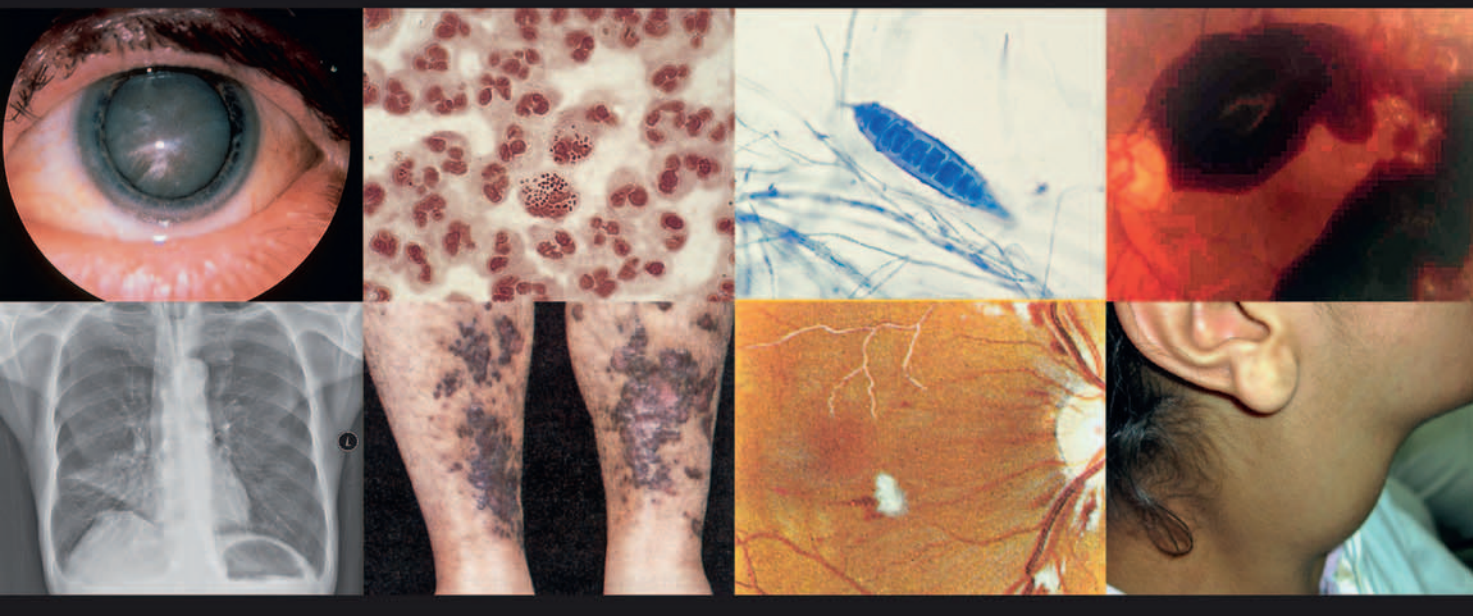
25TH EDITION

125th ANNIVERSARY EDITION

HUTCHISON'S CLINICAL METHODS

An Integrated Approach to Clinical Practice



Michael Glynn ▪ William M. Drake

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An integrated approach to clinical practice

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Preface to the Twenty-fifth Edition

Hutchison's Clinical Methods is a book for students of all ages and all degrees of experience. Although the scope, complexity and technology of clinical medicine continues to evolve with great speed, the aim of this text is exactly as it was when Robert Hutchison published the very first edition 125 years ago in 1897: to provide a detailed guide to the acquisition of the traditional clinical skills of history taking and physical examination leading to the formulation of a differential diagnosis and management plan. This approach remains as essential as ever to providing good patient care; indeed, as the array of potential investigations expands (and the overall cost continues to rise), it is imperative that traditional methods are not ignored, because diagnosis based solely on investigation generates as many problems as it solves. Even though many patients now have easy access, via the Internet, to information about disease and diagnosis, it is the editors' experience that patients need time spent listening to their symptoms, careful physical examination and simple human compassion. Although the circumstances of clinical practice of the readers will vary hugely across the world (with different structures and levels of funding of healthcare), a sound clinical method is indispensable. The layout of this edition adheres to Hutchison's original approach, with sections on the overall patient assessment, assessment in particular situations, the core body systems and key clinical specialties. Overall, this forms a logical sequence if read straight through but also allows study of each section separately.

As in previous editions, new contributors have joined the book. Some have written entirely new chapters and others have modified the work of their predecessors. All the contributors are accustomed to working closely together and the book reflects how a team of specialists working closely together can best serve patients. It has been the editors' responsibility to integrate the chapters into a single text with a logical narrative, but the expertise lies with the contributing authors, whose time and dedication is gratefully acknowledged, as are the extensive contributions of previous experts.

Some of the changes to the previous edition have been made as a result of formally gathered feedback from the International Advisory Board. In addition, a reader survey elicited a range of positive suggestions for improvements to the book. Constructive readers' comments direct to the editors are always welcome.

Michael Glynn and Will Drake
Barts Health NHS Trust

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Sir Robert Hutchison MD FRCP
(1871–1960)

CLINICAL METHODS

A GUIDE TO THE PRACTICAL STUDY OF MEDICINE

BY

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WITH 132 ILLUSTRATIONS AND 8 COLOURED PLATES

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1897

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Clinical Methods began in 1897, three years after Robert Hutchison was appointed Assistant Physician to The London Hospital (named the Royal London Hospital since its 250th anniversary in 1990). He was appointed full physician to The London and to the Hospital for Sick Children, Great Ormond Street in 1900. He steered *Clinical Methods* through no less than 13 editions, at first with the assistance of Dr H. Rainy and then, from the 9th edition, published in 1929, with the help of Dr Donald Hunter. Although Hutchison retired from hospital practice in 1934, he continued to direct new editions of the book with Donald Hunter, and from 1949 with the assistance also of Dr Richard Bomford. The 13th edition, the first produced without Hutchison's guiding hand, was published in 1956 under the direction of Donald Hunter and Richard Bomford. Dr A. Stuart Mason and Dr Michael Swash joined Richard Bomford on Donald Hunter's retirement to produce the 16th edition, published in 1975, and following Richard Bomford's retirement prepared the 17th, 18th and 19th editions. Dr Swash edited the 20th and 21st editions himself and was joined by Dr Michael Glynn for the 22nd edition. On Dr Swash's retirement Prof William Drake joined Dr Glynn as a co-editor from the 23rd edition. In keeping with the tradition that lies behind the book, each of these editions has been revised with the help of colleagues at The Royal London Hospital, and the other hospitals which now form Barts Health NHS Trust, namely St Bartholomew's Hospital, Whipps Cross University Hospital and Newham University Hospital.

Sir Robert Hutchison died in 1960 in his 90th year. It is evident from the memoirs of his contemporaries that he had a remarkable personality. Many of his clinical sayings became, in their day, aphorisms to be remembered and passed on to future generations of students. Of these, the best known is his petition, written in 1953, his 82nd year:

'From inability to let well alone;
from too much zeal for the new
and contempt for what is old;
from putting knowledge before wisdom, science
before art, and cleverness before common sense;
from treating patients as cases;
and from making the cure of the disease more
grievous than the endurance of the same, Good
Lord, deliver us.'

Michael Glynn and Will Drake
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Acknowledgements

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The Editors and Publishers would like to thank all the students and doctors who have provided valuable feedback on this textbook and whose comments have helped shape this new edition. We hope we have listed all those who have contributed and apologise if any names have been accidentally omitted.

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Doctor and patient: General principles of history taking

1

Michael Glynn

Introduction

If asked why they entered medicine, most doctors would say that they wish to relieve human suffering and disease. To achieve this aim for every patient, it is essential to understand what has gone wrong with normal human physiology in that individual and how the patient's personality, beliefs and environment are interacting with the disease process. History taking and clinical examination are initial, but crucial, steps to achieving this understanding, even in an era in which the availability of sophisticated investigations might suggest to a lay person that a blood test or scan will give all the answers. In addition, even though many diseases are now curable, the relief of symptoms is usually what the patient expects from the medical process.

The phrase 'Clinical Methods' is used less than it used to be. It can be defined as the set of skills doctors use to diagnose and treat disease and the manner in which doctors approach clinical problems and relate to patients. The skills that make up Clinical Methods are acquired during a lifetime of medical work, and they evolve and change as new techniques and new concepts arise and as the experience and maturity of the doctor develop. Clinical Methods are acquired by a combination of study and experience, and there is always something new to learn.

The aims of any first consultation are to understand patients' own perceptions of their problems and to start or complete the process of diagnosis. This double aim requires knowledge of disease and its patterns of presentation, together with an ability to interpret a patient's symptoms (what the patient reports or complains of, e.g. cough or headache) and the findings on observation or physical examination (called physical signs or, often, simply 'signs'). Appropriate skills are needed to elicit the symptoms from the patient's description and conversation and the signs by observation and by physical examination. This requires not only experience and considerable knowledge of people in general, but also the skill to strike up a relationship, in a short space of time, with a range of very different individuals.

The two main steps to making a diagnosis:

1. Establishing the clinical features by history and examination, which represents the clinical database.
2. Interpreting the clinical database in terms of disordered function and potential causative pathologies, whether physical, mental, social or a combination of these.

This book is about this process. This first chapter introduces the basic principles of history taking and examination; more detail about the history and examination of each system (cardiovascular, respiratory, etc.) is set out in individual succeeding chapters. Without prejudice, and except in specific scenarios involving female patients, the patient is referred to as 'he' throughout the book, the editors preferring this to 'he/she' or 'they'.

Setting the scene

Most medical encounters or consultations do not occur in hospital wards or Emergency Departments, but in primary care or outpatient settings. Whatever the setting, a certain familiarity to the context of the consultation, including the consulting room itself, the waiting area and all the associated staff, makes the process of clinical diagnosis easier. Patients are less often assessed in their own home than previously, and many doctors now find this a strange concept.

Meeting the patient in the waiting room allows the doctor to make an early assessment of his demeanour, hearing, walking and any accompanying persons. It is good to offer a greeting and careful introduction and to observe the response unobtrusively but with care. It is important to remember that patients are easily confused by medical titles and hierarchies. All the following questions should be quickly assessed:

- Does the patient appear relaxed and smiling or furtive and anxious?
- Does the patient make good eye contact?
- Is he frightened or depressed?
- Are posture and stance normal?
- Is he short of breath or wheezing?

In some conditions (e.g. congestive heart failure, acute asthma, Parkinson's disease, stroke, jaundice), the general nature of the problem is immediately obvious. It is very important to identify the patient correctly, particularly if he has a name that is very common in the local community. Carefully

check the full name, date of birth, address and any numerical identifier used by the local health system (in the United Kingdom all patients will have an NHS number or hospital registration number).

Pleasant surroundings are very important. It is essential that both patient and doctor feel at ease and, especially, that neither feels threatened by the encounter. Avoid looking at the patient full-face across a desk. Note-taking is important during consultations while being able to see the patient and establish eye contact and to show sympathy and awareness of his needs during the discussion of symptoms, some of which may be distressing or even embarrassing. If the doctor is right-handed and the patient sits on the doctor's left, at an angle to the desk, the situation is less formal, and clues, such as agitated foot and hand movements, are more evident. If other people are present, arrange the seating to make it clear that it is the patient who is the centre of attention rather than any others present. Increasingly doctors are entering information directly into a computer, rather than writing, and this affects positioning. It can be helpful for the patient to be able to see the screen to confirm what the doctor is noting there.

Emergency presentations

If the patient is being seen as an emergency, the whole process of history taking is altered according to the surroundings and the degree of illness. No history may be obtainable from a severely ill or unconscious patient, but collateral history from bystanders, relatives or emergency medical personnel is important to gather. In retrospect this information can be hard to get later on in the patient's illness and can be crucial to the diagnosis (e.g. was the patient seen to have a grand mal seizure, or did he complain of sudden pain, before a collapse?).

History taking

Having overcome the strangeness of meeting and talking with a wide variety of people that he might not ordinarily meet, the new medical student usually feels that history taking ought to be fairly simple, but that physical examination is full of pitfalls such as unrecognized heart murmurs and confusing parts of the neurological examination. However, the experienced doctor comes to realize that history taking is immensely skilled, and that the extent to which this skill goes on increasing with experience is probably greater than for clinical examination.

Beginning the history

The process of gathering information about a patient often begins by reading any referral documentation and with the immediate introduction of doctor and patient.

Box 1.1 Areas of questioning that can be covered at the beginning of history taking

- Confirm date of birth and age
- Occupation and occupational history
- Past medical history
- Smoking
- Alcohol consumption
- Drug and treatment history
- Family history

Blood Rev. 2003;17(3):131–142.

However, once the social introductions are achieved, the doctor usually will begin with a single opening question. Broadly, there are two ways to do this.

A single open-ended question along the lines of 'Tell me about what has led up to you coming here today' gives the opportunity for the patient to begin with what he feels to be most important to him and avoids any prejudgement of issues or exclusion of what at first hearing may seem less important. However, at this stage the patient may be very anxious and nervous and still making his own assessment of how he will react to the doctor as a person. A beginning that focuses on issues which may be more factual and less emotive can be more rewarding and lead to a more satisfactory consultation. Box 1.1 lists some of the areas of questioning that can be usefully included at the beginning of the history. It is important to inform the patient that this is going to be the order of things so that he does not feel that his pressing problems are being ignored. A statement along the lines of 'Before we discuss why you have come today, I want to ask you some background questions' should be sufficient to inform the patient satisfactorily.

A particular logic exists in taking the past medical history at this stage. For many conditions, the distinction as to what is a current problem and what is past history is unclear and arbitrary in the patient's mind. A patient presenting with an acute exacerbation of chronic obstructive pulmonary disease may have a history of respiratory problems going back many years. Therefore, taking the history along a 'timeline' will often build up a much better picture of all of the patient's problems, how they have developed and how they now interact with life and work.

Once these preliminaries have been completed, the doctor should use a simple and open-ended question to encourage the patient to give a full and free account of the current issues. This could be something along the lines of 'Tell me what has led up to you coming here today'. This wording leaves as open as possible any question about the cause of the patient's problems and why he is seeing a doctor, and could give rise to an initial answer beginning with such varied phrases as 'I have this pain …', 'I feel depressed …', 'I am extremely worried about

Box 1.2 Particular gestures useful in analysing specific pain symptoms

- A squeezing gesture to describe cardiac pain
- Hand position to describe renal colic
- Rubbing the sternum to describe heartburn
- Rubbing the buttock and thigh to describe sciatica
- Arms clenched around the abdomen to describe mid-gut colic

…', 'I don't know but my family doctor thought …', 'My wife insisted …' or even 'I thought you would already know from the letter my family doctor wrote to you'. All of these answers are perfectly valid, but each gives a different clue as to what are the real issues for the patient, and how to develop the history-taking process further for that individual. This part of history taking is probably the most important and the most dependent on the skill of the doctor. It is always tempting to interrupt too early and, once interrupted, the patient rarely completes what he was intending to say. Even when he appears to have finished giving his reasons for the consultation, always ask if there are any more broad areas that need discussion before beginning to discuss each in more detail.

Developing themes

This stage of the history is likely to see the patient talking much more than the doctor, but it remains vital for the doctor to steer and mould the process so that the information gathered is complete, coherent and, if possible, logical. Some patients will present a clear, concise and chronologically perfect history with little prompting, although they are in the minority. For most patients, the doctor needs to do a substantial amount of clarifying and summarizing with statements such as 'You mean that …', 'Can I go back to when …', 'Can I check I have understood …', 'So up to that point you …', 'I am afraid I am not at all clear about …' and 'I really do not understand, can we go over that again?' If a patient clearly indicates that he does not wish to discuss particular aspects of the history, then this wish must be respected and the diagnosis based on what information is available, although it is also important to explain to the patient the limitations that may be imposed by this lack of information.

Non-verbal communication

Within any consultation, non-verbal communication is as important as what the patient says. There may be contradictions, such as a patient who does not admit to any worries or anxieties but who clearly looks as if he has many. Particular gestures during the description of pain symptoms can give vital clinical clues (Box 1.2). While concentrating on the conversation with the patient, the doctor should keep a wide awareness of all other clues that can be gleaned from the consultation. These include the patient's demeanour, dress and appearance, any walking aids, the interaction between the patient and any accompanying people and the way that the patient reacts to the developing consultation.

Box 1.3 Words and phrases that need clarification

Ordinary English words

- Diarrhoea
- Constipation
- Wind
- Indigestion
- Being sick
- Dizziness
- Headache
- Double vision
- Pins and needles
- Rash
- Blister

Medical terms that may be used imprecisely by patients

- Arthritis
- Sciatica
- Migraine
- Fits
- Stroke
- Palpitation
- Angina
- Heart attack
- Diarrhoea
- Constipation
- Nausea
- Piles/haemorrhoids
- Anaemia
- Pleurisy
- Eczema
- Urticaria
- Warts
- Cystitis

Vocabulary

It is very important to use vocabulary that the patient will understand and use appropriately. This understanding needs to be on two levels: he must understand the basic words used, and his interpretation of those words must be understood and clarified by the doctor. Box 1.3 lists words and phrases that may be used in the consultation that the doctor needs to be very careful to clarify with the patient. If the patient uses one of the ordinary English words listed, its meaning must be clarified. A patient who says he is dizzy could be describing actual vertigo, but could just mean light-headedness or a feeling that he is going to faint. A patient who says that he has diarrhoea could mean liquid stools passed hourly throughout the day and night or could

mean a couple of urgent soft stools passed first thing in the morning only. Therefore, the doctor needs to use words that are almost certainly going to be clearly understood by the patient, and the doctor must clarify any word or phrase that the patient uses to avoid any possibility of ambiguity.

Indirect and direct questions

Broadly, questions asked by the doctor can be divided into indirect or open-ended and direct or closed. Indirect or open-ended questions can be regarded as an invitation for the patient to talk about the general area that the doctor indicates to be of interest. These questions will often start with phrases such as 'Tell me more about …', 'What do you think about …', 'How does that make you feel …', 'What happened next …' or 'Is there anything else you would like to tell me?' These questions inform the patient that the agenda is very much with him, that he can talk about whatever is important and that the doctor has not prejudged any issues. If skilfully used, and if the doctor is sensitive to the clues presented in the answers, a series of such questions should allow the doctor to understand the issues that are most important from the patient's point of view. The patient will also be allowed to describe things in his own words.

Many patients are in awe of doctors and have some conscious or subconscious need to please them and go along with what they say. If the doctor prejudges the patient's problems and tends to 'railroad' the conversation to fit his assumed diagnosis too early in the process, then the patient can easily go along with this and give simple answers that do not fully describe his situation. Box 1.4 illustrates this extremely simple, common and important pitfall of history taking.

Disease-centred versus patient-centred

An interview that uses lots of direct questions is often 'disease-centred,' whereas a 'patient-centred' interview will contain enough open-ended questions for patients to talk about all of their problems and be given enough time to do so. This will also help to avoid the situation in which the doctor and the patient have different agendas. Often there can appear to be a conflict if the patient complains of symptoms that are probably not medically serious, such as tension headache, while the doctor is focusing on some potentially serious but relatively asymptomatic condition, such as anaemia or hypertension. In this situation, a patient-centred approach will allow the patient to air all of his problems and will allow a skilled doctor to educate the patient as to why the other issues are also important and must not be ignored. A general practitioner (GP) may rightly refuse a demand for antibiotics for a sore throat that is likely to be viral but should use the opportunity to educate and inform the patient about the true place of antibiotic treatment and the risks of excess and inappropriate use of them. The doctor needs to grasp the difference between the disease framework (what the diagnosis is) and the illness framework (what are the patient's experiences, ideas, expectations and

Box 1.4 Example of a history that leads to a poor conclusion

A GP is seeing a 58-year-old man who is known to be hypertensive and a smoker. The receptionist has already documented that he is coming in with a problem of chest pain. The GP makes an automatic assumption that the pain is most likely to be angina pectoris, because that is probably the most serious cause and the one that the patient is likely to be most worried about, and therefore starts taking the history with the specific purpose of confirming or refuting that diagnosis.

GP: I gather you've had some chest pain?

Patient: Yes, it's been quite bad.

GP: Is it in the middle of your chest?

Patient: Yes.

GP: And does it travel to your left arm?

Patient: Yes—and to my shoulder.

GP: Does it come on when you walk?

Patient: Yes.

GP: And is it relieved by rest?

Patient: Yes—usually.

GP: I'm afraid I think this is angina and I will need to refer you to a heart specialist.

The GP has asked only very direct and closed questions. Each answer has begun with 'Yes'. The patient has already been quite firmly tagged with a 'label' of angina, and anxiety has been raised by the specialist referral.

Alternatively, the GP keeps an open mind and starts as follows:

GP: Tell me why you have come to see me today.

Patient: Well, I have been having some chest pain.

GP: Tell me more about what it's like.

Patient: It's in the centre of my chest and tends to go to my left arm. Sometimes it comes on when I've been walking.

GP: Tell me more about that.

Patient: Sometimes it comes when I am walking and sometimes when I'm sitting down at home after a long walk.

GP: If the pain comes on when you are walking, what do you do?

Patient: I usually slow down, but if I'm in a hurry I can walk on with the pain.

GP: I am a little worried that this might be angina, but some things suggest it might not be, so I am going to refer you to a heart specialist to make sure it isn't angina, or plan treatment if it is.

The GP has asked questions which are either completely open-ended or leave the patient free to describe exactly what happens within a directed area of interest. Clarifying questions have been used. While being reassuring, the GP expresses some concern about angina and is clear about the exact reason for the specialist referral (for both clarification and treatment).

Box 1.5 Areas of everyday life that can be used as a reference for the severity, importance or clarification of symptoms

Exercise tolerance: 'How far can you walk on the flat going at your own speed?', 'Can you climb one flight of stairs slowly without stopping?', 'Can you still do simple housework such as vacuum cleaning or making a bed?'

Work: 'Has this problem kept you off work?', 'Why exactly have you not been able to work?'

Sport: 'Do you play regular sport and has this been affected?'

Eating: 'Has this affected your eating?', 'Do any particular foods cause trouble?'

Social life: 'What do you do in your spare time and has this been restricted in any way?', 'Has your sex life been affected?'

feelings) and to be able to apply both frameworks to a clinical situation, varying the degree of each, according to the differing demands.

Judging the severity of symptoms

Many symptoms are subjective and the degree of severity expressed by the patient will depend on his own personal reaction and also on how the symptoms interact with his life. A tiny alteration in the neurological function of the hands and fingers will make a huge impression on a professional musician, whereas most others might hardly notice the same dysfunction. A mild skin complaint might be devastating for a professional model but cause little worry in others.

Assessing how the symptoms interact with the patient's life is an important skill of history taking. A simple question such as 'How much does this bother you?' might suffice. It may be helpful to ask specific questions about how the patient's daily life is affected, with comparison to events that many patients will experience. Box 1.5 illustrates some of the relevant areas. Patients do not want exaggerated or 'fake' sympathy, but occasional interjections such as 'That must be difficult, given your work' will provide reassurance that you are assessing their symptoms against the backdrop of their lives.

Medical symptomatology often involves pain, which is more subjective than almost any other symptom. Many patients are stoical and bear severe pain uncomplainingly, whereas others seem to complain much more about apparently less severe pain. A simple pain scale can be very helpful in assessing pain severity. The patient is asked to rate his pain on a scale from 1 to 10, with 1 being a pain that is barely noticeable and 10 the worst pain he can imagine or the worst pain he has ever experienced. It is also useful to clarify what the reference point is for '10,' which for many women will be the pain of labour. The pain scale assessment is useful in diagnosis and in monitoring disease, treatment and analgesia. Assessing a patient with pain is discussed in more detail in Chapter 11.

Box 1.6 Suggested headings for basic history taking

- Name, age, occupation, country of birth, other clarification of identity
- Main presenting problem
- Past medical history: 'Before we talk about why you have come, I need to ask you to tell me about any serious medical problems that you have had in the whole of your life'
- Specific past medical history: e.g. diabetes, jaundice, tuberculosis, heart disease, high blood pressure, rheumatic fever, epilepsy
- History of main presenting complaint
- Family history
- Occupational history
- Smoking, alcohol, allergies
- Drug and other treatment history
- Direct questions about bodily systems not covered by the presenting complaint

Which issues are important?

A problem for those doctors wishing to take the history in chronological order—'Start at the beginning and tell me all about it'—is that people usually start with the part of the problem that they regard as the most important. This is, of course, entirely valid from the patient's viewpoint, and it is also important to the doctor, because the issue that most bothers the patient is then brought to attention. Curing disease may not always be possible, so it is important to be aware of the important symptoms because, for example, pain may be relieved even though the underlying cause of the pain is still present. It is very common for the doctor to be pleased that one condition has been solved, but the patient still complains of the main symptom that he originally came with.

A schematic history

A suggested schematic history is detailed in Box 1.6. In many clinical situations it will be clear that a different scheme should be followed. An important part of learning about history taking is that each doctor develops his own personal scheme that works for him in the situations that he generally comes across. Nevertheless, it is useful to start with a basic outline in mind.

Direct questions about bodily systems

Within the variety of disease processes that may present to doctors, many have features that occur in many of the bodily systems which at first may not seem to be related to the patient's main complaint. A patient presenting with back pain may have had some haematuria from a renal cell carcinoma that has

Box 1.7 Bodily systems and questions relevant to taking a full history from most patients

If the specific questions have been covered by the history of the presenting complaint, they do not need to be included again. If the answers are positive, the characteristics of each must be clarified

Cardiorespiratory

- Chest pain
- Intermittent claudication
- Palpitation
- Ankle swelling
- Orthopnoea
- Nocturnal dyspnoea
- Shortness of breath
- Cough with or without sputum
- Haemoptysis

Gastrointestinal

- Abdominal pain
- Dyspepsia
- Dysphagia
- Nausea and/or vomiting
- Degree of appetite loss
- Weight loss or gain
- Bowel pattern and any change
- Rectal bleeding
- Jaundice

Genitourinary

- Haematuria
- Nocturia
- Frequency
- Dysuria
- Menstrual irregularity: women
- Urethral discharge: men

Locomotor

- Joint pain and/or swelling
- Change in mobility

Neurological

- Seizures
- Collapses
- Dizziness
- Eyesight
- Hearing
- Transient loss of function (vision, speech, sight)
- Paraesthesia

spread and is the cause of the presenting symptom. For this reason, any thorough assessment of a patient must include questions about all the bodily systems and not just areas that the patient perceives as problematic. This area of questioning should be introduced with a statement such as 'I am now going to ask you about other possible symptoms that could be important and relevant to your problem'. A list of such question areas is given in Box 1.7.

In addition, during any medical consultation, however brief, it is the duty of the doctor to be alert to all aspects of the patient's health and not just the area or problem that he has presented with. For example, a GP would not ignore a high blood pressure reading in a patient presenting with a rash, even though the two are probably not connected. This function of any consultation can be regarded as 'screening' the patient. In health economic terms, a true screening programme for a particular disease across a whole population (such as for cervical cancer) has to be evaluated as being useful, economic and with no negative effects. However, once the patient with a complaint has attended a doctor, a simple ('opportunistic') screening process can be incorporated into the consultation with little extra time or effort. The direct questions (and full routine examination) encompass this screening function as well as contributing to solving the patient's presenting problems.

Box 1.8 List of clarifications for a complaint of pain

- Site
- Radiation
- Character
- Severity
- Time course
- Aggravating factors
- Relieving factors
- Associated symptoms

Clarifying detail

One of the basic principles of history taking is not to take what the patient says at face value but to clarify it as much as possible. Almost all of the history will involve clarification, but there are specific areas where this is particularly important.

Pain

Whenever a patient complains of pain, a series of clarifying questions as listed in Box 1.8 should follow. A simple pain scale has been described above. The other characteristics are vital in analysing what might be causing the pain. Some painful conditions have classic sites and radiation patterns (myocardial ischaemia is classically felt in the centre of the chest radiating to the left arm). Pain from a hollow organ is classically colicky (such as biliary or renal colic). The pain of a subarachnoid haemorrhage is classically very sudden, 'like a hammer blow to the head'. Some pains have clear aggravating or relieving factors (peptic ulcer pain is classically worse when hungry and better after food). Colicky right upper quadrant abdominal pain accompanied by jaundice suggests a gallstone obstructing the bile duct; a headache accompanied by preceding flashing lights suggests migraine. It is always worth making sure that any symptom of pain has been clarified in this way, and although some of the points will come out

Box 1.9 Clarifying questions in the drug history

- Can you tell me all the drugs or medicines that you take?
- Have any been prescribed from another clinic, doctor or dentist?
- Do you buy any yourself from a pharmacy?
- Are you sure you have told me about all tablets, capsules and liquid medicines?
- What about inhalers, skin creams or patches, suppositories or tablets to suck?
- Were you taking any medicines a little while ago but stopped recently?
- Do you ever take any medicines prescribed for other people, such as your spouse?
- Do you use herbal or other complementary medicines?

in the open-ended part of the history taking, others will need specific questions.

Drug history

At first glance, asking a patient what drugs he is taking would seem to be one of the simplest and most reliable parts of taking a history. In practice, this could not be further from the truth, and there are many pitfalls for the inexperienced. This is partly because many patients are not very knowledgeable about their own medications and also because patients often misinterpret the question, giving a very narrow answer when the doctor wants to know about medications in the widest sense. The need for clarification in the drug history is given in Box 1.9. The drug history, almost more than any other, benefits from being repeated at another time and in a slightly different way. For example, in trying to define a possible drug reaction as a cause of liver dysfunction, it is not unusual to find that the patient has taken a few relevant tablets (such as over-the-counter nonsteroidal anti-inflammatory drug) just before the onset of the problem and only remembered or realized it was important to say so when asked repeatedly and in great detail.

Family history

Like the drug history, the family history would seem at first glance to be simple and reliably quoted. In general this is true, but it can be dissected into sections that will uncover more information. These are set out in Box 1.10.

Occupational history

It is always useful to know the patient's occupation, if he has one, because it is such an important part of life and one with which any illness is bound to interact. In some situations, a patient's occupation will be directly relevant to the diagnostic process. The classic industrial illnesses, such as lead poisoning and other toxic exposures, are now extremely rare in developed industrial countries, but accidental exposure continues to occur. Other problems, such as asbestosis or silicosis, produce effects many years after exposure, and a careful chronological occupational history may be required to elucidate the exposure. For patients with nonorganic problems, the work environment can often be the trigger for the development of the problem.

Box 1.10 Details of the family history

Are there any illnesses that run in your family?

Occasionally this will reveal major genetic trends, such as haemophilia. More often there will be an answer such as 'They all have heart trouble'.

Basic family tree of first-degree relatives

This should be plotted on a diagram for most patients, including major illnesses and cause and age of any deaths.

Specific questions about occurrence of problems similar to the patient's

Ask the patient about items in the developing differential diagnosis, for example 'Does anyone in your family have gallstones/epilepsy/high blood pressure?' if these seem a likely diagnosis for the patient under consideration.

Box 1.11 Probing the alcohol history

Doctor: Do you drink any alcoholic drinks?
Patient: Oh yes, but not much—just socially.
Doctor: Do you drink some every day?
Patient: Yes.
Doctor: Tell me what you drink.
Patient: I usually have two pints of beer at lunchtime and two or three on my way home from work.
Doctor: And at the weekend?
Patient: I usually go out Saturday nights and have four or five pints.
Doctor: Do you drink anything other than beer?
Patient: On Saturdays I have a double whisky with each pint.

The first answer does not suggest a problem, but based on the figures in Box 1.12, the actual amount adds up to 70 units per week, which clearly confers considerable health risks to this patient.

Alcohol history

The detrimental effects of alcohol on health cause a variety of problems, and the frequency of excess alcohol use means that up to 10% of adult hospital inpatients have a problem related to alcohol. To make an accurate estimate of alcohol consumption and any possible dependency, it is essential to enquire carefully and not to take what the patient says at face value, but to probe the history in different ways (Box 1.11). For documentation, the reported amount should then be converted into units of alcohol per week (Box 1.12). If the reported amount seems at all excessive then an assessment should be made of possible dependency for which the CAGE questions are very useful (Box 1.13). AUDIT-C.

Box 1.12 Units of alcohol (1 unit contains 10 g of pure alcohol)

The units of alcohol can be determined by multiplying the volume of the drink (in ml) by its % alcohol by volume (abv) and dividing this by 1000. For example, 1 pint (568 ml) of beer at 3.5% abv contains: (568 × 3.5) / 1000 = 1.988 units.

It is important to bear in mind that alcohol strength varies widely within each category of drink, but here is a guide to the most common alcoholic drinks:

- Standard-strength beer (3.5% abv): 1 pint = 2 units
- Very strong lagers (6% abv): 1 pint = 3.5 units
- Spirits (whisky, gin, etc., 40% abv): 1 UK pub measure (about 25 ml) = 1 unit
- Wine (12%): 1 standard glass (175 ml) = 2 units

The UK government now recommends that to minimize alcohol-related health effects, both men and women should keep to less than 14 units of alcohol per week.

Box 1.13 The CAGE assessment for alcohol dependency

- C – Have you ever felt the need to Cut down your alcohol consumption?
- A – Have you ever felt Angry at others criticizing your drinking?
- G – Do you ever feel Guilty about excess drinking?
- E – Do you ever drink in the mornings (Eye-opener)?

Two or more positive answers could indicate a problem of dependency.

Retrospective history

The concept of retrospective history taking is a refinement of taking the past medical history and develops the theme of never taking what the patient says at face value. Many patients will clearly say that they have had certain illnesses or previous symptoms using medical terminology. This information may not be accurate, either because the patient has misinterpreted it or because he was given the wrong information or diagnosis in the first place. This area becomes particularly important if any new diagnosis is going to rely on this type of information. For instance, in assessing a patient presenting with chest pain at rest, a history of angina of effort will be considered a risk factor for acute myocardial infarction and will increase the likelihood of that as the current diagnosis. However, on closer questioning, it might become clear that what the patient was told was angina (perhaps by a relative and not even a doctor) was in fact a vague chest ache coming on after a period of heavy work and not a clear central chest pain coming on during exertion.

Clearly the possibility of retaking the history for everything the patient says about his medical past may not be practical in the time available, but the possibility and value of doing this should always be borne in mind and can completely alter the developing differential diagnosis.

Box 1.14 A typical 'garrulous' history

Doctor: Tell me about what has led to you coming here today.

Patient: Well doctor, you see, it was like this. I woke up one day last week; I am not quite sure which day it was; it might have been Tuesday; or, no, I remember it was Monday because my son came round later to visit; he always comes on a Monday because that's his day off college; he's studying law; I'm so pleased that he's settled down to that; he was so wild when he was younger; do you know what he did once …?

Doctor (interrupting): Can you tell me what did happen when you woke up last Monday?

Patient: Oh yes; it was like this; I am not sure what woke me up; it may have been the pain; no, more likely it was the dustmen collecting the rubbish; they do come so early and make such a noise; that day it was even worse because their usual dustcart must have been broken and they came with this really old noisy one …

Doctor (interrupting): So you had some pain when you woke up then?

Patient: Yes. I think it must have been there when I woke up because I lay in bed wondering where on earth there might be some indigestion remedy. I knew I had some but I am one of those people who can never remember where things are; do you know what I managed to lose last year …?

Doctor (interrupting): Was the pain burning or crushing?

Patient: Well, that depends on what you mean by …

Doctor (interrupting): Yes, but did you have any crushing pain?

The doctor gradually changes from very open-ended to very closed questions in order to try to get some information that is useful to building up the diagnostic picture—eventually a question is asked that just has a yes/no answer.

Particular situations

It is true to say that, although many themes, patterns and common areas to history taking and some areas of history taking might seem routine, the process of history taking for different patients will never be identical. Some particular and often challenging situations deserve some further description.

Garrulous patients

A new medical student will soon meet a patient who says a huge amount without really conveying any of the information that goes towards a useful medical history. This will be in marked contrast to some other patients who, from the first introductory question (e.g. 'Tell me about what has led up to you coming here today'), will reveal a perfect history with virtually no prompting. A fictitious but typical history from the former type of patient is given in Box 1.14. When faced with such a patient, the doctor needs to alter significantly the balance of open-ended and direct questions. Open-ended questions

will tend to lead to such a patient giving a long recitation but with little useful content. The doctor will have to use many more clear and direct questions which may just have yes/no answers. The overall history will inevitably be less satisfactory, but it is not possible to get the 'perfect' history in every patient.

Angry patients

Only a few patients are overtly angry when they see a doctor, but anger expressed during a clinical consultation may be an important diagnostic clue but, at the same time, get in the way of a smooth diagnostic process. Some patients will be angry with the immediate circumstances, such as a late-running outpatient clinic. Others will have longer-term anger against the surgery, department or institution that will be more difficult to address. It is always important to acknowledge anger and to try to tease out what underlies it. Even if it is not the doctor's immediate fault that the clinic is running late or there have been other problems, it is always worth apologizing on behalf of the unit or institution.

For some patients, anger may be part of the symptomatology or expressed as a reaction to the diagnosis or treatment. This will be particularly true in patients with a nonorganic diagnosis who insist that there is 'something wrong' and that the doctor must do something. Many types of presentation will fall into this group, including tension headache, irritable bowel and back pain. There may be obvious secondary gain for the patient (such as staying off work and claiming benefits) and challenging this pattern of behaviour may provoke anger.

It is the duty of a doctor to attempt to work with and help a wide variety of patients, and those who are angry are no exception. However, occasionally it may be best to acknowledge that the doctor–patient relationship has broken down and that facilitating a change to another doctor may be in the best interests of the patient.

The well-informed patient

In the last century, doctors often looked after patients for a long time without really explaining their illness to them, and patients were reasonably happy taking the attitude that 'the doctor knows best'. This approach is no longer acceptable and it is the duty of a doctor to give the patient as much information about his illness as possible, particularly so that he is able to make informed choices about treatments. This change of approach has led to many patients seeking out information about their problems from many other sources, particularly the Internet. It is not unusual for a patient to come into the first consultation with a new doctor, armed with printouts from various websites that he feels are relevant, or to show information on his smartphone.

Doctors must take all this in their stride, go through the information with the patient and help him by showing what is relevant and what is not. Many websites with medical content are created by individuals or groups without proper information for a sound basis of knowledge, but it can be difficult for the patient to make a judgement about this. Being able to inform patients of a few relevant and reliable websites can be very helpful. In general, it is easy and more rewarding to look after well-informed patients, provided they do not fall into the very small group that have such fixed and erroneous ideas about their problems that the diagnostic and treatment process is impeded.

Accompanying persons

Some people come to consultations alone and others with one or more friends or family members. Always spend time during the initial exchange of greetings identifying who is present and getting some idea of the group dynamics. If the patient appears to be alone, ask whether there is someone waiting outside. There is always a reason people come accompanied, but if there appear to be too many people present or if the presence of others might threaten the relationship with the patient at any time in the consultation, it is appropriate to consider asking the others to leave, even if only briefly. It is reasonable, if in doubt, to ascertain why others wish to be present, and certainly whether this is also the patient's wish. It is very important to know if the patient does want to object to the presence of others, but feels unable to do so. This is particularly difficult if the doctor does not speak the patient's language and can only speak to those accompanying. Consider whether specific questions about the history should be asked of those accompanying, either with the patient or separately, with specific consent.

Be aware of a situation in which the accompanying people answer all the questions, even if there is not a language difficulty. Many clues to diagnosis may be masked if direct communication with the patient is not possible (using an interpreter/advocate for patients who do not speak the same language as the doctor is discussed below). There may be many reasons that the patient does not speak for himself. These may include embarrassment in front of those accompanying (such as a teenager with his parents). In such circumstances, it may be necessary to leave parts of the history until those accompanying can reasonably be asked to leave, such as during the examination. Occasionally it is clear that the patient will not talk for himself, in which case the history from those accompanying will have to be the working information.

Using interpreters/advocates

Particularly in the cities of Western countries, there will often be found a large immigrant population who do not speak the first language of the country, even if they have been resident for some years, and it is impractical for each patient to be looked after by health professionals

who speak their language. In these circumstances, the medical consultation has to be undertaken with an interpreter. The most immediate solution may be to use a family member; however, if the issues are private or embarrassing, this often does not work well. It is also unethical to use an underage family member as an interpreter (under 16 years of age).

The best solution is to have available an independent interpreter/advocate for the consultation, although in areas where many patients are not native speakers, many interpreters may be needed for a range of languages. Another solution for infrequently encountered languages is a telephone-based interpreting service.

When taking a history via an interpreter/advocate, the overall style usually has to change. The breadth of history and the clinical clues that can be obtained from a good initial open-ended question may well be lost in the double translation, and the doctor often changes to a much more direct style of questioning for which the answers will be unambiguous even when going through the double translation. It is also not unusual for the interpreter/advocate and the patient to have a few minutes of conversation following an apparently simple question from the doctor, but then a very short answer is returned to the doctor. This leaves the doctor bemused as to what is really going on with the patient. Finally, history taking via an interpreter/advocate usually takes considerably longer than when the doctor and the patient speak the same language.

Analysing symptoms

The objective of the history and examination is to begin identifying the disturbance of structure and function responsible for the patient's symptoms. This is done by analysis of the symptoms and signs leading to a differential diagnosis (a list of possible diagnoses that will account for the symptoms and signs, usually set out in descending order of likelihood). This list of possibilities is then often refined by the use of special investigations, but in up to 80% of patients the likely diagnosis is reasonably clear after the initial history. The process of analysis can be likened to detective work, in which the symptoms and signs are the evidence. When a medical student is first faced with the myriad data gleaned on taking a history, he is often baffled as to how to start the analysis, but the student can be reassured that the process becomes easier as more medical knowledge is acquired. An analysis of symptoms from a medical student is more based on facts learned from textbooks, whereas an experienced doctor will tend to base the analysis more on patterns of disease presentation that he has encountered many times. Whereas the analytical process is largely acquired through this type of experience, some principles can be described. This topic is discussed further in Chapter 3.

Box 1.15 'Hard' and 'soft' symptoms

'Hard' symptoms

- Pneumaturia: almost always caused by a colovesical fistula
- Fortification spectra: if associated with unilateral headache, strongly suggests classic migraine
- Rigors: strongly suggests bacteraemia, viraemia or malaria
- A bitten tongue: if associated with a seizure, strongly suggests a grand mal fit
- A sudden severe headache 'like a hammer blow': strongly suggests a subarachnoid haemorrhage
- Pleuritic chest pain: strongly suggests pleural irritation caused by an infection or by a pulmonary embolus
- Itching: if associated with jaundice, indicates intra- or extrahepatic cholestasis

'Soft' symptoms

- Dizziness
- Light-headedness
- Tiredness
- Back pain
- Headache
- Wind

'Hard and soft' symptoms

A detective analysing evidence of a crime will put a lot of weight on fingerprint or DNA evidence and less weight on identification evidence. The same principles apply to analysing symptoms. A 'hard' symptom can be thought of as one that, if clearly present, adds a lot of weight to a particular diagnosis. A 'soft' symptom may be thought of as one which is either reported by patients so variably that its true presence is often in doubt, or one which is present in such a variety of conditions as not to be useful in confirming or refuting a diagnosis. Examples of these two groupings are given in Box 1.15.

Time course

A simple algorithm would be that the character of the symptom suggests the 'anatomy' of the problem and the time course the 'pathology' of it. For instance, a vascular event, such as a myocardial infarct, stroke or subarachnoid haemorrhage, usually has a sudden onset, whereas something that gradually progresses or for which the onset cannot be exactly dated by the patient, such as weight loss or dysphagia, may be a malignant process. Some pitfalls in this type of analysis must be borne in mind to avoid confusion.

Disease processes that gradually progress may start off by being asymptomatic and the patient may only notice symptoms when they start to interfere with his lifestyle and activities. For example, exertional breathlessness in a largely sedentary patient may develop late in a cardiorespiratory disease process, whereas a patient who actively exercises is likely to

notice symptoms much earlier. This phenomenon is also seen where the relevant bodily organ or system has a lot of reserve and the symptom may show itself only when the reserve is used up. This could be true for a relatively chronic liver disease, such as primary biliary cholangitis, apparently presenting acutely. The proverb of the 'straw that broke the camel's back' is a good analogy of this sort of situation (a camel is steadily loaded up with straw until suddenly it appears that a single piece of straw is sufficient to make the camel collapse). In addition, the disease process may have a step-wise worsening rather than a linear decline, such as in a situation of multiple small strokes when the patient may not present until a single small stroke makes a big difference to his functional ability.

Pattern recognition versus logical analysis

It is important to realize that in some clinical situations the diagnosis may be clear based on previous experience; in others the diagnosis has to be built up through a process of logical analysis of symptoms, signs and special investigations. The fact that the process of gaining information from symptoms, signs and special investigations is never completely exact must also be borne in mind so that the patient with an atypical presentation is not assigned the wrong diagnosis. The area of medicine that probably most often uses pattern recognition is dermatology, but recently skin biopsies are used much more to clarify diagnoses that were previously assumed. A patient presenting with chest pain and signs of underperfusion may easily be thought to be having a myocardial infarction, but a brief history of the character of the pain (tearing and going through to the back) may prompt a search for a dissecting aortic aneurysm.

Negative data

An experienced history taker will begin the analysis from the outset of the clinical encounter. This means that during the initial process and without the need for so much later review, questions can be asked for which a negative answer is as important as a positive one. These questions are usually very specific and direct, often with a yes/no answer. A patient whose presenting complaint is exertional chest pain can immediately be asked if the pain is worse on increased exertion and how long a period of rest is needed to relieve it. Pain that is not predictably produced by exertion and is not reliably relieved by rest may well not be angina pectoris. However, it remains very important that interjected questions of this type do not spoil the flow of the patient's story.

What does the patient actually want?

If a patient comes to a doctor with a long history, it is always worth trying to find out why he has come for medical help and what he actually wants from the consultation. There may be various scenarios, as listed in Box 1.16. It is always worth trying to find out which might apply to the individual patient, because it sets the scene for giving advice and treatment, particularly if an exact diagnosis or a complete treatment cannot be provided. It is often much easier to reassure a patient that nothing seriously is wrong rather than giving him an exact diagnosis or fully relieving his symptoms.

Box 1.16 General reasons that patients come to see doctors (other than for a severe or acute problem)

- Cannot tolerate ongoing symptoms and wants to be rid of them
- Someone else noticing specific problems (e.g. jaundice)
- Another doctor noticing specific problems (e.g. high blood pressure)
- Worry about underlying diagnosis (often induced by relatives, friends, books, media or Internet)
- Spouse or relative worried about patient
- Cannot work with symptoms
- Colleagues/bosses complaining about patient's work or time off
- Requirement of others (insurance, employment benefit, litigation)

Retaking the history

It is clear that history taking is an inexact process, heavily influenced by the doctor and by the patient. The logical conclusion of this is that no two histories taken from the same patient about the same set of symptoms will be identical, even if the same doctor repeats the process. Given two slightly or significantly different histories, it may be hard to know on which one to base the diagnosis, or whether to regard history taking for that patient as so unreliable as to be useless. The main message is that a single attempt at the history may not suffice and repeated histories taken at different times by different people and in different ways may provide just as much extra information on which to base a diagnosis as more and more detailed special investigations. When a patient is seen for a second or alternative opinion, the doctor usually spends more time on retaking the history than on repeating the examination.

Note-taking

When making notes, it is important to keep eye contact with the patient. Notes should not be made only at times that might suggest to the patient what items of information are regarded as important. It is better to listen carefully and just record enough to help remember the important points later. A fuller account can be written up or dictated afterwards for typing, or by voice recognition. In the fuller record,

Box 1.17 Duties of doctors registered with the UK General Medical Council (2013)

Knowledge, skills and performance

- Make the care of your patient your first concern
- Keep your professional knowledge and skills up to date
- Recognize and work within the limits of your competence

Safety and quality

- Take prompt action if you think that patient safety, dignity or comfort is being compromised

Communication, partnership and teamwork

- Protect and promote the health of patients and the public
- Treat patients politely and considerately
- Respect patients' right to confidentiality
- Listen to, and respond to, patients' concerns and preferences
- Give patients the information they want or need in a way they can understand
- Respect patients' right to reach decisions with you about their treatment and care
- Support patients in caring for themselves to improve and maintain their health

Maintaining trust

- Be honest and open and act with integrity
- Never discriminate unfairly against patients or colleagues
- Never abuse your patients' trust in you or the public's trust in the medical profession
- You are personally accountable for your professional practice and must always be prepared to justify your decisions and actions

the exact history, the weight placed on various items and, most importantly, what the patient actually said can be recorded. What patients say, word for word, is often as important as any later reconstruction of the history. Increasingly doctors are entering information directly into computers, rather than writing, during a consultation. If an experienced doctor starts this for the first time, it can feel intrusive, but can soon be mastered so as to become second nature. Patients will generally accept the presence of the computer as being part of the fabric of modern life.

Conclusion

History taking is the cornerstone of medical practice. It combines considerable interpersonal skill and diversity, with the need for logical thought based on a wealth of medical knowledge and represents the beginning of treating and caring for patients in the widest sense. Almost all the attributes of good medical practice as set out by the UK General Medical Council (Box 1.17) are encompassed in good history taking. Taking a detailed history while getting to know a patient and arriving at a likely diagnosis is as rewarding in itself as performing a technical procedure for a patient or seeing him get better in the end.

General patient examination and differential diagnosis

2

William M. Drake and Tahseen A. Chowdhury

Introduction

The separation of the history from the examination is artificial because the latter starts with the first greeting and ends when the patient departs. Some physical findings may prompt further questioning; do not be concerned that your history taking was inadequate, but revisit these areas at the conclusion of the examination or during it. From the outset, the clinician is assimilating potentially relevant information from the patient's posture, appearance, speech, demeanour and response to questions. Who is this patient? What kind of person is he? What are his anxieties? What is the reason for consulting a doctor at this time? In the outpatient setting, note the patient's grooming and appropriateness of dress. If the patient is in hospital, are there outward signs of social support, such as get-well cards or indicators of a religious faith?

General examination of a patient

Many patients are apprehensive about being examined; the environment is unfamiliar, they may feel exposed and are likely to have anxieties about the findings. Be open about your status as a medical student or junior doctor. Reassure the patient that the extra length of time you take to complete your examination compared with someone more senior is because you are less experienced but that does not necessarily imply the findings are worrying. Many students, early in their training, are anxious about touching and examining patients. Persevere; with practice and experience, confidence will come quickly.

The examination should be conducted in a warm, private, quiet area. Daylight is preferable to artificial light, which may make the recognition of subtle changes in skin colour (e.g. mild jaundice) difficult. A cold room increases anxiety levels and shivering muscle generates strange noises on auscultation of the chest. In hospital, you may need to ask neighbouring patients to turn down the volume on their television or radio. Prior to conducting a clinical examination, ensure that your hands are thoroughly washed and dried.

A thorough examination requires adequate exposure of the patient. Patients should be asked to undress completely or at least to their underclothes and then to cover themselves with a sheet or an examination gown. If the patient keeps his underclothes on, do not forget to examine the covered areas (buttocks, breasts, genitalia, perineum). Ideally a chaperone should be present when a male doctor examines a female patient and is essential for intimate examinations, such as of the rectal, vaginal and breast areas. This is to reassure the patient and to protect the doctor from subsequent accusations of impropriety. Although the patient's attendance at a consultation suggests he is happy to be examined, this may not be the case and it is always courteous to ask permission. Check to be sure he is able to prepare for the examination by disrobing and mounting the couch unaided. Do not embarrass him by waiting for him to fail and ask for help.

For most patients, start the examination on the right side of the bed/couch with the patient semi-recumbent (approximately 45°). Do not dent the confidence of an already anxious patient with heart failure or peritonitis by moving him unnecessarily from the position he finds most comfortable. From the right-hand side of the patient, it is easier to examine the jugular veins, apex beat and abdominal viscera, although left-handed students will take longer to master this approach. Try to expose only the area you are examining at the time. With practice, you will become adept at using the gown or drape to cover the body part just examined as you proceed to the next. Regular attention to the patient's comfort, such as adjustment/replacement of pillows, helps strengthen the professional bond and reassures him that you are concerned about his welfare.

Quickly make a global assessment of the severity of the patient's illness. Ask yourself: 'Does this person look well, mildly ill or severely ill?' If the patient is severely ill then it is appropriate to postpone a detailed examination until the acute situation has been resolved. Do not put severely ill patients to inconvenience or distress that is not essential at that moment.

Posture and gait

In the outpatient or primary care setting, observe your patient from the moment you meet him in the waiting area. Does he rise easily from a chair? Does

he walk freely, stiffly or with a limp; confidently or apparently fearful of falling; aided or unaided? In the hospital setting, note the patient's posture in bed. Healthy people adjust their position at will, without difficulty. In disease, this ability is lost to variable degrees, and severely ill patients may be sufficiently helpless that they adopt positions that are very uncomfortable. Patients with left-sided heart failure typically find that lying horizontally worsens their sense of breathlessness (orthopnoea). The pain of peritonitis typically compels patients to lie supine, sometimes with the legs drawn up, still and quiet, with shallow breathing movements in order to minimize the pain that movement induces. This contrasts with the restlessness of renal colic, in which the patient often rolls around in a futile attempt to find a position free from pain. With acute inflammatory or infective joint disease, the affected limbs often lie motionless. In severe cases of meningitis, the neck may bend backwards and appear to burrow into the pillow.

Speech and interaction

Much information comes from the first interaction. The face, particularly the eyes, indicate real feelings better than words. Did your patient smile when you introduced yourself? Was it symmetrical or was there obvious facial weakness? Did he make eye contact? Was the face animated or expressionless, as in Parkinson's disease? Was the voice hoarse because of laryngeal disease, recurrent laryngeal nerve palsy or myxoedema? Was the speech pressured, as in thyrotoxicosis or mania or monotonous, and expressionless, as in severe depression? Was it slurred from cerebellar disease or a previous stroke?

Physique and nutrition

The nutritional state of a patient may provide an important indicator of disease, and prompt correction of a deficient nutritional state may improve recovery. The more detailed methodologies available for nutritional assessment and management in the context of complex gastrointestinal disease are covered in Chapter 14. In the general survey, note if the patient is cachectic, slim, overweight or obese (Box 2.1). If obese, is it generalized or centrally distributed? Wasting of the temporalis muscle leads to a gaunt appearance, and recent weight loss may result in prominence of the ribs (Fig. 2.1). Other clues to poor nutrition include cracked skin, loss of scalp and body hair and poor wound healing. Malnutrition, together with acute or chronic illness, often leads to hypoalbuminaemia with associated oedema, making overall body weight an unreliable marker of malnutrition. A smooth, often sore tongue without papillae (atrophic glossitis, Fig. 2.2) suggests important vitamin B deficiencies. Angular stomatitis (cheilosis, a softening of the skin at the angles of

Box 2.1 Body mass index

BMI = weight (kg)/height (m)^2

In Europeans:
- Normal BMI: 20–25
- Overweight: 25.1–30
- Obese: 30.1–35
- Grossly obese: >35.1

In Asians:
- Normal BMI: 18–23
- Overweight: 23.1–28
- Obese: 28.1–33
- Grossly obese: >33.1

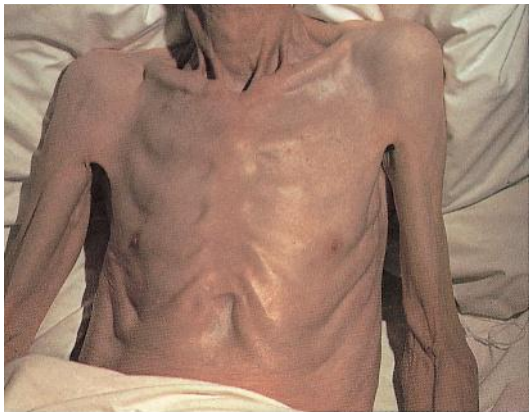

Figure 2.1 A patient with marked cachexia, showing widespread muscle and soft tissue wasting. (From Forbes CD, Jackson WF. Color Atlas and Text of Clinical Medicine, ed 3. 2002. Mosby, Edinburgh.)

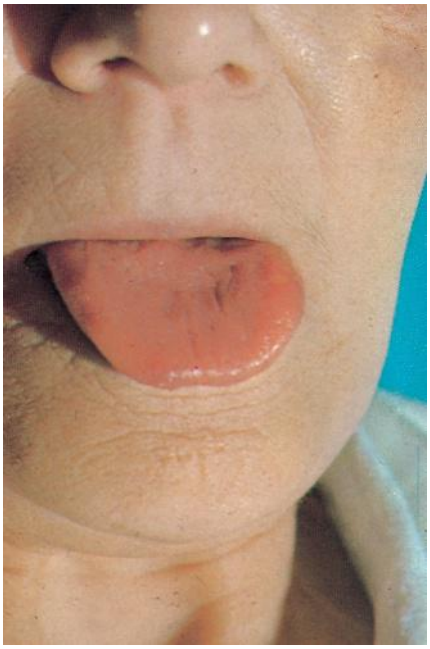

Figure 2.2 Atrophic glossitis in a patient with severe vitamin B12 deficiency. Also seen is angular stomatitis from severe iron deficiency. (From Forbes and Jackson. Color Atlas and Text of Clinical Medicine, ed 3. 2002. Mosby, Edinburgh. Reproduced by kind permission.)

Figure 2.3 Pellagra as a result of niacin deficiency. (From Forbes CD, Jackson WF. Color Atlas and Text of Clinical Medicine, ed 3. 2002, Mosby, Edinburgh. Reproduced by kind permission.)

the mouth followed by cracking) may occur with a severe deficiency of iron or B vitamins. Niacin deficiency, if profound, may cause the typical skin changes of pellagra (Fig. 2.3).

Temperature

Body temperature may be recorded in the mouth, axilla, ear or rectum. A 'normal' mouth temperature is 35.8° to 37°C. Those in the ear and rectum are 0.5°C higher and in the axilla 0.5°C lower. There is a diurnal variation in temperature; the lowest values are recorded in the early morning with a maximum between 6 and 10 pm. In women, ovulation is associated with a 0.5°C rise in temperature. In hospitalized patients, regular temperature measurements may identify certain characteristic patterns of disturbance. A persistent fever is one that does not fluctuate by more than 1°C during 24 hours; a remittent fever oscillates by 2°C during the course of a day; and an intermittent or spiking fever is present for only several hours at a time before returning to normal. None has great sensitivity or specificity for any particular diagnosis, but changes over time may provide useful information about the course of a disease.

Hands

Examine the hands carefully because diagnostic information from a variety of pathologies may be evident. The strength of the patient's handshake may be informative with regard to underlying neurological or musculoskeletal disorders. Characteristic patterns of muscular wasting may accompany various neuropathies and radiculopathies (see Chapter 16). Make note of any tremor, taking care to distinguish the fine tremor of thyrotoxicosis or recent beta-adrenergic therapy from the rhythmical 'pill rolling' tremor of Parkinsonism (see Chapter 16) and from the coarse jerky tremor of hepatic or uraemic failure

Figure 2.4 Dupuytren's contracture. (From Forbes CD, Jackson WF. Color Atlas and Text of Clinical Medicine, ed 3. 2002, Mosby, Edinburgh. Reproduced by kind permission.)

Figure 2.5 Lovibond's angle refers to the angulation between the nail plate and the skin below the nail, when viewed laterally. Normally it is less than 180°. When clubbing is present, the angle is at least 180°, or more.

(sufficiently slow to be referred to as a metabolic 'flap') or the intention tremor of cerebellar disease.

Feel for Dupuytren's contracture in both hands, the first sign of which is usually a thickening of tissue over the flexor tendon of the ring finger at the level of the distal palmar crease. With time, skin puckering in this area develops, together with a thick fibrous cord, leading to flexion contracture of the metacarpophalangeal and proximal interphalangeal joints. Flexion contracture of the other fingers may follow (Fig. 2.4).

Check for clubbing of the fingers. Normally, the angle of the fingernail and the nail base (Lovibond's angle) is approximately 180° and the base feels firm to palpation (Fig. 2.5). As clubbing develops, the tissues at the base of the nail are thickened and Lovibond's angle is lost. Subsequently, the nail becomes more convex, both transversely and longitudinally, and seems to 'float' in a softened nail bed. In normal nails, when both thumbnails are apposed, a diamond-

Figure 2.6 Clubbing of the fingers. This case is very marked. (From Forbes CD, Jackson WF. Color Atlas and Text of Clinical Medicine, ed 3. 2002, Mosby, Edinburgh. Reproduced by kind permission.)

Figure 2.7 Small dermal infarcts in infective endocarditis. (From Forbes CD, Jackson WF. Color Atlas and Text of Clinical Medicine, ed 3. 2002, Mosby, Edinburgh. Reproduced by kind permission.)

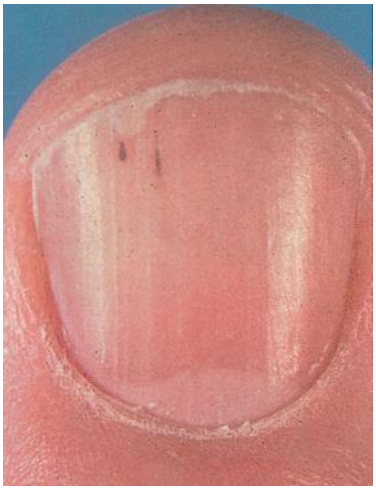

Figure 2.8 Splinter haemorrhages. (From Forbes CD, Jackson WF. Color Atlas and Text of Clinical Medicine, ed 3. 2002, Mosby, Edinburgh. Reproduced by kind permission.)

shaped gap is created, called Schamroth's window. With clubbing, a combination of the thickened nail bed and the loss of Lovibond's angle indicates that this window is reduced or even obliterated. In gross cases (usually owing to severe cyanotic heart disease, bronchiectasis or empyema), the volume of the finger pulp increases (Fig. 2.6) and becomes bulbous like the end of a drumstick. The toes may also be affected. Lesser degrees of clubbing may be seen in bronchial carcinoma, fibrosing alveolitis, inflammatory bowel disease and infective endocarditis. The last of these may also be associated with Osler's nodes—transient, tender swellings caused by dermal infarcts from septic cardiac vegetations (Fig. 2.7). Splinter haemorrhages (Fig. 2.8) and nail-fold infarctions (Fig. 2.9) may be signs of a vasculitic process, but may also be the result of trauma in normal individuals and are therefore rather non-specific.

Trophic changes may be evident in the skin in certain neurological diseases and in peripheral circulatory disorders, such as Raynaud's syndrome, in which vasospasm of the digital arterioles causes the fingers to become white and numb, followed by blue/purple cyanosis and then redness owing to arteriolar dilatation and reactive hyperaemia (Fig. 2.10).

In koilonychia the nails are soft, thin and brittle and the normal convexity replaced by a spoon-shaped concavity (Fig. 2.11). It is a rare feature

Figure 2.9 Nail-fold infarction. (From Forbes CD, Jackson WF. Color Atlas and Text of Clinical Medicine, ed 3. 2002, Mosby, Edinburgh. Reproduced by kind permission.)

Figure 2.10 Raynaud's syndrome in the acute phase with severe blanching of the tip of one finger. (From Forbes CD, Jackson WF. Color Atlas and Text of Clinical Medicine, ed 3. 2002, Mosby, Edinburgh. Reproduced by kind permission.)

Figure 2.11 Koilonychia. (From Forbes CD, Jackson WF. Color Atlas and Text of Clinical Medicine, ed 3. 2002, Mosby, Edinburgh. Reproduced by kind permission.)

of longstanding iron deficiency and is owing to defective collagen formation, which can also cause blue sclerae. Leuconychia (opaque white nails) may occur in chronic liver disease and other conditions associated with hypoalbuminaemia (Fig. 2.12), but are not particularly useful for making a clinical diagnosis of chronic liver disease.

Beau's lines are horizontal (transverse) depressions in the nail that may result from any disease process, illness, chemotherapy or malnutrition that constitutes a sufficient insult to affect the growth plate of the nail. Fingernails grow at a rate of 0.1 mm per day, so the timing of the disease onset can be estimated by measuring the distance from the Beau's line to the nail bed. They disappear over several months as the nail grows out.

Odours

Certain odours may provide diagnostic clues. The odour of alcohol on the patient's breath is easily recognizable, but do not assume that an alcoholic foetor implies alcoholism or that all the patient's current symptoms

Figure 2.12 Leuconychia in a patient with chronic liver disease. (From Forbes CD, Jackson WF. Color Atlas and Text of Clinical Medicine, ed 3. 2002, Mosby, Edinburgh. Reproduced by kind permission.)

and signs are related to alcohol intoxication. Patients with alcohol dependence may have reversible problems, such as hypoglycaemia or a subdural haematoma. The odour of diabetic ketoacidosis resembles acetone ('pear drops' or nail varnish remover) and those of hepatic failure and uraemia have been described as 'ammonia-like' or 'mousy,' respectively, but such terms are rather subjective and their use is limited. Halitosis (bad breath) is common in patients with suppurative lung diseases and in those with gingivitis owing to poor dental hygiene. As with all smells, they are difficult to describe but can be characteristic when previously experienced and learned.

Face and neck

In addition to the important expressions and features of mood and attitude noted above, important diagnostic clues may easily be apparent on inspection of the face. Examination of the cranial nerves is covered in Chapter 16, but palsies of the III (Fig. 16.5) and VII (Fig. 2.13) nerves may be obvious simply on inspection. Parotid swellings are usually easily apparent; the tender bilateral parotid swelling of mumps or the unilateral swelling with reddening of the skin from acute parotitis contrasts with the non-tender bilateral enlargement that sometimes accompanies chronic alcohol use (and possibly accompanying liver disease). Some patients with mitral stenosis have a bright, circumscribed flush over the malar bones, and in some patients with systemic lupus erythematosus there is a red raised eruption on the bridge of the nose extending onto the cheeks in a 'butterfly' distribution (Fig. 2.14). Telangiectasias, minute capillary tortuosities, may be seen on the face of patients with liver disease and, rarely, as a hereditary disorder (Fig. 2.15). In systemic sclerosis, radial puckering (furrows) may be seen around the mouth (Fig. 2.16) that, as the skin becomes tighter, limits the extent to which the mouth may be opened (Fig. 2.17).

Figure 2.13 **A, B.** Lower motor neuron palsy of the right facial nerve (Bell's palsy).

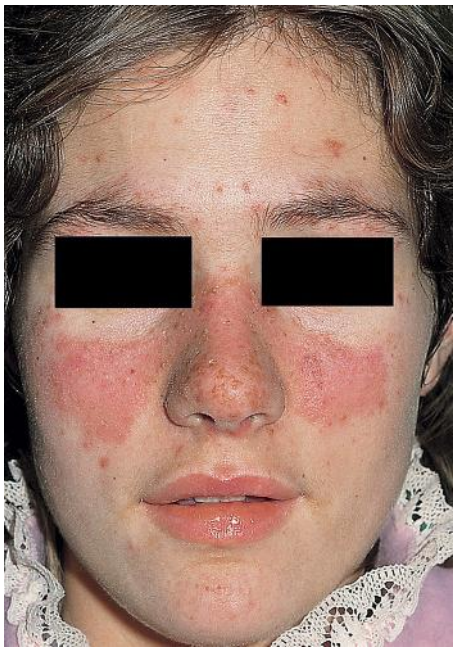

Figure 2.14 Classic butterfly wing rash in a young patient with systemic lupus erythematosus.

The neck should be inspected and palpated. Examination of the jugular venous pulse is described in detail in Chapter 13, but it is an important part of the examination in all patients, not just those with suspected cardiovascular disease. It may contribute useful information regarding the severity of lung disease, and its careful assessment is particularly important in patients suspected of having a disturbance of fluid and electrolyte balance.

Figure 2.15 Hereditary telangiectasia. The telangiectasia can be seen at the margin of the lips and on the lower lip.

Neck swellings are usually best felt from behind the patient. The general principles of lymph node palpation are described below, and the details of examination of the thyroid are covered in Chapter 19.

Lymph glands and lymphadenopathy

Details pertaining to the examination of specific lymph node groups may be found in the relevant chapters (e.g. Chapter 22 for cervical lymphadenopathy). Here, the general principles of palpating for lymphadenopathy will be covered. Lymph nodes are interposed along the course of lymphatic channels, and their enlargement should always be noted. Lymph from the arm drains into the axillary nodes. These should be examined routinely, but particularly in conjunction with examination of the breast

Figure 2.16 Radial puckering (furrows) around the mouth in systemic sclerosis.

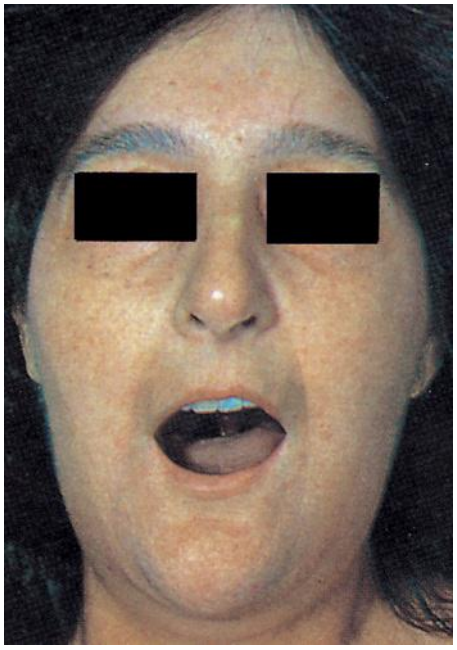

Figure 2.17 Limited mouth opening in systemic sclerosis.

(see below). Lymph from the lower limbs drains via deep and superficial inguinal nodes, although only the latter can be palpated and, in turn, comprise a vertical and horizontal group. The vertical inguinal nodes lie close to the upper part of the long saphenous vein and drain the leg. The horizontal group lies above the inguinal ligament and drains the lower abdominal skin, anal canal, external genitalia (excluding the testes), buttocks and lower vagina.

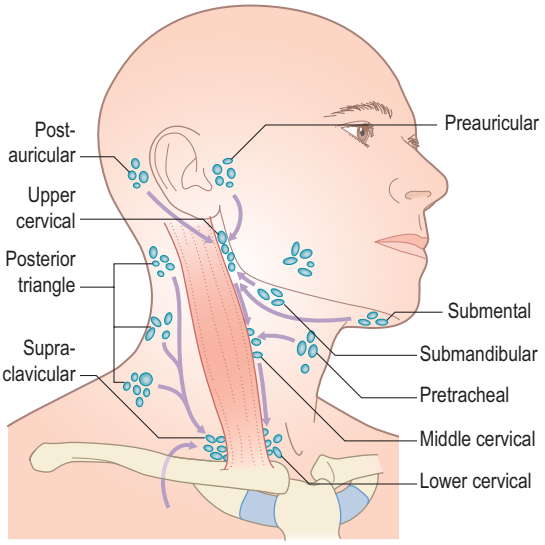

Figure 2.18 The cervical lymph node groups.

Examination of lymph nodes involves inspection and palpation. Inflammation of the overlying skin and any associated pain usually implies an infective aetiology, whereas malignant lymphadenopathy is usually not tender. To palpate for lymphadenopathy, use the pulps of your fingers (usually the index and middle but, for large nodes, the ring finger as well) to move the skin overlying the potentially enlarged node(s). Determine the size, position, shape, consistency, mobility, tenderness of the node and whether it is an isolated lymph node or whether several coalesce. For the head and neck nodes, it is often helpful to tilt the head slightly towards the side of examination in order to relax the overlying muscles. Feel for each of the groups shown in Figure 2.18 in whatever order you find most efficient and reliable. Muscles and arteries in the neck and groin may be mistaken for lymph nodes. If in doubt, try to move the structure in question in two directions (laterally and superior to inferior). It should be possible to move a lymph node in two directions, but not an artery or muscle.

Determining whether a lymph node is pathological can be difficult and requires practice and experience. In general, small, mobile, discrete lymph nodes are frequently found in normal individuals, particularly those who are slim and have little overlying adipose tissue. The finding of an enlarged lymph node should prompt the question 'Is this consequent upon local pathology, for example infection or malignancy, or is it part of a more generalized abnormality of the reticuloendothelial system (including other lymph node groups, liver and spleen)?' (Fig. 2.19).

Axillae

Most information from examination of the axillae comes from palpation for possible lymphadenopathy (Fig. 2.20), but inspection may reveal an absence/

Figure 2.19 Gross enlargement of supraclavicular and cervical lymph nodes. (From Forbes CD, Jackson WF. Color Atlas and Text of Clinical Medicine, ed 3. 2002, Mosby, Edinburgh. Reproduced by kind permission.)

Figure 2.20 Gross (in this case, painless) axillary lymph node enlargement. (From Forbes CD, Jackson WF. Color Atlas and Text of Clinical Medicine, ed 3. 2002, Mosby, Edinburgh. Reproduced by kind permission.)

paucity of secondary sexual hair in either gender (most commonly in association with chronic liver disease, but also in certain endocrinopathies), abnormal skin colouring, such as the dark velvety appearance of acanthosis nigricans (characteristic

Figure 2.21 Acanthosis nigricans (sometimes seen in insulin resistance and gastric cancer) visible in the axilla.

Figure 2.22 Freckling and neurofibromas in von Recklinghausen's disease.

of insulin resistance and occasionally gastric cancer, Fig. 2.21), or (very rarely and almost always in the presence of café au lait spots elsewhere) the characteristic freckling of von Recklinghausen's disease (Fig. 2.22).

Support the weight of the patient's arm by holding his arm at the elbow with your non-examining hand so that the patient's pectoral muscles are relaxed. With the fingers of your right hand cupped together, probe the apex of the left axilla, then slide them downwards against the chest wall to feel for lymphadenopathy. Next, 'sweep' your fingers along the inside of the anterior and posterior axillary folds, feeling for enlargement of the pectoral and subscapular lymph nodes, respectively. Use your left hand in the same way to examine the right axilla.

Skin

Examination of the skin with respect to specific dermatological diagnoses is covered in Chapter 20. In the context of the general examination, the most important features relate to temperature, hydration, pallor, colour/pigmentation and cyanosis. Use the back of your fingers to assess the temperature of the skin. This complements rather than replaces the formal measurement with a thermometer. You

Figure 2.23 Advanced scleroderma. (From Forbes CD, Jackson WF. Color Atlas and Text of Clinical Medicine, ed 3. 2002, Mosby, Edinburgh. Reproduced by kind permission.)

may note generalized warmth in febrile illness or thyrotoxicosis or localized warmth if there is regional inflammation. Cold skin may be localized, such as when a limb is deprived of its blood supply, or generalized in states of circulatory failure, when the skin feels clammy and sweaty.

Lift a fold of skin and make note of its thickness, mobility and how easily it returns to its original position (turgor). The skin on the back of the hand is often thin and fragile in elderly patients; it may show decreased mobility in scleroderma (Fig. 2.23) or in oedematous states and have reduced turgor in the presence of dehydration. The skin of patients who are acromegalic is typically thick and greasy.

Note the colour of the skin (the following description is less relevant to people with dark skin). Normal skin colour varies considerably; some people have a fresh complexion and others, although completely healthy, a pale one. Pallor may be seen temporarily in the context of haemorrhage, shock and intense emotion. Patients who are anaemic are often pale, but not all pale people are anaemic. The colour of the mucous membrane of the eyelids and mouth is a better indication of anaemia than the colour of the skin.

Yellowness of the skin is usually caused by jaundice (Fig. 2.24). A pale lemon-yellow tinge is characteristic of haemolytic jaundice, whereas in obstructive jaundice there is a dark yellow or orange tint, sometimes accompanied by scratch marks from itching caused by bile salts. Lemon tinge may also be associated with uraemia, which may occasionally also cause a 'frosting' of the lips or forehead, the so-called 'uraemic frost,' which only occurs when the blood urea has been very high for several days.

An important determinant of skin colour is the relative amount of oxyhaemoglobin and deoxyhaemoglobin. Oxyhaemoglobin is a bright red pigment. An increase in its flow beneath thinned facial skin causes the characteristic plethora of Cushing's syndrome (Fig. 2.25), whereas a decrease in flow causes pallor. As blood passes through the capillary bed, oxygen is given up to metabolizing tissues to produce deoxyhaemoglobin. This has a darker, less red, more bluish pigment, and its presence in peripheral blood vessels in increased amounts causes the clinical sign of cyanosis. There are two physiological types of cyanosis:

Figure. 2.24 Jaundiced skin. The deep yellow colour is caused by high levels of conjugated bilirubin. This patient also had gynaecomastia owing to chronic liver disease. (From Forbes CD, Jackson WF. Color Atlas and Text of Clinical Medicine, ed 3. 2002, Mosby, Edinburgh. Reproduced by kind permission.)

Figure 2.25 The characteristic plethoric appearance of a patient with Cushing's syndrome. (From Forbes CD, Jackson WF. Color Atlas and Text of Clinical Medicine, ed 3. 2002, Mosby, Edinburgh. Reproduced by kind permission.)

peripheral and central. Peripheral cyanosis is associated with increased extraction of oxygen from capillaries when peripheral blood flow is slowed, often owing to vasospasm caused by cold, heart failure or anxiety. The cyanosed extremity is usually cold and the tongue is unaffected. Any condition causing slowing of the peripheral circulation may lead to peripheral cyanosis because there is more time for oxygen extraction. Central cyanosis is caused by inadequate oxygenation of blood, in turn owing to heart failure, serious respiratory disease or mixing of venous and arterial blood across a right to left cardiac shunt. In the latter situation, a proportion of deoxygenated blood passes directly from the right to the left side of the

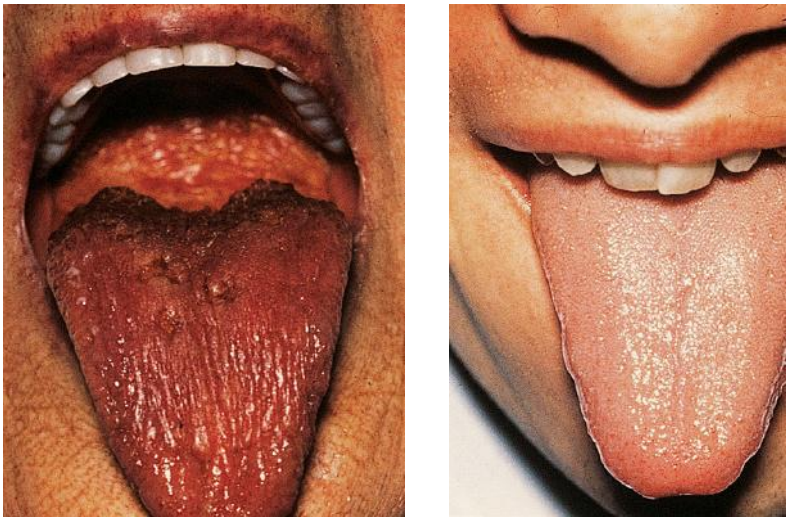

Figure 2.26 Central cyanosis in a patient with severe respiratory disease (*left*) compared with the tongue of a (*right*) normal person. (From Forbes CD, Jackson WF. Color Atlas and Text of Clinical Medicine, ed 3. 2002, Mosby, Edinburgh. Reproduced by kind permission.)

heart, without passing through the pulmonary circulation, thereby 'missing out' on the opportunity to become oxygenated. Central cyanosis is generalized and the peripheries are often warm. At least 5 g/dL of reduced haemoglobin is necessary to produce central cyanosis; therefore, it is less marked in patients who are anaemic. The cyanosis of heart failure is often towing to both peripheral and central causes. The presence of central cyanosis is best appreciated at the lips, mucous membranes and conjunctivae, where the keratinized skin is thinnest (Fig. 2.26).

Pulses

Arterial pulses are detected by compressing the relevant vessel against a firm underlying structure, usually a bone. Details of the characteristic pulse abnormalities that help in the diagnosis of various cardiac disorders are described in Chapter 13, but palpation of all the peripheral pulses should form part of the general examination of all patients. Some may be difficult to feel and you may need to vary the degree of pressure in order to pick up the relevant pulsation. On occasion, you may confuse the patient's pulse with your own. Feel your own pulse on the side of your forehead with your other hand and compare it with the patient's, as they will usually differ.

The radial pulse is palpated by gentle pressure of the artery against the distal shaft of the radius, using the tips of the index and middle fingers. It provides information about rate and rhythm, although significant abnormalities in character may also be detected. If the rhythm is regular, it is safe to count the number of beats for 15 seconds and multiply by 4 for the rate. Irregular and very slow pulses require palpation for a full minute. Palpating both radial pulses simultaneously can give useful information in selected patients. Atheromatous narrowing of the axillary artery may cause reduced strength of one radial pulse compared with the other, as may aortic dissection or compression of a subclavian artery by a cervical rib.

To palpate the femoral pulse, press deeply below the inguinal ligament, midway between the anterior superior iliac spine and the symphysis pubis. The pulse is usually easily felt against the underlying femur. In obese patients it may be useful to use two hands, one on top of the other. Occasionally, such as in young patients with hypertension, it may be appropriate to examine for radio-femoral delay. Here, the radial and femoral pulses on one side of the body are palpated at the same time. The pulsation should occur simultaneously; any delay may suggest coarctation of the aorta, in which the aorta is constricted just beyond the subclavian artery. Blood flow to the arms is good, but to the legs is poor such that the pulse is weak and delayed.

The popliteal pulse is the most difficult to palpate. Flex the knee to approximately 120° with the foot on the bed, and, with your thumbs on the patella, place your fingers in the popliteal fossa such that they meet in the midline. Occasionally, it may be necessary to have the patient lie prone with the knee flexed to 90° and the leg resting against the shoulder or upper arm; press the thumbs deep into the popliteal fossa.

The dorsalis pedis pulse is palpated by pressing against the tarsal bones just lateral to the extensor tendon of the great toe, although in some patients it may be necessary to explore the dorsum of the foot more widely. In general, it is most convenient to use the right hand to examine the left dorsalis pedis pulse; the right pulse is often best felt with the right hand from the left side of the patient.

To feel the posterior tibial pulse, with the patient's foot relaxed between plantar- and dorsiflexion, press your curved fingers against the distal part of the tibia, approximately 1 cm behind and below the medial malleolus. The posterior tibial pulse may be difficult

to feel and require extra patience and pressure in obese or oedematous patients.

Blood pressure

The physiology of blood pressure measurement (including a description of the Korotkoff sounds) is given in Chapter 13. Many doctors and medical students neglect to measure the blood pressure routinely in the belief that it is somehow a 'nursing' observation. This is a poor habit to adopt, not least because, once the technique has been mastered, it can be combined easily with simultaneous, unobtrusive observations of the patient that may provide useful diagnostic information without him feeling self-conscious. Although not necessary or appropriate to perform routinely, assessment for postural (orthostatic) hypotension is frequently informative in older patients, particularly those with symptoms of unsteadiness, syncope or presyncope, or those taking medication for hypertension. It is defined as a drop in blood pressure of greater than 20/10 mmHg within 3 minutes of changing from a supine to an upright position. Various 'protocols' are adopted; the authors favour measurement of blood pressure supine after a period of calm rest and then every minute for 3 minutes after moving to a vertical position. Together with assessment of the jugular venous pulse, it can provide important information about volume status in the evaluation of patients with fluid and electrolyte abnormalities and those with recent gastrointestinal bleeding.

Figure 2.27 Peripheral vascular disease. Seen are pallor, loss of hair and early ulceration on the dorsum of three toes. (From Forbes CD, Jackson WF. Color Atlas and Text of Clinical Medicine, ed 3. 2002, Mosby, Edinburgh. Reproduced by kind permission.)

Legs and feet

Examination of the legs requires adequate exposure from the groins and buttocks to the toes. Note the colour and texture of the skin. Peripheral vascular disease often makes the skin shiny and hair does not grow on ischaemic legs or feet (Fig. 2.27). Pressure on the toes of ischaemic feet will cause blanching of the characteristic purple colour, with subsequent slow return. Passive elevation of an ischaemic leg leads to marked pallor of the foot as perfusion against gravity falls (Buerger's test). Painless trophic lesions, often with deep ulceration, may be seen in diabetic peripheral neuropathy. The posterior aspect of the heels is a particularly important area to inspect in elderly, emaciated or neurologically impaired patients, all of whom are vulnerable to pressure ulcers caused by obliteration of arteriolar and capillary blood flow to the skin.

Inspect the legs for easily seen oedema (fluid in the subcutaneous tissue that appears as swelling) and examine for pitting oedema. Press firmly but gently behind the medial malleolus, over the dorsum of the foot and on the shin. If oedema is present, a depression/concavity will form and persist for some time (Fig. 2.28). The skin over oedematous feet and shins has a pallid, glossy appearance and

Figure 2.28 Pitting oedema in a patient with cardiac failure. A depression remains in the oedema for several minutes after firm fingertip pressure is applied. (From Forbes CD, Jackson WF. Color Atlas and Text of Clinical Medicine, ed 3. 2002, Mosby, Edinburgh. Reproduced by kind permission.)

Figure 2.29 Varicose veins. (From Forbes CD, Jackson WF. Color Atlas and Text of Clinical Medicine, ed 3. 2002, Mosby, Edinburgh. Reproduced by kind permission.)

a characteristic doughy feel. The best place to look for mild degrees of oedema in cardiac disease is behind the malleoli in patients who are ambulant and over the sacrum in those who are confined to bed. Usually, 5 to 10 seconds of finger pressure is sufficient to produce the typical shallow pit, but it may be necessary to press for 20 to 30 seconds to avoid overlooking mild degrees of oedema. Some doctors grade oedema on a 4-point scale (slight and short-lived after relief of pressure to very marked and long lasting), although the system is poorly standardized. Oedema owing to cardiac disease or to conditions associated with a low plasma protein level is bilateral. In local venous obstruction the oedema is confined to the parts from which the return of blood is impeded. Thus, oedema of an arm occurs when malignant lymph nodes constrict the axillary vein, and unilateral leg oedema will develop if the ileofemoral vein is occluded. The oedema of lymphatic obstruction does not pit on pressure.

Varicose veins should be sought with the patient standing (Fig. 2.29). Superficial varicosities are generally obvious in this position, whereas the efficiency of the valves of the long saphenous vein should be assessed by Trendelenburg's test. With the patient lying, the saphenous vein is emptied by elevating the leg. Occlude the upper end of the vein by finger pressure on the saphenous vein opening (alternatively use a tourniquet) and ask the patient to stand while maintaining this pressure. If the valves are incompetent, the veins will rapidly fill from above when the pressure is released.

Venous thrombosis is rare in healthy mobile persons but frequently complicates enforced bed rest, particularly after surgery. The affected limb will be swollen. The circumference of the calf should be measured and compared with the unaffected leg at the same distance below the tibial tuberosity. A discrepancy of more than 1 cm is significant. The affected leg is also tender and warmer than normal, with dilated superficial veins, which do not collapse when the leg is elevated. Forceful dorsiflexion of the foot may cause pain in the calf (Homan's sign). Sometimes a deep vein thrombosis may extend up the thigh leading to a tender, hard, palpable femoral vein.

Breasts

Breast examination should form part of the routine clinical assessment, usually at the time of chest examination. It requires tact and sensitivity and should be conducted with a chaperone. With the patient disrobed to the waist, the arms should be in a relaxed position by the sides, usually starting with the patient sitting or standing. By inspection, note the size, symmetry, contour (e.g. any dimpling) and colour of the breasts. Inflammatory breast cancer with oedema of the overlying skin may produce a characteristic look and texture termed peau d'orange (orange peel skin). Note any asymmetry or nipple inversion. Simple, longstanding inversion is often a normal phenomenon, but associated retraction of the areola and recent nipple inversion are both more sinister. Ask the patient to raise her arms above her head. This manoeuvre allows inspection of the inframammary fold and may expose subtle contour abnormalities. Now, with the patient supine, ask the patient to rest one arm above her head. This helps spread the breast tissue more evenly across the chest and makes palpation of any nodules easier. For ease of annotation, the breast is usually divided into four quadrants, with the upper outer quadrant extending into an axillary tail. Use the pads of your middle three fingers to palpate the breast, using rotatory movements gently to compress the tissue against the chest wall. Proceed systematically to examine all quadrants, the tail and areola. Sometimes it is useful to support the breast with the other hand in order to aid examination, especially when the breasts are large.

Breast tissue varies among patients, ranging from smooth to granular, and may change in a given individual with the menstrual cycle. For any nodule, note its size, shape, consistency, tenderness, mobility and the presence of any tethering or skin ulceration. Ask the patient to press her hands against her hips. If the lump becomes less mobile, it is likely to be attached to the pectoral muscles. Fixation to skin may be assessed by moving the skin overlying the lump independently. If this is not possible then skin involvement is likely.

Swelling of male breast tissue is usually easily apparent (Fig. 2.30). Distinguishing true glandular enlargement from pectoral fat may be facilitated

Figure 2.30 Gynaecomastia in a male patient. (From Forbes CD, Jackson WF. Color Atlas and Text of Clinical Medicine, ed 3. 2002, Mosby, Edinburgh. Reproduced by kind permission.)

with the patient's arms above his head. At some stage of puberty, most boys will have a palpable disc of breast tissue.

Putting it all together

The information given in this and subsequent chapters describes techniques of physical examination that *may* be helpful in elucidating the cause of a patient's symptoms. It is not implicit that *all* of these examinations should be performed for *all* patients. For example, it is not appropriate to make a detailed assessment of the neurological system in someone in severe respiratory distress owing to pulmonary oedema or in abdominal pain from peritonitis. Initially, both alone and during teaching, you will probably practise examining individual systems (e.g. the cardiovascular system). Soon, however, you will be ready to conduct a complete examination. The following is a suggested order for the student to practise, and doctor to perform, in all hospitalized patients who are not acutely ill, in order to exclude any major abnormality in the various bodily systems.

General

- Overall appearance (well, unwell, severely ill; neglected or well-cared for).
- Posture and gait.
- Nutrition, obesity, oedema.
- Skin colour, cyanosis, jaundice, anaemia.
- Skin lesions (spider naevi, vitiligo, purpura, petechiae).
- Body hair (distribution, quantity).
- Vital signs (temperature, pulse, respiration rate).
- Obvious features of endocrine disease (e.g. Cushing's, acromegaly, hyperlipidaemia).

Mouth and pharynx

- Odours, lips, tongue (ask to protrude), teeth, gums, buccal mucous membrane, tonsils.

Hands

- Clubbing, tremor, wasting, arthropathy, metabolic flap, Dupuytren's contracture, splinter haemorrhages, nailfold infarcts, koilonychia, leuconychia, nicotine stains.

Cardiovascular and respiratory (anterior, patient semi-recumbent)

- Radial pulse: rate, rhythm, character.
- Blood pressure, lying and standing.
- Jugular venous pulse.
- Carotid pulses, separately, both sides.
- Inspection for symmetry, scars, dilated vessels, breasts, nipples.
- Praecordial palpation: apex beat, thrills, heaves.
- Auscultate the heart sounds.
- Palpate tracheal position.
- Chest expansion.
- Tactile vocal fremitus.
- Percuss the lungs.
- Auscultate the breath sounds.
- Vocal resonance.

Cardiovascular and respiratory (posterior, sitting forward)

- Inspect for symmetry of movement, scars.
- Chest expansion.
- Tactile vocal fremitus.
- Percuss the lungs.
- Auscultate the breath sounds.
- Vocal resonance.
- Inspect for sacral oedema.

Neck (while sitting forward)

- Thyroid palpation.
- Cervical, submandibular lymphadenopathy.

Abdomen

- Inspection: size, distension, asymmetry, scars, abdominal wall movements, dilated vessels, visible peristalsis, pulsations, pubic hair, spider naevi.

- Palpation: tenderness, rigidity, hyperaesthesia, masses, organomegaly, hernial orifices, inguinal lymphadenopathy, genitalia, digital rectal (where relevant).
- Percussion: organomegaly, masses.
- Auscultation: bowel sounds, bruits.

Upper limbs

- Inspection: fasciculations, wasting, trophic changes.
- Test for tone, power, reflexes, coordination and cutaneous sensation.
- Test joints for swelling, pain and movement, if relevant.

Lower limbs

- Inspection: fasciculations, wasting, trophic changes, ulceration, varicose veins, oedema.
- Test for tone, power, reflexes, coordination and cutaneous sensation.
- Test joints for swelling, pain and movement, if relevant.
- Peripheral pulses.

Cranial nerves

- Visual acuity, pupillary responses, visual fields, extraocular movements, nystagmus fundoscopy.
- Facial movements and sensation.
- Rinne and Weber test.
- Palatal elevation, tongue appearance and protrusion.

Documentation and communication

An accurate, concise record of a clinical episode is crucial for effective care. It serves as a tool for ordering the doctor's thoughts as he reviews the findings before constructing a provisional differential diagnosis. It may identify errors or missing data (did I examine the reflexes?). It serves as a reminder of those thought processes at future consultations as the results of investigations become available and/or the condition evolves, and it allows colleagues to pick up the 'thread' of a case if the initial assessing doctor is unavailable. Furthermore, as rising expectations and increasing availability of medical information via the Internet embolden more patients to question the quality of their care, accurate documentation is vital in order to provide the evidence for the quality of the decision-making and assessment in the event of a disagreement between patient and doctor. All medical note entries should be dated, timed and signed and each page should have the patient's name and hospital record number clearly written. In many countries, this is now automatic on account of the increasing use of electronic (paperless) medical records. Although, in many ways, a major advance, the increasing use of electronic records carries new possibilities for error, particularly for patients with chronic illness or those whose hospital stay is prolonged. 'Cutting and pasting' the original assessment and problem list into the clinical record at subsequent inpatient or outpatient encounters has the potential to perseverate (well-intentioned) error that may have arisen from incomplete information and/or lack of availability of initial results. It is the authors' view that, in the era of electronic notes, maintaining diagnostic rigour and 'open-mindedness' requires extra discipline; something it is never too early to practice.

The style and extent of note-taking will vary according to circumstance. For example, a postoperative visit to a surgical outpatient clinic after a routine hernia repair is likely to focus exclusively on issues relating to pain and scar healing, with brief documentation. In contrast, the initial consultation at a falls clinic will involve the expert in elderly medicine gathering potentially relevant information about past medical history, current medication, social support and the history of the current problem, and will certainly require a comprehensive physical examination. A General Practitioner likely already knows the details of the patient's family, social, past medical and drug histories, so in the limited time available will focus on the current problem. In all of these situations, however, the clinician should avoid being constantly engaged in writing notes or, increasingly, looking at a computer screen. Maintain eye contact as the patient talks about his problems. The following suggestions refer to a new patient consultation in the outpatient clinic or a non-acutely ill hospitalized patient. The goal is to write a complete yet concise record of the patient's problem that can be followed easily as a logical narrative by the next doctor to see that patient.

Start with the routine social data: name, address, marital status, occupation, dependent family members and children. The order in which the family, past medical and presenting complaint histories are documented is not rigidly set. For those patients who have enjoyed good health to the point of the current illness, the presenting complaint and history of the current problem fall naturally out of the context of the above background information. Medical notes for such a patient with (for example) a spontaneous pneumothorax might read as follows:

Mr JW, aged 32, manual labourer, married, 2 children.
Generally in excellent health and symptom free.
Keen sportsman.
No relevant past medical history.
Presenting complaint (PC): Breathlessness.
History of presenting complaint (HPC):

- Sudden-onset right-sided chest pain.
- Worse on inspiration.
- Associated severe breathlessness; unable to get comfortable.

- No cough or sputum or haemoptysis.
- No injury or trauma to chest.
- No previous similar episodes.
- No recent periods of immobility.
- No leg swelling or pain.

Past medical history (PMH):

- Appendectomy age 6.
- Varicocoele found and surgically corrected age 25 following assessment for primary infertility.

An important differential diagnosis in a patient with pneumothorax is pulmonary embolism, sometimes with prior deep venous thrombosis. The 'negative' features of the history (no leg symptoms, no recent immobility) 'steer' the narrative and any subsequent reader of the history away from this diagnosis, but they serve as a focus for its consideration. If a rigid system were recommended of documenting all *potentially* relevant past medical and family history prior to the presenting problem, the same history might read:

Mr JW, age 32, manual labourer, married, 2 children. Generally in excellent health and symptom free. Keen sportsman.

No family history of deep vein thrombosis or pulmonary embolism. No family history of tall stature, lens dislocation, valvular heart disease (all features of Marfan's syndrome, an important association with pneumothorax in young patients). Varicocoele surgery age 25 with no history of postoperative deep vein thrombosis or pulmonary embolism.

PC: Breathlessness.

HPC:

- Sudden-onset right-sided chest pain.
- Worse on inspiration.
- Associated severe breathlessness; unable to get comfortable.
- No cough or sputum or haemoptysis.
- No injury or trauma to chest.
- No previous similar episodes.
- No recent periods of immobility.
- No leg swelling or pain.

Although used as an extreme example, such a style of documentation could 'obstruct access' to the presenting complaint. For many patients, however, it *is* appropriate to detail a pertinent family history and/or past medical history prior to the current problem or as an 'introduction/context' to it. Good examples of this would include a middle-aged man with rectal bleeding and a strong family history of carcinoma of the colon, or a young person, breathless on exertion, who underwent corrective surgery for congenital heart disease as a child. For other patients, the current problem is the latest development of a long-standing illness, such as cough and breathlessness in a patient with chronic obstructive pulmonary disease. This skill of interweaving the past/family history with the current problem will develop with experience, so do not be disheartened if your notes initially seem disjointed.

Box 2.2 Example of a cardiovascular system statement

- Pulse 76 regular, peripheral pulses normal
- Neck veins not distended. No peripheral oedema
- BP 130/80
- Apex beat not displaced
- Heart sounds I and II heard in all areas
- No murmurs, lungs clear

Many patients have had medical and surgical episodes in their history that are essentially 'closed events'; for example cataract removal, hernia repair or tonsillectomy as a child. Although they may seem irrelevant to the current problem, they may subsequently provide important useful information and it is important to document them meticulously. For example, knowing that a bilateral oophorectomy was performed at the time of a hysterectomy is helpful information in the assessment of a woman with ascites. The past medical history (if accurate) makes a diagnosis of carcinoma of the ovary highly improbable. Documentation of any surgical procedures, however minor, can provide reassuring or helpful anticipatory information in patients likely to undergo general anaesthesia. Recording of the history concludes with the full list of drugs, dosages and dosing intervals, any adverse reactions to previously prescribed medicines and documentation of the review of systems (see Chapter 1).

Details of the physical examination should be documented in a clear, structured framework. Start with a general, non-judgemental comment about the patient's overall appearance, such as 'well man with moderate generalized adiposity' or 'drawn, anxious woman, breathless on undressing'. Record important positive and negative features on general examination, for example jaundice, clubbing, rash, fever, lymphadenopathy. The remainder of the examination should be documented under bodily systems: cardiovascular, respiratory, gastrointestinal (often referred to as abdominal), nervous system, skin, limbs and joints. Negative findings are often as pertinent as positive ones. Simple line drawings are often particularly effective. A concise summary of the findings in the cardiovascular system might read as in Box 2.2.

The case notes should conclude with a brief summary of the history and the major abnormalities found on examination, which leads to the differential diagnosis and management plan (Boxes 2.3 and 2.4).

Presenting a case

It is very valuable to your learning to practice making short summaries of your findings, emphasizing both important positive findings and relevant negative ones. The summary should begin with the name, age, sex and occupation of the patient and end with a

Box 2.3 Framework of pathological processes informing a differential diagnosis

- Congenital
- Degenerative
- Infective/inflammatory
- Metabolic
- Neoplastic
- Nutritional
- Toxic
- Traumatic
- Vascular

Box 2.4 Order of tasks to follow when constructing a provisional management plan

1. List the monitoring/nursing recommendations that are imperative to the patient's immediate comfort, wellbeing and safety.
2. List the investigations that need to be done immediately (e.g. blood cultures and malaria film in a patient returning from overseas with a fever of unknown origin).
3. Document the medications you propose to prescribe, including the dosages and frequency of administration (this includes intravenous fluid therapy).
4. List the investigations that may need to be done at some stage in order to provide further diagnostic information.

brief statement of the problem. Another important skill to acquire is that of oral presentations of the cases you see to colleagues; the ultimate test is the ability to communicate a difficult problem to a senior colleague on the telephone. The history and findings on examination should be communicated in temporal, coherent order, making an interesting and easily grasped narrative.

Summary

Ultimately, the goal is for the clinician to use a combination of experience, knowledge and appreciation of the accuracy and limitations of history taking and examination to try to come to a correct diagnosis, or diagnoses, and facilitate the best treatment with the least discomfort and anxiety for the patient. As with everything described in this chapter, no substitute exists for practice and an open-ended willingness to learn from both success and error.

The next steps: Differential diagnosis and initial management

3

Michael Glynn

Introduction

The term 'Differential Diagnosis' used to be very widely used by doctors, but it now seems to be used less, and is less well understood. It might be better termed as 'Differential Diagnoses', because the process of preparing it is to formulate a list of possible diagnoses that cover the presenting clinical situation, usually written in the descending order of likelihood. It is a very important part of the overall treatment of a patient from initial presentation, particularly in the emergency situation. Hopefully, the doctor clerking a patient will write a thorough history and complete a detailed examination. He may write a good plan of treatment, but the intermediate step of preparing the differential diagnoses is often missed or replaced by something which is entitled 'Impression', which often only considers one possibility. Box 3.1 gives three illustrations of situations in which the 'Impression' is too restrictive, whereas a full differential diagnosis would allow the treating doctors to consider the full range of possibilities, including those that are quite rare, but nevertheless vitally important if present.

One of the most common reasons for attendance at an Emergency Department with chest pain is because the patient himself or a referring doctor is worried that the chest pain is of cardiac origin. This is the reason a receiving doctor might write 'chest pain, rule out cardiac cause' as the overall 'impression'. However, there are other causes of acute chest pain, both common and rare. There is often a feeling that suggesting rare diagnoses opens avenues of investigations that are time consuming and expensive, but this is far from the truth. For instance, it may take only brief consideration that the patient may have a dissecting thoracic aortic aneurysm to return to the patient and clarify the character of the chest pain (dissecting aneurysms produce pain that is tearing in nature and clearly going through from front to back) and to check the blood pressure in both arms. Together with a simple chest X-ray, this may be sufficient evidence to exclude a dissecting thoracic aortic aneurysm without the need to resort to an emergency computed tomography (CT) scan.

The most common cause of an acute headache is probably a tension headache. There is no useful test for this and the diagnosis will largely be made on history. Particularly in the emergency situation, some very serious causes of acute headache must not be missed, such as a subarachnoid haemorrhage or a sagittal sinus thrombosis. Careful and accurate differentiation between these two is clearly imperative because anticoagulation for a suspected sagittal sinus thrombosis would be completely the wrong treatment for a subarachnoid haemorrhage.

The process of differential diagnosis does not mean that every single possible cause needs to be specifically excluded in every clinical situation. However, having the full list of differential diagnoses written down helps the doctor weigh the likelihood of each one and then clarify the situation as is appropriate to the particular clinical situation. This clarification will not necessarily mean arranging complex investigations. It might mean just a mental

Box 3.1 Samples of common emergency medical problems and the contrast between a simple 'impression' and a full list of 'differential diagnoses'

Presenting problem	Impression	Differential diagnoses
Chest pain	Rule out cardiac cause	Acute coronary syndrome Pulmonary embolus Gastro-oesophageal reflux Musculoskeletal pain Dissecting thoracic aneurysm
Severe headache	Likely migraine	Tension headache Migraine Subarachnoid haemorrhage Temporal arteritis Sagittal sinus thrombosis
Apparent stroke	Cerebral infarction	Cerebral infarction (thrombus or embolus) Cerebral haemorrhage Carotid or vertebral dissection Hemiplegic migraine Brain tumour with haemorrhage Cerebral abscess Cerebral vasculitis

Box 3.2 Examples of key questions that help to confirm or refute specific diagnoses

Diagnosis	Key questions
Subarachnoid haemorrhage	■ Was it the worst headache you have ever had? ■ Did it start extremely suddenly like a blow on the head?
Diarrhoea caused by irritable bowel	■ Does the need to open your bowels ever wake you from your sleep (rare in irritable bowel)?
Cardiac chest pain	■ Does the pain feel like a weight pressing on your chest?
Intermittent claudication or angina pectoris	■ Does the pain come on with a predictable amount of exercise?

check that the right specific questions have been asked or making sure that particular physical signs have been checked.

This reviewing, checking and clarification process that is mentally undertaken by the doctor clerking the patient is not something that needs to be delayed until the history and examination are completed. As the student and doctor become more experienced in the process of history and examination and the preparation of the differential diagnoses, they will begin to think through the patient's problems as soon as the consultation begins. The consultation will often be punctuated by key questions aimed at confirming or refuting a particular diagnosis that has occurred to the doctor during the course of the clerking process. Box 3.2 is a list of some key questions and the diagnoses to which they refer.

Management plan

Having obtained the history and examination details and formulated a list of differential diagnoses, the student or doctor needs to decide on what should happen next. As with everything clinical, what the patient actually wants is of paramount importance. Box 1.16 in Chapter 1 gives a list of the general scenarios that may lie behind a consultation between patient and doctor. Of particular relevance to the process of differential diagnosis and planning management is the degree to which patients want answers to queries or relief of symptoms. Quite a useful question can be 'Are you worried about your symptoms because of the trouble they give you and you want to be rid of them, because of what might be wrong, or both?' This can be quite a confusing question for the patient, but if explained carefully and answered specifically, it can avoid a lot of unnecessary investigation. In addition, starting out on the right track can make subsequent management much simpler, and it is often much easier to reassure patients that nothing is seriously wrong than to give them an exact diagnosis or full relief of symptoms. This process particularly applies to a patient who has a fear of cancer. In a relatively young patient with quite harmless symptoms, even if a serious diagnosis is not really suspected, it may be necessary to perform some sort of investigation (such as an endoscopy or a CT/magnetic resonance image scan) to provide the necessary reassurance, even if it is not absolutely necessary for the process of resolving the differential diagnosis.

The priority of different investigations, the order in which they are done and the question of when treatment is given, all have to be considered and planned carefully. There is often quite a strong temptation for the doctor making the initial plan to start off with quite a large series of investigations. This is often done because the doctor assumes the patient needs the reassurance of normal tests and, to some extent, doctors need that reassurance themselves. There may even be a temptation to practice defensive medicine to avoid being accused in the future of under-investigating and missing diagnoses. However, this level of investigation is often not a productive way forward; it can overuse resources, sometimes prevent other patients having their tests in a timely manner, and, according to circumstance, can be financially detrimental to the individual patient. However, there may also be drawbacks to a logical series investigation and planning the next test only when the results of the first one are known. On occasions, this can seem a slow and tedious process for the patient, particularly if the health system allows only relatively infrequent patient review. Box 3.3 illustrates some clinical scenarios and the contrast in investigation style.

What to write in the case notes

Recording the possible differential diagnoses and the thinking behind them at the time of an initial consultation is a very important process, and can be crucial in getting to the correct diagnosis and avoiding the very real risk of neglecting a diagnosis that seemed very possible at the outset, but seems less likely as clinical events change. This is particularly true if the relevant symptoms are likely to become less severe after the initial presentation. An example might be a patient who presents with chest pain and who is hypoxic. When reassessed later, the hypoxia may have resolved and, if the original differential diagnosis is not reviewed, the diagnosis of pulmonary embolus might be overlooked. It is particularly good practice to write down the differential diagnostic list annotated either with confirmatory features for each possible diagnosis or any areas that lack confirmation. Such a list is given in Box 3.4.

Some items on a list of possible differential diagnoses may be more a result of a hunch on the part of the doctor rather than logical derivation

Box 3.3 Examples of clinical scenarios and contrasting investigation styles

Clinical scenario	Logical investigation	Immediate investigation
Iron deficiency anaemia with dyspepsia in a man	Gastroscopy—if no ulcer, then colonoscopy—if no colonic source of blood loss, then do coeliac check and exclude or treat for parasites/worms	Gastroscopy and colonoscopy combined and a check for coeliac disease: exclude or treat for parasites/worms
Transient ischaemic attack	Carotid ultrasound—if no clear embolic source, then cardiac ECHO for possible cardiac source of emboli—if normal, then blood tests for hypercoagulability	Carotid ultrasound, cardiac ECHO and blood tests for hypercoagulability all arranged at the same time
Abnormal liver function tests without alcohol excess or medication side-effect	Blood tests for viral hepatitis and ultrasound—if no cause found, then blood tests for rarer liver diseases	Do a full 'liver screen' in all patients, including tests for viral hepatitis, fatty liver disease and rarer liver diseases

from the available information. This might particularly apply to conditions that have relatively vague presentations rather than with a classical symptom complex. An example might be putting Addison's disease on the differential diagnostic list of a patient who presents with a specific condition but has also been non-specifically unwell, has a relatively low systolic blood pressure and a sodium concentration below the lower limit of normal. The initial focus would be on treating the specific presentation. However, having Addison's disease on the differential list will allow this to be reviewed later and investigations planned, such as basal paired measurements of cortisol and corticotropin. Addison's disease would be a good example of a good style of clinical practice which states 'once you have thought of it, you need to exclude it'. This is particularly true in many areas of medicine which now rely on teamwork and doctors changing their duties from day to day. If the first doctor had considered Addison's disease as a possible diagnosis, it would often be unwise for a second doctor to come along and discard that possible diagnosis without arranging the specific test or at least considering it very carefully. This clinical approach applies in many situations, although each consultation is a clinical episode in its own right, and the doctor must make the best judgement of the clinical circumstance relevant at the time.

Box 3.4 A 'model' write-up of a differential diagnostic list in a patient presenting as an emergency with chest pain (see Box 3.1), with relevant positive and negative pointers written down for each possible diagnosis

Differential diagnostic list	Key features
Acute coronary syndrome	Many risk factors, mildly raised initial troponin
Pulmonary embolus	Sudden onset, but pain not pleuritic, not hypoxic and no electrocardiographic change
Gastro-oesophageal reflux	Burning pain but no previous dyspeptic history
Musculoskeletal pain	Tender right lower anterior ribs
Dissecting thoracic aneurysm	Blood pressure same in both arms, no mediastinal widening on chest X-ray

What to say to the patient

Every doctor has a duty to be truthful with patients. However, this does not mean there is duty to tell a patient 'the whole of the medical textbook'. This means that there is a duty to say what is likely and also what is serious, the two not always coinciding. For example, in a patient aged 46 attending a gastroenterology out-patient clinic with a change in bowel habit of 3 months' duration associated with some cramping abdominal pain and bloating and a few episodes of bright red rectal bleeding, the most likely diagnosis is not serious. A full differential list would include as relatively likely diagnoses, irritable bowel syndrome accompanied by some haemorrhoidal bleeding and also inflammatory bowel disease. A less likely but certainly a serious diagnosis would be the presence of colorectal cancer, which would be unusual at age 46, but certainly not unknown. Rare diagnoses might include gut vasculitis and ischaemic colitis. Good practice would be to say to the patient, 'I think you have irritable bowel syndrome accompanied by some haemorrhoidal bleeding, but to exclude inflammatory bowel disease and the unlikely possibility of bowel cancer, I recommend that you have a colonoscopy' (the rarer diagnoses do not need to be mentioned at this stage).

What to do when the diagnosis is unclear

At the outset, the diagnosis relevant to any clinical situation is almost always unclear. Occasionally the doctor may make a 'spot diagnosis', such as when a patient walks into the consulting room with obvious and previously undiagnosed Parkinson's disease, although the patient may have come with problems and issues that have a different underlying cause. After history and examination, the student or doctor will prepare a list of differential diagnoses

and will start a process of confirming or refuting those diagnoses, often with key investigations, or sometimes starting treatment and watching the effect of that treatment.

Doctors must be prepared for the not uncommon situation in which the diagnostic list appears to be exhausted and the patient's condition has not improved. It is at this point that the initial diagnostic list is particularly useful, to double check that it is complete and to rethink what level of testing is needed to confirm or refute any diagnoses. The list may well be reviewed in the light of how the clinical situation has evolved.

One particular issue will often arise that can be posed as the question, 'Which is more likely—a rare condition that has not yet been thought of, or a common condition that has been missed on the first round of testing?' This way of looking at a problem will often lead to the repeat of an examination (e.g. an upper gastrointestinal endoscopy) or an alternative look at the same problem (e.g. an abdominal CT scan following a normal ultrasound scan). It is certainly important to realise that every medical test has an error rate, even with the best quality control in laboratories and the highest standards in departments such as radiology and endoscopy.

Multiple causation

A common challenge facing the doctor is whether to accept the clinical findings on the basis of a single pathological process, or whether to invoke more than one bodily system or pathological process. This skill can be acquired only with time and experience but, in general, younger patients, shorter histories and examination findings confined to a single organ system tend to favour a single cause, whereas multiple causation is more likely among older patients with symptoms and signs in more than one bodily system.

Selecting appropriate investigations

As with history taking and physical examination, judicious selection of appropriate investigations to clarify a patient's diagnosis is a skill that develops through teaching, practice and a willingness to learn from mistakes. This is increasingly true as access to high-definition radiological imaging becomes more widespread and the vast majority of haematological and biochemical investigations are automated and provided as a 'package' rather than individually selected. Although it might instinctively be thought by the student that the easy availability of such data could only be beneficial to a patient (i.e. lead to the fortuitous diagnosis of unsuspected disease), in many cases it can lead to unnecessary expense and patient anxiety. This is because asymptomatic benign lesions identified on imaging or minor disturbances of haematological/biochemical parameters often necessitate further investigation and surveillance.

Ask yourself the following questions when considering which investigations to request:

- Will this test confirm/complement the information derived from the history and examination?
- Will this test provide new information (such as a chest X-ray in a patient with a productive cough and weight loss but no physical findings on examination)?
- Could this test provide useful information over a period of time as a marker of disease progression (e.g. the inflammatory markers erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) in a patient with infective endocarditis. Neither test is specific for the diagnosis, but changes in both values may be useful markers of disease progression)?
- What are the possibilities of this test yielding clinically irrelevant/distracting information compared with a diagnostically informative result? A good example of this would be the indiscriminate use of cranial computed tomography (CT) scans in patients with ill-defined neurological symptoms (such as dizziness) before a detailed neurological examination has been performed. Meningiomas (benign tumours arising from the meninges) are not-infrequent findings in patients undergoing cranial imaging. In a patient with dizziness without other neurological symptoms or signs, such a finding is likely to be irrelevant and, because the meningioma will need routine surveillance, is likely to cause unnecessary anxiety. In contrast, the finding of a meningioma in a patient with a carefully taken history of focal seizures is likely to be highly relevant (and, in fact, a reassuring finding for many patients because the differential diagnosis includes many other, more aggressive, brain tumours with a bleak outlook).
- What are the potential risks and discomfort to the patient of the proposed test (including the risk of unnecessary anxiety generated by an irrelevant finding demanding further evaluation)? In the case of routine haematological and biochemical tests requiring straightforward venipuncture, the immediate risk (aside from minor discomfort) is extremely low. In the case of coronary angiography, the risk of death is around 0.1% and of serious complication (myocardial infarction, stroke, arrhythmia, cardiac perforation) approximately 1.7%. Following a kidney biopsy, the risk of a haemorrhage sufficiently severe to require an emergency nephrectomy is around 0.0003% (1 in 3000). In these and other situations, the clinician must balance benefit and risk. The benefit can be diagnostic information leading to targeted treatment of a serious illness, or excluding problems for which the treatment has significant risk. The risk is that of the investigation itself or of the anxiety or distress that it may provoke.

- What information does the laboratory and/or radiology department require to make this test maximally useful? A biopsy or surgical specimen sent to the pathology laboratory is likely to yield much more diagnostic information when accompanied by clinical details and a specific question than if delivered, speculatively, without either.

Conclusion

The process of formulating a set of differential diagnoses is simple, quick, rewarding, and without cost. Clinicians must keep it in the forefront of their mind when attending to patients, after the initial assessment, and then revise and refine as the clinical journey progresses.

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Ethical considerations 4

William M. Drake

Introduction

The cornerstone of a good relationship between doctor and patient is trust. In primary care, this relationship (often in the context of caring for the whole family) may be built up over several years, but in hospital practice or in an emergency, the patient and the doctor may be meeting for the first time. Patients expect a high standard of behaviour and care when they seek medical help. This includes the following expectations:

- They will be consulted about decisions bearing on their treatment.
- They will be informed about their illness.
- They will be informed about the likely outcome of any treatment offered.
- Their right to confidentiality will be respected.

Always assume that a patient is able fully to understand the nature of the medical problem and its implications, regardless of your impression of educational level. Some patients like to discuss what they would like to know early in a consultation and many will say clearly what information they would like to be given to the family. Occasionally, family members may feel that the patient would not be able to comprehend medical information or ask that he be 'protected' from the full details of a serious illness. Patients may insist that they do not wish the family to know about their medical problems or, sometimes, that they themselves do not wish to know the diagnosis. In all such instances, the needs and rights of each individual patient should be considered paramount, over and above those of the family, in the event of conflict.

Autonomy

The fundamental principle underlying medical ethics is autonomy: patients have the right to decide their own medical destiny. This gives rise to the concept of seeking the patient's consent for medical interventions, for research and for teaching. Only in the case of a minor or a mentally disturbed person may consent be sought from the patient's lawful parents or guardians. Assent, but not consent, may be sought from relatives, such as in the case of an unconscious patient in an intensive care unit. The doctor therefore has a duty not only to advise but also to explain. This principle crosses all religious and cultural boundaries.

Consent

The patient's consent should be sought for any treatment, however minor, even when that consent might appear implicit as, for example, by attendance at an emergency unit with injury. Sometimes assessment of a minor symptom discloses a separate, more serious issue. In such circumstances, consent to investigate the new problem is required.

To give consent, a patient must have sufficient, accurate information about the illness in order to make an informed judgement about whether its investigation and treatment are justified. There are four requirements of the doctor discussing an intervention with a patient:

1. The procedure itself must be described, including the technique, its implications and the intended benefit of doing it.
2. Information about the risks and complications must be given, which usually means all the risks, as well as some information about the consequences of any complication.
3. Associated risks (e.g. from anaesthesia or from other drugs that may be necessary) should be described.
4. Alternative medical or surgical investigations or treatments should be discussed, so that the reasons for the specific advice given are clear. In addition, the implications of the 'do nothing' option should be discussed.

Obtaining consent

The amount of information divulged will vary according to the context of the discussion and according to the needs of the patient as they emerge in the consultation. The objective is not to place the patient in the situation of having to decide between conflicting medical data, but to explain why a particular investigation or treatment is being recommended. The patient must not feel under duress.