Operating theatre etiquette, sterile technique and surgical site preparation

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Abstract

The operating theatre is an unusual environment and understanding the systems in place there is an important part of surgical training. 'Non-technical skills' is a term used to describe everything a surgeon does in the operating theatre, other than the technical aspects of the procedure itself. This includes communication, decision making and leadership. Non-technical skills have become a vital aspect of the development of a surgeon and should form part of training programmes. A fundamental responsibility of the surgeon is the maintenance of sterility. The techniques of the surgical scrub and preparing and draping a patient only become second nature after good teaching and reflection by the surgeon. The purpose of this article is firstly to describe how a surgical trainee can get the most out of an operating session. We will describe what non-technical surgical skills are and why they are important. We will focus on safety in the operating theatre and discuss worldwide strategies such as the 'Surgical Safety Checklist' that aims to improve this. Finally we will present data on measures to reduce surgical site infection, such as which surgical scrub solution to use and whether drapes or wound protectors work.

Keywords Double gloving; face mask; handwash; non-operative skills; NOTSS; surgical brief; surgical safety checklist; surgical scrub; theatre etiquette; wound protector

Introduction

The operating theatre can be an intimidating environment for the uninitiated. The purpose of this article is to describe the most appropriate behaviour for the operating theatre, particularly for those at the beginning of surgical training. As well as the technical aspects of surgery, modern training emphasises so-called 'non-technical skills'. These describe all aspects of operating theatre behaviour other than the technical aspects of the procedure itself. To maximize the educational value of time spent in the operating theatre, trainees should prepare themselves adequately. This will involve familiarization with the patients on the list, the staff in the theatre, and the procedures being performed. The use of surgical checklists is particularly useful and all theatre users should be familiar with the local protocols used. We will go on to describe the guidelines and latest evidence relating to sterile technique used in scrubbing, preparing the operation site and draping.

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Theatre etiquette

Preparing for a surgical list

Every theatre session is a training opportunity, regardless of the seniority of the trainee. Trainees usually gain maximum benefit from a theatre session if they have looked at the cases on the list before attending. Meeting each patient, becoming involved in the consent process and looking up scans and test results prior to the list will all give a better understanding of the patient's condition and the need for surgical management. It is also helpful to read about surgical techniques and procedures on a more practical level and to have an understanding of the anatomy that will be involved to further compound learning during each case.

Introducing the team

Good communication in theatre is crucial. It is important that all members of the theatre team are introduced to each other prior to surgery commencing. When working in a new theatre department for the first time, always ensure that you are wearing correct surgical attire in line with hospital policy. Surgical 'scrubs', a theatre hat and appropriate clean footwear that has not been worn outside are the essential minimum.

Always wear an identification badge and on entering the department introduce yourself to the members of the team present that day. In particular, present yourself to the theatre sister, anaesthetist and the operating surgeon if not a member of your usual team. Always ensure the theatre sister and scrub nurse know who you are — as well as being polite and respectful as a relatively new member in their environment, these colleagues can make life a lot easier when you start a new post, particularly for more junior trainees. They are likely to have worked with the consultant for a long time and will have a good knowledge of different surgeons' preferences, suture and instrument choice.

Surgical safety checklist

As part of the World Health Organization's (WHO) Safe Surgery Saves Lives initiative, in January 2007 the World Alliance for Patient Safety developed the WHO Safe Surgery Checklist.[1] Most surgical departments have now implemented these checklists, and their aim is to identify and prevent the most common risks to patients having surgery. There are three main phases in which a checklist is used: before the induction of anaesthesia ('sign in'), before the incision of the skin ('time out', also known as the 'surgical pause') and before the patient leaves the operating room ('sign out').[1]

Use of a checklist creates a culture that firmly focuses on safety. Checklist contents (Figure 1) can be adapted to local needs, and WHO provides an implementation manual to guide users in the individual setting.

The National Patient Safety Agency (NPSA) published a document in December 2010 entitled 'Five steps to safer surgery'. This gives guidance on the implementation of the WHO checklist and also describes a briefing and debriefing stage as a time to discuss important information regarding the safety of the patient.[2] In 2009 there were 155,000 reports of patient safety incidents from surgical specialties in England and Wales.[2] Over

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World Health Organisation Surgical Safety Checklist[1]

World Health Organization

SURGICAL SAFETY CHECKLIST (FIRST EDITION)

Before induction of anaesthesia ▶▶▶▶▶▶▶▶▶ Before skin incision ▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶ Before patient leaves operating room

SIGN IN

- ☐ **PATIENT HAS CONFIRMED**
  - IDENTITY
  - SITE
  - PROCEDURE
  - CONSENT
- ☐ **SITE MARKED/NOT APPLICABLE**
- ☐ **ANAESTHESIA SAFETY CHECK COMPLETED**
- ☐ **PULSE OXIMETER ON PATIENT AND FUNCTIONING**

DOES PATIENT HAVE A:

KNOWN ALLERGY?
- ☐ NO
- ☐ YES

DIFFICULT AIRWAY/ASPIRATION RISK?
- ☐ NO
- ☐ YES, AND EQUIPMENT/ASSISTANCE AVAILABLE

RISK OF >500ML BLOOD LOSS (7ML/KG IN CHILDREN)?
- ☐ NO
- ☐ YES, AND ADEQUATE INTRAVENOUS ACCESS AND FLUIDS PLANNED

TIME OUT

- ☐ **CONFIRM ALL TEAM MEMBERS HAVE INTRODUCED THEMSELVES BY NAME AND ROLE**
- ☐ **SURGEON, ANAESTHESIA PROFESSIONAL AND NURSE VERBALLY CONFIRM**
  - PATIENT
  - SITE
  - PROCEDURE

ANTICIPATED CRITICAL EVENTS

- ☐ **SURGEON REVIEWS:** WHAT ARE THE CRITICAL OR UNEXPECTED STEPS, OPERATIVE DURATION, ANTICIPATED BLOOD LOSS?
- ☐ **ANAESTHESIA TEAM REVIEWS:** ARE THERE ANY PATIENT-SPECIFIC CONCERNS?
- ☐ **NURSING TEAM REVIEWS:** HAS STERILITY (INCLUDING INDICATOR RESULTS) BEEN CONFIRMED? ARE THERE EQUIPMENT ISSUES OR ANY CONCERNS?

HAS ANTIBIOTIC PROPHYLAXIS BEEN GIVEN WITHIN THE LAST 60 MINUTES?
- ☐ YES
- ☐ NOT APPLICABLE

IS ESSENTIAL IMAGING DISPLAYED?
- ☐ YES
- ☐ NOT APPLICABLE

SIGN OUT

NURSE VERBALLY CONFIRMS WITH THE TEAM:

- ☐ **THE NAME OF THE PROCEDURE RECORDED**
- **THAT INSTRUMENT, SPONGE AND NEEDLE COUNTS ARE CORRECT** (OR NOT APPLICABLE)
- ☐ **HOW THE SPECIMEN IS LABELLED** (INCLUDING PATIENT NAME)
- ☐ **WHETHER THERE ARE ANY EQUIPMENT PROBLEMS TO BE ADDRESSED**
- ☐ **SURGEON, ANAESTHESIA PROFESSIONAL AND NURSE REVIEW THE KEY CONCERNS FOR RECOVERY AND MANAGEMENT OF THIS PATIENT**

THIS CHECKLIST IS NOT INTENDED TO BE COMPREHENSIVE. ADDITIONS AND MODIFICATIONS TO FIT LOCAL PRACTICE ARE ENCOURAGED.

Figure 1

1000 of these incidents caused severe harm or death. In 2009 the NPSA issued a safety alert to NHS organizations and in 2010 a requirement was introduced in England and Wales for all NHS Trusts to implement an adapted WHO Safety Checklist and to record and monitor the use of this tool.

The NPSA guideline describes a 5 minute briefing 'before the start of the list that will enable the core team to meet and discuss the requirements of that list, including safety concerns, equipment and staffing'.[2] This may also include special instructions for patient positioning and antibiotic prophylaxis. It also describes a debriefing stage during which any concerns or incidents can be discussed with team members to promote improvement.

Non-technical skills for surgeons (NOTSS)

The NOTSS project was developed by a team of surgeons, psychologists and anaesthetists and acts as a framework for training and assessment of non-technical skills in the operating theatre. It is necessary for surgeons to develop these non-technical or non-operative skills in conjunction with their clinical and surgical skills. Four areas are included in the assessment framework: *situation awareness*, *decision making*, *communication and teamwork*, and *leadership* (Table 1). It incorporates ideas from similar systems used in professional training elsewhere in industry, and has been developed to enable surgical trainers to implement it in the operating theatre with minimal difficulty. The skills taxonomy shown in Table 1 can be used to assess key competencies including professionalism, interpersonal and communication skills, and systems-based practice.[3]

In a prospective observational study published in 2011, the NOTSS system was used to assess surgical trainees' non-technical skills.[4] This study found that minimally trained assessors were sufficiently discriminating and consistent in their judgements of trainee surgeons' non-technical skills to provide reliable scores based on an achievable number of observations.[4] These assessors included scrub nurses, anaesthetists and surgical care practitioners.

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