

Edited by  
**Comus Whalan**

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# Assisting at Surgical Operations

A Practical  
Guide



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**Assisting at  
Surgical Operations****A Practical Guide**

There are many superb books on how to do operations but there are few or none on how to assist at them, and none written either by or for medical students or doctors. Therefore, the skills that make an expert surgical assistant are difficult to acquire. Normally, they can only be learnt in a haphazard way, by spending years in the operating theatre.

This book describes those skills in a concise and systematic way, in surgery in general, and in ten different speciality areas. Although intended mainly for clinical-level medical students and junior doctors, other people who assist at surgical operations, including general practitioners, nurse assistants and surgical technologists, will also find it useful.

Whether planning a career in surgery, or simply aiming for high marks in a surgical rotation, there are few better ways to impress a surgeon than by skilfully assisting at surgical operations.

**Dr Comus Whalan** is a Visiting Surgeon, Noarlunga Health Service, Adelaide, South Australia.



# Assisting at Surgical Operations

## A Practical Guide

Edited by

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# Foreword

Despite continual turmoil in medical structures and hierarchies, the surgeon remains the principal individual responsible for the performance of an operation within the confines of the operating theatre. While the ultimate decisions for the procedure and the conduct of the operation remain largely in the hands of the surgeon, the successful performance of any surgery requires a well-trained and committed team. This team involves not only anaesthetists, nursing staff, orderlies, but also the surgical assistant. When a team of such committed individuals are brought together for the performance of surgery, simple or complex, the outcomes will be optimised when the environment in which all are working is skilful, focussed and competent. To this end the surgical assistant needs to be well trained and familiar with not only the instruments, tools and techniques of the operating room, but also their role in providing expert assistance to the surgeon. This book provides the basic guide for aspiring assistants so they can better understand the equipment they are using and the purpose of their assistance at surgical interventions.

All surgeons have had to progress through a period of time as a surgical assistant. Some surgeons are able to rapidly train their assistants to provide the support and skill they require to make the operation they are performing look surprisingly easy. Other surgeons have little idea how to best utilise the assistant that is made available to them. As a trainee surgeon, my knuckles were repeatedly bruised by a surgeon quick to point out my faults by the use of instruments being applied to the back of my hand as I held the retractor! Other surgeons created an atmosphere in the operating room that was unnecessarily stressful, while others behaved in a fashion that was rude, condescending and insulting to a professional colleague. These individuals, while scarred on my memory, have done little to encourage one to assist well, involve oneself in a learning experience and gain satisfaction from the conduct of a well-orchestrated surgical procedure.

Assisting at operations is not necessarily second nature to many surgeons and, indeed, some very competent surgeons make appalling assistants. It is true,

however, that the very best surgeons often make extraordinarily good assistants. They understand the important tissue planes, how to hold instruments to best display the anatomy, and are able to provide helpful guidance for a trainee or an experienced surgeon.

The need to focus on the skills required of excellent surgical assistance is long overdue. This book provides such a guide and will be of immense value to all levels of surgical practitioners. Beginners will gain some insight into the range of activities required of an assistant and the experienced surgeon will be able to reflect on their own practice and consider which aspects could be improved or modified.

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# Preface

Assisting at a surgical operation is an important task, and one that in my opinion, is sometimes under-appreciated. Without a skilful surgical assistant, all operations become more difficult. This added difficulty may not matter much in simple operations, but in complex ones, it matters a great deal. It may make the difference between a complex operation being merely challenging for the surgeon, and it being unsafe or almost impossible. Most surgeons would be reluctant to perform a complex operation without skilful assistance.

Surgery, and assisting at surgery, is a manual craft. In any manual craft, no expert can be created by simply reading textbooks on the subject. However, it is my hope that this book will hasten the process. I hope that it will help the reader to acquire more rapidly, information that previously has largely been obtainable only in a haphazard manner by spending years in the operating theatre.

The purpose of this book is to describe the general principles and techniques, which help to make a skilful surgical assistant in any specialty of surgery. However, some surgical subspecialties do require of the assistant, certain additional skills, which are described in the relevant chapters by my subspecialist colleagues.

It is not the book's intention to describe particular operations in detail. Indeed, specific operations are only mentioned where they are useful as examples, or where the assistant has a specific important role. To include here, a comprehensive description of all the various surgical operations in all the surgical specialties would obviously require a very large (and therefore very expensive) set of texts. Furthermore, it would also merely duplicate information that is already easily available elsewhere, in a number of superb textbooks of operative surgery. The reader is referred to some of these in the section 'Suggested further reading'.

There are places in the text where I am unflattering to my fellow surgeons. This is because I believe an accurate portrait is more useful than a flattering one. My intention is neither to omit blemishes, nor to paint them bigger than they truly are. Nor do I suggest that every surgeon has all the blemishes described in this book, any more than every patient suffers from all known diseases. If any of my

colleagues is offended by my descriptions, I respectfully suggest that, while he or she may be free of all these flaws, most of the rest of us are not so lucky.

The subspecialty chapters were written by my friends and colleagues, whose names appear alongside each. While I may have added, subtracted or altered a few sentences here and there in each chapter, I cannot claim credit as a co-author for any of them. Some of the wording may be mine, but the wisdom is theirs.

I do not claim to have devised any of the techniques described in this book. Rather, other surgeons taught them to me during my years of surgical training. I have merely written them down and drawn pictures of them.

I would like to thank my parents Mrs Elizabeth Whalan, and the late Emeritus Prof. Douglas Whalan, AM LL.M PhD, for their love, understanding and encouragement; all my friends and colleagues who contributed to this book; the staff at Cambridge University Press, especially Peter Silver and Emma Pearce; the operating theatre staff at Noarlunga Hospital for allowing me to photograph surgical instruments; all the surgeons who trained me, for putting up with my undoubted imperfections, and my wife Ange for the same reason, but on a larger scale.

# Introduction to the operating theatre

## **A note on terminology**

In the United States, the term 'operating room' or 'OR' is used, while in Australia and the United Kingdom, it is referred to as an 'operating theatre'. In the author's opinion, the word 'room' is probably more accurate. Unfortunately, however, if you use this term in Australia, listeners may think that your only operative experience has consisted of watching American television programmes.

Confusion sometimes arises over the correct way to address surgeons. That is, some surgeons use the title 'Mister' while others use 'Doctor'. Since all surgeons are doctors, it might seem logical that they should all be addressed as 'Doctor', and indeed, in the United States and Canada this is the rule. However, in the United Kingdom, the Republic of Ireland and some Commonwealth countries, the title 'Mister' is usual. This custom arose for a good reason: until the nineteenth century, most surgeons were not doctors at all. That is, in the present-day system, in order to train as a surgeon, one must first graduate from medical school. Previously, this was not required; an apprenticeship system existed. The title 'Mister' is simply a customary reminder of those earlier times (Loudon, 2000). (Although some surgeons might argue that surgeons calling themselves 'Mister' are more correct than other medical practitioners calling themselves 'Doctor'. This is because the word 'doctor' is Latin for 'teacher', and there are those who argue that the title should therefore properly be reserved for people holding a doctorate degree, i.e. a Ph.D. or similar qualification.)

To make matters more confusing, the broad geographical rules described above are subject to much regional and even local variation. That is, in some hospitals,

only some surgeons will use the title 'Mister'. For example, in some hospitals, it is customary to address only consultant surgeons as 'Mister', while senior registrars (even if fully qualified) are called 'Doctor'. Even then, some consultant surgeons in Commonwealth countries prefer to be addressed as 'Doctor', for a variety of reasons of their own. Most female surgeons use the title 'Doctor', but some prefer 'Miss' or occasionally 'Mrs' or 'Ms'.

Although these may seem petty matters, some surgeons are offended by being addressed as 'Doctor', while others equally dislike being addressed as 'Mister'. The only reliable way to know the preferred form of address is to ask either the surgeon, or some other reliable local source.

This book refers throughout, to '*the* assistant' at surgical operations. However, at some operations, more than one assistant may be present. Sometimes this is simply to teach more people, but at larger operations, it is often because more than one extra pair of hands is needed. In this case, the assistants are often given the specific titles of 'first assistant', 'second assistant' and so on. These roles imply certain positions at the operating table. Exactly where that position is, will vary depending on the operation, but the first assistant is the person who is most directly involved in assisting the main surgeon (e.g. by providing counter-traction, see p. 51). The second assistant usually has a less active role, for example holding retractors and cutting suture material, sometimes interspersed with periods of relative inactivity. It is best to establish beforehand, who is to be first or second assistant. This helps both assistants to avoid feeling an uncomfortable uncertainty about 'who should do what'.

A third reason for more than one assistant being present, is simply that the operation is done in two parts with two primary surgeons, each with their own assistant(s). In this case, each primary surgeon may have first, second and subsequent assistants. Each team may operate simultaneously (if operating in different parts of the body), or sequentially (if operating in the same area), or a combination of both. Examples of operations involving two primary surgeons operating simultaneously, include abdomino-perineal resections of the rectum (where the abdominal and perineal parts are performed simultaneously), and many oesophagectomies (where the thoracic and abdominal parts are performed simultaneously). An example of a sequential operation, is a major resection of a cancer of the oropharynx, where the cancer is resected by a team of ear, nose and throat surgeons, and the resultant defect is repaired by plastic-reconstructive surgeons.

# General conduct in the operating theatre

## ■ Relationship with theatre staff

Just like people anywhere else, theatre staff will usually react favourably to being treated like human beings instead of automatons. Like most normal people, if you are kind to them, they will help you. Often they teach you useful things about the operating theatre, which surgeons do not know. Just about everyone in an operating theatre is expert at something. Even the unassuming theatre orderlies usually know quite a lot about the various machines in the theatre. They are sometimes the only people who can fathom the mysteries of obscure operating table functions.

The words 'please' and 'thank you' are not commonly used during operations. This is not because surgeons have an abrupt, impolite manner (although unfortunately, some of them do), but rather because it eliminates words that may be mis-heard, and so makes a request easier to understand. That said, simple politeness seldom annoys people, so it is not wrong to say 'please' and 'thank you' if you speak clearly.

If you are on your first trip to the operating theatre, you may feel unsure about how to do some apparently simple things. In this case, the best thing to do is simply ask for advice from an experienced staff member. This particularly applies to scrubbing, gowning and gloving (see p. 36–42). You may be proud of the fact that you are already capable of washing your hands and dressing yourself unaided. However, these seemingly simple acts are done in the operating theatre in ways that vary subtly but importantly from the way they are done elsewhere. You will almost certainly do them wrongly the first time, if you do not ask someone to supervise you.

Always try to conduct yourself in a friendly, professional way. For example, be respectful to patients, even when they are under general anaesthetic. This is for at least three reasons. Firstly, and most importantly, it is simply professional courtesy. Secondly, if you have walked into the operating theatre after the operation has started, it is possible to believe mistakenly that a patient is under general anaesthetic,

when he or she is under regional anaesthetic such as a spinal. Thirdly, it is possible that a patient under general anaesthetic will still be able to hear you and remember what you say. This poorly understood phenomenon, known as awareness, is thankfully rare, occurring in about one to two cases per thousand (Sebel *et al.*, 2004).

A careless unkind remark about the patient's physique under either of the second two circumstances may haunt you for a long time. A simple rule is to avoid saying anything in the presence of an anaesthetised patient, which you would not say if he or she were awake.

An extension of this point, is that it is best to avoid making comments suggesting that the operation is not proceeding well. In particular, comments suggesting that the surgeon is not doing a good job are almost never helpful. If the patient is awake, either one of these types of remarks will cause him or her great anxiety. Even if the patient is under deep general anaesthesia, such remarks will not endear you to the surgeon.

**Punctuality** helps to create an illusion of excellence, even where none exists. Operating theatres are extremely expensive to run (perhaps £35 (US \$70) per minute, depending on the method of calculation used), so if you are asked to assist at an operation, try to ensure you arrive on time. If you are early, make the most of your time. Familiarise yourself with the patient and the disease (see 'Preparing for operation' p. 21). It is important to realise that, once you have agreed to assist at an operation, this is a commitment that should not be broken. If you have other important engagements (such as tutorials), into which the operation may run, you must explain to the parties involved in this second commitment, that you may be delayed. It is inexcusable to desert a patient (and surgeon) and leave them without an assistant.

**Delays** in starting an operation are very common in the operating theatre, and sometimes these can be for several hours. There are innumerable reasons for this. For example, an important pre-operative blood test may not yet be available, the patient may not have fasted for the required time, or the theatre may still be occupied by a previous operation that has taken longer than expected. Therefore, if you are studying, it is worth making up and carrying with you, pocket-sized cards with study topics summarised on them. Anatomy topics are particularly useful, because a lot of information can be put on one small card or diagram. That way, if you are delayed, and have run out of things to do, you can read these and so not waste time. Obviously, you can also use the cards anywhere else where you may have a few idle minutes (e.g. standing in a queue at the supermarket). Alternatively, you may use a hand-held computer for the same purpose.

The general way in which most operations are done, does not vary much between one surgeon and another, and even between one continent and another. However, surgeons sometimes attach a good deal of significance to these little variations. Indeed, some can become quite displeased at any variation from their routine, even if this variation may be perfectly reasonable practice. Although as an assistant, you may feel that the surgeon's displeasure is petty or even childish, it is best just to accept it. The reason it occurs is mostly that the surgeon has found a particular method works well in his or her hands. Therefore, he or she becomes reluctant to try a different method, which may not work so well. Your path will be smoother if you learn 'your' surgeon's routine.

## ■ **Medio tutissimus ibis. [The middle course is safest and best.]**

Ovid (b. 43 BC) [in Bulfinch, 1919]

This ancient quotation applies today in the operating theatre, as it does in many situations in life outside it. It is something of a recurring theme in this book. For example, it applies when cutting sutures (p. 57), when providing counter-traction (p. 51), when releasing clips (p. 82) and when 'following' sutures (p. 88). It also particularly applies to: (a) how active you should be as an assistant, (b) 'stress' and (c) talking in the operating theatre. These topics are discussed further below.

### **Activity versus passivity**

When assisting at operations, try to steer the middle course between being a passive retractor-holder, and being overly helpful to the point that you become intrusive and the surgeon feels you are trying to take over the operation. This is comparable to a good restaurant waiter, who steers the middle course between ignoring customers (on the one hand), and omnipresence (on the other). Sometimes this can be difficult, but generally, how closely you steer between passivity and activity depends on how experienced you are in comparison to the surgeon. Occasionally, when the assistant is very experienced (e.g. when a consultant is assisting a registrar), it can be difficult to tell who is the assistant and who is the primary operator. Early in your career, it is better to err on the side of being unobtrusive.

### **Stress**

For obvious reasons, an operating theatre can be a stressful place, not only to the patients entering it, but also to staff working there. Psychologists tell us that people

perform tasks at their best when they are neither over-stressed, nor so under-stressed that they are bored. Therefore, try to keep yourself in the middle ground, even if others around you are not. This applies both to other staff members, including the surgeon, and to the patient. Remember that an operation that seems minor or even trivial to the staff, is not trivial to the patient (See also 'Concentrate on your task', p. 24).

## Talking in the operating theatre

Although this may seem a trivial topic, it is not. The impression you create amongst the operating theatre staff is probably as much dependent on what you say, and when you say it, as what you do. Continuous light-hearted banter during a difficult operation will annoy even the most placid surgeon. On the other hand, unwavering monastic silence may make you seem timid and unsociable.

It can be difficult to know when to talk and when not to. Generally, this will depend on a number of factors, some of which are obvious, but some of which are not. These factors include the surgeon's individual preference, the complexity of the operation about to be performed, and whether or not it is an emergency. For example, some surgeons insist on absolute silence while they are operating, while at the other end of the spectrum, some surgeons seem to prefer the continuous sound of music, or their own voice. Most occupy the middle ground, where talking is only unwelcome during some parts of the operation.

Even travelling to work prior to a complex operation such as a pancreaticoduodenectomy ('Whipple's procedure'), most surgeons will be thinking about the operation and will not be particularly interested in light social banter. Their mood is a little similar to students about to sit an examination. This seemingly unsociable attitude will also show itself during the 'tricky bits' which are usually found in the middle of any operation, but may be absent once that part is over (see 'general stages common to all operations' p. 30).

If you feel the need to speak during an operation, you may find it helpful to pause first, and classify your intended conversational subject matter into categories in order of importance. For example, your intended topic may be one of the following:

- 1 Important things you must say immediately, if you think a serious mistake is about to be made, for example 'an instrument may be left in the abdomen if we close it now'.
- 2 Questions you would like to ask about the operation.
- 3 General information about the patient, or about medicine in general.
- 4 Unrelated social banter.

Having classified your intended topic, decide if it is appropriate to the setting.

It is perfectly reasonable to ask a surgeon prior to an operation, whether or not you can ask questions during it.

## ■ Pagers and mobile (cell) phones

These devices inevitably cause disturbance, and some surgeons even ban them from the operating theatre while they are operating. Unless it is essential that you be contactable immediately (e.g. if you are on emergency call), try to keep them either outside the operating theatre, diverted elsewhere, or switched off.

In some operating theatres, clerical staff at the front desk are employed to answer pagers and mobile phones belonging to staff in the operating theatre. Otherwise, if you are at the operating table, other nursing or medical staff in the theatre must answer them for you. This can sometimes create friction: the other staff may sometimes resent answering your calls, because it interrupts their other proper duties, and because they feel (with some justification) that they are being used as your personal secretary. Therefore, if you find yourself with no alternative but to take your pager or mobile phone into the operating theatre, other staff will be much more understanding if you explain your situation, and apologise in advance for any inconvenience it may cause.

For some reason, the location of a ringing pager or mobile phone can be surprisingly difficult to pinpoint by ear. Consequently, if there is more than one pager or mobile phone in the theatre, staff may have difficulty working out which one is ringing. Therefore, the devices are best kept a metre or two apart, but so that they are easily visible. Although this may seem a small point, when you are dependent on someone else doing you a favour to answer your pager, it saves him or her the irritation of having to pick up several different pagers, simply to discover which one is ringing.

Surgeons often forget to remove mobile phones and pagers from their pockets before scrubbing. This means that when the device rings, other staff in the operating theatre must rummage around in the surgeon's pockets in the middle of an operation. This is usually slightly embarrassing to both rummager and rummagee. If you are so fond of your device that you must have it in your pocket, the back pocket of your scrubs is probably the easiest place from which to retrieve it.

## ■ Food and drink

These are not permitted in the operating theatre, although of course they are encouraged in the tea-room. It is wise to enter the operating theatre with a full

stomach and an empty bladder whenever possible. This is especially so when the case you are about to assist at may take several hours. Although this may seem obvious, one is often in a rush to 'get to theatre'. It is too easy to omit a sandwich and quick glass of sustaining beverage, and so condemn yourself to spending the next few hours feeling uncomfortable. As a consequence, your enjoyment of and learning from the operation will be decreased, as will your ability to concentrate on the task. Except in dire emergencies, few will begrudge you a quick break.

## ■ If you feel faint

It is common for this to occur early on in your career. Presumably, it occurs from the hypotensive effects of standing still for long periods in a warm environment, coupled with the mediaeval spectacle of human viscera on open display. While faintness is embarrassing, it is far better to admit to it early on, and be excused to sit down, rather than try to continue and then fall face-first into the surgical wound.

The risk of faintness can be reduced, though not eliminated, by ensuring you are well hydrated before entering the operating theatre. Periodically contracting your leg muscles may also help, by reducing venous pooling. Because of the obvious need to wear standardised theatre clothes, little can be done to avoid overheating by modifying your clothing. You may improve matters slightly by wearing cooler underwear (especially, avoiding thermal underwear), and perhaps by choosing a cloth gown rather than a waterproof one.

## ■ Know dimensions

During an operation, it is common for a surgeon to ask that you place an instrument in a certain site, with an accompanying description in centimetres or millimetres. In particular, surgeons often request that a suture be cut to a certain specified length (e.g. half a centimetre). Although it is only a small point, when you have a spare moment outside the operating theatre, it is useful to check with a ruler, that you know how long half a centimetre is. This seems to be one of those odd facts, which we often think we know, when we do not. That way, when you are asked to cut a suture a certain length, you will be able to do so reasonably accurately. A rough guide, which can be used intra-operatively, is that an average adult man's index finger is about 2 cm broad at the distal phalanx.

# Universal Precautions

It hardly needs stating that it is possible to acquire disease from your patient during an operation. 'Universal Precautions' is the name given to a set of recommendations which are aimed at minimising the risk of this occurring in the operating theatre and elsewhere. The recommendations mainly aim to reduce transmission of blood-borne viral diseases such as HIV/AIDS and the various forms of hepatitis, especially Hepatitis B and C. However, there are other diseases (both known and as yet unknown) against which Universal Precautions will, or at least should, help to protect you. The key principle of Universal Precautions is that every person should be treated as though he or she has one of these diseases, regardless of his or her known or supposed infection status. In the operating theatre, Universal Precautions measures include double-gloving, and wearing a waterproof gown, a mask and proper eye protection such as an eye shield or safety glasses.

## ■ Transmissible disease in the operating theatre

This can occur in several different ways, but the commonest are needle-stick injuries and splash of body fluids into the eye. Infection can also be transmitted by the patient's body fluids coming into contact with an open wound (e.g. a cut on the finger with a hole in the glove). For this reason, it is strongly recommended that you follow your hospital's policy on immunisation. Most hospitals advise that you should be immunised against Hepatitis B.

## ■ If you suffer a needle-stick injury

Most hospitals have an Occupational Health and Safety Department, and in the larger ones, there is usually a member of that department available after normal office hours. Most hospitals also have standard protocols to be followed in the