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BMJ Books
Geriatric Medicine

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Geriatric medicine is practised by many different clinicians in a wide variety of settings: hospital wards, outpatient clinics, day hospitals, general practitioner surgeries, care homes and the patient's own home.

Most doctors will spend a large part of their time dealing with older patients, which is why geriatric medicine is important. It is also a challenge: illness in older people often presents in atypical ways; and there is sometimes an inaccurate perception that little can be done to help them, or that their problems are ‘social’ rather than medical.

The *ABC of Geriatric Medicine* is written as an introduction to the specialty. The chapters are based on the UK’s postgraduate curriculum for geriatric medicine and cover both general and specific aspects of medicine for older people, with further resources.

This book is for doctors in training – in hospital or general practice – and for medical students and specialist nurses. It can also be used as a resource for teaching. We hope you enjoy using it.

**Interpretation of the text**

The conditions discussed in this book refer specifically to older people and it should not be assumed that the same approach is relevant in younger patients, unless specifically stated.

The text and figures refer mainly to geriatric medicine in the UK; however, many of the principles apply to other developed countries.

Nicola Cooper
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The editors would like to thank Mary Banks of Wiley-Blackwell for allowing this project to go ahead, and to the rest of the Wiley-Blackwell team for all their hard work. Thanks also go to the authors and to Dr Jon Martin, specialist registrar in radiology, Leeds, for his help in providing and interpreting radiological images for publication.
Geriatric medicine is important because most doctors deal with older patients. In the UK, people over the age of 65 make up around 16% of the population, but this group accounts for 43% of the entire National Health Service (NHS) budget and 71% of social care packages. Two-thirds of general hospital beds are used by older people and they present to most medical specialties (Figure 1.1).

The proportion of older people is growing steadily (Figure 1.2), with even greater increases in the over 85 age group. According to official figures, the numbers of people aged 85 and over are projected to grow from 1.1 million in 2000 to 4 million in 2051.

Geriatric medicine is mainly concerned with people over the age of 75, although most ‘geriatric’ patients are much older. Many of these have several complex, interacting medical and psychosocial problems which affect their function and independence.

**Age-related differences**

There are important differences in the physiology and presentation of older people that every clinician needs to know about. These in turn affect assessment, investigations and management (Box 1.1).

Special features of illness in older people include the following.

**Multiple pathology**

Older people commonly present with more than one problem, usually with a number of causes. A young person with fever, anaemia, a heart murmur and microscopic haematuria may have endocarditis, but in an older person this presentation is more likely to be due to a urinary tract infection, aspirin-induced gastritis and aortic sclerosis. Never stop at a single unifying diagnosis – always consider several.

**Atypical presentation**

Older people commonly present with ‘general deterioration’ or functional decline. Acute disease is often masked but precipitates...
Some clinical findings are not necessarily pathological
Neck stiffness, a positive urine dipstick in women, mild crackles at the bases of the lungs, a slightly reduced PaO₂ and reduced skin turgor may be normal findings in older people and do not always indicate disease.

The importance of functional assessment and rehabilitation
Older people may take longer to recover from illness (e.g. pneumonia) compared with younger people. However, their ability to perform activities of daily living and thus gain independence can improve dramatically if they are given time and rehabilitation.

Ethics
Geriatric medicine involves balancing the right to high-quality care without age discrimination with the wisdom to avoid aggressive and ultimately futile interventions. End-of-life decisions, risks vs benefits, capacity and consent, and dealing with vulnerable adults are all part of geriatric medicine.

In acute illness, the above factors combined can make clinical assessment very difficult and early intervention more important. For example, in severe sepsis, older patients may have cool peripheries and appear ‘shut down’, with a normal white cell count and no fever. Drowsiness is common, and does not necessarily indicate a primary brain problem. The patient may not be able to give a history, and their usual level of function and previously expressed wishes may not be known. Thus, gathering as much information as possible, as soon as possible, is vital.

Comprehensive geriatric assessment
In the 1930s, the very first geriatricians realised that the thousands of patients living in hospitals and workhouses were not suffering from ‘old age’ but from diseases that could be treated: immobility, falls, incontinence and confusion – called the ‘geriatric giants’ because they are the common presentations of different illnesses in older people (Box 1.3).

Today, geriatric medicine is the second biggest hospital specialty in the UK and a popular career choice. It involves dealing with acute illness, chronic disease and rehabilitation, working in

Box 1.1 Atypical presentation
An 85-year-old lady was recovering from surgery on an orthopaedic ward when she became withdrawn and stopped eating and drinking. Before this she had been well and mobilising. Her temperature, pulse, blood pressure and ‘routine bloods’ were normal. Her carers thought she was acting as if she wanted to die. However, it was later noted that her respiratory rate was high and a subsequent chest X-ray showed pneumonia. The patient was treated with antibiotics and recovered.

Box 1.2 Joint statement from the Royal College of Physicians and British Geriatrics Society on Intermediate Care, 2001
‘At the core of geriatric medicine as a specialty is the recognition that older people with serious medical problems do not present in a textbook fashion, but with falls, confusion, immobility, incontinence, yet are perceived as a failure to cope or in need of social care. This misconception that an older person’s health needs are social leads to a prosthetic approach, replacing those tasks they cannot do themselves rather than making a medical diagnosis. Thus the opportunity for treatment and rehabilitation is lost, a major criticism of some current services for older people. Old age medicine is complex and a failure to attempt to assess people’s problems as medical are unacceptable…Deficiencies in medical care can lead to failure to make a diagnosis; improper and inadequate treatment; poor clinical outcomes; inappropriate or wasteful use of scarce resources; communication errors and possible neglect.’

Reduced homeostatic reserve
Ageing is associated with a decline in organ function with a reduced ability to compensate. The ability to increase heart rate and cardiac output in critical illness is reduced; renal failure due to medications or illness is more likely; salt and water homeostasis is impaired so electrolyte imbalances are common in sick older people; thermoregulation may also be impaired. In addition, quiescent diseases are often exacerbated by acute illness; for example heart failure may occur with pneumonia and old neurological signs may become more pronounced with sepsis.

Impaired immunity
Older people do not necessarily have a raised white cell count or a fever with infection. Hypothermia may occur instead. A rigid abdomen is uncommon in older people with peritonitis – they are more likely to get a generally tender but soft abdomen. Measuring the serum C-reactive protein can be useful when screening for infection in an older person who is non-specifically unwell.

Box 1.3 The ‘geriatric giants’
The four Is were originally coined by Bernard Isaacs, a professor of geriatric medicine.

- Incontinence
- Immobility
- Instability (falls and syncope)
- Intellectual impairment (delirium and dementia)

Several different illnesses can present as one of the geriatric giants. Two common examples also begin with the letter ‘i’: iatrogenic disease (caused by medication), and infection. The common sources of sepsis in older people are the chest, urine and biliary tract.
Introducing Geriatric Medicine

Simple interventions can make a big difference

Another characteristic of geriatric medicine is that simple interventions can make a big difference to a patient’s function and quality of life. Sometimes there is a perception that ‘nothing can be done’ for very old people. This is rarely the case. For example:
- ear syringing, cataract surgery and a new pair of glasses can dramatically improve a person’s sense of social isolation and loneliness
- specially fitted shoes and a properly measured walking aid can improve balance, mobility and confidence
- reducing medications can stop a person from feeling dizzy when they walk and allow them to go out of the house again
- adaptations at home can allow people to function more easily and retain their independence.

When older people have the benefit of medical assessment and treatment for problems which are often perceived as being due to old age (e.g. incontinence, falls, memory problems), they and their carers can enjoy a better quality of life.

The future directions of geriatric medicine

The National Service Framework (NSF) for Older People in England was published in 2001 (Figure 1.3). NSFs are long-term multidisciplinary teams in the community and in hospitals, medical education and research.

Comprehensive geriatric assessment is the assessment of a patient made by a team which includes a geriatrician, followed by interventions and goal setting agreed with the patient and carers. This can take place in the community, in assessment areas linked to the emergency department, or in hospital. It covers the following areas:
- medical diagnoses
- review of medicines and concordance with drug therapy
- social circumstances
- assessment of cognitive function and mood
- functional ability (i.e. ability to perform activities of daily living; Box 1.4)
- environment
- economic circumstances.

Randomised controlled trials show that comprehensive geriatric assessment leads to improved function and quality of life, and also reduces hospital stay, readmission rates and institutionalisation. There is no evidence for the effectiveness of a comprehensive assessment that does not include a doctor trained in geriatric medicine.

Rehabilitation is an important aspect of geriatric medicine (see Chapter 11). Many older patients now have rehabilitation in intermediate care facilities or in their own homes. However, some of these patients undergo rehabilitation without the benefit of a comprehensive geriatric assessment, so that the opportunity for diagnosis, treatment and optimum rehabilitation may be lost.

Communication in geriatric medicine

Communication is particularly important in geriatric medicine. A history from the patient’s relatives or carers is often required and may differ significantly from that of the patient. The assessment of older people often requires a multidisciplinary team and the observations, skills and opinions of nurses, physiotherapists, occupational therapists and social workers may shed significant new light on the patient’s problems. Doctors who work with older people need to be comfortable with this multidisciplinary approach, and the often jigsaw puzzle-like progress in assessment that can sometimes occur.

Communicating with older patients may be difficult because of impaired vision, deafness, dysphasia or dementia. Healthcare professionals can aid communication by checking that the patient can hear what is being said, writing down instructions, and involving carers in the consultation and decision-making.

Box 1.4  Activities of daily living

- Mobility including aids and appliances
- Washing and dressing
- Continence
- Eating and drinking
- Shopping, cooking and cleaning

Figure 1.3  National Service Framework for Older People.
This has resulted in improved access to services, an increase in people having assessment and rehabilitation without the need to stay in hospital, and the development of specific age-related services (i.e. stroke and falls). More recently the Department of Health has launched ‘dignity in care’ which aims to improve key aspects of health and social services care for older people. It covers areas that older people and their carers consider to be important yet are often neglected.

- Being valued as a person (e.g. listened to, respected).
- Being given privacy during care.
- Having assistance with and enough time to eat meals.
- Being asked how one prefers to be addressed (e.g. whether by first name).
- Having services that are designed with older people in mind.

Considerable progress has been made in optimising the assessment and care of older people. However, the future still holds some challenges. These include how we can improve:

- the experience of older people in hospital and care homes
- access to comprehensive geriatric assessment in a variety of settings
- services for older people who present to the emergency department with falls, dementia and minor medical illnesses
- research that answers questions about important geriatric problems and processes of care.

Despite the persistence of some negative stereotypes (Figure 1.4), there is a great deal of variety and job satisfaction to be found in practising geriatric medicine, whether in hospital or in general practice. Older people can get better after assessment and treatment, and they are often very grateful for it.

**Further resources**

www.bgs.org.uk. The British Geriatrics Society website. For hospital doctors, general practitioners and specialist nurses working in geriatric medicine.
Contains useful information about comprehensive geriatric assessment and other topics.


www.dh.gov.uk. The UK Department of Health website. By using the search term ‘older people’ various relevant policy documents can be found.
Two-thirds of people over the age of 60 are taking regular medication, and over half of those with repeat prescriptions are taking more than four drugs. People in care homes are even more likely to be taking several regular medications. Adverse drug reactions account for up to 17% of hospital admissions.

**Pharmacokinetics and pharmacodynamics**

Pharmacokinetics and pharmacodynamics are different in this age group. Older people are much more likely to suffer from the side-effects of drugs. Polypharmacy and problems with concordance are particular issues in geriatric medicine. Drug trials tend not to include people over the age of 80.

Pharmacokinetic differences

Age-related changes lead to differences in absorption, distribution, metabolism and elimination of drugs. Whilst some of these differences are not clinically significant, some are.

- There is a reduced volume of distribution for many drugs because of reduced total body water and an increase in the percentage of body weight as fat. As a result, dose requirements are less in younger people. For example, digoxin is a water-soluble drug, and lower loading doses may be required. Diazepam is a lipid-soluble drug and the relative increase in body fat may lead to accumulation, causing toxicity.
- Liver metabolism is reduced, leading to slower drug inactivation. Reduced liver blood flow is made worse by cardiac failure, potentially leading to increased drug concentrations, although this is rarely of clinical significance. However, care should be taken when prescribing drugs that are metabolised in the liver and have a narrow therapeutic index: warfarin, theophyllines and phenytoin. Plasma levels of these drugs should be monitored.
- Perhaps the most clinically significant difference is that renal blood flow and mass reduce significantly with age, leading to a reduction in the clearance of many drugs, especially water-soluble ones. Because of less muscle mass, the creatinine can remain within the quoted normal range in older people, despite a significantly impaired glomerular filtration rate (GFR). Doses of some commonly prescribed drugs should be reduced to account for reduced renal function (as measured by GFR). Examples are ciprofloxacin, gentamicin, digoxin and lithium.

Pharmacodynamic differences

There is an increased sensitivity to drugs in general, and lower doses are often required compared to younger adults, primarily due to changes in drug receptors and impaired homeostatic mechanisms. For example, a patient started on treatment for hypertension may develop dizziness due to reduced baroreceptor sensitivity causing postural hypotension.

Adverse drug reactions

Adverse drug reactions (ADRs) are a common reason for hospital admission. Around 80% of ADRs are dose related, predictable and potentially preventable. Other ADRs may be allergic or idiosyncratic (unpredictable). However, ADRs often present in older patients non-specifically e.g. with confusion or falls.

Older people are more likely to have diseases that result in disease–drug interactions. Table 2.1 illustrates examples of diseases in old age and the disease–drug interactions that can occur with commonly prescribed medications. Every prescriber should consider these before prescribing for an older person.

There are a number of ‘problematic’ drugs in older people – prescribed medications that commonly cause side-effects. These are listed in Box 2.1.

Polypharmacy and drug–drug interactions

‘Polypharmacy’ is when a patient is taking a large number of different prescribed medications, some of which may be required, and
<table>
<thead>
<tr>
<th>Disease in older age</th>
<th>Drugs</th>
<th>Potential effect</th>
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<tbody>
<tr>
<td>Dementia</td>
<td>Benzodiazepines</td>
<td>Worsening confusion</td>
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<td></td>
<td>Antimuscarinics, (some) anticonvulsants</td>
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<td>Levodopa</td>
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<td>Antidepressants</td>
<td>Reduced seizure</td>
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<td></td>
<td>Antipsychotics</td>
<td>threshold/seizures</td>
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<td>Alcohol</td>
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<tr>
<td>Glaucoma</td>
<td>Antimuscarinics</td>
<td>Worsening glaucoma</td>
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<td>COPD/asthma</td>
<td>β-blockers</td>
<td>Bronchospasm</td>
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<tr>
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<td>Benzodiazepines</td>
<td>Respiratory suppression</td>
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<td>Heart failure</td>
<td>Diltiazem, verapamil</td>
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<td></td>
<td>NSAIDs</td>
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<td>NSAIDs, pseudoephedrine</td>
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<td></td>
<td>Tricyclic antidepressants</td>
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<td></td>
<td>Levodopa</td>
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<td>Cardiac conduction disorders</td>
<td>β-blockers, digoxin, diltiazem, verapamil,</td>
<td>Bradycardia, heart block, prolonged QTc</td>
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<td>amiodarone, Tricyclic antidepressants</td>
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<td>Peripheral arterial disease</td>
<td>β-blockers</td>
<td>Intermittent claudication</td>
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<td>NSAIDs, anticoagulants</td>
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<td>Digoxin</td>
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<td>Diuretics</td>
<td>Worsening hyponatraemia</td>
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<td></td>
<td>Tricyclic antidepressants</td>
<td>May cause or exacerbate SIADH</td>
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<td>Carbamazepine</td>
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<td>Benign prostate hyperplasia</td>
<td>α-blockers</td>
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<td>Urinary incontinence</td>
<td>Antimuscarinics</td>
<td>Polyuria</td>
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<td>Analgesics (e.g. opioids)</td>
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<td>Benzodiazepines</td>
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<td>Tricyclic antidepressants</td>
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<td>Constipation</td>
<td>Antimuscarinics</td>
<td>Worsening constipation</td>
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<td>Steroids</td>
<td>Accelerated osteoporosis</td>
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<td>Enzyme inducing drugs</td>
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COPD, chronic obstructive pulmonary disease; NSAIDs, non-steroidal anti-inflammatory drugs; SIADH, syndrome of inappropriate antidiuretic hormone.
Concordance is good when there is clear communication (Figure 2.2), understanding and agreement, and a drug regimen that is easy to follow, with packaging, labels and delivery systems that are easy to use. Compliance (or adherence) is the extent to which a person follows the prescriber’s advice and drug regimen. Both concordance and compliance are particularly relevant to older people, although age itself is not a predictor of non-compliance.

Box 2.3 lists some of the risk factors associated with poor compliance, and Box 2.4 shows the American Geriatric Society guidelines for providing information on medicines to patients.

Taking a large number of different drugs is linked to adverse drug reactions, increased risk of hospital admission, non-compliance, and increased costs to the National Health Service. Figure 2.1 gives an example.

Drug–drug interactions become more likely with increasing number of medications. Herbal remedies and food can also interact with prescribed medication. A patient on warfarin for atrial fibrillation may develop bleeding after starting Gingko Biloba, a herbal medicine that inhibits platelet aggregation. A patient prescribed felodipine for hypertension may develop profound dizziness after drinking grapefruit juice, which increases drug levels.

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Drug–drug interactions become more likely with increasing number of medications. Herbal remedies and food can also interact with prescribed medication. A patient on warfarin for atrial fibrillation may develop bleeding after starting Gingko Biloba, a herbal medicine that inhibits platelet aggregation. A patient prescribed felodipine for hypertension may develop profound dizziness after drinking grapefruit juice, which increases drug levels.
Old patients are often excluded from clinical trials. Clinical application of evidence extrapolated from younger adults should sometimes be undertaken with caution. Interpreting evidence should be based on clinical significance as well as statistical significance, and the risks of adverse effects should be considered as well as the benefits. Box 2.5 shows an example of how ‘evidence’ is sometimes applied inappropriately to older people.

On the other hand, some drugs are under-prescribed in older people; for example, antidepressants, some treatments for heart failure, and warfarin. This is because of worries about side-effects despite evidence that the benefits outweigh the risks in this age group. Decision support tools (e.g. stroke risk for atrial fibrillation – see Chapter 7) or evidence-based resources may help in individual decision-making.

**Better prescribing**

How can prescribing in older patients be improved?
Think about the route of administration
Some patients with poor dentition may find chewable tablets difficult to take. Some people may have swallowing problems, and others may have poor dexterity, making inhalers or pumped sprays difficult to use. In hospital or care homes it is especially important that certain regular medications are continued via a different route if the patient is temporarily unable to take them in the usual way. Examples include: anti-epileptic drugs, drugs for Parkinson’s disease, angina medication, and long-term benzodiazepines.

Provide information and education
Adopting a patient-centred approach improves health outcomes for patients. Talking with patients about their disease and its treatment is an important part of concordance, particularly when starting a new drug or stopping old ones. Written information and involving relatives and carers (including care home staff), especially for people with cognitive impairment, is also helpful.

Further resources

*BMJ Clinical Evidence* http://clinicalevidence.bmj.com

**Acknowledgements**

The authors would like to thank Dr Richard Fuller, Dr Sam Limaye and Dr Lauren Roulsten for their constructive comments on the manuscript.
Delirium, or acute confusional state, is a common condition in older people. It frequently goes unrecognised and is often poorly managed. Patients who develop delirium have increased mortality, length of stay, complication and institutionalisation rates compared to non-delirious patients, independent of other factors. In up to one-third of cases, delirium can be prevented.

**Aetiology**

The aetiology of delirium is not fully understood. A genetic predisposition is possible. Inflammatory mediators may play a part. There is widespread cortical involvement in delirium, reflected in the wide range of symptoms, disturbances of conscious level and sleep–wake cycle, with illusions and hallucinations.

Although little is known of the pathophysiology of delirium, more is known about its predisposing and precipitating factors. These are shown in Box 3.1. Many of these factors occur commonly. If more predisposing factors are present, a lower severity of precipitating factor may provoke delirium.

**Diagnosis**

Delirium is particularly common in the post-operative period (43–61% after hip fracture, and higher in intensive care). It is also prevalent in the emergency department, affecting one in seven older patients. It is an acute condition, with symptoms developing over hours or days. People with delirium appear disorientated and are unable to focus their attention. Conversations are difficult to follow. Fluctuation in symptoms occurs, often with a diurnal pattern (i.e. worse at night), and lucid or symptom-free intervals may occur.

A diagnosis of delirium can be made when all four of the following features are present.

1. Acute onset.
2. Disturbance of consciousness.
3. Impaired cognition or perceptual disturbance, not due to pre-existing dementia.
4. Clinical evidence of an acute general medical condition, intoxication or substance withdrawal.

The International Classification of Diseases further describes the diagnostic features of delirium; these are outlined in Box 3.2. There are two main patterns of delirium:

- Hyperactive delirium (agitated and wandering)
- Hypoactive delirium (quiet and withdrawn)

Some patients may have features of both. The hypoactive pattern is particularly important because it often goes unrecognised. Affective symptoms are sometimes prominent in delirium and may lead to the erroneous diagnosis of a mood disorder. In patients with pre-existing dementia, delirium can be hard to spot. Delirium varies...
in both its severity and duration, and can last from a few days to several weeks.

National guidelines recommend that all older people should have routine cognitive testing on admission to hospital (e.g. using the Abbreviated Mental Test – see Box 3.3). This is to aid the detection of delirium.

The differential diagnosis of delirium includes:
- dementia
- depression
- hysteria
- mania
- schizophrenia
- dysphasia
- seizures (temporal lobe seizure or non-convulsive status epilepticus).

The most important aspect of diagnosis in delirium is to get a full history from someone who knows the patient (see Figure 3.1).

Management of delirium

Prevention
Those at high risk for developing delirium (see Box 3.1) can be targeted for proactive care aimed at preventing it. Some risk factors cannot be changed, but many in the list of precipitating factors can be. Other factors, including environmental ones, are also important in the prevention (and management) of delirium, and are listed in Box 3.4.

Detection
Half of all cases of delirium go unrecognised. Detection is more likely in those with difficult behaviours. Routine cognitive testing will not in itself identify delirium, but will alert the clinician to the presence of cognitive impairment and trigger further questions to differentiate delirium from dementia. Testing at presentation to acute medical services also gives a baseline for comparison later.

The Confusion Assessment Method (CAM) is designed to be used by any clinician (Box 3.5). Staff can be trained to use the screening instruments for detecting delirium, and these can be incorporated into routine care.
Delirium

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Treatment

People with delirium should be admitted to hospital, in order to facilitate observation, investigation and treatment. Treatment in delirium has four components:

1 treatment of the underlying cause(s)
2 environmental measures
3 pharmacological measures
4 prevention of complications.

There is good evidence that delirium incidence, severity and duration can be reduced through a multicomponent approach that ensures the delivery of good clinical care, focusing on the measures outlined in Box 3.4.

There are particular challenges in delivering even these simple interventions. For example, not all people in hospital can see a window or a clock, and the provision of a quiet, well-lit area to help avoid illusions may not be possible given the layout and facilities of many wards. Current hospital environments often make things worse. Patients may be moved between different wards, there is often constant activity and noise (see Figure 3.2) and a sea of unfamiliar faces, and there may be problems carrying out basic functions such as going to the toilet or eating. However, good holistic care from a multidisciplinary team can make a difference.

Staff who care for people with delirium should be adequately trained to manage the condition, which can include wandering, rambling speech and sometimes agitation and hallucinations. The least restrictive option should always be used. Distraction often works well. Communication should be optimised (e.g. by ensuring good lighting, spectacles and hearing aids) to find out the cause of

---

**Box 3.4 Other factors in the prevention and management of delirium**

Do the following:

- Ensure an appropriate environment:
  - avoid over-stimulation
  - ensure the patient is not deprived of spectacles and/or hearing aids
  - provide environmental and personal orientation
- Minimise discontinuity of care
- Encourage mobility
- Reduce medicines where possible (but ensure adequate analgesia)
- Maintain adequate fluid intake and nutrition
- Maintain normal sleep pattern
- Avoid constipation
- Involve relatives and carers
- Ensure regular medical, nursing and therapy reviews
- Avoid urinary catheters

**Box 3.5 Confusion Assessment Method (CAM)**

To have a positive CAM, the patient must display:

1 The presence of acute onset and fluctuating course
2 Inattention (e.g. counting from 20 to 1, with reduced ability to maintain or shift attention)
and either
3 (a) Disorganised thinking (disorganised or incoherent speech) or
   (b) Altered level of consciousness (lethargic or stuporous)

**Box 3.6 Common drug groups that can cause delirium in older people**

- Opioid analgesics
- Drugs with anticholinergic properties
- Sedating drugs e.g. benzodiazepines
- Corticosteroids

**Box 3.7 Investigations in delirium**

<table>
<thead>
<tr>
<th>First-line investigations</th>
<th>Second-line investigations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full blood count</td>
<td>Arterial blood gases</td>
</tr>
<tr>
<td>C-reactive protein</td>
<td>Computed tomography of the brain*</td>
</tr>
<tr>
<td>Urea and electrolytes</td>
<td>Electroencephalogram†</td>
</tr>
<tr>
<td>Calcium</td>
<td>Specific cultures e.g. wound swab, urinary, sputum, urinary, sputum, and cerebrospinal fluid</td>
</tr>
<tr>
<td>Thyroid function tests</td>
<td></td>
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<tr>
<td>Liver function tests</td>
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<tr>
<td>Glucose</td>
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<tr>
<td>Chest X-ray</td>
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<tr>
<td>Electrocardiogram</td>
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<tr>
<td>Pulse oximetry</td>
<td></td>
</tr>
<tr>
<td>Urinalysis</td>
<td></td>
</tr>
</tbody>
</table>

* If focal neurological signs, history of head injury or recurrent falls, evidence of raised intracranial pressure.
† If non-convulsive status epilepticus is suspected.

**Determining the underlying cause**

When delirium has been detected, an assessment to look for the underlying cause is the next step. Several different acute illnesses, as well as medication, can produce delirium in at-risk patients. There is often more than one underlying cause. One in four patients will have at least two causes. Common causes of delirium are:

- infection (especially urine, chest and biliary)
- acute hypoxaemia
- electrolyte imbalance
- prescribed medicines
- myocardial infarction (which may be painless)
- alcohol or benzodiazepine withdrawal
- urinary retention
- faecal impaction
- neurological – stroke, subdural haematoma, seizures
- post-operative cognitive dysfunction (see Chapter 10).

The common drug groups that can cause delirium in older people are listed in Box 3.6.

The history, physical examination and inspection of the drug chart will often lead to the underlying cause. However, investigations are often needed and are shown in Box 3.7. First-line investigations are aimed at the more common causes of delirium. Second-line investigations should be requested in certain patients. Once the underlying causes have been identified, treatment should start without delay.
any agitation. Relatives can be encouraged to stay with the patient. Arguing with, or restraining patients, usually makes things worse.

Pharmacological measures are a last resort and are indicated in the following situations.
- To prevent the patient endangering themselves or others.
- To allow essential investigations or treatment.
- To relieve distress in a highly agitated patient.

There is very little evidence on which drugs to use. Antipsychotics (e.g. haloperidol) are believed to treat the psychotic symptoms of delirium, but take several days to have an effect. In fact, the psychotic symptoms in delirium are treated by treating the underlying cause. Low doses of a short-acting benzodiazepine (e.g. lorazepam) are effective and possibly safer. The following two drugs are therefore recommended for use in delirium:
- lorazepam 0.5 mg orally
- haloperidol 0.5 mg orally.

Only one drug should be used, starting once a day in the evenings, and more frequently if necessary. In extreme agitation, larger doses may be given intramuscularly, under the supervision of an experienced doctor. If regular low doses do not work, there is little additional benefit (and an increase in side-effects), from giving more, and a mental health opinion should be sought.

Further information on the use of these drugs in delirium can be found in *The Prevention, Diagnosis and Management of Delirium in Older People* in the further resources section at the end of this chapter.

The main complications of delirium are:
- falls
- pressure sores
- hospital-acquired infections
- functional impairment
- incontinence
- over-sedation
- malnutrition.

These should be actively prevented whenever possible and treated.

Figure 3.3 summarises the prevention, diagnosis and management of a patient with delirium.
Challenges in delirium

Absence of an underlying cause
In up to a fifth of cases of delirium, an underlying cause cannot be found. In most, this is because delirium can persist long after the precipitating factor has resolved.

The aftermath
Patients who have had delirium may recall some or all of the events afterwards and be embarrassed or fearful. Research suggests that delirium is often a very unpleasant experience. An open and supportive approach can help. People who have had delirium are at increased risk of future episodes and this should be explained to them and their relatives and/or carers so that appropriate preventative action can be taken. The risk of developing dementia is increased after an episode, possibly due to delirium being a marker of reduced cerebral reserve, or a consequence of damage to the cerebral cortex by inflammatory mediators.

Difficult situations
The management of delirium may be hampered by lack of compliance from the patient. In severe cases, physical examination and investigations may be impossible. However, delirium is a medical emergency and its underlying cause should be treated as soon as possible. If patients lack mental capacity, they can be treated against their will, in their ‘best interests’ (which is legally defined – see further resources section in Chapter 15). Since delirium is a mental disorder, the Mental Health Act may also be used to detain patients, but is usually not necessary.

The future
Although delirium is common and detrimental, we still know little about its identification and management, which is frequently sub-optimal. Acute medical services that cater for older people need to ensure that:
• high-risk patients are identified
• staff are trained to recognise and manage patients at risk of, or those who develop, delirium
• the environment is suitable for patients with delirium.

Further resources
Falls are a common presentation to GP surgeries, emergency departments and medical and orthopaedic admission units. The term ‘mechanical’ (i.e. accidental) fall is commonly used – accidental falls among older people admitted to hospital are uncommon, and recurrent falls should never be considered accidental. Older people often fall because of medical problems, many of which can be treated.

The problem of falls

For research purposes, the definition of a fall is ‘unintentionally coming to rest on the ground or some lower level and other than as a consequence of sustaining a violent blow, loss of consciousness, or sudden onset of paralysis as in stroke or epileptic seizure’. Around one-third of people over the age of 65 living in their own homes fall each year. Half of all falls occur in the home, during routine activities of daily living, often with no obvious environmental hazard. The incidence of falls is higher for those living in institutions. Around half of care home residents who are mobile fall each year.

Falls in older people are more likely to lead to injuries. These occur in 50% of cases, mostly minor. In 1999 there were around 650 000 emergency department attendances for fall-related injuries in the over 60s. Even without an injury, some fallers are unable to get off the floor by themselves, which can lead to a ‘long lie’ causing dehydration, hypothermia, pressure sores and pneumonia. Falls also lead to loss of confidence and fear of falling. After a fall, half of older people report a fear of falls, and one-quarter limit their activities.

Around 5% of falls in older people lead to fractures. There are 86 000 hip fractures each year in the UK and 95% of these are the result of a fall. The total cost to the National Health Service is £1.7 billion per year – and this does not take into account loss of independence, reduced quality of life and costs to carers and social services.

Why do older people fall?

Falls in older people can be categorised into one of three groups:
• fall due to an acute illness
• single fall, which may be accidental
• recurrent falls.

A fall can be the presenting complaint for a range of acute illnesses in older people, and if faced with a person who has just fallen, you should screen for these (Box 4.1). The most common precipitating
How to assess an older person who has fallen

The 2004 National Institute for Health and Clinical Excellence (NICE) guidelines on the assessment and prevention of falls in older people recommend that all people over the age of 65 in contact with a member of the healthcare team should be asked how many times they have fallen in the last 12 months. People reporting a fall, or deemed to be at risk of falls, should receive a basic assessment as they may benefit from participation in a local falls programme, which involves muscle strength and balance training, information and help (e.g. for home hazards).

Older people who require medical attention because of a fall or who report more than one fall in the last 12 months should receive a ‘multifactorial falls risk assessment’. This is because recurrent falls usually have many causes (see Figure 4.2) and multifactorial interventions rather than single ones have been shown to be effective. A multifactorial assessment can be done by any trained member of the healthcare team, and usually involves more than one. The main components, as well as making any medical diagnoses, are vision assessment, medication modification, muscle strength and balance training, and assessment of home hazards. Home care staff and paramedics, as well as other healthcare professionals, should be able to refer people for such an assessment. Figure 4.3 summarises the basic and multifactorial risk assessments of an older person who has fallen. An action plan should follow.

Box 4.2 Risk factors for falls

1 Social and demographic factors
   - Advanced age
   - Living alone
   - Previous falls
   - Limited activities of daily living

2 Age-related changes
   - Reduced ability to discriminate edges (e.g. stairs)
   - Reduced peripheral sensation
   - Slower reaction times
   - Muscle weakness

3 Poor gait and balance (postural instability)

4 Medical problems
   - Cognitive impairment
   - Parkinson’s disease
   - Cerebrovascular disease
   - Eye diseases that reduce acuity (e.g. cataracts, glaucoma, age-related macular degeneration)
   - Arthritis
   - Foot problems
   - Peripheral neuropathy
   - Incontinence

5 Medications
   - Psychiatric medication (e.g. antidepressants)
   - Cardiovascular medication (e.g. antihypertensives)
   - Being on four or more medications

6 Environmental factors
   - Ill-fitting footwear (e.g. high heels, loose slippers)
   - Wearing bifocal or varifocal spectacles

How to assess an older person who has fallen

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Referral to a geriatrician with a special interest in falls is appropriate in the following situations:
- an abnormal gait and balance that require a diagnosis
- possible loss of consciousness
- when dizziness is a precipitating factor
- when medical conditions contributing to the falls could be optimised (e.g. postural hypotension, Parkinson’s disease)

Box 4.3 explains the ‘get-up-and-go test’ in more detail and Figure 4.4 outlines when admission to hospital is indicated after a fall.

The relationship between falls and syncope

Many older people are found lying on the floor without an eyewitness account of how they got there. It is impossible to decide whether a fall, syncope or seizure occurred – all are common in this age group. Cognitive impairment, retrograde amnesia or even a desire to explain the event means that older people often say they have tripped when they have not. Other causes (e.g. syncope) should be considered as a cause of falls when the falls are unexplained or the patient cannot remember hitting the ground.

In the SAFE PACE study, older people attending an emergency department because of falls without loss of consciousness were screened for carotid sinus hypersensitivity, a condition that causes transient bradycardia and hypotension when the carotid body in the neck is pressed or stretched. Of those who were diagnosed as having...
Older patients with recurrent unexplained falls should be considered for syncope investigations, for example, tilt testing and carotid sinus massage. Carotid sinus massage should ideally be performed in a tilt test room both supine and upright. It is a safe test, with a less than 1% risk of neurological complications. Further information is given in Chapter 6.

**Dizziness and falls**

Dizziness is frequently associated with falls and is a common symptom in older people. There are three patterns of dizziness: light-headedness or ‘not right’ on standing or walking around vertigo ‘fuzzy all the time’.

Light-headed episodes independent of posture can be caused by hypoglycaemia or cardiac arrhythmias and will not be considered further. Postural (orthostatic) hypotension is common in older people (see Box 4.4), but many do not describe their symptoms as ‘light-headedness’, instead referring to feeling ‘not right’ or ‘off balance’ when standing or walking. If the symptoms are mainly present when upright or walking around, postural hypotension should be suspected, particularly if the individual tends to have a low blood pressure or is taking antihypertensive medication. Many older people have a blood pressure that falls slowly after assuming the upright position, and a simple lying and standing blood pressure may not detect any change. A tilt test can be used to investigate this further in the context of collapses (see Chapter 6).

Vertigo refers to a sensation of movement in any direction and does not necessarily mean ‘spinning’. Four main types of vertigo are outlined in Figure 4.5. Benign paroxysmal positional vertigo (BPPV) is extremely common and can present with balance problems and falls in older people as well as the classical brief vertigo on looking up. Posterior canal BPPV is the most common type and is diagnosed by the Dix–Hallpike manoeuvre and treated by the Epley manoeuvre (see Figure 4.6). The other types of vertigo shown can also be successfully treated (see Furman and Cass in further resources section).

Brief vertigo on looking up is often attributed to vertebrobasilar insufficiency, which is rare and does not cause vertigo alone; or cervical spondylosis, which is a common X-ray finding but is controversial as a cause of dizziness, does not cause vertigo alone, and should not be considered an adequate explanation.

‘Fuzzy all the time’ is a particularly frustrating form of dizziness, and in older people may be associated with diffuse cerebrovascular...
disease or medication. Sometimes it is compounded by other things that cause dizziness (e.g. postural hypotension or a vestibular problem) and in addition the patient may have poor vision/bifocals and a peripheral neuropathy. This syndrome is referred to as 'multifactorial dizziness in the elderly' [sic]. As well as having more than one type of dizziness, there are multiple pathologies in different parts of the body that together produce a sensation of disequilibrium most of the time. These patients can be helped by referral to a geriatric team with a special interest in dizziness.

Figure 4.5 Patterns of dizziness in older people. An additional cause of vertigo alone is migrainous vertigo, more common in younger people. This can present with attacks of vertigo lasting up to one hour, with or without headache, or with symptoms of a decompensated vestibular disorder, or both.
Figure 4.6 The Hallpike and Epley manoeuvres for BPPV. Most benign paroxysmal positional vertigo (BPPV) is caused by a problem with the posterior semicircular canal in the inner ear. It is diagnosed on the basis of history, normal neurological examination and a positive Dix–Hallpike manoeuvre (pictures 1 and 2) which produces transient vertigo and characteristic nystagmus. If positive, the clinician can go on to perform the Epley manoeuvre (pictures 3, 4 and 5), which repositions stray endolymphatic debris which is the cause of the symptoms. In 75% of cases of BPPV, symptoms spontaneously resolve in a month or two. But for those whose symptoms persist, the Epley manoeuvre is extremely effective and can be performed with assistance even in frail elderly patients. For a more detailed explanation, see Furman and Cass in further resources section.

1. To test the right ear, the patient sits on a couch with the head turned to the right.

2. The clinician supports the neck, as the patient lies flat as quickly as possible, with the head slightly dangling over the edge of the couch so that the chin points slightly upwards, still turned to the right. This may produce vertigo and nystagmus. The hallmarks of nystagmus in posterior canal BPPV are delayed (by up to 20 seconds), rotational (towards the affected side), and fatigueable (it gets less each time the manoeuvre is performed).

3. The vertigo and nystagmus settle after a few minutes, then the patient’s head is turned to the opposite side.

4. After a further few minutes, the patient’s head is turned to look down at the floor. He has to turn on his side to do this.

5. After a further few minutes, and with the head still turned towards the left shoulder, the patient is assisted into a sitting position. Once upright, the head is tilted so that the chin points slightly downward.
Further resources

The promotion and maintenance of bone health in older people is vitally important in order to reduce the incidence of fragility fractures related to falls. A fragility fracture is defined as a fracture sustained when falling from standing height or less. Falls are a major cause of disability and the leading cause of mortality due to injury in people aged over 75 in the UK (see Chapter 4). Osteoporosis increases the risk of fracture when a person falls, and up to 14,000 people each year in the UK die as a result of an osteoporotic hip fracture.

The National Institute for Health and Clinical Excellence (NICE), Royal College of Physicians and the National Osteoporosis Society have issued guidance on bone health which recommends lifestyle changes, good nutrition and pharmacological treatment for those at risk of osteoporosis and vitamin D deficiency.

Osteoporosis

Osteoporosis is defined by the World Health Organization (WHO) as 'a progressive, systemic skeletal disease characterised by low bone mass and micro-architectural deterioration of bone tissue, with a consequent increase in bone fragility and susceptibility to fracture.' Often known as 'the silent disease,' due to the slowly progressive and asymptomatic decline of skeletal tissue, there may be no clinical signs until a person presents with a painful fracture. The most common areas for fracture are the spine (Figure 5.1), wrist and hip (Figure 5.2); but the general nature of the condition means that any bone may be involved. Chronic pain, disability, loss of independence and premature death may result, which is why it is important to identify and manage those at risk.

Aetiology

Osteoporosis predominantly affects post-menopausal women as a result of oestrogen deficiency but it also occurs in men. One in three women and one in twelve men will suffer an osteoporotic fracture after the age of 50. The incidence of osteoporosis rises with increasing age but fracture risk is higher in older people compared with younger people with the same bone mineral density. Around half of cases in men are associated with hypogonadism (20%), corticosteroid use (20%) or alcohol excess (5%) so these risk factors should be specifically sought. Secondary causes of osteoporosis (see Box 5.1) occur in both sexes.

Diagnosis

The standard for the diagnosis of osteoporosis is assessment of bone mineral density (BMD) by axial dual-energy X-ray absorptiometry (DEXA). A diagnosis of osteoporosis may also be suspected from any of the following:

- marked osteopenia on plain X-ray
- a previous fragility fracture
- the identification of risk factors for osteoporosis.

The WHO classification of osteoporosis has been widely adopted and is based on the measurement of BMD with reference to the number of standard deviations (SD) from the mean in an average 25-year-old woman, known as the T-score (see Box 5.2). The threshold for osteoporosis is at least 2.5 SD below this reference point (i.e. a T-score of –2.5 or more). T-scores can vary by anatomical site so the prediction of fracture risk is usually based on measurements estimated at the femoral neck as this is most predictive of hip fracture (the major cause of loss of independence, mortality and cost).

Assessing fracture risk

Although low BMD is helpful in assessing fracture risk, it does not alone predict whether a person will sustain a fracture in absolute
terms. Other factors such as a tendency to fall should also be considered. Those who have already had one fragility fracture are at highest risk of sustaining further fractures and should be prioritised for investigation and treatment. Over the past few years many meta-analyses have been carried out to identify risk factors that could be used to identify those at risk of osteoporosis and fracture. A 10-year fracture prediction tool, currently in development,

Box 5.1 Risk factors for the development of osteoporosis

Non-modifiable
- Female gender
- Family history of osteoporosis (especially maternal history of hip fracture at less than 75 years old)
- Caucasian or Asian ethnicity
- Age more than 65 years
- Previous fragility fracture

Modifiable
- Low body mass index (less than 19 kg/m²)
- Smoking
- Alcohol excess
- Low calcium intake and vitamin D deficiency
- Inactivity

Hormonal
- Menopause before age 45 years or prolonged untreated amenorrhea
- Male hypogonadism

Secondary causes
- Rheumatoid arthritis
- Hyperthyroidism
- Malabsorption (particularly coeliac disease)
- Chronic liver disease
- Primary hyperparathyroidism
- Prolonged immobilisation
- Anorexia nervosa

Drugs
- Glucocorticoids
- Anticonvulsants
- Prolonged heparin therapy
- Cytotoxic therapy
Bone Health

Little exposure to the sun as well as those with an inadequate diet. It is common in older people, and is found in at least a third of those aged over 65 years. Lesser degrees of vitamin D deficiency may be found in as many as 55% of this age group. Symptoms may range from none at all, through to insidious onset of muscular and bony aches and pains, to frank osteomalacia. In the presence of osteoporosis, vitamin D deficiency exacerbates bone loss and can provoke secondary hyperparathyroidism which substantially increases the risk of fractures.

Treatment for osteoporosis

Lifestyle changes

Patients should be advised to stop smoking and reduce alcohol consumption if this is excessive. It is important to promote a healthy balanced diet with good calcium intake (see Box 5.4) and to maintain vitamin D levels through diet and appropriate sun exposure (suberythemal exposure to the face, arms, hands or back for 15 minutes, two or three times a week). A high salt intake may also increase bone loss. Use of oral corticosteroids should be kept to a minimum and consideration given to steroid-sparing agents if required long term. A Cochrane systematic review has shown incorporates clinical risk factors that are independent of BMD. These include:

- age
- prior fragility fracture
- smoking history
- excess alcohol use
- a family history of hip fracture
- rheumatoid arthritis
- systemic corticosteroid use.

Investigations in osteoporosis or after a fragility fracture

Patients with osteoporosis and/or a fragility fracture will need further investigation to exclude secondary causes of the disease and other causes of a pathological fracture. These are outlined in Box 5.3.

The role of vitamin D

Vitamin D regulates calcium and phosphate absorption and metabolism, and is essential for bone health. Our main source of vitamin D is through the action of sunlight on the skin to produce vitamin D3 and a smaller contribution is made from diet (e.g. vitamin D2 from vegetables or D3 from meat). These metabolites are converted initially in the liver and then in the kidneys to the fully active metabolite 1,25-dihydroxycholecalciferol. Primary vitamin D deficiency is more common in individuals who have

Box 5.2 WHO classification of osteoporosis based on bone mineral density

- Normal: T-score of –1 SD or more
- Low bone mass (osteopenia): T-score between –1 and –2.5 SD
- Osteoporosis: T-score below –2.5 SD
- Severe (established) osteoporosis: T-score below –2.5 SD, with one or more associated fragility fractures

SD, standard deviation.

Box 5.3 Further investigation of fragility fractures and possible osteoporosis

- Full blood count
- Erythrocyte sedimentation rate or plasma viscosity
- Serum urea, creatinine and electrolytes
- Serum calcium, alkaline phosphatase and phosphate
- Thyroid function tests
- Liver function tests
- Serum electrophoresis and urinary Bence-Jones protein

Additional investigations that may be required

- Lateral thoracic spinal X-ray
- Testosterone and luteinising hormone (men)
- Parathyroid hormone
- Vitamin D levels

Box 5.4 Calcium content of foods

<table>
<thead>
<tr>
<th>Food</th>
<th>Milligrams of calcium/100 g of food</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily products</td>
<td></td>
</tr>
<tr>
<td>Edman cheese</td>
<td>795</td>
</tr>
<tr>
<td>Cheddar cheese</td>
<td>739</td>
</tr>
<tr>
<td>Semi-skimmed milk (100 mL)</td>
<td>120</td>
</tr>
<tr>
<td>Fish</td>
<td></td>
</tr>
<tr>
<td>Whitebait, fried</td>
<td>860</td>
</tr>
<tr>
<td>Sardines in oil</td>
<td>500</td>
</tr>
<tr>
<td>Sardines in tomato sauce</td>
<td>250</td>
</tr>
<tr>
<td>Salmon, tinned</td>
<td>91</td>
</tr>
<tr>
<td>Tuna, tinned in oil</td>
<td>12</td>
</tr>
<tr>
<td>Vegetables</td>
<td></td>
</tr>
<tr>
<td>Okra, stir fried</td>
<td>220</td>
</tr>
<tr>
<td>Spinach boiled</td>
<td>160</td>
</tr>
<tr>
<td>Watercress</td>
<td>170</td>
</tr>
<tr>
<td>Pulses, beans and seeds</td>
<td></td>
</tr>
<tr>
<td>Sesame seeds</td>
<td>670</td>
</tr>
<tr>
<td>Red kidney beans</td>
<td>71</td>
</tr>
<tr>
<td>Green/French beans</td>
<td>56</td>
</tr>
<tr>
<td>Cereal products</td>
<td></td>
</tr>
<tr>
<td>Ready Brek</td>
<td>1200</td>
</tr>
<tr>
<td>White bread</td>
<td>177</td>
</tr>
<tr>
<td>Wholemeal bread</td>
<td>106</td>
</tr>
<tr>
<td>Fruit</td>
<td></td>
</tr>
<tr>
<td>Figs, dried</td>
<td>250</td>
</tr>
<tr>
<td>Orange</td>
<td>47</td>
</tr>
</tbody>
</table>

Adapted from National Osteoporosis Society patient information leaflet Calcium Rich Foods.
that regular weight-bearing exercise is effective in preventing and treating osteoporosis in post-menopausal women.

**Pharmacological treatments**

**Calcium and vitamin D**

Daily supplementation with calcium (1200 mg) and vitamin D (800 IU) should be offered to all institutionalised older people as this is proven to reduce fractures in a meta-analysis of randomised controlled trials (RCTs) and a Cochrane systematic review. NICE recommends that all patients treated for osteoporosis with other therapies should also receive calcium and vitamin D supplementation unless the clinician is confident that levels are normal, or there are contraindications (e.g. hypercalcaemia).

**Bisphosphonates**

Bisphosphonates act by reducing the rate of bone turnover and have an important role in both the prevention and treatment of osteoporosis. Three bisphosphonates, alendronate, risedronate and cyclic etidronate, are specifically licensed for the prevention and treatment of post-menopausal and glucocorticoid-induced osteoporosis, but only alendronate is licensed for use in men.

Alendronate and risedronate can be given daily or weekly. They have been proven in RCTs to produce statistically significant reductions in the incidence of vertebral, non-vertebral and hip fractures. Alendronate can cause oesophagitis and is contraindicated when a patient has abnormalities of the oesophagus that delay emptying (e.g. stricture or achalasia), but risedronate may be used with caution. Both should be avoided if renal function is impaired (a glomerular filtration rate (GFR) of less than 35 mL/min).

Cyclical etidronate is given daily in a cycle with calcium carbonate. It is effective in reduction of vertebral fractures but has not been proven in pooled RCTs to reduce non-vertebral or hip fractures. It has few upper gastrointestinal side-effects. It is contraindicated in moderate to severe renal impairment.

**Raloxifene**

Raloxifene is a selective oestrogen receptor modulator and is licensed for the prevention and treatment of vertebral fractures in post-menopausal women. Its most serious side-effect is a threefold increase in the risk of venous thromboembolism. It can also cause hypertension.

**Strontium ranelate**

Strontium ranelate has a dual action of stimulating new bone formation and reducing bone resorption. It is licensed for the treatment of post-menopausal osteoporosis and is proven in RCTs to reduce the incidence of both vertebral and hip fractures. There may be a small increase in the risk of venous thromboembolism. It should also be avoided in renal impairment (a GFR of less than 30 mL/min).

**Teriparatide**

Teriparatide is a recombinant fragment of parathyroid hormone given as a daily subcutaneous injection for 18 months. It is licensed for the treatment of post-menopausal osteoporosis and reduces vertebral and non-vertebral fractures. It should be initiated only by a secondary care specialist in osteoporosis.

**Calcitonin**

Parenteral calcitonin is licensed for the treatment of post-menopausal osteoporosis. A systematic review has shown a reduction in vertebral and non-vertebral fractures but to a lesser extent than bisphosphonates.

**Hormone replacement therapy (HRT)**

Although HRT has been shown to reduce vertebral and non-vertebral fractures, it is no longer recommended for long-term use.

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**Box 5.5 NICE guidance for the secondary prevention of osteoporotic fragility fractures in post-menopausal women**

Calcium and/or vitamin D supplementation should be provided to those who receive osteoporosis treatment if it is suspected that levels are inadequate.

**Treatment groups**

- **Aged 75 years and older – DEXA scan not required**
- **Aged 65–74 years – DEXA scan confirms osteoporosis (T-score <−2.5)**
- **Younger than 65 years – DEXA scan confirms osteoporosis with**
  - T-score <−3 or
  - T-score <−2.5 PLUS one or more age-independent risk factors:
    - body mass index <19 kg/m²
    - maternal hip fracture before age 75 years
    - untreated premature menopause
    - medical disorders associated with bone loss (e.g. hyperthyroidism)
    - conditions associated with prolonged immobility.

**Treatment guidance**

- **Bisphosphonates (alendronate, etidronate and risedronate) are recommended as first-line therapy.**
- **Raloxifene as second-line therapy if:**
  - bisphosphonates are contraindicated or patient is unable to comply with recommendations for use
  - an unsatisfactory response to bisphosphonates
  - intolerant of bisphosphonates.
- **Teriparatide as second-line therapy in those aged 65 years and older if:**
  - unsatisfactory response or intolerance to bisphosphonates and
  - T-score <−4 or
  - T-score <−3 PLUS >2 fractures PLUS one or more age-independent risk factors:
    - body mass index <19 kg/m²
    - maternal hip fracture before age 75 years
    - untreated premature menopause
    - medical disorders associated with bone loss (e.g. hyperthyroidism)
    - conditions associated with prolonged immobility.

Unsatisfactory response is defined as a further fragility fracture despite adhering to treatment for 1 year plus evidence of decline in baseline BMD. Intolerance of bisphosphonates is defined as oesophageal ulceration, erosion or stricture, or severe lower gastrointestinal symptoms.
because of an increased risk of breast cancer and cardiovascular disease.

**National osteoporosis guidelines**

NICE issued guidance on the secondary prevention of osteoporotic fragility fractures in post-menopausal women in January 2005 (see Box 5.5). This did not include strontium ranelate, but an updated guideline is currently being produced. NICE guidance on the primary prevention of post-menopausal osteoporotic fragility fractures is also in development. The treatment and prevention of glucocorticoid-induced osteoporosis was excluded by NICE; however, the Royal College of Physicians issued guidance on this in 2002, which is outlined in Figure 5.3.

**Further resources**


The National Osteoporosis Society. www.nos.org.uk
CHAPTER 6

Syncope

Raja Hussain

'Collapse' usually refers to an episode of transient loss of consciousness leading to a fall. In clinical practice, the main differential diagnosis when a person collapses or has a 'blackout' is syncope or a seizure.

An overview of syncope

The word 'syncope' is derived from the Greek 'syn' (with) and 'koptein' (to interrupt). It is characterised by transient, self-limiting loss of consciousness, usually leading to a fall. The onset is relatively rapid and recovery is spontaneous, complete and usually prompt. Syncope is always the result of transient global cerebral hypoperfusion, and there are different causes.

Syncope accounts for up to 5% of emergency department visits, and can have a major impact on lifestyle. In older people its prevalence is higher, injuries and loss of confidence are more common, and so is admission to hospital. Isolated episodes are common. If a person has experienced more than one episode, it is more likely to recur. The prevalence of syncope in older people may be underestimated because it can also present as 'falls' because of retrograde amnesia or lack of eye witnesses.

Older people are at higher risk of syncope because of age-related physiological changes in heart rate, blood pressure, cerebral blood flow, baroreceptor sensitivity and blood volume regulation. In addition, they have a high prevalence of diseases that can predispose to syncope and are often taking several prescribed medications.

Figure 6.1 shows the main causes of collapse, divided into syncope and non-syncopal attacks. The four main categories of syncope are also shown.

Neurally mediated syncope refers to vasovagal syncope (fainting) and situational syncope (e.g. micturition syncope). A neurally mediated reflex is triggered, leading to vasodilation and bradycardia (vagal stimulation), causing hypotension and cerebral hypoperfusion. Carotid sinus hypersensitivity is also neurally mediated. In this case the reflex is triggered by pressure on the carotid body.

Postural (orthostatic) hypotension is the result of impaired autonomic reflexes, leading to pooling of blood in the veins of the lower limbs. Volume depletion is another cause.

Tachy- or bradycardias can reduce cardiac output, leading to cerebral hypoperfusion and syncope. Structural cardiopulmonary disease can also lead to syncope when there is an impaired ability to increase cardiac output (e.g. in aortic stenosis or hypertrophic obstructive cardiomyopathy). Figure 6.2 outlines the main categories of syncope in more detail.
In older people, the most common causes of syncope are:
- postural hypotension (20–30%)
- carotid sinus hypersensitivity (20%)
- cardiac arrhythmias (20%)
- vasovagal or situational syncope (15%).

This is different to young people in whom vasovagal and situational syncope are far more common and carotid sinus hypersensitivity is extremely rare.

How to assess a patient with a collapse

A thorough history is essential in the evaluation of any collapse. A detailed account of the incident from the patient, and any available eye witnesses (over the telephone if necessary) is crucial. Past medical history, medications, cardiovascular and neurological examination, lying and standing blood pressure and 12-lead electrocardiogram are the other essential components of the evaluation. Patients should also be asked about their social circumstances and whether or not they drive. Box 6.1 outlines the key questions that should be asked in the history. Syncope is characterised by a brief loss of consciousness, with few abnormal movements, pallor and a quick recovery. Box 6.2 outlines the main differences between syncope and seizures.

If the history suggests syncope (as opposed to a seizure or other non-syncopeal attack), the key questions are as follows.
1. Is there an acute illness? (Syncope can be the presenting feature in a wide range of acute illnesses e.g. sepsis, bleeding.)
2. If no acute illness, is the cause of syncope obvious after the initial evaluation?
3. Does the patient have structural heart disease?
4. Does the patient drive?

After a full history, examination, lying and standing blood pressure and 12-lead electrocardiogram, the cause of syncope will be apparent in at least one-third of cases. For example, syncope due to postural hypotension as a result of medication is common in older people. This can be diagnosed and treated without further tests.

Patients with structural heart disease and syncope have a higher mortality (see Box 6.3). A person is considered to have structural heart disease if they have one of the following: a history of heart disease (e.g. previous myocardial infarction, heart failure), a clinically significant murmur (e.g. aortic stenosis), or an abnormal
The investigation of syncope is the same in older people as for younger people, with the addition of routine supine and upright carotid sinus massage. A 24-hour ambulatory blood pressure monitor can also be useful to look for post-prandial hypotension or over-treated hypertension.

The evaluation of frail older people who present with recurrent collapses depends on compliance with tests and overall prognosis. Clinical decisions on the value of further evaluation should be made for each individual. Lying and standing blood pressure measurements, carotid sinus message and tilt testing are well tolerated even in frail older people with some cognitive impairment.

The following are common pitfalls when evaluating syncope in older people.

• Collapsing without warning is common with vasovagal syncope or postural hypotension in older people and does not necessarily indicate a cardiac cause. Older people have impaired sympathetic reflexes, which means they do not necessarily experience a typical prodrome of feeling light-headed, hot, nauseated and sweating before collapsing.

• 'Talking nonsense' does not necessarily mean an expressive dysphasia. Brief disorientation while coming round can occur in syncope.

• Syncope while sitting is common in older people, especially after meals. Slumping to one side occurs when muscle tone is lost and does not necessarily indicate a transient ischaemic attack.

• 'I must have tripped' is a common statement made by older people with syncope, who have retrograde amnesia for the event. About one-third of patients who lose consciousness during carotid sinus massage deny they have done so immediately afterwards.
Frail older people can appear ‘post-ictal’ after syncope because they are less able to compensate for brief cerebral hypoperfusion than young people.

Tilt testing

During a tilt test, the patient lies flat for around 10 minutes and is attached to a cardiac and beat-to-beat blood pressure monitor. The patient is then tilted upright at 70° and observed for 30 minutes for symptoms and signs of syncope (see Figure 6.4). If the patient remains asymptomatic, various methods may be used to increase orthostatic stress (e.g. sublingual glyceryl trinitrate or application of lower body negative pressure) and the heart rate and blood pressure response is monitored for a further 20 minutes. The tilt table is also used to perform carotid sinus massage both supine and upright, as one-third of cases of carotid sinus hypersensitivity are missed if the test is only performed supine. Autonomic function tests can also be done in certain patients.

Tilt testing can be useful if the patient’s symptoms are reproduced and accompanied by hypotension, bradycardia or both, particularly early in the test (see Figure 6.5). A slow fall in blood pressure after head-up tilt in older people is also commonly observed, and can confirm a suspected diagnosis of postural hypotension despite normal lying and standing blood pressures. More details about tilt testing can be found in the further resources section.

Table 6.1 Driving regulations in the UK for syncope (2007).

<table>
<thead>
<tr>
<th>Disorder</th>
<th>Group 1 licence (car or motorcycle)</th>
<th>Group 2 licence (bus, lorry) and taxi drivers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vasovagal and situational syncope</td>
<td>No restrictions</td>
<td>No restrictions</td>
</tr>
<tr>
<td>Cough syncope</td>
<td>Driving must cease until liability to attacks has been controlled</td>
<td>Driving must cease and the person must be free of syncope for 5 years</td>
</tr>
<tr>
<td>Unexplained syncope* and low risk of re-occurrence (i.e. no abnormality on cardiovascular and neurological examination and normal ECG)</td>
<td>Can drive 4 weeks after the event</td>
<td>Can drive 3 months after the event</td>
</tr>
<tr>
<td>Unexplained syncope* and high risk of re-occurrence (i.e. abnormal ECG, structural heart disease, syncope causing injury, occurring at the wheel or whilst sitting or lying, more than one episode in the last 6 months)</td>
<td>Can drive 4 weeks after the event if the cause has been identified and treated</td>
<td>Can drive after 3 months if the cause has been identified and treated If no cause identified, then licence revoked for 1 year</td>
</tr>
<tr>
<td>Loss of consciousness with seizure markers (i.e. strong clinical suspicion of a seizure but no evidence)</td>
<td>Cannot drive for 1 year</td>
<td>Cannot drive for 5 years</td>
</tr>
<tr>
<td>Loss of consciousness with no clinical pointers whatsoever (after evaluation by a specialist)</td>
<td>Cannot drive for 6 months</td>
<td>Cannot drive for 1 year</td>
</tr>
</tbody>
</table>

* ‘Unexplained syncope’ should be the opinion of an experienced doctor. See Figure 6.3 for the evaluation of unexplained syncope.

Use of the implantable loop recorder in older people

The implantable loop recorder (Reveal® device) is an electrocardiogram monitor which is placed subcutaneously under local anaesthesia in a similar way as a pacemaker box. It records the patient’s electrocardiogram on a continuous loop and can remain implanted for up to 24 months. It can be activated by the patient after a

Figure 6.4 A patient during a tilt test.
Figure 6.5 Blood pressure readings during a tilt test. This recording shows blood pressure (vertical axis) over time (horizontal axis). Just after time 12:00:20, there is a sudden fall in blood pressure, which recovers quickly as soon as the tilt table is laid flat.

Figure 6.6 When to admit and when to refer patients with syncope. Adapted from: Brignole M, Alboni P, Benditt DG et al. The Task Force on Syncope, European Society of Cardiology. Eur Heart J 2001; 22(15): 1256–1306.
collapse. The implantable loop recorder has a high diagnostic yield for infrequent events and has a high patient compliance. Indications for an implantable loop recorder include the following.

- Patients with recurrent syncope with structural heart disease in whom arrhythmias are suspected despite negative tests.
- Patients with recurrent unexplained syncope without structural heart disease when understanding the exact mechanism may alter treatment.
- Patients with ‘epilepsy’ who are not responding to appropriate treatment.

**Treatment of recurrent syncope**

Figure 6.6 shows when to admit and when to refer patients with syncope. Neuraly mediated syncope is treated by patient education and general measures such as ensuring good hydration, avoidance of triggers and exacerbating antihypertensive medication, and increased salt in the diet if the blood pressure is low and there are no other contraindications. Certain patients may benefit from a pacemaker, such as those with cardioinhibitory (bradycardic) carotid sinus hypersensitivity.

Postural (orthostatic) hypotension is treated in a similar way. Very often, reducing or stopping certain medication is all that is required. Box 6.4 shows a list of drugs that commonly cause postural hypotension in older people. Some patients benefit from volume-expanding medication (e.g. fludrocortisone), and severe cases (e.g. in autonomic failure) may require midodrine, a vasoconstrictor drug which can only be prescribed on a named patient basis by a specialist.

The treatment of cardiac arrhythmias and structural cardio-pulmonary disease requires referral to a cardiologist.

**Box 6.4 Drugs that commonly cause postural hypotension in older people**

**More likely to cause a problem**

- Alpha blockers
- Vasodilators (e.g. nitrates)
- Other antihypertensives
- Diuretics
- Psychiatric drugs (e.g. tricyclics, major tranquillisers, benzodiazepines)
- Any drug with anticholinergic properties

Syncope is a common condition and a thorough initial evaluation will often reveal the underlying diagnosis without the need for further tests. It may be the presentation of a serious heart condition, but more commonly, neurally mediated syncope or postural hypotension is the cause.

**Further resources**


The European Society of Cardiology website www.escardio.org

The Driver and Vehicle Licensing Agency website www.dvla.gov.uk

Cerebrovascular disease is no longer regarded as an inevitable consequence of old age, but rather a treatable syndrome which is a medical emergency when it presents acutely. Every year in the UK there are about 110,000 patients with new strokes, 30,000 with recurrent strokes and 20,000 with transient ischaemic attacks. This includes 10,000 strokes in adults under retirement age. Overall, 11% of all deaths each year in the UK are attributable to stroke and it is the largest cause of serious adult neurological disability, with about £2.8 billion spent each year on direct care. As the proportion of older people increases, so will the impact of stroke.

The pathophysiology of stroke

Stroke is caused by a sudden disruption to the blood supply to the brain. There are two main types: cerebral infarction and intracerebral haemorrhage, the latter of which includes subarachnoid haemorrhage (see Figure 7.1). Infarction and haemorrhage are not underlying diagnoses, as there are several different mechanisms (see Figure 7.2).

Cerebral infarction results from a blockage of arterial blood supply either by atherothromboembolism to large or small vessels, or embolisation from a proximal source such as the heart, as in atrial fibrillation. Rarer causes such as arterial dissection and inflammatory vasculopathies also occur. Following disruption of cerebral blood flow, there is disturbance to the neuronal electrical activity (reversible) and cellular membrane integrity (irreversible) through a neurochemical cascade. The ‘ischaemic penumbra’ is an area of brain that has not passed into the irreversible stage and has the potential to recover. This is the rationale for emergency therapy in cerebral ischaemia. Figure 7.3 shows the computed tomography (CT) appearances of various types of infarct.

Primary intracerebral haemorrhage (ICH) follows a rupture of blood vessels into brain tissue, resulting in direct neuronal injury and cerebral oedema (see Figure 7.4).

Clinical assessment

Stroke and TIA are clinical diagnoses, characterised by the sudden onset of a focal neurological deficit. It is impossible to reliably differentiate cerebral infarction from cerebral haemorrhage on clinical grounds alone.

The particular symptoms of stroke and TIA depend on which part of the brain is affected and these are listed in Box 7.1. There are also a number of other disorders that may mimic stroke (Box 7.2), but these can often be differentiated by history and physical examination.

The traditional difference between a stroke and TIA is timing. In TIA, neurological symptoms and signs resolve within 24 hours.
However, most TIAs last less than 1 hour and those of the eye last for only a few minutes. Many so-called TIAs lasting several hours are actually infarcts (as evidenced on CT scanning).

Our concepts of stroke and TIA are evolving. It is more helpful to think in terms of a ‘brain attack’, particularly for those assessed within the first few hours of their event, in whom it is unclear whether it will turn out to be a TIA or a stroke. For patients who present with a TIA, it is possible to identify those at the highest risk for stroke using a simple score (see the ABCD2 score in Box 7.3). This is crucial in prioritising patients, organising investigations, modifying risk factors and starting effective secondary prevention (see Box 7.4).

**Box 7.1 Clinical features of stroke/TIA with arterial territory**

<table>
<thead>
<tr>
<th>Anterior (carotid) circulation</th>
<th>Posterior (vertebrobasilar) circulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cortical dysfunction:</td>
<td>Cranial nerve palsy</td>
</tr>
<tr>
<td>dysphasia</td>
<td>Ataxia/incoordination/</td>
</tr>
<tr>
<td>sensory/visual inattention</td>
<td>disequilibrium*</td>
</tr>
<tr>
<td>hemianopia</td>
<td>Diplopia*</td>
</tr>
<tr>
<td>Monocular blindness</td>
<td>Isolated homonymous</td>
</tr>
<tr>
<td>Unilateral weakness</td>
<td>hemianopia</td>
</tr>
<tr>
<td>Unilateral sensory disturbance</td>
<td>Bilateral visual loss</td>
</tr>
<tr>
<td>Dysarthria*</td>
<td>Unilateral/bilateral weakness</td>
</tr>
<tr>
<td>Neumorphologic dysphagia*</td>
<td>Unilateral/bilateral sensory</td>
</tr>
<tr>
<td>* Unlikely to be TIA or stroke if symptoms are in isolation.</td>
<td>disturbance</td>
</tr>
<tr>
<td>Dysarthria*</td>
<td>Dysarthria*</td>
</tr>
<tr>
<td>Neuromuscular dysphagia*</td>
<td>Neuromuscular dysphagia*</td>
</tr>
</tbody>
</table>

However, most TIAs last less than 1 hour and those of the eye last for only a few minutes. Many so-called TIAs lasting several hours are actually infarcts (as evidenced on CT scanning).

Our concepts of stroke and TIA are evolving. It is more helpful to think in terms of a ‘brain attack’, particularly for those assessed within the first few hours of their event, in whom it is unclear whether it will turn out to be a TIA or a stroke. For patients who present with a TIA, it is possible to identify those at the highest risk for stroke using a simple score (see the ABCD2 score in Box 7.3). This is crucial in prioritising patients, organising investigations, modifying risk factors and starting effective secondary prevention (see Box 7.4).
All patients with a TIA or stroke should be assessed urgently (see Box 7.5). Patients with a TIA and a high ABCD2 score and patients who still have neurological symptoms and signs should be admitted to hospital. Patients with more than one TIA in a week are also considered to be at high risk.

For patients with a high-risk TIA, admission to hospital allows urgent:
- carotid Doppler ultrasound, if the TIA was in the carotid territory (see Box 7.1 and Figure 7.5), and surgery if there is significant stenosis in the symptomatic artery
- risk factor assessment and secondary prevention
- anticoagulation if the patient is in atrial fibrillation
- thrombolysis if the patient has a stroke while in hospital.

Those with lower risk scores or who refuse admission should have their risk factors addressed, be started on antiplatelet therapy and referred to a TIA clinic.

The management of stroke should take place without delay – including neuroimaging, consideration of hyperacute treatment (thrombolysis), initiation of early secondary prevention and admission to organised stroke unit care. This allows medical stabilisation, and monitoring of blood pressure, pulse rate and rhythm,
temperature, blood glucose and oxygen saturations (all things which can affect the ischaemic penumbra mentioned earlier). Complications can be identified early (e.g. raised intracranial pressure, aspiration pneumonia – see Box 7.6), specific stroke treatment can be given, and early co-ordinated rehabilitation can begin (see Chapter 11).

There is strong evidence that stroke unit care is more effective than care on general medical wards, reducing death and disability by about 30%.

The management of patients with spontaneous primary intracerebral haemorrhage is generally supportive. Patients on anti-coagulants should be considered for treatment with vitamin K or prothrombin complex concentrate, depending on the reason for anticoagulation and the clinical severity of the haemorrhage. There is insufficient evidence to support neurosurgical intervention in most cases, apart from cerebellar haematomas or superficial bleeding in patients who deteriorate neurologically.

Investigations

The investigations for patients with TIA and stroke are shown in Box 7.7.

All patients with a stroke should have CT of the brain. CT accurately differentiates cerebral infarction from haemorrhage (up to 2 weeks) and can identify some conditions that mimic stroke. An immediate scan should be undertaken if:

• thrombolysis is being considered
• subarachnoid haemorrhage is suspected
• there is rapidly deteriorating neurology
• the patient is anticoagulated.

Otherwise CT should be performed as soon as possible within the first 24 hours. A normal CT scan does not exclude stroke. Small infarcts may not be seen, and large infarcts may produce only subtle changes on imaging if performed very early.

Thrombolysis in stroke

There is a firm evidence base that cerebral reperfusion with thrombolysis (r-tPA, Alteplase) improves recovery in selected subgroups of stroke patients. Although there is an increase in early mortality from intracerebral haemorrhage, total mortality at 3 months is unchanged, with more patients surviving with less disability. The effect of treatment is time dependent and most benefit is seen when it is given within 3 hours. Patients presenting within this time and in whom rigid inclusion and exclusion criteria are applied can be considered for treatment in stroke centres with specialists trained in thrombolysis.

Secondary prevention

Antiplatelet agents

Antiplatelet agents should be considered the first line of treatment in all patients with TIA and ischaemic stroke, apart from those with a potential cardiac source of embolisation. In terms of early secondary prevention, aspirin is the only antiplatelet with proven benefit in acute stroke and though the effect is small, it reduces subsequent death and disability. It should be started as soon as the diagnosis of stroke has been made or within 48 hours if there will be a delay in obtaining CT results. The dose (excluding those with contraindications or who have received thrombolysis) is 300 mg daily by mouth or nasogastric tube, or 600 mg per rectum.

Following the first event, in which a patient is not taking an antiplatelet agent (and in whom there is no high-grade internal carotid artery stenosis for which surgery is being planned), aspirin 300 mg orally once daily should be continued for 2 weeks, reducing to 75 mg once daily plus modified-release dipyridamole 200 mg twice daily. This regimen is cost-effective and is superior to aspirin alone in reducing subsequent stroke risk.

When a patient already taking aspirin suffers a ‘breakthrough’ event, modified-release dipyridamole 200 mg twice daily should be added. Clopidogrel is possibly more effective than aspirin alone in preventing recurrent vascular events, but is not cost-effective as a first-line treatment following TIA or stroke. Patients who are allergic to aspirin or who suffer a ‘breakthrough’ event on an aspirin–dipyridamole combination should be prescribed clopidogrel 75 mg once daily. There is no current evidence at this time to support the combination of clopidogrel with aspirin or dipyridamole.

<table>
<thead>
<tr>
<th>Box 7.6 Post-stroke complications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Neurological</strong></td>
</tr>
<tr>
<td>Progression or stroke completion</td>
</tr>
<tr>
<td>Further stroke</td>
</tr>
<tr>
<td>Haemorrhagic transformation</td>
</tr>
<tr>
<td>Cerebral oedema</td>
</tr>
<tr>
<td>Seizure (partial or generalised)</td>
</tr>
<tr>
<td>Hydrocephalus</td>
</tr>
<tr>
<td><strong>Non-neurological</strong></td>
</tr>
<tr>
<td>Sepsis: urinary</td>
</tr>
<tr>
<td>aspiration pneumonia</td>
</tr>
<tr>
<td>Metabolic: electrolyte disturbance</td>
</tr>
<tr>
<td>hypo-/hyperglycaemia</td>
</tr>
<tr>
<td>dehydration</td>
</tr>
<tr>
<td>Pulmonary embolus</td>
</tr>
<tr>
<td>Cardiac arrhythmia</td>
</tr>
</tbody>
</table>

If a patient becomes more drowsy after a stroke, think of the five Ss: seizures, sepsis, sugar, stroke recurrence and secondary hydrocephalus.

<table>
<thead>
<tr>
<th>Box 7.7 Investigations for TIA or stroke</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>All patients</strong></td>
</tr>
<tr>
<td>FBC</td>
</tr>
<tr>
<td>CBC</td>
</tr>
<tr>
<td>Clotting</td>
</tr>
<tr>
<td>12-lead ECG</td>
</tr>
<tr>
<td>CT brain scan</td>
</tr>
<tr>
<td><strong>Selected patients</strong></td>
</tr>
<tr>
<td>Thyroid function</td>
</tr>
<tr>
<td>Liver function</td>
</tr>
<tr>
<td>Fasting glucose</td>
</tr>
<tr>
<td>Oral glucose</td>
</tr>
<tr>
<td>Tolerance test</td>
</tr>
<tr>
<td>Chest X-ray</td>
</tr>
<tr>
<td>Carotid Doppler ultrasound</td>
</tr>
<tr>
<td><strong>Difficult ‘syndromes’</strong></td>
</tr>
<tr>
<td>Vasculitic screen/ immunology</td>
</tr>
<tr>
<td>Echocardiogram</td>
</tr>
<tr>
<td>Transcranial Doppler ultrasound</td>
</tr>
<tr>
<td>Magnetic resonance imaging</td>
</tr>
<tr>
<td>Cerebral angiography</td>
</tr>
</tbody>
</table>

* PV, plasma viscosity; ESR, erythrocyte sedimentation rate.
Anticoagulation
Prophylactic low molecular weight heparin or anticoagulation for atrial fibrillation should not be used in the acute phase of cerebral infarction. Although this treatment leads to a reduction in venous thromboembolism and fewer recurrent ischaemic strokes, there is an increase in symptomatic intracerebral haemorrhage, with no net benefit in reducing recurrent stroke. The convention is to wait about 14 days after the event before starting anticoagulation. Patients in atrial fibrillation with a recent TIA or cerebral infarct should be considered for long-term anticoagulation with warfarin, particularly if their annual risk of stroke is high (see Box 7.8). This reduces the risk of subsequent stroke by about two-thirds, aiming for a target international normalised ratio (INR) of 2.5 (range 2.0–3.0). Any decision to recommend oral anticoagulation should take into account the risks (major bleeding complications) and benefits (stroke reduction). Oral anticoagulation is not more effective than antiplatelet therapy for patients in sinus rhythm.

Risk factor management
Hypertension is an important modifiable risk factor for stroke. Epidemiological data have shown a linear relationship between arterial blood pressure and stroke. Acute reduction in blood pressure following stroke may cause harm and is subject to ongoing clinical trials. Treatment should begin at least 1 week following stroke, aiming for a blood pressure of less than 140/85 mmHg (130/80 mmHg in people with diabetes).

Cholesterol has a weak but positive association with ischaemic stroke compared to coronary artery disease, but reducing cholesterol to less than 3.5 mmol/L (e.g. with simvastatin 40 mg orally once daily) reduces the risk of stroke and other vascular events by about 25%. There are few data for cholesterol reduction in patients over 82 years of age.

Smoking is an important risk factor and all patients who smoke should be advised to stop. Dietary advice is also important and includes salt restriction, five portions of fresh fruit and vegetables a day, oily fish once a week, low saturated fat diet, and moderate alcohol consumption, as well as increased physical exercise and weight reduction if necessary.

Carotid revascularisation
There is good evidence that carotid endarterectomy reduces stroke risk in patients with a recent carotid territory TIA or non-disabling stroke, if they are fit and willing for surgery. The benefit of surgery is greater if done early and when there is a higher degree of stenosis. If the event occurred within 2 weeks, surgery is of benefit with a greater than 50% stenosis, but after this time the benefit is only seen in a 70–99% stenosis and the absolute risk reduction for stroke declines rapidly. Those with carotid occlusion require no vascular intervention.

Outcome following stroke
Death and disability remain an unfortunate consequence of stroke with a mortality of 12% at 7 days, 19% at 30 days and 31% at 12 months. Impaired consciousness, cerebral haemorrhage, location and size of the lesion, age and medical co-morbidities all affect mortality. Poor functional outcome is associated with cognitive decline, poor motivation, urinary incontinence, severe motor weakness, and perceptual, proprioceptive and postural problems. Around one-third of stroke survivors will suffer a recurrence.

Further resources

Acknowledgements
The author would like to thank Dr Tony Goddard and Dr David Kesle (consultants in neuroradiology and vascular radiology respectively) for their help with image selection and Edward Taylor (vascular radiographer). Dr Richard Fuller kindly reviewed the manuscript.

Box 7.8 CHADS2 score for prediction of stroke risk in atrial fibrillation

<table>
<thead>
<tr>
<th>Score</th>
<th>Risk classification</th>
<th>Risk per year</th>
<th>Therapy</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–1</td>
<td>Low</td>
<td>1.9–2.8%</td>
<td>Aspirin</td>
<td>75–300 mg daily</td>
</tr>
<tr>
<td>2–4</td>
<td>Moderate</td>
<td>4.0–8.5%</td>
<td>Aspirin or warfarin</td>
<td>INR 2.0–3.0</td>
</tr>
<tr>
<td>5–6</td>
<td>High</td>
<td>12.5–18.2%</td>
<td>Warfarin</td>
<td>INR 2.0–3.0</td>
</tr>
</tbody>
</table>

Introduction

The risk of developing dementia rises with increasing age (see Table 8.1). An ageing population means that dementia is on the increase. This should allow planners and politicians to forecast needs and hopefully to develop services. In the UK there are currently over 750,000 people with dementia. This is projected to rise to over 850,000 by 2010 and 1.8 million by 2050. Because of its economic impact, dementia is an important target for diagnostic and therapeutic research and development. To the clinician it presents a challenge in accurate differential diagnosis and management, and is also a factor in managing other illnesses in older people.

Definitions

Dementia is defined as an acquired, global and progressive impairment of mental function. Being acquired distinguishes it from learning disability, being global distinguishes it from focal disorders such as stroke or Parkinson’s disease (though both of these can result in dementia) and being progressive distinguishes it from non-progressive impairment, for example following trauma, or reversible impairment in delirium.

Dementia can also be defined as a syndrome due to disease of the brain, usually of a chronic or progressive nature in which there is, in the absence of clouding of consciousness, disturbance of multiple higher cognitive functions (Box 8.1).

Types of dementia

Dementia is a syndrome with a variety of causes (Table 8.2). Of these causes, Alzheimer’s disease is the most common, followed by various types of vascular dementia (which have the same risk factors as stroke – see Chapter 7) and dementia with Lewy bodies (DLB). The metabolic ‘dementias’, although rare, are important because of their potential reversibility (e.g. hypothyroidism). Other causes of dementia are also rare and usually manifest at a younger age. There are some rare genetic variants of Alzheimer’s disease with early onset and increased familial risk. Early-onset Alzheimer’s is also a feature of Down’s syndrome.

Symptoms and differential diagnosis

Deficiencies in memory, orientation, judgement, comprehension and learning (especially in new situations) are the most common...
presenting symptoms of dementia. The term ‘confusion’ is often used by relatives or doctors but is imprecise and should be clarified, or avoided. Cognitive testing will often reveal deficiencies in these and other areas. The Mini Mental State Examination (MMSE) accesses a variety of these areas (orientation, registration, attention, calculation, recall and language) and gives a rough indication of severity (see further resources section). However, poor intelligence and education, or acute illness causing delirium, are factors that can affect the result.

The time course of the illness is important in differential diagnosis. Figure 8.1 shows the typical time courses of delirium (discussed further in Chapter 3), Alzheimer’s disease and multi-infarct dementia, the most common form of vascular dementia. DLB shows an overall gradual decline similar to Alzheimer’s but with much greater fluctuation in performance during the day. Extrapyramidal signs, susceptibility to the extrapyramidal side-effects of antipsychotics and prominent visual hallucinations are also characteristic of DLB. Subdural haematoma may also give a fluctuating picture, but often with more obvious transient impairment of conscious level.

The course of multi-infarct dementia is described as stepwise with periods of sudden decline interspersed with periods of relative stability. Findings of hypertension, atrial fibrillation, diabetes, or neurological signs and symptoms suggestive of cerebrovascular disease support the diagnosis. Computed tomography (CT) of the brain (Figure 8.2) may confirm the presence of vascular lesions, but does not exclude the possibility of mixed vascular and Alzheimer’s dementia.

Investigations

The metabolic ‘dementias’ may be excluded by appropriate laboratory tests (see Box 8.2). Blood tests for syphilis, serum lipids and HIV should be considered in high-risk populations. A CT scan of the brain should be routine in early-onset dementia and should be requested urgently in the presence of:

- a rapid unexplained deterioration
- neurological signs or symptoms
- a recent head injury
- urinary incontinence or gait apraxia (in which the feet seem to stick to the floor) early in the illness, suggesting normal-pressure hydrocephalus which may be treatable
- an atypical presentation of dementia.

Table 8.2 Different types of dementia.

<table>
<thead>
<tr>
<th>Type of dementia</th>
<th>Approximate % of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alzheimer’s disease</td>
<td>55% (includes a considerable number of mixed Alzheimer–vascular cases)</td>
</tr>
<tr>
<td>Vascular dementia (subtypes: acute onset, multi-infarct, subcortical)</td>
<td>20%</td>
</tr>
<tr>
<td>Dementia with Lewy bodies (DLB)</td>
<td>15%</td>
</tr>
<tr>
<td>Frontotemporal dementia syndromes (e.g. Pick’s disease)</td>
<td>5%</td>
</tr>
<tr>
<td>Other dementias (e.g. metabolic ‘dementias’ like vitamin B12 and thyroid deficiency, Creutzfeldt–Jakob disease, Huntington’s disease, Parkinson’s disease, AIDS-related dementia)</td>
<td>5% (though small in number, these are important to diagnose because some may be reversible, some are inherited and others are potentially transmissible)</td>
</tr>
</tbody>
</table>

Figure 8.2 Typical CT appearances in vascular dementia. The image shows an area of low attenuation (darker) within the posterior limb of the right internal capsule (bottom left circle) which is an old infarct. There are also two further areas of low attenuation around both frontal horns of the lateral ventricles (top two circles). This is due to small vessel ischaemic damage, often termed ‘periventricular white matter changes’, due to diffuse cerebrovascular disease. The ventricles and sulci are also prominent, indicating some atrophy which may be normal for the patient’s age.
Management

Assessment in practice

The assessment and management of dementia is a multidisciplinary exercise. A useful framework is given in Figure 8.3. To ensure the best possible outcome for someone with dementia, function should be optimised in each area.

When the onset of cognitive impairment is sudden or when there is sudden worsening of existing confusion, there is likely to be a medical cause such as infection, metabolic disturbance, stroke or medication (e.g. drugs with anticholinergic properties or sedatives). Thorough physical examination and urgent investigations are indicated, followed by appropriate treatment. Once this has been dealt with, a re-assessment should determine the cause and extent of any remaining cognitive impairment, associated sensory impairment and relevant social and family factors.

When cognitive impairment presents more gradually, there is time to make a comprehensive assessment from the start. Increasingly this is a function of specialist memory services associated with mental health services for older people and follows Royal College and National Institute for Health and Clinical Excellence (NICE) guidelines (see further resources section).

Person-centred care

The general management of dementia should follow a person-centred approach – this recognises that some of the handicaps we see in people with dementia are caused or made worse by their environment. Admission to hospitals poses particular problems, as acute hospital care focuses on the medical rather than the psychosocial needs of demented people.

People with dementia benefit from being with family or friends, and in familiar surroundings whenever possible. If they have to be admitted to hospital or intermediate care, someone they know and trust should accompany them to explain (repeatedly, if necessary) what is going on. Lack of comprehension is made worse when allowances are not made for the difficulties people with dementia have about learning, remembering and adapting to change. These aspects are considered in more detail in the NICE guidelines and in books such as Dementia Reconsidered (see further resources section). The medical role may focus on diagnosis, review of medication, management of physical health problems and appropriate prescribing, but it is essential for the doctor to ensure that other areas are considered and that appropriate services are delivered to improve function and reduce carer strain.

Dementia requires long-term care planning as well as acute management. Older people with dementia are vulnerable to abuse and doctors must know how to deal with suspected abuse.

Pharmacological management

Pharmacological management in dementia consists of:
- specific anti-dementia drugs
- medication for co-existing physical problems
- medication for behavioural disorders.

The cholinesterase inhibitors donepezil, rivastigmine and galantamine opened a new era in the treatment of Alzheimer’s dementia. However, a recent NICE guideline has stated that the benefits are only sufficient to justify treatment of moderate Alzheimer’s. Thus patients with mild dementia have to wait until they deteriorate before they can have treatment and patients with severe dementia are likely to have treatment withdrawn (though most local services reinstate treatment if there is marked deterioration on withdrawal).

The treatment of vascular dementia is the same as that for the secondary prevention of stroke (see Chapter 7).

Patients with dementia may not complain about physical illness in a way that is easy to understand. Their health should therefore be kept under regular review. They may not be good at remembering to take medication. Prescribers should simplify the medication regimen as far as possible, seek to explain to patients and carers the purpose and importance of any prescribed medication and co-operate with carers to optimise compliance.

Person-centred care minimises the risk of behaviour disturbance. Behavioural problems in dementia may be due to:
- an acute illness causing delirium
- chronic problems (e.g. constipation or pain)
- undiagnosed or untreated depression
- sensory deprivation (e.g. flat hearing aid battery, inadequate spectacles)

Box 8.2 Investigations in dementia

- Full blood count
- Urea and electrolytes
- Glucose
- Liver function tests
- Calcium
- Erythrocyte sedimentation rate (ESR) or plasma viscosity
- Vitamin B12 and folate
- Thyroid function tests

Figure 8.3 An interactive model of dementia. For successful treatment, all these interacting aspects of a person’s function should be considered.
• carer strain
• inadequately trained or over-busy staff.
A simple behavioural analysis using ‘ABC’ (antecedents, behaviour, consequences) may be useful. Understanding the causes is more likely to lead to appropriate remedial action, rather than the prescription of antipsychotic or sedative medication. When antipsychotics are indicated they should be initiated by specialists and given in the lowest effective dose for the shortest possible time.

Social, emotional and spiritual support
Social, environmental and spiritual support can be offered to patients with dementia and their carers in the following ways.
• Their involvement in decisions about their care.
• Information about their disease and what they can do to help themselves.
• Information about financial benefits (see Chapter 15).
• Practical support with day-to-day living.
• Respite care.
• Support in maintaining social life and religious practice.
• Emotional support in coping with the effects of the disease.
• If necessary, long-term care.

People with dementia are not well served by present health or social services. We can all play our part in changing this for the better.

Further resources
The Alzheimer’s Society. For people with dementia, their relatives and carers and professionals. www.alzheimers.org.uk
Urinary incontinence is a common condition that affects people of all ages and both sexes. Changes occur in the urinary tract with ageing (see Box 9.1) that predispose to incontinence in older people.

Incontinence is defined as ‘any involuntary leakage of urine’. Although more common, incontinence is not inevitable in old age, and much can be done to prevent and treat it. A positive attitude and a thorough assessment can mean maintaining dignity and independence for most people.

The prevalence and impact of incontinence

Up to 1 in 5 women and around 1 in 10 men over the age of 65 suffer from incontinence. The prevalence increases with increasing age and co-morbidity. Two-thirds of care home residents are incontinent of urine. However, with variations in definitions and under-reporting due to embarrassment, the prevalence of incontinence is probably an underestimate.

Incontinence can significantly affect a person’s wellbeing. People with incontinence restrict their social activities. Carer strain is common and incontinence is second only to dementia as an initiating factor in admission to a care home. Soiled clothing, bed linen and soft furnishings have to be laundered and replaced frequently, resulting in an increased financial burden. Incontinence overall costs the NHS over £420 million per year (approximately 1% of the total NHS budget).

Co-morbidities and incontinence

Diseases that are prevalent in older age can affect continence. Any disability affecting vision, mobility, dexterity or cognition may have an adverse effect on continence, especially if an individual has a problem with urgency of micturition.

Treatments for diseases may also have the unintended effect of precipitating incontinence. Some examples are given in Box 9.2. Patients with dementia may have incontinence because of either the disease process itself or its treatment, for example with cholinergic drugs, which can worsen an overactive bladder.

Patients with poorly controlled diabetes may have polyuria. Less commonly, patients with hypercalcaemia, hypokalaemia or diseases of the pituitary gland may present with urinary frequency or incontinence. There is also an association between incontinence and falls.

Assessment

There are different types of urinary incontinence and symptoms vary in nature and severity (see Table 9.1). Each type is treated differently, so it is important to assess which type of incontinence a person has. This is based on the history and examination – urodynamics (specialised tests) are rarely needed.
There are five main types of urinary incontinence in older people:

- Urge incontinence (or over-active/unstable bladder)
- Stress incontinence
- Mixed incontinence (both urge and stress)
- Voiding problems (due to obstruction or a neurogenic bladder)
- Functional incontinence (due to an inability to get to the toilet, or confusion).

All older people presenting with urinary incontinence should be offered an assessment. Box 9.3 shows the key components of this. Any member of the healthcare team can initiate it and there are useful diagnostic tools available to facilitate this.

As well as the assessment outlined in Box 9.3, a simple 'symptom sorter' is useful in determining the type of incontinence (Box 9.4). A bladder diary, detailing volumes of urine voided, wet episodes, type and amount of fluids taken is also useful – for example, caffeine and citrus drinks can exacerbate bladder instability. A physiotherapist or occupational therapist can help if patients have mobility problems or difficulty accessing toilet facilities in their own home.

A physical examination of the abdomen for palpable masses or urinary retention, and the rectum for faecal impaction, is important. In males, a rectal examination should include an assessment of the prostate. In females, an examination of the perineum and vagina is useful to identify a prolapse or atrophic vaginitis (a reddened excoriated vulva) and to assess for weak pelvic floor muscle contraction – all of these problems contribute to incontinence and can be treated.

Urinalysis can detect infection or diabetes. In continence clinics, a portable bladder ultrasound scanner is used to assess whether patients have a significant post-micturition volume of urine that may indicate voiding problems (see Figure 9.1). Figure 9.2 shows a portable urine flow meter.

### Treatment

#### General measures

General measures that can help promote continence in older people include:

- staying active
- losing weight if necessary
- drinking water rather than caffeine or alcohol.
In hospitals or care homes, toilets should be clearly identified and walking aids or assistance available if needed. If an older person has an impaired memory, carers should prompt them regularly to use the toilet. Carers of people with dementia should be aware of non-verbal cues such as agitation or wandering, which may mean the person needs the toilet.

**Urge incontinence (or over-active/unstable bladder)**

With urge incontinence, patients cannot wait. They have to pass urine as soon as they feel an urge to go. They may also complain of frequency and nocturia. "Bladder drill" (going to the toilet at regular intervals) followed by "bladder training" (gradually extending the length of time between these intervals) is of benefit for patients with this condition.

Drug treatment may be required and there are a number of anticholinergic treatments that act on the detrusor muscle of the bladder. Many drugs are non-selective anticholinergic agents, but newer drugs have been developed that specifically target the muscarinic receptors found predominantly in the bladder, with a lower incidence of side-effects, an important consideration in older people.

The National Institute for Health and Clinical Excellence (NICE) guidance in 2006 recommended the use of immediate-release oxybutynin, but this is not well tolerated in older people as it is a non-specific anticholinergic agent. Anticholinergic side-effects include:

- confusion
- dry mouth
- blurred vision

---

**Box 9.4 Symptom sorter**

Yes to the following suggests **STRESS INCONTINENCE**

- I leak when I cough, laugh, sneeze, exercise
- I leak small amounts of urine
- I know when I have leaked
- Only my pants get wet
- I leak during sex

Yes to the following suggests **URGE INCONTINENCE**

- I have an urgent need to pass urine
- I sometimes do not reach the toilet in time
- I get up more than twice at night
- I pass urine more than 7 times a day
- I get very wet

Yes to the following suggests **VOIDING PROBLEMS**

- My urine flow stops and starts
- Sometimes I cannot pass urine straight away
- I sometimes feel I have not emptied my bladder properly
- I have a feeling of fullness in my bladder area
- I get frequent urine infections

Yes to the following suggests **FUNCTIONAL INCONTINENCE**

- I have lots of health problems
- I have problems with memory and concentration
- I need help to move about
- I have problems adjusting my clothing
- I have a feeling of sadness, depression, loneliness

---

**Figure 9.1** A portable bladder scanner.

**Figure 9.2** Portable urine flow meter used in a continence clinic.
• constipation
• urinary retention
• postural hypotension
• oesophageal reflux.

Extended-release preparations, or antimuscarinic drugs such as tolteradine, are often more acceptable, with a lower incidence of side-effects. These preparations also have the advantage of once-daily dosage. Trospium chloride (a newer antimuscarinic drug) is useful in patients with cognitive impairment, as it has fewer cognitive side-effects.

If treatment for an over-active/unstable bladder is unsuccessful, patients may be offered botulinum toxin which is injected into the detrusor via cystoscopy. This procedure has to be repeated and there is a lack of research on its efficacy. Surgery to augment the bladder is rarely performed nowadays.

**Stress incontinence**

With stress incontinence, patients leak urine whenever they cough, sneeze, laugh or even stand up. This is usually because of weak pelvic floor muscles in women, as a result of childbirth. The mainstay of treatment for this condition is pelvic floor muscle exercises, which can produce improvement in symptoms even in relatively frail older patients. The patients must be clear about the muscle groups they are trying to strengthen and they must be committed to a programme of regular exercise to obtain and maintain improvement. Working with a trained physiotherapist is the best way to achieve this. Patients with very low pelvic floor tone may benefit from augmentation of their exercise programme with either vaginal cones (Figure 9.3) or biofeedback (in which vaginal cones are connected to a computer that senses muscle contraction and helps the patient contract the right muscles correctly).

If exercise treatment fails then duloxetine may be tried. This is a selective serotonin and noradrenaline re-uptake inhibitor which has some efficacy in patients with stress incontinence, although it is not always tolerated in older patients.

Surgery is also an option for stress incontinence. Even quite frail patients may be able to undergo a TVT (tension-free vaginal tape) or TOT (trans-obdurator tape) procedure. However, outcome data specific to older people suggest that voiding problems, tape divisions and urinary tract infection are more common post-operatively than in younger patients. Periurethral bulking procedures that involve injection of collagen or gels are less invasive but may need to be repeated.

**Mixed incontinence**

Urge and stress incontinence may co-exist. Usually, it is easy to tell this on the basis of a history and bladder diary. Initial treatment on the basis of a clinical assessment is reasonable, but if the diagnosis is unclear or the patient fails to respond to first-line treatment, urodynamic tests (Box 9.5) may be useful.

**Voiding problems**

Voiding problems occur in both sexes and are caused by:
• outflow obstruction e.g. enlarged prostate, urethral stricture, constipation
• neurogenic bladder e.g. diabetes, neurological diseases.

Patients with voiding problems present with hesitancy and a poor stream. However, chronic outflow obstruction also affects the detrusor muscle and causes bladder instability, so in a man who presents with urge incontinence, anticholinergic treatment may worsen matters if the underlying problem is an enlarged prostate causing outflow obstruction – the underlying cause should be looked for and treated.

Voiding problems are treated with drugs to improve bladder emptying, surgery to remove an obstruction, or urinary catheterisation (intermittent or long term).

Drugs to improve bladder emptying include alpha blockers for prostatic hypertrophy which act on the bladder sphincter, but cause postural hypotension which can be a problem. Anti-testosterone tablets (e.g. finasteride) are an alternative, but these take at least
3 months before an effect is noticed. These drugs are often given together.

If catheterisation is required the preferred option is intermittent self-catheterisation. This is associated with a lower risk of infection and is usually more acceptable to patients. Long-term catheterisation may be the only usable method for some patients, but is a last resort as a treatment for incontinence. A valve should be used if possible, rather than a drainage bag (see Figure 9.4) in order to maintain normal bladder filling and reduce infection risk. If a bag is to be used then leg bags are preferable.

**When treatment does not work**

If treatment for incontinence is unsuccessful there is a huge range of aids and appliances to help the older person cope with their symptoms and remain active and independent. Most of these are available on prescription. A continence nurse specialist can assess the patient and help to decide which aids and appliances would be most effective. This is important, because incorrect appliances or the wrong type of pad may be ineffective and reinforce the myth that incontinence is a problem that cannot be managed.

**Further resources**

Assessing older patients who may require surgery can be challenging. They are more likely to present with atypical symptoms and signs. The risks vs benefits of any surgical procedure have to be weighed carefully, and peri-operative care is more likely to be complicated and prolonged. Yet there is good evidence that outcomes can be improved when older people receive tailored care before, during, and after surgery.

**Atypical presentation**

The following considerations, outlined in Chapter 1, are important when assessing older surgical patients. There is often:

- Multiple pathology
- Atypical presentations
- Reduced physiological reserve
- Impaired immunity
- Difficulty weighing the benefits vs risks of treatment
- Capacity or communication problems.

When older people present with an acute illness, they may have more than one acute diagnosis (e.g., intra-abdominal pathology and fast atrial fibrillation), as well as more than one chronic problem, diagnosed or otherwise.

Older people represent a high percentage of patients with acute abdominal pain. They often present late, have a disproportionately severe pathology compared with the pain they complain of, and their physical findings are less sensitive and less specific. Morbidity and mortality among older patients with abdominal pain is higher than in other age groups.

Because of reduced physiological reserve and impaired immunity, symptoms and signs that one would expect to find in a younger person may be absent (e.g., tachycardia, fever, raised white cells and abdominal rigidity). Evaluating an older patient with acute abdominal pain can be difficult and an experienced surgeon should be involved early in the process.

Figures 10.1 and 10.2 describe an approach to the older patient with acute abdominal pain.

**Peri-operative complications**

Older people have an increased incidence of peri-operative complications, especially after emergency surgery. This is because of age-related physiological differences and reduced physiological reserve that affect all body systems (see Table 10.1). Some peri-operative problems may go unrecognised because of their atypical presentation.

The care of the elderly surgical patient was highlighted in a National Confidential Enquiry into Peri-operative Death...
The NCEPOD report in 1999, which looked at over 1000 patients over the age of 90. The recommendations of the report are shown in Box 10.1.

The NCEPOD report highlighted the following areas.

**Fluid management**
The mismanagement of fluid prescribing was a contributory factor in many cases of post-operative morbidity and mortality. Patients were given either too little or too much fluid,
with inadequate assessment and monitoring – vital in this age group.

Nutrition
Early nutrition after surgery is associated with reduced mortality and length of stay in hospital. The report recommended that feeding should be started as early as possible after surgery.

DVT prophylaxis
Older patients have an increased risk of death from thromboembolism following emergency admission to hospital. Many studies have shown a reduced incidence of deep vein thrombosis (DVT) and pulmonary embolism if prophylaxis is given (see Figure 10.3).

Pain control
The report highlighted the inaccurate perception that older people do not feel as much pain, which may be due to an inability to express it, or patients not wanting to bother staff. Judicious use of opioid analgesics is often required and works well.

Oxygen therapy
Oxygen therapy for 3–4 days after major surgery, especially at night, reduces the incidence of post-operative cardiac complications (e.g. myocardial infarction).

Particular geriatric problems associated with surgery

Under-nutrition
Improving peri-operative nutrition improves outcome in certain surgical patients (e.g. those with fractured neck of femur). However, under-nutrition is common among older people admitted to hospital, so they start at a disadvantage. Malnourished people stay in hospital for longer, are three times more likely to develop peri-operative complications, and have a higher mortality. Two-thirds of older people are at risk of becoming malnourished while in hospital. The UK Department of Health report Improving Nutritional Care (see further resources section) was largely in response to successful campaigning by charities for older people.

Pressure ulcers
Pressure ulcers occur when patients are immobile or in bed for prolonged periods of time. The presence of pressure ulcers is associated with prolonged hospital stay and delayed rehabilitation, and may lead to sepsis. Box 10.2 lists the factors associated with the development of pressure ulcers.

Pressure ulcers can usually be prevented. Identification of at-risk patients, skilled nursing care, adequate pain control, hydration and nutrition, the use of pressure redistribution devices, and correct positioning are all important aspects of care.
Post-operative cognitive dysfunction

Post-operative cognitive dysfunction (POCD) is the term used for delirium following anaesthesia with no other apparent cause, for example infection or medication. It is a transient, usually short-lived disorder of memory, cognition and attention. When other causes of delirium have been excluded, a diagnosis of POCD can be made. It is thought to be related to the interaction of anaesthetic agents and the neurotransmitters involved with cognition. The prognosis is good in most patients. However, in some it can be prolonged or lead to complications (see Chapter 3).

Initially, POCD was believed to be a side-effect of cardiac bypass surgery, but an international study found an incidence of 26% at 1 week and 10% at 3 months in older patients undergoing non-cardiac surgery. Box 10.3 lists the risk factors for the development of POCD.

These findings have partly led to the increased use of regional anaesthesia for surgery whenever possible in older people. However, some patients develop POCD after regional anaesthesia, suggesting that other factors are involved.

Decline in ability to perform activities of daily living

Many patients suffer a decline in mobility and ability to perform activities of daily living (ADLs) after admission to hospital for an acute illness. Studies have found that the following premorbid factors are independently associated with decline in ability to perform ADLs:
- cognitive impairment
- depression
- malnutrition
- unsteadiness
- older age.

Peri-operative care programmes that incorporate the principles of comprehensive geriatric assessment (see chapter 1) reduce disability and need for admission to a care home.

Pre-optimisation

Major surgery, especially emergency surgery, places a huge physiological stress on the body. Older people, and those with cardiorespiratory disease, may not have the ability to increase their cardiac output sufficiently to meet increased demands, and this group of patients faces the greatest risk of peri-operative complications and death (Box 10.4). ‘Pre-optimisation’ refers to physiological measurements and treatment before surgery, specifically aimed at improving a person’s cardiac output and oxygen delivery. Pre-optimisation improves patient outcome, especially in high-risk surgical patients.

At a basic level, pre-optimisation involves measuring a patient’s vital signs, performing key blood tests (e.g. haemoglobin and electrolytes), and aiming to restore these as far towards normal as possible before surgery. This is so the patient can mount his or her best compensatory response during the peri-operative period. Simple interventions include oxygen therapy and fluid resuscitation. For elective surgery, a physician may be involved in optimising a chronic disease before admission.

At a more sophisticated level, pre-optimisation involves admission to a high dependency unit (HDU) or intensive care unit (ICU) where cardiac output and oxygen delivery can be measured and manipulated by fluid resuscitation and drugs.

For elective surgery, risk prediction scores can predict overall peri-operative morbidity and mortality, but these do not provide individualised information that can help to plan care for an individual patient. Cardiopulmonary exercise (CPX) testing is increasingly being used to provide an objective measure of a person’s physiological reserve (Figure 10.4). Studies have focused on those over the age of 60, or with a history of heart disease. The patient is asked to pedal on an exercise bicycle while measurements are taken that calculate the anaerobic threshold (AT). The test does not require high physical stress or motivation on the part of the patient and accurately predicts those who are at higher risk of peri-operative cardiovascular complications. This information can be used to triage patients to ICU, HDU or ward care, if the patient and surgeon decide to go ahead.
**Intensive care for older people**

As a group, patients over the age of 80 have poorer outcomes following admission to ICU, compared with younger people. ICU mortality in the over 80s is 27% overall in the UK, and about 50% of patients over the age of 70 will die within 3 months of discharge. However, prognosis depends more on the severity of the acute illness and the patient’s previous functional ability, rather than age itself. Severe sepsis and brain injury have particularly poor outcomes.

There is little evidence on which to predict long-term outcomes for physical and cognitive function after discharge from ICU. Studies show that at least one-third of survivors are more disabled in their ability to perform activities of daily living. For selected patients, the evidence is that ICU and HDU care is worthwhile. However, many doctors do not know the preferences of their patients regarding invasive ventilation or cardiopulmonary resuscitation. Information from outcome studies may help doctors and patients make better informed decisions.

The factors that should be taken into account when deciding on admission to ICU are listed in Box 10.5.

**The effectiveness of multispecialty teams**

Several studies have shown reduced hospital stay and morbidity following elective surgery in older people by using a multispecialty care approach. They have used various methods affecting all or part of the pre-, peri- and post-operative care period (see Table 10.2).

A multispecialty team approach for surgery in older people combines the following:

- pre-operative patient education
- pre-optimisation
- fast-track surgery
- attenuation of surgical stress
- optimised pain relief
- early mobilisation
- nutritional support.

Delivering these requires a co-ordinated approach between geriatricians, surgeons and anaesthetists, as well as other disciplines (e.g. physiotherapy) and hospital managers.

Harari et al. in a cohort study (see further resources section) showed improvements in pressure ulcers, pain control, mobilisation and reduced length of stay in elderly patients undergoing elective orthopaedic surgery. They used a multispecialty team targeting most of the above aspects of care. However, they did not look at surgical or anaesthetic techniques, which also affect outcome for older people.

In the UK, a new speciality of orthogeriatrics has evolved to improve care for elderly trauma patients. Different models exist, all of which involve a geriatrician sharing the care of patients with fractures, predominantly fractured neck of femur. This involves pre-optimisation, post-operative care, rehabilitation and discharge planning in a multidisciplinary team. Other important aspects of care include reducing subsequent falls risk and investigations and treatment for osteoporosis.

All successful models of care for older surgical patients adopt an integrated approach, involving the surgical team and a geriatric multidisciplinary team. Experience worldwide has shown that an unintegrated approach results in poorer overall outcomes.

**Further resources**


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**Box 10.5 Factors in deciding on admission to ICU**

The decision to admit an elderly patient to ICU should be based on:

- co-morbidities
- nature and severity of the acute illness
- pre-hospital functional status, especially mobility and social independence
- patient preferences.

<table>
<thead>
<tr>
<th>When</th>
<th>What</th>
<th>Who</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-operatively</td>
<td>Assessment</td>
<td>General practitioner</td>
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<tr>
<td></td>
<td>Patient education</td>
<td>Nurse</td>
</tr>
<tr>
<td></td>
<td>Medical optimisation</td>
<td>Surgeon</td>
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<td></td>
<td>Nutrition</td>
<td>Anaesthetist</td>
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<td>Geriatrician</td>
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<td></td>
<td></td>
<td>Physiotherapist</td>
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<tr>
<td>Peri-operatively</td>
<td>Type of anaesthetic</td>
<td>Nurse</td>
</tr>
<tr>
<td></td>
<td>Fluids and monitoring</td>
<td>Surgeon</td>
</tr>
<tr>
<td></td>
<td>ICU or high dependency unit</td>
<td>Anaesthetist</td>
</tr>
<tr>
<td></td>
<td>Minimally invasive surgery</td>
<td>Geriatrician</td>
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<td></td>
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<td>Physiotherapist</td>
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<tr>
<td>Post-operatively</td>
<td>Pain relief and fluids</td>
<td>Nurse</td>
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<tr>
<td></td>
<td>Nutrition</td>
<td>Surgeon</td>
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<tr>
<td></td>
<td>Post-operative complications</td>
<td>Anaesthetist</td>
</tr>
<tr>
<td></td>
<td>Early mobilisation</td>
<td>Geriatrician</td>
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<tr>
<td></td>
<td>Rehabilitation</td>
<td>Occupational therapist</td>
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<td></td>
<td></td>
<td>Physiotherapist</td>
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</tbody>
</table>
CHAPTER 11
Rehabilitation
Lauren Ralston & John Young

OVERVIEW
- Illness in older people often has functional consequences
- Randomised controlled trials show that rehabilitation is effective in improving function and independence
- Rehabilitation is a multidisciplinary process, with specific treatment goals
- Barriers to successful rehabilitation include unidentified medical problems that can be treated

Introduction
Illness in older people often has functional consequences, especially in relation to mobility and self-care. This was recognised by one of the pioneers of geriatric medicine – Marjory Warren (Figure 11.1). She took over the care of several hundred chronically sick, bedridden, ‘incurables’ in the West Middlesex Hospital in the 1930s and devised a novel programme that was patient-centred and involved multidisciplinary team working. So successful was her approach that most of these incurable patients improved sufficiently to be discharged from hospital. This was the beginning of the specialty of geriatric medicine and her novel approach would today be recognised as rehabilitation.

What is rehabilitation?
Rehabilitation is a complex intervention that aims to address the functional, psychological and social consequences of ill-health in a context that values and promotes independence. It requires a multidisciplinary team, identifies specific individualised treatment goals, and measures progress against these goals.

The World Health Organization (WHO) International Classification of Functioning, Disability and Heath (ICF) describes the consequences of illness and provides an important framework within which the rehabilitation process can be understood (Box 11.1). The WHO ICF framework requires a medical diagnosis

Box 11.1 WHO International Classification of Function (1991)
- Body functions: the physiological functions of body systems (including psychological functions)
- Impairments: problems in body function or structure such as a significant deviation or loss
- Activity: the execution of a task or action by an individual
- Participation: involvement in a life situation

Figure 11.1 Dr Marjory Warren. ‘The treatment of long-stay cases should be undertaken by a team whose central theme is optimism and hope. It is wise to get elderly folk up as soon as their physical condition warrants, and it is of great value to their morale to get them dressed in their own clothing as soon as possible.’ From Marjory Warren. Care of the chronic sick. Lancet 8 June 1946. Picture reproduced with the permission of the British Geriatrics Society.
Who is rehabilitation for?

Activity limitation, or disability, is strongly related to increasing age. This reflects the increasing prevalence of common disabling conditions: stroke, arthritis, heart failure, chronic lung disease, fractured hip and peripheral vascular disease. There are around 1.3 million disabled older people in England and Wales. This is 16% of those aged over 65 years. Nearly all disabled older people, even those categorised as severely disabled, live in their own homes, but many rely on formal and informal support. Rehabilitation can improve the quality of life for these people and make them less dependent on other people. There is randomised controlled trial evidence that rehabilitation interventions can improve outcomes for older people with the following conditions:
- falls
- arthritis of the knees
- Parkinson’s disease
- stroke
- chronic lung disease
- old age and multiple conditions (frailty)
- long-term care home residents.

Who provides rehabilitation?

Rehabilitation is provided by a multidisciplinary team (MDT). Core members of this team include the following.

Nurses and support staff – enable patients to be as independent as possible, even though this is usually more time-consuming than completing tasks for them. This is facilitated by ensuring that patients are dressed and are wearing appropriate footwear, and that hearing aids, dentures and glasses are worn if needed.

Doctors – have a lead role in establishing an accurate diagnosis of the underlying and associated conditions, and in optimising their medical management.

Physiotherapists – are skilled at assessing and managing problems of muscles, movement and mobility. Key aims of physiotherapy are to improve balance, flexibility, strength and stamina, often by practising everyday activities such as walking, transferring and climbing stairs.

Occupational therapists – optimise daily living activities and may recommend the use of different aids to assist rehabilitation or maintain independence.

Speech and language therapists – assess and treat speech (e.g. dysphasia, dysarthria) and swallowing impairments.

Social workers – provide access to benefit and allowance advice, and can co-ordinate home support services.

Other staff may need to be involved, depending on the specific needs of the individual patient (Figure 11.3).
How is rehabilitation organised?

Effective rehabilitation requires several steps (Box 11.2) and requires some key functions described below. Omission of any of these key functions will jeopardise the success of the rehabilitation process.

**Assessment** – by each member of the MDT to identify the diseases and their consequences, best expressed in terms of impairments, activity limitations and participation limitations.

**Co-ordination** – each member of the MDT will have a different perspective of the issues. These need to be shared and formulated into an action plan. This is usually achieved through a regular MDT meeting.

**Leadership** – at the MDT meeting, someone needs to assume the role of a team leader to co-ordinate information, achieve a consensus on rehabilitation priorities and goals and agree tasks.

**Communication** – an important aspect of the MDT meeting is to ensure that decisions are documented and are discussed fully with the patient and close supporters.

**Rehabilitation goals** – arise from the assessment process as discrete steps within the overall aims of the rehabilitation plan. They can be short or medium term and are most effective when there is significant patient and carer involvement. Rehabilitation goals should be SMART, that is:

- **Specific** who will do what, when and how often.
- **Measurable** so that it is clear when the goal has been achieved.
- **Achievable** but challenging enough to stretch the patient.
- **Relevant** to what the patient wishes to achieve.
- **Time limited** to maintain focus on patient improvement.

### Standardised rehabilitation measures

Many standardised rehabilitation measures have been developed. Ideally, measures should be valid (i.e. measure what they are supposed to measure), reliable (give the same result for the same patient when repeated), and sensitive to clinical change – but there is no perfect rehabilitation measure. A commonly used generic measure is the Barthel Index (Box 11.3), which measures independence across 10 daily living activities with a score range of 0 (dependent) to 20 (independent). It is rather insensitive to clinical changes and has a low ceiling – patients may score the maximum of 20 points but still have activity limitations in areas not covered by the index, such as cooking or trips outside.

### Box 11.2 The rehabilitation process

1. Recognition of potential
   - A multidisciplinary rehabilitation team assessment
2. Rehabilitation goal setting
   - MDT rehabilitation meeting
3. Re-ablement
   - Rehabilitation interventions
4. Regular review
   - Further assessment
5. Resettlement
   - Home visits, post-discharge follow-up, involvement of primary healthcare team
6. Readjustment
   - Empowerment by education about disability and available services

### Box 11.3 The Barthel Index

Assesses the level of dependence for 10 activities of daily living. The maximum score is 20. The higher the score, the more independent the person is.

- **Feeding**
  - 2 = independent
  - 1 = needs help
  - 0 = unable

- **Bathing**
  - 1 = independent
  - 0 = dependent

- **Grooming**
  - 1 = face/hair/teeth all alone
  - 0 = dependent

- **Dressing**
  - 2 = independent
  - 1 = needs help but can do at least half
  - 0 = dependent

- **Bowels**
  - 2 = continent
  - 1 = occasional accidents, needs help with enemas
  - 0 = incontinent

- **Bladder**
  - 2 = continent, manages own catheter
  - 1 = occasional accidents, needs help with catheter
  - 0 = incontinent

- **Toilet**
  - 2 = independent
  - 1 = needs help
  - 0 = dependent

- **Transfers from bed to chair**
  - 3 = totally independent
  - 2 = minimal help needed
  - 1 = able to sit with major help
  - 0 = needs to be lifted/hoisted

- **Walking**
  - 3 = independent for 50 metres with or without an aid
  - 2 = needs help of a person
  - 1 = independent with a wheelchair
  - 0 = immobile

- **Stairs**
  - 2 = independent
  - 1 = needs help
  - 0 = unable

Gait assessment

Limitation of mobility is a common consequence of many chronic conditions affecting older people and adversely affects quality of life. Understanding gait assessment is therefore a useful clinical skill. Much can be learnt from careful observation of balance and gait using the standardised approaches listed in Box 11.4 (see also Chapter 4).

Walking sticks

Walking sticks transmit a proportion of body weight through the upper rather than the lower limb, thus reducing forces through an unstable or painful joint. This can improve balance, reduce postural sway and increase confidence. Walking sticks are commonly single ended but may have three (tripod) or four (quadripod) feet to improve stability. The choice of handle can improve performance: a straight handle with finger grips is preferable as it improves grip and reduces pressure on the hand; however, a ‘crook’ is often preferred by patients as it allows the user to hook it over the arm when not in use (Figure 11.4). The stick should ideally be used on the contralateral, unaffected side if the aim is to reduce sway (e.g. in a hemiparesis), or to reduce weight through a painful joint (e.g. osteoarthritis of the hip). The length of the stick should be the distance from the wrist crease to the floor when the arm is resting at the side of the body. The ferrule or rubber tip (see Figure 11.5) should be checked regularly for wear.

Walking frames

Walking frames promote an upright posture, provide stability and reduce the weight transmitted through painful legs. Two main types exist: the Zimmer frame (four legs, no wheels) and rollator frames with wheels. The Zimmer frame with its four rubber tips provides superior stability but this is at the cost of an abnormal, stop/start gait pattern that tends to force the user to lean backwards when lifting the frame forwards. In contrast, rollator frames promote a smoother, striding, more natural gait pattern as demonstrated by a doubling of gait speed compared to the Zimmer. Studies show that increased gait speed is correlated with improved balance, fewer falls and less fear of falling. Additionally, the energy cost of using a wheeled frame is half that of a Zimmer frame.

A delta frame, or tri-wheeler, is another type of wheeled frame. It has a single front wheel which swivels and two unidirectional back wheels. It promotes greater stride length and speed, and is often preferred by users because of its superior manoeuvrability. Finally, the gutter frame is a large, cumbersome frame that allows the user to lean heavily forward by resting their forearms in horizontal gutters and offers maximum stability when the legs are very weak and/or painful (Figure 11.6).

Daily living aids

Many daily living aids are available. Careful assessment to define the key patient and carer problems is needed before the most appropriate aid can be selected. Instruction and training following selection has been shown to improve their effectiveness. Examples of items commonly required are wheelchairs, special seating, kitchen and bathing aids, chairs and orthoses (insoles, shoe modifications, support collars, lumbar supports and splints). Such devices promote independence for the patient but may also help protect the patient and carer from injury (Figure 11.7).

Box 11.4  Gait assessment tools

Timed unsupported stand
The ability to stand is essential to perform many functional tasks. Ask the patient to stand unsupported and observe for more than 1 minute.

Timed walk
Gait speed correlates well with balance, fear of falling and limb power. Ask the patient to walk 10 metres at normal speed (with usual walking aid) and time using stop watch. Repeated measurements are a simple method to monitor progress.

Timed get-up-and-go test
Used to assess functional mobility. The time taken to rise from a chair, walk 3 metres, turn around, return to chair and sit down. Less than 20 seconds is usually adequate for independent transfers and mobility. More than 30 seconds indicates higher dependence and risk of falls.

Figure 11.4  Crook and straight-handle walking sticks.

Figure 11.5  A walking stick ferrule (rubber tip).
![Figure 11.6](image1)

<table>
<thead>
<tr>
<th>Type of frame</th>
<th>Zimmer frame</th>
<th>Rollator</th>
<th>Delta frame</th>
<th>Gutter frame</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advantages</td>
<td>Rubber tips and wide base give increased stability Aid of choice for people with a tendency to lean backwards and in Parkinson’s disease</td>
<td>Normal or striding gait pattern Aid of choice for people with a tendency to lean backwards and in Parkinson’s disease</td>
<td>Striding gait pattern Highly manoeuvrable Brakes Greater stride length and speed versus two-wheeled rollator</td>
<td>Increased stability Grip not essential</td>
</tr>
<tr>
<td>Disadvantages</td>
<td>Abnormal, stop/start gait pattern</td>
<td>Small wheels unsuitable for use on carpets Requires good weight-bearing ability</td>
<td>Less stable than frames Brakes dependent on wrist strength</td>
<td>Large cumbersome frame</td>
</tr>
<tr>
<td>Example of use</td>
<td>Osteoarthritis of the knee or hip</td>
<td>Stroke, post-fall syndrome and Parkinson’s disease</td>
<td>Parkinson’s disease</td>
<td>Severe pain and weakness in legs</td>
</tr>
</tbody>
</table>

**Figure 11.6** Types of walking frame. ‘Zimmer’ is the name of a manufacturer, but the four legs, no wheels walking frame is commonly referred to by this name.

![Figure 11.7](image2)

(a) Toilet aid and (b) grabber (which helps patients to reach for objects).
Some patients may not progress as expected. Common reasons include the following.

**Unidentified medical problems** such as anaemia, heart failure, undertreated pain and adverse effects of medication.

**Unidentified depression** – mood disorders are commonly associated with physical disease in older people. The geriatric depression scale (GDS) can be used for screening purposes (Box 11.5).

**Unidentified dementia** – impaired memory and concentration may impede rehabilitation techniques that rely on learning and carry-over. Screening for cognitive impairment is advisable using a standardised assessment measure (e.g. the Mini Mental State Examination – see Chapter 8).

**Box 11.5 The Geriatric Depression Scale (GDS 15)**

Used as a screening tool to identify depressive symptoms in the elderly. Consists of 15 Yes/No questions; 1 mark is given for each answer in **bold** below.

1. Are you basically satisfied with life? Y/N
2. Have you dropped many of your activities and interests? Y/N
3. Do you feel that your life is empty? Y/N
4. Do you often get bored? Y/N
5. Are you in good spirits most of the time? Y/N
6. Are you afraid something bad is going to happen to you? Y/N
7. Do you feel happy most of the time? Y/N
8. Do you often feel helpless? Y/N
9. Do you prefer to stay at home rather than going out and trying new things? Y/N
10. Do you feel you have more problems with your memory than most? Y/N
11. Do you think it is wonderful to be alive now? Y/N
12. Do you feel pretty worthless the way you are now? Y/N
13. Do you feel full of energy? Y/N
14. Do you feel that your situation is hopeless? Y/N
15. Do you think that most people are better off than you are? Y/N

Score 0–4 = no depression
5–10 = mild depression
11+ = severe depression

Advantages: quick test, takes 5–10 minutes, well tolerated, sensitivity 80%.

Disadvantages: moderate specificity of 60%.
A four-point scale consisting of questions 1, 3, 6 and 7 is also in use.
A score of 1 or more suggests depression.


**Barriers to rehabilitation**

Some patients may not progress as expected. Common reasons include the following.

**Time** – patients can only recover at a rate that is appropriate to their physical and psychological condition and some patients will require a longer period of contact with rehabilitation services.

**Where should rehabilitation take place?**

The location of rehabilitation services varies between geographical areas. There is considerable randomised trial evidence to support the following:

- hospital-based rehabilitation within elderly care services
- stroke unit rehabilitation
- community falls services
- community stroke services.

There is also a trend towards improved outcomes from trial evidence for:

- day hospitals
- community hospitals
- some hospital-at-home services in which patients receive home support and therapy in their own homes.

There are concerns over inferior outcomes associated with care home-based rehabilitation and nurse-led units.

Rehabilitation is one of the success stories of geriatric medicine. Acute and chronic medical conditions in older people commonly lead to reduced function and activities of daily living. With a proper assessment, older people with the potential to improve can be identified and effectively treated.

**Further resources**


Around 1% of the UK population dies each year but only 25% of these die from cancer. Figure 12.1 shows the other common causes of death, which include heart failure, chronic respiratory diseases and stroke. Although most people say that they would prefer to die at home, over half will die in hospital. Most people who die are older, which is why palliative care is an important aspect of geriatric medicine.

Definitions

The World Health Organization (WHO) defined palliative care in 2005 as ‘the approach that improves the quality of life of patients and their families facing the problems associated with life-threatening illness, through the prevention and relief of suffering by means of early identification and thorough assessment and treatment of pain and other problems – physical, psychosocial and spiritual.’

Palliative care:
- provides relief from pain and other distressing symptoms
- affirms life and regards dying as a normal process
- intends neither to hasten nor postpone death
- integrates the psychological and spiritual aspects of patient care
- offers a support system to help patients live as actively as possible until death
- offers a support system to help the family cope during the patient’s illness and their own bereavement

Who provides palliative care?

Most patients receive palliative care from their general practitioners and/or hospital teams. End of life initiatives, such as the Gold Standards Framework and Liverpool Care Pathway for the Dying, have been implemented to support palliative care in these settings (Box 12.1). Referral to specialist palliative care teams should be considered for patients with physical, psychological, social or spiritual needs that cannot be met by their current healthcare teams.

Specialist palliative care (SPC) services are needs based rather than diagnosis based. They include hospices, as well as community and hospital palliative care teams. Hospices provide inpatient services
for patients requiring management of complex needs, terminal care or rehabilitation, with an average length of stay of approximately 2 weeks. Many patients are discharged home following a hospice stay. Day care, bereavement support and complementary therapies may also be available.

Community and hospital SPC teams have a mainly advisory role. They also have an important role in education. SPC services have expertise in the management of complex symptoms, whether physical and/or psychological, including pain that is difficult to manage, prescribing at the end of life, and can also offer an outside perspective or second opinion.

### Palliative care in older people

The majority of patients requiring palliative care are old, and special consideration needs to be given to their assessment and management because of differences in physiology, co-morbidities and social circumstances. Box 12.2 outlines some of the differences that need to be taken into account.

### Symptom management

Symptoms are common at the end of life. Approximately 70% of cancer patients and 65% of patients with non-malignant diseases will experience pain during the course of their illness. Pain and other symptoms should be considered as a total experience, with physical, psychological, social and spiritual components. The pharmacological management of pain uses the stepwise approach of the WHO pain relief ladder, starting with non-opioid analgesics and progressing to increasingly strong opioids, ensuring that drugs are prescribed both regularly and as required (see Figure 12.3).

Morphine remains the opioid analgesic of choice for moderate to severe cancer pain, but interindividual variability in absorption, metabolism and excretion may lead to a poor analgesic response or signs of toxicity in up to one-third of patients. In this situation a switch to a different kind of opioid will be necessary.

Neuropathic pain is only partially opioid responsive and usually requires the addition of co-analgesics such as amitriptyline or gabapentin. Nerve blocks can also be considered in difficult pain.

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**Box 12.2 Special considerations in palliative care for older people**

**The patient**
- Impaired homeostasis (see Chapter 1)
- Cognitive impairment is common
- Symptoms such as pain and insomnia may be seen as ‘normal’ consequences of ageing
- Activities of daily living are affected more by the same symptom burden than in younger patients

**The family**
- Older carers, who may not be in good health
- Many patients live alone

**The disease**
- Increased co-morbidities
- Prognostication is more difficult in non-cancer diagnoses such as chronic obstructive pulmonary disease and end-stage heart failure

**Drugs**
- Increased number of drugs – therefore higher potential for interactions
- Different pharmacokinetics and pharmacodynamics (see Chapter 2)
- Renal impairment is common
- Concordance may be a problem

**Communication**
- Hearing loss and visual impairment are common
- Subjective assessment of symptoms requires intact cognition
- Preferred decision-making styles vary with age
Up to two-thirds of cancer patients will experience nausea and vomiting. The choice of anti-emetic is determined by the cause of the symptoms. Excellent and concise summaries of the management of nausea and vomiting are available in introductory palliative care texts (see further resources section), and local guidelines may also be available, e.g. through Regional Cancer Networks. Anti-emetics sometimes need to be started parenterally, via a continuous subcutaneous infusion, until symptoms are controlled and the patient is able to absorb the drug orally.

Breathlessness and other symptoms should be asked about directly. Patients often do not volunteer information about anorexia, fatigue, insomnia and mouth problems, thinking they are an inevitable consequence of their illness. However, acknowledgement and explanation can help and where treatments are available they can have a significant impact on quality of life.

Box 12.3 shows some of the questions to ask of a patient in a palliative care situation, Box 12.4 gives some tips on symptom management in palliative care, and Figure 12.4 shows how palliative care symptoms can be the result of several factors, and therefore their management involves consideration of the total picture. More information on treatment for difficult symptoms can be found in the further resources section.

**Estimating prognosis**

Estimating prognosis is vital in palliative care. It helps to determine appropriate treatment options. Patients and families need to make plans about future care and prepare for death. Access to various services and benefits are dependent upon a person’s prognosis. In the UK, patients are entitled to receive the higher rate of disability living allowance if their life expectancy is thought to be less than 6 months. Eligibility for some continuing care packages is dependent on a life expectancy of weeks.

The ability of health professionals to predict survival is known to be poor. In cancer patients, doctors are usually over-optimistic, but predictions become more accurate as death

**Figure 12.3** The WHO pain relief ladder. PRN, as required; NSAID, non-steroidal anti-inflammatory drug.

Non-steroids should usually be prescribed with a proton pump inhibitor in older people.

In palliative care:

1. Prompt oral administration of drugs for pain should be initiated in the order shown, until the patient is free of pain.
2. Other drugs (adjuvants) may be needed for neuropathic or bone pain, and for anxiety and poor sleep which can also affect pain.
3. Drugs should always be taken regularly rather than PRN.

This simple ‘three-step approach’ is 80–90% effective. Specific surgical treatments or radiotherapy may also be indicated. From www.who.int/cancer/palliative/painladder/en

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
</tr>
</thead>
</table>
| Opioid for moderate to severe pain<br>
+/- non-opioid<br>
+/- adjuvant |
| For example: regular morphine plus paracetamol<br>
+/- NSAID |
| Non-opioid<br>
+/- adjuvant e.g. regular paracetamol or NSAID |

**Box 12.3 Questions to ask of a patient in a palliative care situation**

<table>
<thead>
<tr>
<th>Questions about</th>
<th>Possible courses of action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain</td>
<td>See the WHO pain relief ladder&lt;br&gt;Certain pains such as neuropathic pain, liver capsule pain, constipation pain, or headaches due to raised intracranial pressure require specific treatments</td>
</tr>
<tr>
<td>Nausea and vomiting</td>
<td>Treat with appropriate anti-emetics. Specific causes (e.g. bowel obstruction, brain metastases) require specific treatment</td>
</tr>
<tr>
<td>Sleep</td>
<td>Lack of sleep may be due to other symptoms e.g. pain or anxiety, or be longstanding. Sedatives may help</td>
</tr>
<tr>
<td>Low mood/anxiety</td>
<td>Eliciting and addressing concerns, talking therapy, antidepressants or anxiolytics</td>
</tr>
<tr>
<td>Appetite and mouth</td>
<td>Can sometimes be helped by adjustment of medication and mouth care, and simple dietary advice. Ill-fitting dentures are a common consequence of weight loss in older people</td>
</tr>
<tr>
<td>Breathlessness</td>
<td>Treatment of the underlying cause if possible. Relaxation techniques, a fan, oxygen if hypoxaemic, and careful titration of morphine or benzodiazepines are other measures</td>
</tr>
<tr>
<td>Fatigue</td>
<td>Can be a serious problem. Lifestyle adaptation, antidepressants (if low mood) or dexamethasone may help</td>
</tr>
<tr>
<td>Relationships, social support and housing</td>
<td>May need help and adaptations at home – involve social services and occupational therapist</td>
</tr>
<tr>
<td>Spiritual needs</td>
<td>Offer information about available support if wanted</td>
</tr>
<tr>
<td>Any other concerns/ things the person wants to do but cannot</td>
<td>For example, this may be something as simple as wanting to go out and visit somewhere, and a wheelchair might allow this</td>
</tr>
<tr>
<td>Ask patients to prioritise their problems. Sometimes what is important to the doctor is not the most important thing to the patient.</td>
<td></td>
</tr>
</tbody>
</table>
approaches. Determining prognosis in non-malignant diseases such as end-stage heart failure and severe chronic obstructive pulmonary disease is even more difficult. These diseases usually have 'entry–re-entry' death trajectories involving acute exacerbations followed by some improvement. Illness trajectories can be useful when looking at prognosis and when trying to match palliative care needs to different patient groups (see Figure 12.5). Box 12.5 lists some prognostic factors in advanced cancer.

Patients often ask, ‘How long have I got?’ It is helpful to explore why the patient is asking the question now, as a precise answer may be impossible (and sometimes inappropriate), but this provides a useful opportunity to discuss patient expectations, and progress in general, and facilitates the setting of realistic goals.

Box 12.6 summarises a checklist of dos and don’ts in palliative care.

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**Box 12.4** Tips – symptom management in palliative care includes:

- Thorough assessment, including the patient’s perspective.
- Consider whether the problem is:
  - related to the underlying disease(s)
  - related to the treatment for the disease(s)
  - a co- incidental problem (e.g. angina, arthritis)
  - all of the above? Expect to find multiple causes
- Establishing a realistic management plan with the patient and the rest of the team, and revising the plan as necessary
  - Is the underlying cause treatable?
  - What is the likelihood of success of any treatment?
  - Is the treatment appropriate on the basis of the balance of risks versus benefits for this individual?
  - What is the likely timescale in which improvement will take place?
  - What degree of improvement can be expected?
  - What other options will be available?
- Considering different routes of administration of drugs
  - Although the oral route is preferable, there are several other routes of administration that are used in palliative care, including subcutaneous, rectal, transdermal and transmucosal
- Regular re-assessment, timed according to the severity of the symptom. If symptoms persist, reconsider diagnosis, and route of drug administration. Also remember:
  - treatment of a severe symptom may unmask other symptoms
  - new and evolving symptoms are to be expected in progressive disease
  - ineffective medication should be stopped
- Anticipation of problems – for example, malignant hypercalcaemia usually recurs
- Remembering that mechanical problems require mechanical solutions
  - Constipation secondary to complete tumour obstruction of the rectum will not respond to laxatives and a colostomy may be required


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**Figure 12.4** Symptoms can be the result of several factors. The aetiology of symptoms ranges from simple to complex. Complex symptoms are the result of several factors, and management involves considering the whole picture.

**Figure 12.5** Deaths per general practitioner per year and their illness trajectories. Adapted from Keri Thomas (with reference to Joanne Lynn) in Fallon M, Hanks G, eds (2006) ABC of Palliative Care, 2nd edn. Blackwell Publishing, Oxford.

**Withdrawing and withholding treatment**

The benefits and burdens of treatment need to be reviewed when death is imminent and inevitable. Little is known of the
Physiology of dying, but body homeostasis (e.g. whether or not a patient experiences thirst) does appear to be different in the very terminal stages of advanced disease.

If there is uncertainty regarding the potential benefits of a treatment, a therapeutic trial can be undertaken with defined goals and a review date. Making decisions at the end of life requires excellent communication skills, reasonable estimation of prognosis, and teamwork – often the hardest aspects of care. Knowledge of patient wishes and goals in advance helps decision-making, and formal advance decisions can be useful. In the case of patients who have not made advance decisions and who are unable to communicate their wishes or who lack capacity, the views of carers and relatives regarding the patient’s likely wishes must be sought. Decisions must be made within the framework of the law and professional guidance (see further resources section).

### Cardiopulmonary resuscitation

Decisions regarding cardiopulmonary resuscitation (CPR) can be particularly challenging. Sensitivity is required, and an informed decision made by a competent patient requires realistic information about their prognosis, likelihood of success, and the risks of the procedure.

Older hospital inpatients at best have a 10% chance of surviving to discharge after CPR. For oncology patients there is a survival rate of less than 1% in those who are bed bound with multiple organ failure unresponsive to medical treatment.

Doctors are not obliged to provide treatments that will not work. However, exploration of the patient’s expectations and wishes regarding potentially life-sustaining treatments is part of establishing direction, location and goals of care. Studies in older people have shown that preference for CPR is strongly influenced by the perceived probability of surviving a CPR attempt. The majority of patients think that resuscitation is successful most of the time. However, when presented with accurate survival statistics, the number of people who choose CPR falls.

### Bereavement

Bereavement has serious health consequences for many people, with up to one-third developing depression. Older people may be even more susceptible for a number of reasons.

- Negative life events are the most important risk factor for depression in older people.
- Poor health, reduced mobility and sensory loss make it more difficult to rebuild an identity or take on new roles.
- Social isolation.
- Lack of employment to buffer the strain of a stressful life event.
- Dementia can reduce the capacity to understand what has happened.

Bereavement support should be offered proactively to those considered most at risk. This includes those lacking social support, those whose history or personality indicate a risk of prolonged grief or circumstances where the events surrounding the death were especially distressing.

### Further resources


Decisions relating to cardiopulmonary resuscitation. A joint statement from the British Medical Association, the Resuscitation Council (UK) and the Royal College of Nursing (Oct 2007). www.bma.org.uk/ap.nsf/Content/CPRDecisions07

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**Box 12.5** Prognostic factors in advanced cancer

The following may be useful in estimating prognosis in advanced cancer.

- Clinical judgement
- Performance status of the patient
- The presence of anorexia, weakness and weight loss
- Breathlessness
- Delirium
- Cognitive failure
- Laboratory tests

Some of these factors have been incorporated into validated prognostic scoring systems.


**Box 12.6** Dos and don’ts – a checklist for palliative care

**DO**

- Elicit patient priorities
- Engage the patient and carers in the management plan
- Set realistic goals
- Try to pre-empt predictable problems whenever possible
- Review progress regularly in view of response, and changing goals
- Stop ineffective medications and interventions
- Plan ahead
- Ensure prompt communication (including the patient) across service boundaries
- Recognise your own limitations and refer on if necessary

**DON’T**

- Make assumptions about what the patient will want
- Promise things that are not in your control
Definitions

Discharge planning is the process by which the hospital team, liaising with relatives and carers, community services and general practitioners, organises the return of patients to their homes or transfer to other places of care. It is often a multidisciplinary process, which ensures that patients spend no unnecessary time in hospital. Some discharges can be time-consuming and complex. The keys to a successful discharge are information gathering, sharing this information, and planning (Box 13.1). Every detail needs to be considered, especially if the patient has several different problems.

The discharge planning process

Discharge planning starts on admission, by collecting information from the patient and relatives and/or carers about social circumstances and function. It includes a risk assessment for those who are frail or cognitively impaired, or have inadequate social support. It prepares the patient, relatives, multidisciplinary team and other healthcare providers for a safe and efficient discharge back to the pre-admission destination or suitable alternative. The stages of discharge planning are shown in Figure 13.1.

Discharge planning involves good communication:

- with the patient and relatives or carers, whose active involvement is central to the success of the discharge
Discharge Planning

within the ward-based multidisciplinary team (e.g. at formal meetings, during ward rounds or at other times). See Figure 13.2.

between the ward staff and members of the community team. The different members of the multidisciplinary team are shown in Box 13.2.

Comprehensive geriatric assessment

Patients identified as high risk (e.g. recurrent falls, dementia, struggling at home) should have a comprehensive geriatric assessment (see Chapter 1). In the context of discharge planning, this involves the following.

Medical assessment and treatment.

Review of medicines and concordance (see Chapter 2).

Gathering information about social circumstances, including details of carers, social services, benefits and whether there is any carer strain.

Assessment of cognitive function, including the patient’s ability to participate in discharge planning, and if not, identifying a representative.

Assessment of functional ability (i.e. ability to perform activities of daily living and instrumental – or extended – activities of daily living which is helpful in assessing a patient’s need for rehabilitation or support – see Box 13.3).

Asking about living arrangements (e.g. whether there are stairs at home).

Formulating goals, which should be specific and agreed with the patient, relatives and carers.

Eliciting patient preferences about discharge plans.

Following this, referrals may be made to social services or mental health teams. Physiotherapy and occupational therapy input may be needed. An estimation of when patients will be medically fit is made – this may include when they will be ready to go to a rehabilitation facility, if needed.

The single assessment process (SAP)

The SAP brings together health and social services information in a single document. It aims to improve communication between healthcare and social care workers, in theory allowing services to be more responsive to the patient’s needs. It avoids the patient having to repeat the same information to a range of professionals and is started in hospital if the patient does not have one already. The file follows the patient. The language used is clear and concise, avoiding jargon and abbreviations.
Good practice with medications
A review of medicines and concordance is usually done by a pharmacist. Medicine aids can be helpful in improving compliance. Examples are:

- **Dosette box** – a plastic refillable box with labels for the days of the week and time of day, filled by the patient or their relatives/carers
- **Blisters** – like a Dosette box only heat-sealed and prepared under the direct supervision of a pharmacist.

Prescriptions should be explained to the patient and/or carers, highlighting any changes since admission (see Figure 13.3). They should also be informed about important side-effects. Inadequate preparation is associated with adverse events. Patients who are unable to remember a discussion about the side-effects of their medication are at a threefold greater risk of experiencing an adverse event than patients who can recall such information.

Home visits and equipment
Visiting the home with or without the patient, either before or on the day of discharge, can provide hospital or community staff with the opportunity to identify problems, as well as addressing any other needs that the patient and/or carers may have. Home visits are done in selected complex patients by occupational therapists and physiotherapists (see Figure 13.4).

Occupational therapists also determine if the patient would benefit from equipment or modifications in the home. They decide whether any previously provided equipment is still suitable and if any new aids, appliances or environmental adjustments (e.g. Telecare – see Chapter 14) are required.

Discharge summaries
The discharge summary is an important communication tool. It provides key information about admission, diagnosis, investigations, interventions and follow-up arrangements. It is useful for healthcare providers to implement the treatment strategies planned during admission, thus ensuring effective continuity of care in the community. However, many summaries omit information on cognition (e.g. Mini Mental State Examination score) and function (ability to perform activities of daily living).

It is important that discharge summaries are clear, complete and sent to the general practitioner and care home at the earliest opportunity (ideally within a few days, although organisational...
Discharge Planning

Problems in discharge planning

Fragmentation of care can occur if different specialties are involved or if the patient has been moved from ward to ward. Further difficulties can arise when:

- patients and relatives/carers are not fully involved in discharge plans
- patients and relatives/carers do not co-operate with assessments (e.g. physiotherapy or giving information to the social worker)
- there is conflict about the preferred destination on discharge
- there is patchy availability of community services
- patients, relatives/carers or staff want discharge to occur before the patient is medically fit
- ward teams are understaffed or poorly trained and not enough time is given to planning discharge properly (see Box 13.5).

Delayed discharges

A delayed discharge occurs when a multidisciplinary team decision has been made that the patient is ready for discharge from a hospital bed but the patient is still occupying that bed. An unfortunate term for this is ‘bed-blocking’ – a term that blames the patient for what is an organisational problem. Delayed discharges have a direct and negative impact on the quality of care for patients. For example, if they stay in an acute ward once their medical needs have been met, they may lose their independence, mobility and social networks, and are at risk of falls and hospital-acquired infections. For patients with dementia, there are additional risks of losing capacity and of premature entry into a care home.

Recurrent admissions

Patients who frequently attend hospitals are a vulnerable heterogeneous group – a mixture of patients with chronic medical, mental health and psychosocial problems. The inelegant term ‘frequent flyer’ is used to describe such individuals. Most re-admissions are the result of a new medical problem, exacerbation of an existing problem, or care-giver difficulties. Multidisciplinary teams and community matrons have been introduced in many areas to see if improved community care for such people can prevent admissions to hospital. Hospital-acquired infections may become evident only after patients have gone home, so information about what to look out for and whom to call is useful. Follow-up plans should also be clear, otherwise patients can inadvertently ‘slip through the net’.

Carer strain

Carers often provide a vital role in supporting patients at home. Many carers find their role fulfilling, but caring can be an exhausting task. ‘Red flags’ that can identify situations in which there is potential carer strain include sleep disturbance, faecal incontinence and behavioural problems on the part of the patient.

Conclusions

The key to a successful discharge is good communication between individuals and teams. This includes patients, their relatives/carers, hospital and community services. Box 13.6 provides some further tips.

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Box 13.4 Checklist for a discharge summary

- Hospital, ward, consultant and contact numbers
- Patient’s name and unique identifier (i.e. hospital number, date of birth and address)
- Date of admission and date of discharge
- Discharge destination (which may not be home)
- Problem list
- Clinical story including significant investigation results
- What information has been given to the patient and family
- Functional and cognitive status on discharge
- What follow-up is required or has been arranged
- Medication list, with an explanation of changes

If the patient has been discharged to a care home, or an intermediate care bed, a copy of the discharge summary should also be sent to the attending doctor there.

Box 13.5 Types of suboptimal discharge

- Too soon
- Delayed
- To unsafe environments
- To inappropriate environments (e.g. premature discharge to long-term care)
- Poorly organised (e.g. not meeting the patient’s and relatives/carers’ needs or expectations)

Box 13.6 Tips for a successful discharge

- Make no assumptions (e.g. that families can provide care, that family members agree with each other)
- Keep up to date with developments from other members of the multidisciplinary team – often new information comes to light which changes the original discharge plan
- Review the patient on the day of discharge, to ensure there is no new medical problem
- Ensure that patients are discharged only when necessary equipment and services are in place
- Ensure that the preliminary discharge summary (usually written by a junior doctor) is clear, comprehensive and correct
- Telephone the general practitioner before discharge if the patient is terminally ill or requires medical monitoring in the early days after discharge
Further resources


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Intermediate care – the context

The development of intermediate care services first became UK Department of Health policy with the publication of the National Health Service (NHS) Plan in 2000. The National Service Framework for Older People followed in 2001, setting out targets and goals for the introduction of intermediate care services. In 2004, the NHS Improvement Plan introduced the new role of community matrons to support patients with long-term conditions at home.

In 2006, Our Health, Our Care, Our Say: a New Direction for Community Services was published and set out the government’s vision for integration of health and social care services, and providing more care closer to people’s homes. The clinical case supporting these changes was set out by the National Director for Older People in his 2007 report A Recipe for Care – Not a Single Ingredient.

In response to these agendas, intermediate care services have been developed. Community matrons have been appointed. Increasing numbers of consultant geriatricians now work in the community as well as the acute hospital. Teams are working to support older people in the community, including palliative and end of life care.

What is intermediate care?

Intermediate care is a range of integrated services provided at or near to a person’s home that aims to promote faster recovery from illness, maximise independence, prevent unnecessary admission to hospital and facilitate timely discharge (see Box 14.1). It allows appropriate and early access to comprehensive geriatric assessment and involves working across health and social care boundaries.

Services at the interface between hospital and primary care have developed in response to national policies and local needs. This has resulted in geographical variations in local implementation and different models of intermediate care (Box 14.2). Many areas run a combination of models. Composition of teams and leadership of services also varies (Box 14.3). Services may be led by nurses, general practitioners or geriatricians.

Why is intermediate care important?

Intermediate care offers a co-ordinated service that links primary and acute hospital care, community health services, social care, carer support and health promotion. It makes more effective use of hospital capacity and consequently helps support waiting time targets and allows better response to emergency and seasonal pressures.

Evaluation of intermediate care services has demonstrated reduced length of stay in hospital and higher patient satisfaction ratings. Outcomes are at least as good as traditional acute hospital care and costs are roughly equivalent. Intermediate care may also
reduce the need for long-term residential care by allowing time and space for recovery of health and independence before decisions are made about future care needs.

**The single assessment process**

The single assessment process (SAP), described in Chapter 13, is central to intermediate care provision. It is documentation that facilitates a thorough assessment of people’s needs without duplication by different agencies. Examples of documentation tools include:

- EASY-Care
- Camberwell Assessment for the Needs of the Elderly (CANE)
- Functional Assessment of the Care Environment (FACE).

Use of SAP is not unique to intermediate care. The vision is for hospital and community health providers to use the same documentation along with social care agencies, enabling sharing of information to best meet the needs of the individual.

**Community matrons and long-term conditions**

Patients with long-term conditions (chronic diseases) are high users of NHS resources, requiring a large number of visits to their general practitioner and often frequent admissions to hospital. Community matrons have been introduced to take a proactive approach to chronic disease management for the most complex patients, instead of the previous reactive pattern of healthcare. Their roles have been developed from models of care in the United States by companies such as Kaiser Permanente and Evercare (see Figure 14.1).

Patients needing the support of a matron are identified using various tools designed to predict future likelihood of hospital admission. These are based on the number of conditions and previous admission rates. The most commonly used is the PARR tool (Patients At Risk of Readmission) developed by the King’s Fund and partners (see Box 14.4). The decision algorithms are constantly being refined following ongoing research, to improve their case-finding accuracy. The main drawback of the currently available versions is that they use an acute admission as the trigger for analysis and identification and give weight to the number of previous admissions. At present there are no tools to help identify those who have not yet had several admissions but will go on to do so in the future.

Community matrons are experienced nurses trained in chronic disease management, including skills in history taking, clinical
examination and prescribing. They provide a holistic assessment of the patient’s needs. By visiting the person regularly in their own home, they are able to build up a full picture of the individual, incorporating physical, psychological, social and family dimensions, all of which have an impact on healthcare use. They act as co-ordinators of the various agencies involved in the individual’s care and facilitate access to specialist teams and social support networks where appropriate.

Community matrons work alongside general practitioners and hospital specialists to ensure that management of chronic disease is optimised. They teach patients and carers how to self-manage their condition whenever possible. Regular monitoring allows early detection of exacerbations, frequently at a stage when treatment can be successfully modified in the community, in theory avoiding an acute admission to hospital.

Psychological problems are a common trigger for acute admission when there is no objective change in the patient’s physical status. A common example is anxiety in breathless patients with chronic lung disease. Community matrons build a trusting relationship with their patients and can help alleviate these problems by giving people time to talk through their concerns, as well as accessing anxiety management therapy where appropriate.

**Telecare**

Used in combination with other services, telecare systems use a variety of assistive technologies and monitoring devices to maintain safety and allow access in order to support patients’ independence in the home. Sophisticated adaptations are possible that allow people with extremely limited physical function to operate domestic appliances independently using computer controls. However, these systems are complex and expensive and are usually reserved for younger disabled people. For older people, telecare equipment assists in the care of patients with cognitive impairment using such things as door entry systems, pendant alarms, automated medication prompt devices, fall detectors and movement sensors.

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**Advanced care planning and end of life care**

There are increasing initiatives to improve advanced planning of care, particularly end of life care, in the community. Community matrons and other staff are being encouraged to use ‘preferred place of care’ documentation with their service users. This facilitates discussion of the patients’ wishes regarding their care in the future, specifically where they wish to be cared for at the end of life. Research suggests that most patients want to die at home, but currently the majority die in hospital.

The preferred place of care document (Figure 14.2) is a form of advance directive, also known as a ‘living will’, which allows people to state their wishes while they are able to do so, in order that those caring for them know what they would have wanted when they are no longer able to participate in decision-making. Advance directives take many forms, from specific instructions about advance refusal of a particular treatment, to values statements about what is important to the individual’s quality of life.

The NHS End of Life Care Programme (Figure 14.3), the Gold Standards Framework (GSF) mentioned in Chapter 12 (Figure 14.4), and similar initiatives are gradually being introduced to further
improve palliative care. The GSF provides a plan to assist primary care organisations to develop a palliative care register where patients nearing the end of life are identified before the final terminal stage. This allows time for their needs and wishes to be defined and planned so that systems are in place to properly support the individual and their family when death is near. These initiatives were first introduced for patients at home but are now being extended to people in care homes.

Tools such as the Liverpool Care Pathway for the Dying, commonly used in hospital environments, are increasingly being used in a form adapted for community use. This improves end of life care by prompting staff to systematically address all aspects of care. This includes withdrawal of unnecessary medications and ensuring drugs are prescribed for symptom control, including for symptoms that are likely to develop. In addition there are prompts to ensure spiritual needs have been met as well as bereavement care for the family.

**Long-term care**

One aim of geriatric medicine, and community services in particular, is to maintain older people in their own homes for as long as possible. However, inevitably some do need long-term care in residential or nursing homes. Currently there is little systematic care for these individuals and standards vary widely. In some areas, general practitioners undertake regular visits to care homes. In other areas, community matrons are starting to provide support and advice to residents and care home staff. Community geriatricians are also beginning to increase their involvement in care homes.

**Further resources**


Old people in society

Old people are more likely to have low incomes and problems with housing (see Box 15.1). Although there is a wide range of statutory services and benefits available, many older people have a limited understanding of their entitlements. Indeed, many health professionals are unfamiliar with the full range of services available. This may serve as a barrier to older people claiming benefits or services for which they are eligible.

Only about 5% of older people live in institutions, although this figure rises to 25% in those aged over 85 (see Figure 15.1). Most elderly people live independently at home, with over half of women over the age of 75 living alone. There are estimated to be 6 million informal carers in the UK, many of whom are pensioners themselves (see Figure 15.2). The physical, emotional, financial and social strain placed upon some carers is therefore a significant problem.

Benefits

All people over the age of 65 who have paid sufficient national insurance contributions are eligible for a state pension in the UK. If their weekly income falls below a minimum threshold a top-up pension credit may be payable. Those on a low income may be able to claim housing benefit to cover part or all of their rent, and council tax credit to the value of all or part of their council tax liability. Winter fuel payments are made to those aged over 60 to cover the additional costs of heating during winter months.

Attendance allowance may be paid to people aged over 65 to help meet the cost of paying for personal care (e.g. help with washing, dressing and getting in or out of bed). Disability living allowance is a similar benefit payable to younger adults living with a chronic disability. Mobility allowance can be claimed for the

Box 15.1 Older people and income

- State benefits are the main source of income for pensioners
- Older pensioners generally have less wealth than those around retirement age
- At least half a million pensioners do not claim the benefits to which they are entitled
- Spending priorities change with age, with an increasing proportion of total spending going on food, housing and fuel
- In 2001 a third of older households lived in poor housing and this proportion increased with age. The most common reason for a dwelling to be declared inadequate was insufficient heating

Information from the Office for National Statistics. www.statistics.gov.uk

Figure 15.1 People who live in care homes, by age and sex (April 2001, Great Britain). Information from the Office for National Statistics. www.statistics.gov.uk

first time by people below the age of 65, but once granted it may continue to be paid after that age.

Supporting carers

Carers may request an assessment of their needs at any time. In England and Wales carers can have services provided directly to them, which may be subject to means testing. In Scotland, carers cannot receive services in their own right, but their needs should be taken into account when assessing the person they care for. Home adaptations and help with caring and household tasks may be available. Sitting services can allow carers to leave the house for a few hours at a time, or respite care may allow them to take a longer break. There is a number of voluntary organisations providing support and advice for carers (see further resources section) and there are a number of ways in which clinicians can help (Box 15.2).

Carers’ allowance is a means-tested benefit payable to those caring for a chronically disabled person for at least 35 hours a week. To be eligible, the carer’s income must be below a minimum threshold, and the disabled person must be receiving either an attendance allowance or disability living allowance.

Box 15.3 A typical case history

An 83-year-old lady was admitted following a fall at home. A diagnosis of a urinary tract infection with a background of dementia was made. She lived alone in her own property, and had been widowed 2 years ago. She received regular support from her daughter, but did not have a formal package of care. Her mobility had declined in recent years, and she sometimes had difficulty reaching the toilet in time. Her daughter assisted with shopping, but often found out-of-date food in the fridge. She seemed disinclined to prepare her own meals, and ate mainly soup or sandwiches.

Before discharge, a comprehensive geriatric assessment was performed, including assessments by physiotherapists, occupational therapists, nursing staff and social workers. A care plan was made.

- The council installed grab rails at her front door, on the stairs and in the bathroom, and a downstairs commode was provided
- A local voluntary organisation could deliver meals on wheels, and Age Concern provided contact details for a local luncheon club
- Home care was arranged, to assist with bathing and medication prompts in the mornings. Costs were met in part by the local authority, and partly by the patient herself
- The social worker advised that she could claim attendance allowance to cover the cost of employing a carer
- Since her basic state pension fell below the minimum threshold, she was also eligible to receive pension credit and council tax credit

Statutory services

Any older person has the right to request a social services care assessment. This may be focused upon meeting specific needs, such as home adaptations, or a more general multidisciplinary team assessment may be required. Following the assessment, a care plan is agreed, and a care manager appointed to act as a liaison between the patient and social services. Care may be provided by a number of different agencies. Social services provide care that meets primarily social rather than healthcare needs – for example, assistance with toileting, bathing or dressing. Voluntary organisations may provide meals on wheels, day centres or luncheon clubs. Care designed to meet medical needs, such as the administration of medication or the care of pressure areas, is funded by the National Health Service (NHS). Some people may choose to accept direct cash payments, to enable them to purchase their own choice of care services. Box 15.3 illustrates a typical case history.

There are regional variations in the extent to which service users are expected to fund their own care. In Scotland personal care is free to those aged over 65; in Northern Ireland home help services are provided free to the over 75s; in England and Wales, a means-tested contribution may be payable and each local council sets its own charging policy, in accordance with national guidelines.

Continuing care

Continuing healthcare is funded primarily by the NHS rather than by social services, and is appropriate for people who have ongoing medical needs requiring care delivered by, or under the supervision of, registered healthcare practitioners. Care may be delivered in
Box 15.4 Levels of continuing care

- **Level 1** – suitable for those requiring assistance with activities of daily living, or intervention from a trained nurse on an intermittent and predictable basis.
- **Level 2** – suitable for those requiring 24-hour supervision, but not necessarily the constant presence of a registered nurse.
- **Level 3** – suitable for those requiring primarily accommodation and social care, but who have co-existing medical needs requiring the constant availability of trained nursing staff.
- **Level 4** – suitable for those requiring either a short-term specialist rehabilitation assessment, or long-term rehabilitation.
- **Level 5** – suitable for those with complex or unpredictable physical or mental health needs who require frequent intervention, treatment or supervision by a healthcare professional. Examples include patients with challenging behaviour or frequent seizures, or those in a persistent vegetative state.
- **Level 6** – suitable for patients in the final stages of life, with a prognosis not expected to exceed a matter of weeks. They may require specialised palliative care, and high-intensity nursing. Provided there is agreement that care can be delivered safely, patients may choose to receive care in any setting, including their own home.

Moving into a care home

Older adults in England and Wales with the means to pay can choose to move into a care home at any time, applying directly to a home of their choice. Those requiring financial assistance must apply to social services for funding. The first step is to conduct a multidisciplinary assessment of the person’s care needs. His or her views, and those of their relatives or carers, are also taken into account.

Funding for a care home placement may be met in full or in part by the local council or from the person’s savings. In cases where nursing care is required, the NHS may make a contribution. A financial assessment is performed by a social worker, to assess what contribution, if any, the elderly person should make towards the cost of care. An inventory of assets is taken. Those with savings above a set threshold are expected to meet the full fees. This upper limit varies between regions, but is around £20 000.

If a person owns his own home, its value will be disregarded for the first 12 weeks of a permanent placement. Thereafter, it may be counted as ‘capital’, and the person may be expected to sell it to pay their fees. An exception may be made if a relative or partner would be made homeless if the property were sold. If the person has chosen to give away property or savings to a relative, these may still be counted as capital unless they were transferred more than 7 years ago.

Once funding arrangements have been agreed, the person and their relatives are invited to choose a home. The home must be willing to enter into a contract with the local council, and be suitable for the person’s needs. If the preferred choice of home costs more than the local council would normally expect to pay, the person or the relatives may be asked to make up the difference. Box 15.5 outlines the different levels of care home available.

Mental capacity

Capacity is a legal term, and refers to a person’s ability to make decisions or take actions that have legal consequences. Every adult is assumed to have capacity unless there is evidence to the contrary. To have capacity an individual must be able to:

- understand and retain information relevant to the decision
- believe that information
- weigh the information and arrive at a choice
- communicate the decision.

The rejection of medical advice does not mean a lack of capacity. Any adult may choose to refuse any proposed intervention in full or in part, no matter how irrational, illogical or ill-considered their decision may appear.

Capacity may change with time, for example due to delirium or the natural progression of a dementia. The presence of a dementia or mental illness per se does not mean a lack of capacity. On a good day a person may be lucid enough to discuss his or her care. In addition, the degree of capacity required depends upon the legal consequences of the decision being made. A person with advanced dementia may have the capacity to refuse to have a wash that day, but not to make a will or sell his or her house.

Any doctor with the appropriate skills can assess a person’s capacity. A psychiatric assessment is not necessary except in difficult cases. Social workers, lawyers and healthcare professionals can also
When people are unable to give or withhold consent, healthcare professionals may proceed with any necessary treatment that is in their best interests. Consideration should be given not only to medical interests, but also emotional, social, financial and spiritual interests as well. A person’s previously expressed wishes, including any written advanced directives, must also be taken into account.

Before April 2007 in England and Wales, no-one could give consent on behalf of another adult who lacked mental capacity. The role of a person’s relatives was therefore restricted to providing background information on previous beliefs, values, and opinions which might have influenced his or her decisions if they had had capacity. However, the Mental Capacity Act (2005) now makes provision for people to appoint a ‘lasting power of attorney’. An attorney is empowered to make decisions on the person’s behalf, in circumstances when he or she no longer has capacity. This may encompass medical care, as well as social welfare, housing and financial affairs. See Boxes 15.6 and 15.7. Further information on the Mental Capacity Act can also be found in the further resources section.

**Further resources**

Age Concern – the UK’s largest charity working with and for older people. www.ageconcern.org.uk
Help the Aged – an international charity. www.helptheaged.org.uk
Carers UK (formerly the carers’ national association) – a carers’ support and information network. www.carersuk.org
Alzheimer’s Society – a charity for people with dementia and their families and carers. www.alzheimers.org.uk

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**Box 15.6 The Mental Capacity Act (2005)**

This allows a person with lasting power of attorney to make decisions about personal welfare, as well as property and affairs. Personal welfare includes:

- deciding where the patient will live
- giving or refusing consent to medical treatment on the patient’s behalf.

The act is underpinned by five key principles.

- Everyone is presumed to have capacity unless proved otherwise.
- People have the right to be supported and helped to make their own decisions wherever possible.
- People have the right to make what might seem to be unwise or eccentric decisions.
- Decisions made on behalf of another should be made in the person’s best interests. The patient’s medical, emotional, social, spiritual and financial needs should be taken into account, as should any previously expressed wishes and their right to liberty, quality of life and dignity.
- Decisions made on behalf of another must be the least restrictive of their basic rights and freedoms.

The Act also stipulates that any relevant advance statements must be considered in the decision-making process. This includes advance refusal of life-saving treatment.

**Box 15.7 Powers of attorney**

- An **ordinary** power of attorney can be arranged via your solicitor if you go abroad for a year. It allows someone else to manage your property and financial affairs in your absence, but becomes invalid if you lose the capacity to do so
- An **enduring** power of attorney remains in force if you lose capacity. It is commonly used by older people to empower their relatives to help them manage their affairs and property should they lose capacity, for example in dementia
- A **lasting** power of attorney may manage your property and affairs, and take decisions regarding your personal welfare and medical care if you lack capacity to do so

A power of attorney can only be granted by a person who has the capacity to do so. If a person already lacks capacity, an attorney may be appointed by the Court of Protection.
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