

英文原版教材



Clinical Anatomy 临床解剖学

A core text with
self-assessment

STANLEY MONKHOUSE



北京大学医学出版社

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self-assessment**

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北京大学医学出版社
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Stanley Monkhouse
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Using this book

This chapter explains how a big subject like anatomy, covered by some other textbooks in over 1000 pages, can be squashed into a small book like this. It also explains how the book is organised, and why, and gives some tips on how to study. In short, this introductory chapter aims:

1. to help you plan your learning
2. to show you how to use the book to increase your understanding as well as your knowledge
3. to show that self-assessment can make learning easier and more enjoyable.

Philosophy of the book

The effective diagnosis and management of disease, whatever the cause, depends upon some knowledge of structures that may be involved. In many disease conditions, symptoms and signs result not only from changes in the affected organ, but also from effects on neighbouring structures and from the spread of disease to them. This is why as a medical professional you need to know something about how the body is put together.

It is possible to learn anatomy in great detail. This has at least two disadvantages. Firstly, it is mind-numbingly boring, and secondly you may be lulled into a false sense of security: there is much variation from person to person, and from birth to death. So a choice has to be made: it has to be recognised that some items of information are important, and some are not; lines have to be drawn between 'need to know' and 'nice to know'. My decisions about where to draw these lines have been based on over 25 years of teaching and reflecting upon clinical anatomy, on over 10 years as a full-time or part-time medical practitioner, and on extensive experience as an examiner in all types of situations (discipline-based exams, integrated exams, postgraduate exams, exams for health care workers other than medical students). The questions I have asked myself when deciding whether or not to include something have generally been 'does it matter to the junior hospital doctor or general practitioner?' and 'does it aid the understanding of an important topic?' If the answer to both these questions is no, then the topic has been omitted. There are plenty more comprehensive books on the market that can be consulted if you want a more in-depth account.

Having said that, there are several topics that are considered in some depth. This is either because they are important and such knowledge is generally clinically useful, or else because a little more detail will, I hope, clarify a complex picture. In such situations I have tried to make it clear that you need not bother with the details. Also, from time to time I stray into physiology and other disciplines if I think it helpful to do so: my experience is that these short digressions are sometimes just the things that help important information to stick. The text, therefore, is more than just lists and bullet points for cramming: it is a mixture of zoological principles, functional and clinical considerations, and opinions. I hope that the inclusion of some explanatory material will stimulate rather than bore you, and that it will not obscure the basics.

Layout of the book

Section 1 (Chs 1–9) includes a consideration of anatomical terminology, followed by a brief survey of the body organised by the main physiological systems – this is systematic anatomy. In Section 2, from Chapter 10 onwards, the body is considered in more depth by region, one chapter for each major region. Within a chapter, each main topic is preceded by an overview and learning objectives. Use these as checklists so that nothing of major importance passes you by. The numerous clinical boxes scattered throughout the text will provide some focus for your study, and I recommend not only that you read these, but also reflect upon them. How are the symptoms produced? What other symptoms could accompany them? Might the manifestation of the disease depend upon anatomical variations? These are some of the questions that you should ask yourself.

Approach to study in general

I am a disorganised and undisciplined student and so I feel unworthy to offer advice to anyone, other than the following:

- Make a plan with realistic targets, but be prepared to adjust it if necessary.
- If a course and guidelines are available, attend and heed them diligently.

- Read about, and reflect upon, all learning material within 1 or 2 days of having considered it, and at most within a week.
- Discuss your studies with friends and colleagues (and I include educators as colleagues). You cannot be certain you have 'got' something until you have successfully explained it to someone else. (The look on the face of a previously perplexed student when the penny drops is one of the things that attracted me to teaching.) It also follows, then, that you can serve others by listening to their explanations. Such two-way sessions will probably be the most productive time you will ever spend educationally.
- If your goal is to pass an examination, find out everything you can about the format of the examination and get hold of as many past papers as possible. Then, when you feel you have done enough work, try to do the papers under exam conditions and discuss your answers with someone else – an examiner if possible, or a colleague if not.
- There is more to life than work: ignore this at your peril.
- Above all, think imaginatively.

Self-assessment

Questions are provided at the end of Section 1, and subsequently after each chapter. Do not be surprised to see that within these questions, the same items of information are tested in more than one question type: this is deliberate.

Multiple choice questions

You are required to mark each statement as true or false. Remember that within a group of five responses, all may be correct, or all may be incorrect. Negative marking is used in some centres, and not in others, so you would do well to find out what you will be confronted by. The combination of negative marking and guessing when you do not know the right answer is not recommended! These questions can easily be adapted to several formats: the simple true/false question; or the more complex, where the answer depends upon which responses are correct from each group of five.

Matching item questions

In these questions you must choose the option from the list provided that best fits the given statement or question. This type of question, not normally associated with negative marking (although there is no reason why it could not be), is used in United States licensing examinations, and similar exams for other

bodies, and is used by several undergraduate schools. These questions can easily be adapted to fit multidisciplinary ('integrated') assessments.

Short answers

Some of these questions require single items of information that may be needed in answering 'filling in the gaps' questions. Others require more extended responses in which there are several different ways of presenting the information, the choice being left up to you. In these, try to limit yourself to no more than one page, and aim to complete these longer questions well within 10 minutes. It is very important that you answer the question that is asked: if specific items of information are requested, you must give them: by all means give additional information if you wish, but not at the expense of what is required. Once again, the topics asked in these short answer questions can easily be adapted to fit multidisciplinary ('integrated') assessments, and you may find it useful to try to construct these questions for yourself.

Essays

I have not provided any titles for essay questions because I can see no purpose served by essays in clinical anatomy that is not better served by short notes, and from the point of view of the marker, short answers are much easier and quicker to deal with. If you are unfortunate enough to be confronted by anatomy essays, many of the short notes topics would serve.

Viva questions

As a visual subject, anatomy has traditionally been associated with visual recognition tests using photographs, living models or displayed specimens. This component of anatomy has traditionally been tested in viva voce (oral) exams. From a clinical point of view, it is essential that you are able to point to where something is: being able to write about it is of minor importance. I base most such assessments in which I am involved on radiographs and surface anatomy live models, using simple clinical skills to test anatomical information. As visual examinations, these assessments can be computer based, and some people, though by no means all, find the impersonal nature of computerised exams less challenging than being forced to indulge in conversation with a real live examiner!

Compose your own questions

You will find it very beneficial to try to construct your own examination questions, and then to produce your

own model answers. This will highlight some of the difficulties, and it may give you some sympathy for the poor examiner.

Conclusions

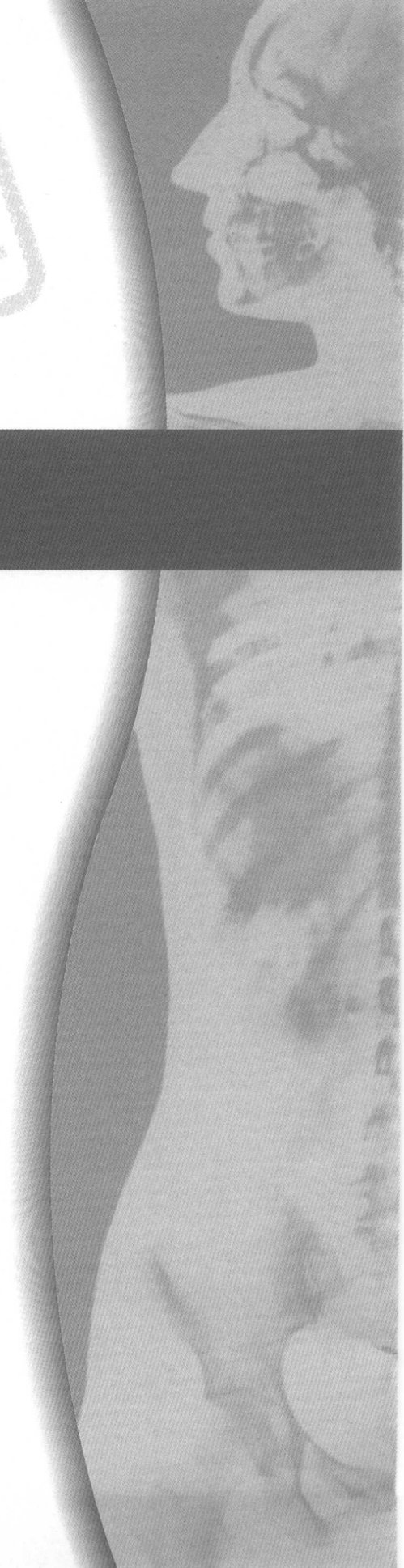
You should amend the framework for using this book according to your own needs and the examinations you are facing. Although rote learning can not entirely be avoided, your aim should always be the acquisition of an understanding of the principles involved, rather than simply the tedious memorisation of a large number of apparently unrelated facts.



1

SECTION 1

Systematic anatomy



1

Introduction

Studying anatomy

Anatomy is a visual subject: ideally, you need to see, touch and feel to get an idea of three dimensions. When you read a portion of text you should try to picture the structures concerned: dissected parts and a good anatomical atlas, whether on paper or computer, will help.

Different people study differently, and some find an understanding of three dimensions easier to come by than do others. Nevertheless, as a basis for study I recommend that you use the nervous system and the main arteries, together with the following conceptual framework, common to all living things:

- we reproduce
- we seek sustenance
- we absorb and distribute nutrients
- we excrete waste products
- we try to prolong our own existence; and
- we endeavour to control these processes.

Surface markings and vertebral levels

The surface projection of internal organs is important

since it forms the basis of the clinical examination of a patient. When you read about any structure, the heart for example, you should try to picture the body and relate the printed word to a precise location. Better still, get a friend to be a surface anatomy model (it is no good looking at yourself in a mirror because right and left are the wrong way round).

The horizontal level of a structure in the body is described by reference to the vertebra(e) at the same level – that is to say in the same transverse plane. This is known as ‘the vertebral level’.

Both surface markings and vertebral levels are important and useful in the clinical context.

Study Figure 1.1 and note that:

- the suprasternal notch is at vertebral level T2
- the sternal angle is at vertebral level T4
- the xiphoid process is at vertebral level T9 (about)
- the surface marking of the gall bladder is the tip of the right ninth costal cartilage (at the anterior end of the ninth rib). Its vertebral level is L1.

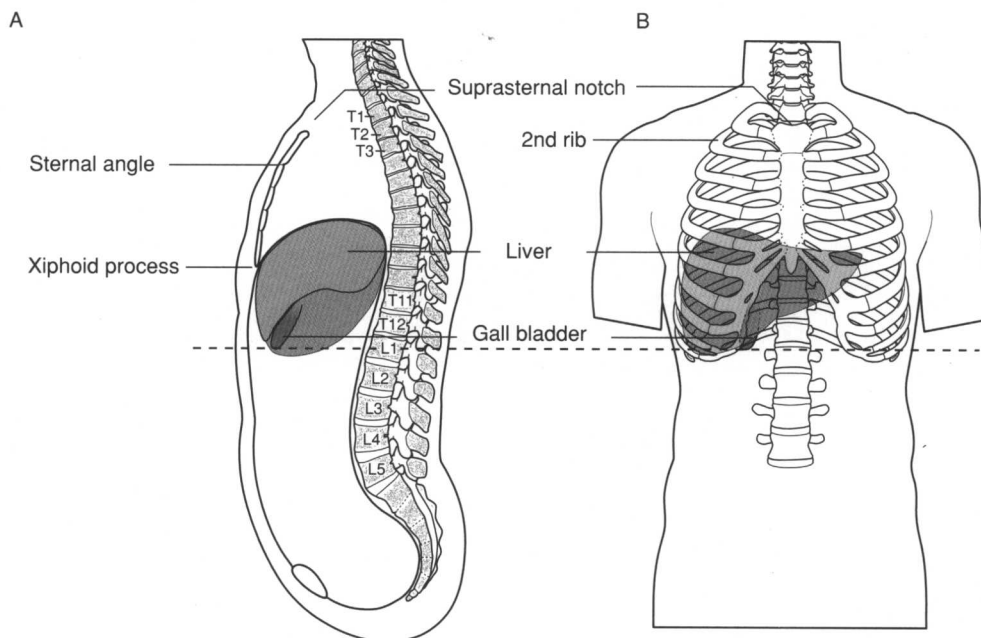


Fig. 1.1 Vertebral levels and surface markings using the gall bladder and liver as examples. (A) Trunk: medial sagittal section. (B) Trunk: anterior view.

Regional anatomy and systematic anatomy

The cardiovascular and nervous systems are found in all parts of the body. The respiratory system is in the head, neck and thorax. The alimentary system is in the head, neck, thorax, abdomen and perineum. To study anatomy by systems is relevant to the particular system, but wasteful since it means that, for example, different parts of the thorax must be studied on different occasions for several systems. Study by systems also fails to give an appreciation of the fact that disease knows no boundaries: a bronchial carcinoma may cause symptoms in more than one system because the carcinoma may involve adjacent structures. Both approaches, systematic and regional, are important and after a superficial survey of the anatomically important systems, a regional approach is used in this book.

Prenatal development

Knowledge of prenatal development is necessary to understand how congenital anomalies arise, and it helps in appreciating why the structures of the body are as they are. Development itself is a consequence of history – the succession of living things – and of the demands of the embryo for nutrition and survival. This

is not a textbook of embryology, or of anthropology or evolution, but occasional references to these topics will be made where it seems helpful.

Variation

You should bear in mind when you are studying anatomy or examining a patient that variations are found, and in some organs and systems, for example superficial veins, variations are common. Nevertheless, there are 'averages' and it is these, given in this book, that you should be familiar with.

Eponyms

Angle of Louis, foramen of Winslow, Hirschsprung's disease – who are these people? Why do we continue to use their names? Such eponyms are commonly used in medicine despite the best efforts of grey men and women to abolish them. They remind us of history and of personalities and they are sometimes easier to pronounce than the proper names. In this book I use the more commonly occurring eponyms, and give the proper names with them. You will hear eponyms used by others sooner or later, so you might as well start now.

2

Words and the anatomical position

2.1 Anatomical position

2.2 Singular and plural

2.3 Colloquial or correct?

9

9

9

Relations: caution!

This word is used a great deal. It simply means geographical neighbours and it passes no comment on similarity. Related structures might be similar (e.g. arch of aorta and pulmonary artery), or they might not (arch of aorta and left main bronchus). The oesophagus is related to the left atrium of the heart – they are close neighbours (and this may matter clinically), but they are dissimilar in form and function.

Overview

Studying the medical sciences involves learning a new language, more than half of which is anatomical. A brief excursion into words and grammar is both desirable and necessary, and Table 2.1 gives some of the most commonly occurring words, prefixes and suffixes that you are unlikely to have met before in this context.

Planes and movements (Figs 2.1, 2.2)

Study Figures 2.1 and 2.2 and understand the meaning of the terms: you will need them in clinical work.

Learning Objectives

You should:

- be able to describe and demonstrate the anatomical position
- be able to demonstrate planes: coronal, sagittal, transverse
- have a reasonable working knowledge of the terms in Table 2.1
- try to discern the different components of medical and anatomical terms.

2.2 Singular and plural

Many anatomical and medical words are from Latin and Greek with plurals that are formed in ways other than by simply adding 's' or 'es'. A few of the more obvious examples are given in Table 2.2. Refer back to this table as necessary: as you become more familiar with its contents, you will be able to predict the meanings of new words when you encounter them for the first time.

2.3 Colloquial or correct?

2.1 Anatomical position

Many words and descriptions assume the use of a standard position in relation to which surfaces and movements are defined. This is the anatomical position in which the body is pictured as standing erect with the palms of the hands facing forwards. This reference position is used irrespective of posture: your hand is *always* distal to your elbow, and your head *always* superior to your chest, even if you are upside down.

When you stand in the anatomical position, your head is superior to your chest. In everyday language you say that your head is above your chest. Strict anatomists frown at colloquialisms like this, but they are in common use. In this book I switch between correct and colloquial terms as seems most natural to me. On the whole, I prefer the colloquial in the hope that readability is more important than pedantic fastidiousness. You need to remember, though, that the matter takes on great importance when the patients are lying down, as they so often are.

Table 2.1 Commonly used words, prefixes and suffixes

| Term | Meaning and example |
|--------------|---|
| ab- | Away from. Abduct: move away from midline |
| ad- | Towards. Adduct: move towards midline |
| adeno- | Related to glands |
| afferent | Travelling towards. Afferent nerve impulse: towards the brain and spinal cord |
| anastomosis | Network (usually arteries or veins) receiving inputs from more than one source (plural: anastomoses) |
| anterior | Front (with reference to anatomical position); see ventral |
| -blast | Primitive cell or structure which gives rise to other cell type or structure. Osteoblast: primitive bone-forming cell. See -cyte |
| brachial | Pertaining to the arm (shoulder–elbow) |
| branchial | Associated with the entrance to the digestive system derived from primitive buccopharyngeal structures. Branchial structures are the successors of the gill apparatus in fish |
| bronchial | Pertaining to the bronchi |
| cancer | Malignant tumour |
| carcinoma | Cancer of epithelial (rather than connective tissue) origin |
| cardiac, -um | Heart |
| caudal | Nearer the tail (or where it would be). The kidneys are caudal to the diaphragm |
| cephalic | Nearer to, or pertaining to the head |
| coronal | Side-to-side plane which divides the structure into a front portion and a rear portion (not necessarily equal) |
| cranial | Nearer the head |
| -cyte | Cell. Mature cell type. Osteocyte: cell type found in bone. See -blast |
| deep | Far, or further, from the surface (see superficial) |
| distal to | Further away from. The foot is distal to the thigh (see proximal) |
| dorsal | Towards the back (with reference to anatomical position); similar to posterior in erect humans |
| -ectomy | Removal. Appendectomy: removal of the appendix |
| efferent | Travelling away from. Efferent nerve impulse: away from the central nervous system |
| endo- | On the inside of. Endocardium: lining of the heart. Endometrium: lining of the uterus. Endoscopy: looking inside |
| endocrine | Secretion by a cell into its blood vessels (see exocrine) |
| epi- | On the surface of. Epithelium: all external surfaces. Epidermis: the epithelium of the skin |
| eversion | Turning the sole of the foot outwards (laterally) |
| ex- | Out of |
| exocrine | Secretion by a cell or group of cells into a duct for transport elsewhere (see endocrine) |
| extend | (Usually) straighten |
| extra- | Outside. Extracapsular: outside the capsule |
| fascia | Two meanings: Loose connective and fatty tissue, of variable thickness: superficial fascia, prevertebral fascia Fairly tough sheath or membrane: deep fascia, clavipectoral fascia |
| fasciculus | Group of axons of nerves all serving similar functions (same as tract) |
| flex | (Usually) bend |
| fistula | Artificial connection between two epithelial tubes |
| foramen | Opening or passage, often through bone |
| fossa | Depression, hollow, pit |
| ganglion | A swelling. In the context of the nervous system, its commonest usage, a ganglion is a collection of nerve cell bodies in the peripheral nervous system. It may be a sensory ganglion (without synapses), or an autonomic ganglion (with synapses). See nucleus |
| gyrus | Eminence of brain tissue between two sulci (see sulcus) |
| haemo- | Blood. Haemostasis: stagnation or sluggish flow of blood |
| hiatus | Gap, opening |
| hilum | Place where vessels and nerves enter |
| hyper- | Above, increase. Hyperplasia: increased cell division. Hypertrophy: increase in size (see hypo-) |
| hypo- | Below, decrease. Hypogastric: under the gastric area. Hypoplasia: decrease in cell division (see hyper-) |
| inferior | Below (with reference to anatomical position) |
| infundibulum | Funnel, funnel-like part of cavity |
| inter- | Between |
| intra- | Inside. Intracapsular: inside the capsule |
| inversion | Turning the sole of the foot inwards (medially) |
| -itis | Inflammation. Gastritis: inflammation of the stomach. Arthritis: inflammation of joint |
| lapar- | Abdomen. Laparoscopy: looking inside the abdomen. Laparotomy: opening the abdomen |
| lateral | Further from the midline (see medial) |
| ligament | Connective tissue tying together two or more structures (usually) |
| limbus | Edge, rim. Limbus of foramen ovale |
| lumen | Central cavity of a tube (artery, vein, intestine, etc.) |
| meatus | Pathway or passage |

Table 2.1 (Cont'd)

| Term | Meaning and example |
|-------------|--|
| medial | Nearer the midline (see lateral) |
| median | In the midline |
| meso- | Between |
| metrium | Uterus. Myometrium: uterine muscle; endometrium: uterine lining |
| mucus | Sticky liquid produced by glands. Mucus is a noun (see below) |
| mucous | Sticky (see serous): this is an adjective (see above) |
| myo- | Muscle. Myocardium: muscle of the heart |
| nucleus | In the context of the nervous system, a nucleus is a collection of cell bodies in the central nervous system (brain and spinal cord), all with a similar function. See ganglion |
| -oma | Swelling (tumour, not necessarily malignant). Lipoma: tumour of fat. Osteoma: bone tumour. Lymphoma: tumour of lymphoid tissues. Melanoma: tumour of cells containing melanin. And so on |
| -ostomy | Making a permanent opening. Colostomy: permanent (or semipermanent) opening of the colon on to the abdominal surface. Tracheostomy: permanent (or semipermanent) opening into the trachea |
| -otomy | Making a small hole or temporary (e.g. emergency) opening. Laryngotomy: emergency opening into larynx |
| para- | By the side of, alongside. Paravertebral: by the side of the vertebral column |
| parietal | Concerning the walls of a cavity |
| peri- | Around or near. Periosteum: membrane covering the surface of bone |
| plexus | Network |
| posterior | Behind or rear (with reference to anatomical position); see dorsal |
| procto- | From proctodaeum – cloacal origin. Proctoscopy: observation of anal canal and terminal rectum |
| proximal to | Nearer to. The thigh is proximal to the foot. See distal |
| raphe | Seam. Line of union of separate parts |
| sagittal | Front-to-back plane which divides the structure into a right portion and a left portion (not necessarily equal) |
| sarcoma | Cancer of connective tissue (rather than epithelial) origin |
| serous | Thin, watery (see mucous) |
| sinus | Cavity or channel |
| somatic | Of, or derived from, body wall or somites: skeleton, skeletal (voluntary) muscle and associated connective tissue, and the skin and its appendages (breast, sweat glands, hair, nails, teeth). Nerves that supply these structures tend to be under voluntary control (if motor) and sensation from these structures tends to be immediately and precisely perceptible |
| sphincter | Muscular valve capable of closing a tube |
| splanchnic | Much the same as visceral – see later (splanchnic is from the Greek, visceral from the Latin. We do not need two terms, but we have them) |
| squamous | Flattened, scale-like |
| stasis | Lack of movement, stagnation. Haemostasis: stagnation of blood |
| synapse | The site where the terminal of one nerve transmits its electrical impulse to another, separate, nerve |
| sulcus | Gutter, depression |
| superficial | Near, or nearer, the surface (see deep) |
| superior | Above (with reference to anatomical position) |
| tendon | Attaching muscle to bone |
| tract | Group of axons of nerves all serving similar functions |
| ventral | Towards the front (belly) (with reference to anatomical position); similar to anterior in erect humans |
| visceral | Concerning internal organs (viscus, viscera). Nerves that supply these structures tend to be under involuntary control (if motor) and sensation from these structures tends to be vague and imprecisely perceptible or even imperceptible |
| viscus | Originally, hollow organ, but now used for any internal organ (liver, spleen, etc.) |

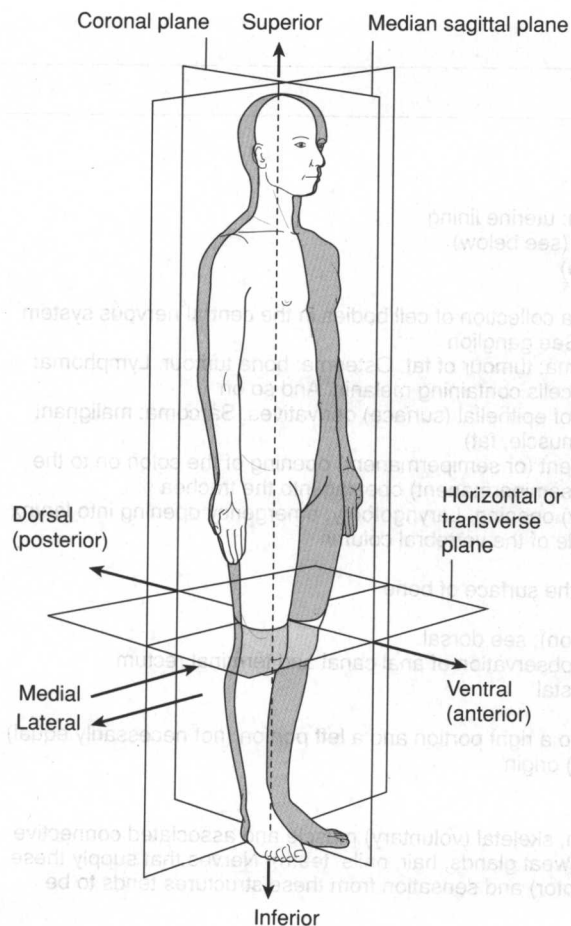


Fig. 2.1 Planes. A plane parallel to the median (sagittal) plane is a parasagittal plane.

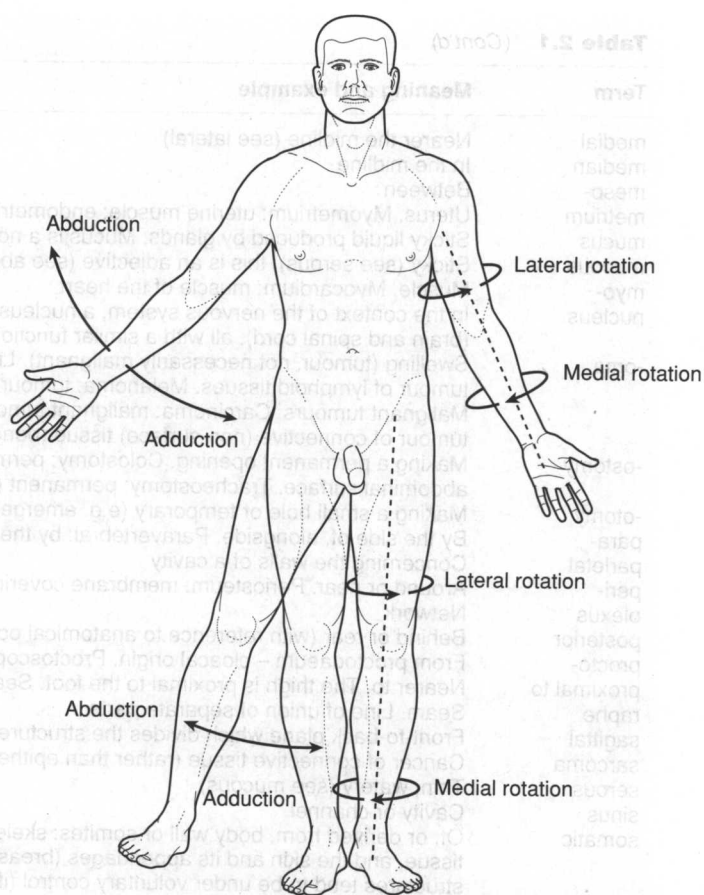


Fig. 2.2

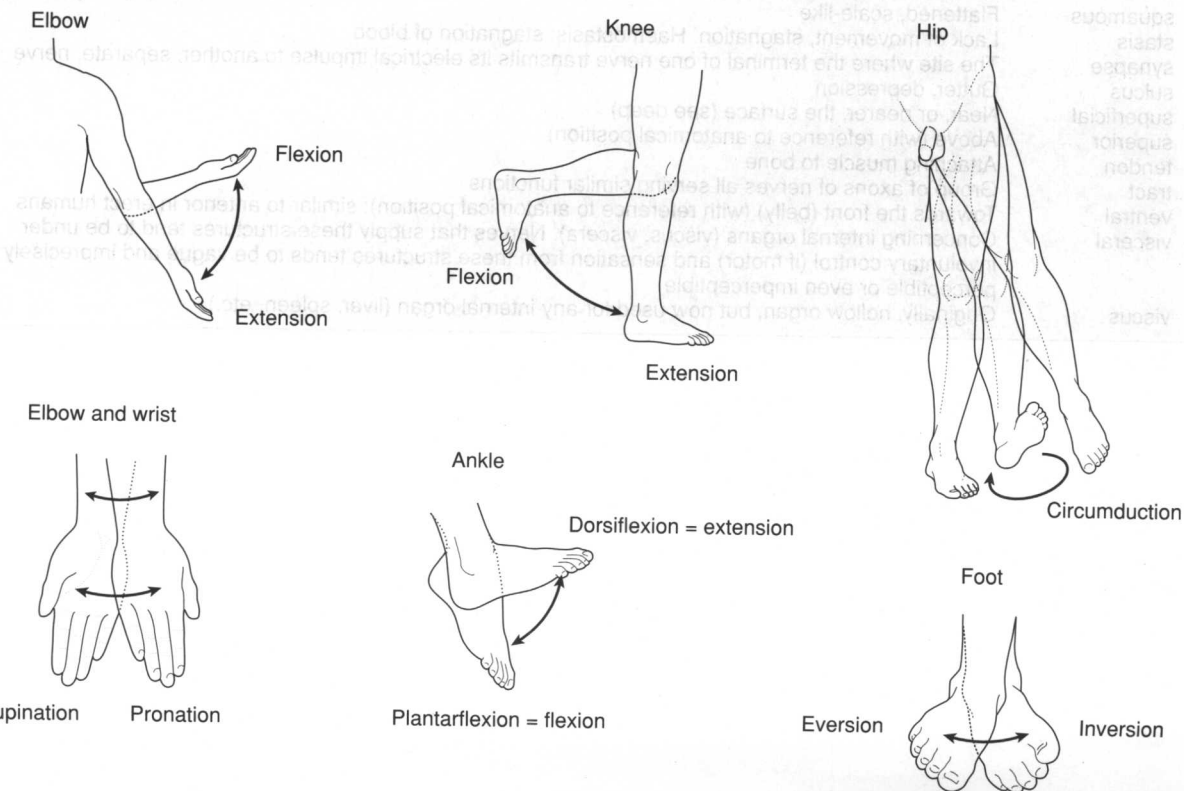


Fig. 2.2 Supination Pronation

Plantarflexion = flexion

Eversion

Inversion