticipated that better data will become available enabling investigative audit leading to improved theatre efficiency.

13. References

1. NHS Modernisation Agency. Theatre Programme. Step Guide to Improving Operating Theatre Performance. June 2002.
2. Kerridge R, Lee A, Latchford E, Beehan SJ, Hillman KM. The Peri-operative System: a new approach to managing elective surgery. *Anaesthesia and Intensive care* 1995;23:591-6.
3. NHS Plan. A plan for investment. A plan for reform.
4. Audit Commission. Anaesthesia Under Examination. The Efficiency and Effectiveness of Anaesthesia and Pain Services in England and Wales. December 1997.
5. Functioning as a Team : The 2002 Report of the National Confidential Enquiry into Peri-operative Deaths (1.4.2000-31.3.2001).
6. The Association of Anaesthetists of Great Britain and Ireland. *Infection Control*. November 2002.
7. The Association of Anaesthetists of Great Britain and Ireland. The High Dependency Unit-acute care in the future. February 1991.
8. Department of Health. *Comprehensive Critical Care : A Review of Adult Critical Care Services*. May 2000.
9. Department of Health *Improving Working Lives Standard*.
10. The Royal College of Anaesthetists. *Raising the Standard*. February 2000.
11. The Allocation and Use of Trauma & Orthopaedic Operating Theatres in Two English Regions. A report by Dr. M. Harley, Mr R. Jayes and Prof. J. Yates IACC University of Birmingham Feb. 2000.
12. The Association of Anaesthetists of Great Britain and Ireland. *Day Case Surgery. The Anaesthetists Role in promoting High Quality Care*. February 1994.
13. The effect of a dedicated emergency theatre facility on emergency operating patterns *Journal of the Royal College of Surgeons of Edinburgh* 1998;43:17-19.
14. *Changing the way we operate : The 2001 Report of the National Confidential Enquiry into Peri-operative Deaths (1.4.1999-31.3.2000)*.
15. *Who operates when? : The 1997 Report of the National Confidential Enquiry into Peri-operative Deaths (1.4.1995-31.3.1996)*.
16. *Anaesthesia and Peri-Operative Care of the Elderly. The Association of Anaesthetists of Great Britain and Ireland*. December 2001.
17. *Extremes of Age : The 1999 Report of the National Confidential Enquiry into Peri-operative Deaths (1.4.1997-31.3.1998)*.
18. The Association of Anaesthetists of Great Britain and Ireland. *Pre-operative Assessment. The Role of the Anaesthetist*. November 2001.

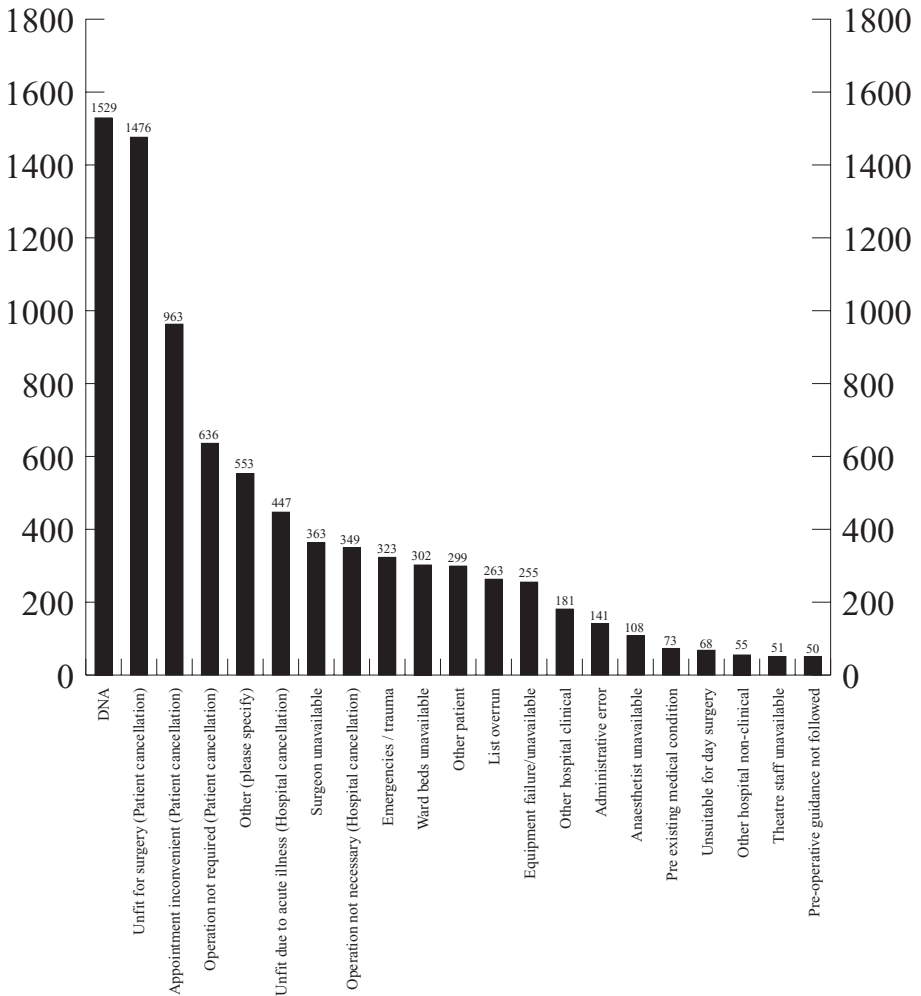
APPENDIX 1:

Cancellation affected by pre-operative assessment on the day or day before surgery for inpatients



APPENDIX 2:

Cancellation affected by pre-operative assessment on the day or day before surgery for day case patients





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