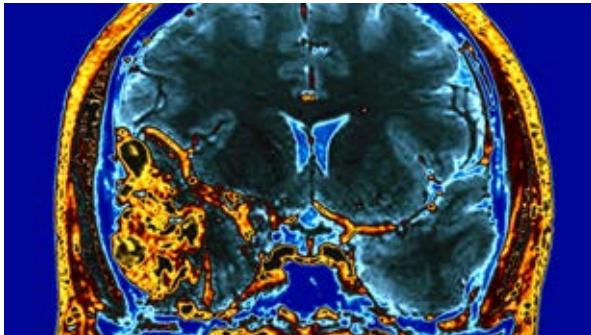


education

ART OF MEDICINE

A gram of gadolinium is worth a thousand neurologists



"So what do you want to specialise in?"

It was a question I'd been dreading from my neurosurgery consultant. I wanted to do neurology, and told him so. His face lit up at the chance to preach his favourite message—I was told, with great pleasure, that neurologists "don't do anything for patients" and "just give steroids."

Between any medical and surgical specialty, a certain number of jokes are to be expected, but the picture commonly painted—that neurologists are solely interested in making a diagnosis as there are no treatments available—seems widely accepted among surgeons and physicians alike. But it was a picture shown all the more false by my subsequent neurology rotation, in which I saw the lame walk, the blind see, and "demons cast out" after transverse myelitis, optic neuritis, and autoimmune encephalitis, respectively, were treated with potent immunotherapy. Furthermore, this picture downplays the importance of accurate diagnostic and prognostic information for the patient.

This particular neurosurgery consultant also liked to claim that it is the neuroradiologists "who make all the diagnoses anyway"—indeed, he was so bold as to claim that a gram of gadolinium (for a contrast enhanced MRI) was worth "a thousand neurologists." I thought better than to mention the obvious exceptions, such as epilepsy, motor neurone disease, Parkinson's disease, etc.

Neurologists should be more assertive in correcting such views wherever possible. They should also avoid proposing a trial of "steroids and see" within earshot of the neurosurgery team.

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We welcome contributions to this column via our online editorial office: <https://mc.manuscriptcentral.com/bmj>

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CORRECTIONS

Clinical assessment and management of multimorbidity: summary of NICE guidance

In this article by Caroline Farmer and colleagues (*BMJ* 2016;354:i4843, doi:10.1136/bmj.i4843) an error occurred in the version that appeared in print. The first half of the fourth sentence in the first paragraph should read: "Clinicians express uncertainty about [not "Clinicians cause uncertainty about"] the balance of benefit and harm of treatments in people with multimorbidity because evidence is largely based on trials of interventions for single conditions, from which people with multimorbidity are often excluded."

Spot Diagnosis: An ankle that just didn't look right

Figures that appeared in the print edition of this article by Alistair R M Macey and Charitra Grama were incorrect (November 12, 2016). The correct images appear online (*BMJ* 2016;355:i5056, doi:10.1136/bmj.i5056).

FAST FACT—PREVENTING FALLS IN HOSPITAL

- Patients should be nursed in a "cohort bay"
- Clearly record patients' mobility on the board above their bed
- Ensure patients have adequate footwear
- Ensure patients have their glasses
- Ensure patients have access to a walking aid that is appropriate for their needs
- Explain the risk of falling to patients, and encourage them to ask for assistance (such as using the staff call button) when mobilising on the ward.



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Assessment of shoulder pain for non-specialists

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With more than 120 different “special tests” of the shoulder described,¹ it is easy to see how its assessment can seem an enigma for non-specialists. Shoulder pain is common, and most cases will be managed in the community.² Its prevalence in Dutch primary care is around 11 per 1000 patients seen each year,³ and as many as two in three people may experience it at some point in their life.⁴

Most diagnoses can be made from the patient’s history and examination considering relevant risk factors such as age, occupation, previous trauma, and relevant comorbidities. Here, we simplify the process of shoulder assessment to empower non-specialists evaluating a patient presenting with shoulder pain for the first time and provide an update on common shoulder pathologies.

A three step approach can test for the diagnosis most likely to be seen in primary care

Form a working diagnosis

Take a targeted history For some guide questions, see box 1. Watch out for features that may warrant secondary care specialist referral, orthopaedic or otherwise (fig 1).⁵
Perform a targeted examination Use the standard “look, feel, move, special tests” approach (see box 2 and the linked video), including a “three step” approach to test for the diagnoses most likely to be seen in primary care.

The presentation of common causes of shoulder pain

Shoulder pain can either arise from the joint (fig 3) or be referred from elsewhere (box 3).

Subacromial pain syndrome is an umbrella term for non-traumatic shoulder disorders and includes:

- Impingement
- Subacromial bursitis
- Calcific tendinitis
- Biceps tendinitis
- Cuff degeneration
- Supraspinatus or rotator cuff tendinopathy
- Partial rotator cuff tear (compare with traumatic rotator cuff tear, below).⁹



thebmj.com

Watch a video relating to this article

WHAT YOU NEED TO KNOW

- Shoulder pain is a common presenting complaint in primary care that can arise from the joint or be referred from elsewhere
- Most diagnoses can be made from a systematic history and targeted examination
- Most shoulder pathologies can be managed with treatment in primary care, but the non-specialist clinician needs to be aware of features in the history and examination that warrant referral

Box 1 | Questions for a targeted shoulder pain history

- Shoulder pain analysis:
 - Onset, character, and duration of shoulder pain on motion, at rest, and whether it is present at night or affects sleeping?
 - History of trauma?
 - History of instability?
- History of neck pain?
- Other joints—Pain, stiffness, or swelling?
- Occupation, hobbies, and sports—Manual or repetitive?
- Constitutional symptoms—Such as weight loss, fever?
- Relevant comorbidity—Such as diabetes, cancer, rheumatoid arthritis?

Box 2 | A targeted shoulder examination

Look

From the front, back, and side, assess for evidence of obvious asymmetry, deformity, muscle wasting, or skin changes

Feel

Comparing sides, systematically palpate the sternoclavicular joint, clavicle, acromioclavicular joint (tenderness may suggest acromioclavicular osteoarthritis), glenohumeral joint, and scapula to assess for tenderness, deformity, swelling, or warmth

Move

Comparing sides, assess active and passive range of motion, power, and stability of each shoulder, and the presence or absence of crepitus on movement

Package of special tests

Undertake three simple tests to screen for common conditions in primary care (see fig 2):

- 1 Lack of passive external rotation—Is there evidence of a stiff frozen shoulder or glenohumeral joint osteoarthritis?
- 2 Neer’s sign—For evidence of subacromial pain syndrome
- 3 Jobe’s test—For evidence of a large cuff tear (that is, a test of the integrity of the rotator cuff)

Additional

Examine the range of motion of the cervical spine

Optional—Consider Spurling’s test if a cervical radiculopathy or nerve root disorder is suspected as the cause of the shoulder pain (fig 2)

It typically affects those aged between 35 and 75 years and is the most common cause of shoulder pain in primary care.⁶⁻¹⁰

Those affected tend to describe lateral shoulder pain localised to the acromion that is made worse by lifting the arm (such as when lifting a heavy kettle or making overhead movements). Ask about an occupational or sporting history involving repetitive movements or heavy lifting.⁷ On examination there is typically a painful arc and positive impingement tests such as Neer's sign (as detailed in fig 2 and video on bmj.com). The power of the rotator cuff muscles is typically normal.

The underlying pathophysiology of subacromial pain syndrome is poorly understood but may include age related degeneration coupled with inflammatory change.^{8,11}

Traumatic rotator cuff tear

This is commonly seen with an acute injury, most commonly in active young adult to middle aged patients. Distinguish a degenerative rotator cuff tear as part of the SAPS spectrum from a traumatic rotator cuff tear. This distinction is important as surgical repair of traumatic tears is significantly affected by delay to diagnosis and treatment (and hence requires urgent referral), whereas degenerative tears are not.

Patients with traumatic tears describe a shoulder injury such as dislocation or a traction injury (where the shoulder joint is forcibly stretched, such as from a pull on the arm during sporting activities) after which shoulder function is severely affected. Large tears may be associated with pain and acute shoulder weakness.⁷ In patients with massive tears, where most or all of the rotator cuff muscles are no longer attached to bony structures, the arm may seem to be paralysed (so called pseudoparalysis): active forward flexion of the arm is less than 90° but passive range of motion is normal.¹²

Adhesive capsulitis (frozen shoulder)

Patients present with stiffness, particularly on external rotation. Ask about impairment of activities of daily living such as difficulties putting on a coat. Ask about disturbed sleep and if catching the arm causes pain. Adhesive capsulitis is more common and severe in those with diabetes.⁶ The typical age range of patients affected is 40-60 years. Patients with adhesive capsulitis progress through three overlapping phases—deep shoulder pain and stiffness in the absence of trauma, followed by painless stiffness, and finally spontaneous improvement of range of motion.¹³

On examination, the most common abnormality is pain with a loss of active and passive external rotation.¹⁴

Osteoarthritis

Osteoarthritis is more common in people over 60 years old and can affect the glenohumeral and acromioclavicular joints.⁶


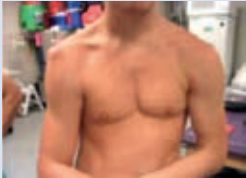


SUSPECTED DIAGNOSIS	IMAGE	CLINICAL FEATURES
Glenohumeral joint infection		Erythematous skin (image), fever, systemic upset, warm joint
Unreduced glenohumeral joint dislocation		Trauma, visible deformity (image), loss of rotation
Fracture		Trauma, visible deformity (image), risk factors for fracture (such as known osteoporosis)
Neurological lesion		Unexplained motor or sensory deficit, muscle wasting (left infraspinatus and supraspinatus of image)
Acute traumatic rotator cuff tear with acute weakness	Typically normal clinical appearance	Trauma, acute pain or weakness at shoulder, especially initiation of abduction (referral as option for early repair)
Cancer	Typically normal clinical appearance	Known primary cancer elsewhere (most commonly breast, prostate, kidney, thyroid and lung cancers), unexplained deformity or mass, night pain
Calcific tendinitis	Typically normal clinical appearance	Intense crescendo pain, made worse with movement, calcium deposits within tendon demonstrated on x ray or ultrasound scan
Locked, posterior dislocation	Typically normal clinical appearance	Arm locked in internal rotation, characteristic appearance on 2-view x ray

Fig 1 | Red flags for shoulder pain that warrant urgent referral.

Images adapted from BMJ Best Practice

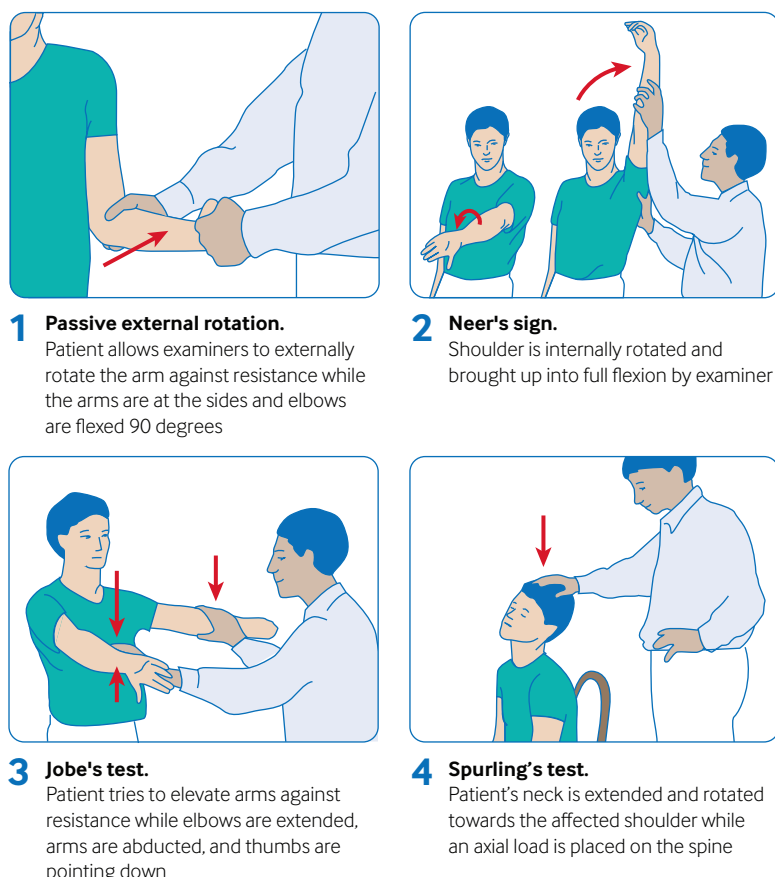


Fig 2 | Simple tests to screen for common conditions in primary care and optional Spurling's test for cervical radiculopathy or nerve root disorder

Acromioclavicular joint osteoarthritis is common but is often asymptomatic. Patients describe localised tenderness over the acromioclavicular joint, which is exacerbated by high elevation of the arm and cross-chest adduction.

Glenohumeral osteoarthritis is relatively rare, but patients with a history of shoulder trauma and overuse (such as from a manual occupation requiring repeated upper limb activity) are at greater risk. It tends to present with reduced range of motion and deep shoulder pain, felt especially on external rotation.

Box 3 | Pain referred to the shoulder

- Cervical spine pathology
- Diaphragmatic pain (shoulder tip pain)
- Malignancy (metastasis, apical lung cancer)
- Polymyalgia rheumatica
- Myocardial ischaemia
- Early herpes zoster or shingles (C5-T1 dermatomes)

Box 4 | Triggers for referral to secondary care

- Any patient where there is diagnostic uncertainty after an unsuccessful trial of management (at least 2-3 weeks) in improving pain and disability
- Patients for whom shoulder pain is particularly disabling (heavy manual labour, athletes involved in overhead sports)
- A history of recurrent joint instability
- Any red flag features (fig 1)

Patients may complain of not being able to carry out normal activities of daily living.

Shoulder instability

Instability tends to affect younger patients who describe a shoulder that feels unstable.¹⁵

Traumatic instability occurs after a dislocation, and further dislocations may become possible with more trivial trauma. It can occur in elderly people with massive cuff tears. Patients can present with a painful or weak arm that may dislocate with trivial movement.¹⁵

Atraumatic instability is more common in adolescent females with hypermobile joints and can be debilitating if left untreated. The underlying pathophysiology is complex, but patients can have a subluxing shoulder due to progressive loss of proprioceptive control of the shoulder, which can be addressed with specialist physiotherapy.

Pain referred from outside the shoulder

Cervical spine pathology is the most common cause of referred pain in the shoulder, and box 3 lists additional causes.

Non-specialist management of shoulder pain

Working diagnosis	Treatment (in escalating order)	Evidence
Subacromial pain syndrome (SAPS)	<ul style="list-style-type: none"> • Modification of activity to avoid exacerbators • Physiotherapy rehabilitation²¹ • Subacromial corticosteroid injection²² 	Systematic reviews of randomised control trials ^{21 22}
Adhesive capsulitis (frozen shoulder)	<ul style="list-style-type: none"> • Early activity • Physiotherapy with joint mobilisation,²³ usually combined with corticosteroid injection or hydrodilatation^{13 11} • Surgical options include manipulation under anaesthesia (MUA) and arthroscopic arthrolysis²⁴ 	Systematic review of randomised control trials ²³ and survey of surgeons' treatment preferences ¹³
Osteoarthritis (including glenohumeral and acromioclavicular)	<ul style="list-style-type: none"> • Analgesia • Physiotherapy rehabilitation⁷ • Corticosteroid injection may be of benefit for acromioclavicular joint osteoarthritis^{25 26} • Shoulder arthroplasty²⁷ 	Sparse evidence for interventions identified on systematic review. ²⁷ Retrospective uncontrolled ²⁵ and prospective data ²⁶ supporting steroid injection in acromioclavicular joint osteoarthritis
Shoulder instability	<ul style="list-style-type: none"> • Physiotherapy rehabilitation¹⁵ • Surgical options include soft tissue repair (open or arthroscopic) and bone block¹⁵ 	Case series evidence for physiotherapy intervention. ²⁸ Randomised control trial evidence for surgical repair ²⁹ and systematic review evidence demonstrating comparable outcomes for open and arthroscopic surgery ³⁰
Traumatic rotator cuff tear	<ul style="list-style-type: none"> • Early orthopaedic referral (see fig 1) 	N/A

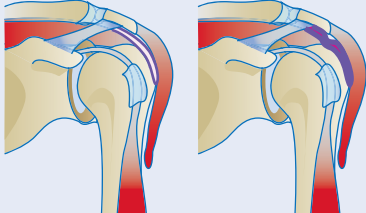
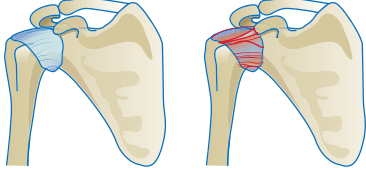
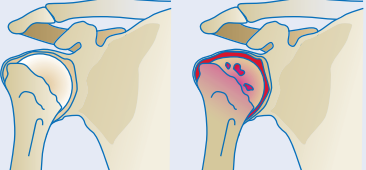
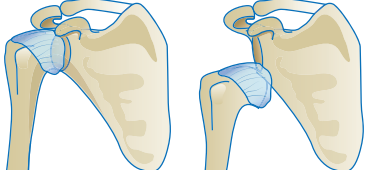
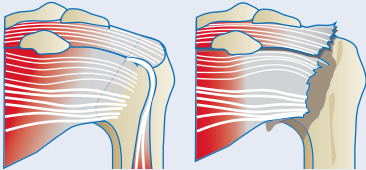
JOINT BASED PAIN (GLENOHUMERAL JOINT OR SUBACROMIAL SPACE)	TYPICAL CLINICAL PRESENTATION	TYPICAL AGE AFFECTED
Subacromial pain syndrome (SAPS)  <p>SAPS is the umbrella term for a number of shoulder conditions (see text), including, for example, pathology in the subacromial space (right) compared with normal anatomy (left).</p>	History of occupational or sporting risk factors. Pain exacerbated with overhead movements.	35-75
Adhesive capsulitis (frozen shoulder)  <p>Adhesive capsulitis (right) is thought to be associated with pathological change in the joint capsule.</p>	Deep joint pain. Other symptoms according to overlapping three-stage process. Functional impairment (such as unable to put on coat). More common in diabetic patients and with prolonged immobilisation. External rotation limitation is most consistent feature.	40-60
Osteoarthritis of glenohumeral or acromioclavicular joint  <p>Osteoarthritis (right) involves loss of joint space, osteophyte formation, and degenerative articular cartilage damage.</p>	Deep joint pain. Functional impairment. Risk factors for developing osteoarthritis.	>60
Shoulder instability  <p>Shoulder instability results in a tendency for the glenohumeral joint to sublux or dislocate (right).</p>	History of previous shoulder dislocation, trauma, family history.	10-35
Traumatic rotator cuff tear  <p>Normal anatomy of anterior shoulder (left). Trauma results in rotator cuff muscles being torn from attachment on proximal humerus (right).</p>	Acute onset, history of trauma. Pain and weakness of shoulder movement, especially initiation of abduction and general functional weakness.	Young adult to middle-aged (active)

Fig 3 | Joint based causes of shoulder pain⁶⁻⁸

Is imaging needed?

Consider a two-view (anteroposterior and lateral views) shoulder x ray¹⁶ when conservative management has failed and a corticosteroid injection is being considered: if there are radiological signs of osteoarthritis a steroid injection is not indicated, but may be of use for calcific tendinitis. Also consider a shoulder x ray for patients with, for example, a suspected bony malignancy.

Ultrasound scanning can be used to exclude a cuff tear^{17 18} or to establish the presence or absence of calcium deposits associated with calcific tendinitis.¹⁹ If the cuff is intact on scanning, then a trial of steroid injection and physiotherapy could be safely undertaken in primary care.

What are the first steps for management?

Offer referral to secondary care for those with concerning features (see fig 1). For other patients, we lack high quality evidence for the initial treatment of shoulder pain,²⁰ but a pragmatic approach to the first steps in primary care is:

- Explain to patients the suspected diagnosis and consider offering a patient information leaflet.
- Consider offering simple analgesia (including one or a combination of paracetamol, low dose weak opioids, and non-steroidal anti-inflammatory drugs (NSAIDs))
- Encourage as normal activity as the patient is able
- Patients asking about return to work or sport could pragmatically be advised to rest from aggravating activities for six weeks. If necessary, facilitate "light duties" at work
- Explain that, although the common shoulder disorders are largely self limiting, they can be associated with long rehabilitation periods in the order of six months or more.

Specific treatment approach depends on suspected diagnosis, and the table provides an overview of treatment strategies.

Secondary care referral triggers

Although this paper focuses on managing shoulder pain in primary care, it is important to be aware of features in the history or examination that require referral to an orthopaedic specialist.⁵ These are detailed in box 4.

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HOW PATIENTS WERE INVOLVED IN THE PRODUCTION OF THIS ARTICLE

We interviewed several patients to ensure their experiences of shoulder pathologies were accurately reported.

Influenza

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The World Health Organization estimates that one billion people are infected and up to 500 000 people die from influenza each year.¹ The greatest burden of illness usually occurs among children, while the highest burden of severe disease (in terms of hospitalisation and death) occurs in those with underlying medical conditions, infants and young children, and elderly people.² Current circulating influenza strains in humans include influenza A(H1N1)pdm09, influenza A(H3N2), and both influenza B viruses (B/Victoria and B/Yamagata).^{3 4} This article provides non-specialists with information on how to diagnose, manage, and prevent flu.

WHAT YOU NEED TO KNOW

- Influenza is an acute viral infection of the respiratory tract that spreads easily from person to person
- Influenza is usually self limiting in healthy individuals, with recovery in 3-7 days
- Elderly people, children under 6 months old, pregnant women, and people with chronic conditions or immunosuppression are at increased risk of complications
- Offer influenza vaccination to people at risk of complications and increased influenza exposure, as well as to young children
- People in high risk groups may benefit from antiviral therapy, hospitalisation, or intensive care

What is influenza virus?

There are four types of influenza viruses: influenza A, B, C, and D,³⁻⁶ but only influenza A and B viruses cause clinically important human disease and seasonal epidemics (table 1).¹ Influenza A viruses cause the most severe clinical disease and are the commonest cause of seasonal epidemics and pandemics in human populations.¹

What are the symptoms of influenza?

Influenza is characterised by sudden onset of fever, myalgia, headache, malaise, dry cough, sore throat, and nasal congestion (fig 1).¹³⁻¹⁵ Gastrointestinal symptoms including nausea, vomiting, and diarrhoea are also common.¹⁶ The incubation period of influenza (time from infection to development of symptoms) is 1 to 4 days.¹⁷ Viral shedding, when the virus is infectious, usually occurs from one day before the onset of symptoms, to 5-7 days after.¹⁸⁻²⁰

Influenza can cause severe illness or death, particularly in high risk populations (box 1).²³ Mortality is higher among individuals with complicated influenza (illness necessitating hospital admission, or an exacerbation of an underlying chronic illness) across all age groups, but is highest in infants aged 6 months or younger.²

Box 1 | When to offer antiviral treatment for influenza^{21 22*}

Individuals at risk of influenza related complications

- Adults >65 years old
- Individuals with underlying chronic health conditions (chronic heart, lung, kidney, liver, neurological, and metabolic diseases, such as diabetes)
- Individuals with reduced immunity (such as after chemotherapy, asplenia, prolonged steroid treatment, splenic dysfunction, or HIV infection)
- Pregnant women, including up to two weeks post partum
- Any other individual whom the clinician feels is at increased risk of developing complications from influenza
- Morbidly obese individuals (body mass index >40)

Individuals admitted to hospital with suspected or confirmed influenza

*Based on guidance from National Institute for Health and Care Excellence (NICE)

Table 1 | Influenza viruses A and B

Influenza type	Classification	Reservoir	At risk groups
A	<ul style="list-style-type: none"> • Classified into subtypes on the basis of haemagglutinin (H) and neuraminidase (N) antigens on the surface of the viral envelope • To date, 18 haemagglutinin subtypes and 11 neuraminidase subtypes have been identified • Only three haemagglutinin types (H1, H2, and H3) are recognised to cause epidemic disease in humans • Nomenclature includes the virus type and subtype, natural host species, geographical origin, year of isolation, and strain number (such as H1N1/A/duck/Alberta/35/76)⁷ 	The primary reservoir is aquatic birds, but viruses also circulate among many other species, such as pigs, horses, and sea mammals ⁸	Infects people of all ages, but disproportionately causes severe disease in older adults and individuals with underlying chronic health problems
B	Divided into lineages on the basis of the haemagglutinin glycoprotein	Mainly infects humans	Children are affected by influenza B infection at a disproportionately higher rate among the general population ^{9 10}

HOW PATIENTS WERE INVOLVED IN THE PRODUCTION OF THIS ARTICLE

No patients were involved in the production of this article

How do influenza epidemics and pandemics occur?

Minor changes that occur in virus proteins between influenza seasons (known as antigenic drift) result in annual epidemics, with winter peaks in temperate regions.³ In tropical and subtropical regions the seasonality of influenza is less well defined (fig 2).^{24 25}

In contrast, pandemics (severe global epidemics) of influenza occur when a new influenza A subtype emerges abruptly because of a major shift in the proteins on the virus surface (antigenic shift), often because of combination with viruses circulating in animals.²⁶ As most people have no immunity to the new subtype, infection spreads quickly.

How is influenza diagnosed?

Most influenza is diagnosed clinically in the community at times when the virus is known to be circulating. Patients admitted to hospital may have respiratory samples taken for testing by polymerase chain reaction (PCR), rapid antigen test, or immunofluorescence assay. With respiratory outbreaks in a closed setting (such as care homes, schools, hospitals) nasal swabs may be taken from the first few symptomatic individuals to identify the responsible organism.

What treatments are available for influenza?

Influenza is usually self limiting in healthy individuals. Treatment of uncomplicated disease in healthy individuals is supportive and includes antipyretics, adequate fluid intake, rest, and staying off work or school until 24 hours after resolution of fever to limit spread to others.²¹

Most randomised trials of antiviral drugs have been conducted among otherwise healthy individuals and have shown modest reductions in symptom duration (0.7 days).²⁷ Fewer studies have been conducted among individuals at risk of complicated influenza. Data from observational studies and trials suggest that antiviral treatment may reduce adverse outcomes.²⁸⁻³⁰ For example, the meta-analysis from 2015 reported fewer lower respiratory tract complications requiring antibiotics after oseltamivir treatment compared with placebo (risk difference -3.8%) and fewer hospital admissions (risk difference -1.1%).³⁰

NICE,²¹ Public Health England,¹² UK Chief Medical Officers,³¹ and WHO³² recommend treatment of suspected and confirmed influenza for individuals at risk of complicated influenza (box 1). When considering prescription of antivirals, discuss with patients likely benefits as well as possible harms including nausea (number treated to cause nausea in one patient=28)²⁷ and vomiting (number treated to cause vomiting in one patient=22).²⁷

Individuals with complicated influenza may be helped by antiviral treatment.^{21 22} Treatment is most effective if started within 48 hours of symptom onset, and it should not be delayed while awaiting results of investigations.^{12 28} Neuraminidase inhibitors oseltamivir and zanamivir inhibit

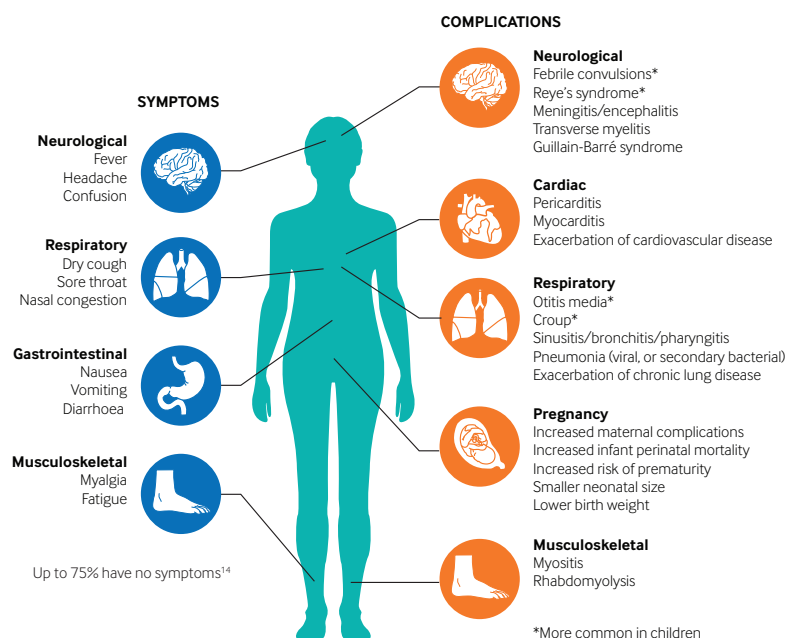


Fig 1 | Symptoms and complications of influenza. Complicated influenza is defined as an infection that requires hospital admission¹²

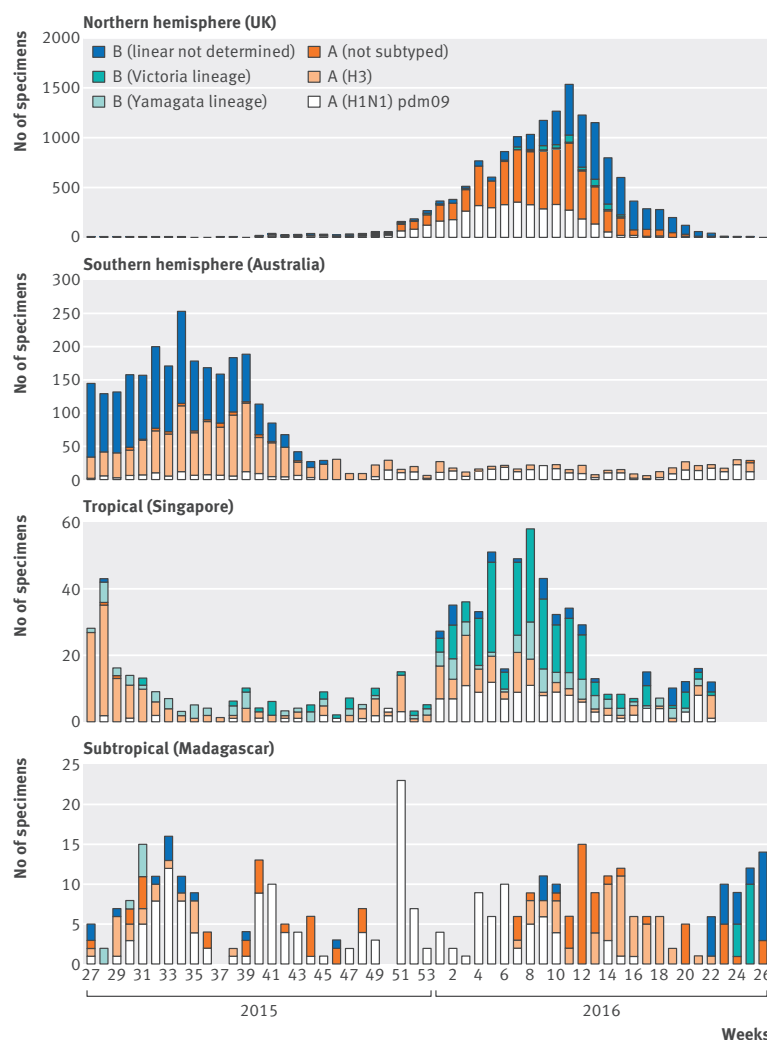


Fig 2 | Circulating influenza viruses reported to WHO through global laboratory surveillance systems for selected countries: 2015-16. Data from WHO FluNet Interactive https://pmapc.shinyapps.io/Influenza_isolates/

Box 2 | Who is offered influenza vaccination in the UK?²³

People at risk of influenza related complications*

- Adults over 65 years old
- Individuals with underlying chronic health conditions (for example, chronic heart, lung, kidney, liver, neurological, and metabolic diseases, such as diabetes)
- Individuals with reduced immunity (such as after chemotherapy, asplenia or splenic dysfunction, or HIV infection)
- Pregnant women
- Morbidly obese individuals (body mass index >40)

People at risk of influenza exposure or transmitting influenza to vulnerable groups

- Health and social care workers
- Individuals who live with or care for vulnerable people

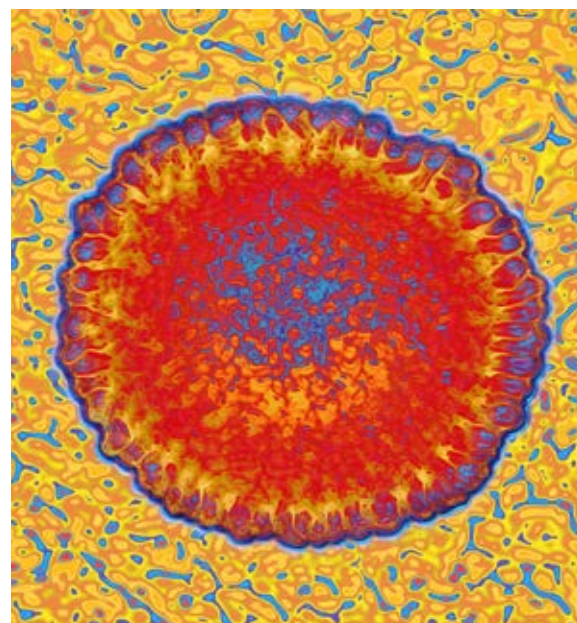
People living in settings where rapid spread is likely after introduction of infection, potentially resulting in high morbidity and mortality

- Individuals living in long stay care facilities

Efficient influenza spreaders

- Children aged 2-17 years

*Children <6 months old are not eligible to receive influenza vaccines and should be protected against influenza through vaccination of their mother during pregnancy.



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viral release from infected cells and reduce the rate of viral replication. Meta-analysis of individual participant data found that, compared with late treatment, early treatment (within 48 hours of symptom onset) of hospitalised individuals with complicated influenza reduced the odds of mortality by 52%.²⁸ Some individuals may require antibiotic therapy to treat secondary bacterial infections.

How can influenza be prevented?

Vaccination

Vaccination is the most effective means of preventing influenza and its complications. Immunity developed in one influenza season may not provide protection in future years mainly because of changes in circulating strains, antigenic drift, and waning immunity. Influenza vaccines are updated annually to include the viral strains that are predicted to circulate in winter.^{3 4}

Box 2 lists the UK recommendations for vaccination.²³ Vaccination schedules may vary internationally, and so it is important to check local policies. In healthy adults, trivalent inactivated vaccines have an overall vaccine efficacy of 60%.^{33 34} Newer quadrivalent vaccines are being increasingly adopted owing to the broader protection from the inclusion of an additional influenza B virus.³⁵⁻³⁸

Since 2013, the UK influenza vaccination programme has been extended to children aged 2-4 years, with planned phased introduction to children of school ages.²³ Attenuated live nasal spray formulation is recommended in children aged 2-17 years based on its superior efficacy and greater immunity against mismatched strains compared with inactivated vaccines.⁴¹⁻⁴³

Studies have found that inactivated influenza vaccines cannot cause influenza disease and are safe in pregnancy.⁴⁴⁻⁴⁷

Common side effects of vaccination include local injection site reactions and cold-like symptoms. Fever, malaise, and myalgia are less common.³³ Contraindications include confirmed severe allergic reaction (anaphylaxis) to a previous influenza vaccine or to any component of

EDUCATION INTO PRACTICE

What steps have you taken to improve the uptake of influenza vaccination among staff and eligible patients under your care?

Have you reviewed your organisation's infection control policy for responding to an outbreak of influenza-like illness?

the vaccine.²³ Live attenuated influenza vaccine (LAIV) should not be given to children or adolescents with severe immunodeficiency or to those taking salicylate treatments because of the risk of Reye's syndrome.²³ LAIV is also not recommended for pregnant women or adults with immunosuppression.²³

Antiviral chemoprophylaxis

Influenza may be prevented or rendered less severe by post-exposure prophylaxis (PEP) with antivirals (oseltamivir and zanamivir).^{27 48} NICE²¹ and Public Health England¹² recommend that, when influenza is circulating, antivirals are offered to those who are:

- In at-risk groups (box 2) *and*
- Who have had close contact with people with confirmed or suspected influenza (that is, living in the same household or residential setting) *and*
- Able to start prophylaxis within 48 hours (oseltamivir) or 36 hours (zanamivir) of contact *and*
- Have not received vaccination in the current influenza season, or who have been vaccinated <14 days since contact or where there is significant mismatch between vaccine and circulating strains, or during an outbreak in a closed setting regardless of vaccination history.

Infection control and isolation

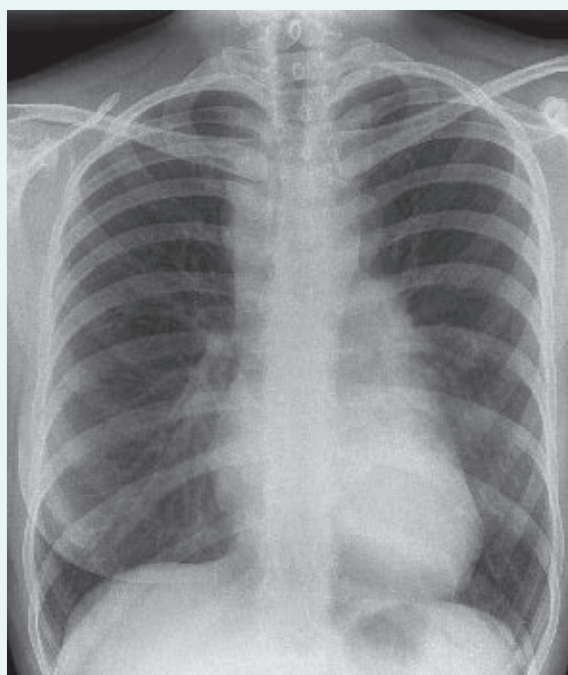
Although published evidence for effectiveness is limited, hand and cough hygiene are likely to be important interventions to reduce influenza spread in the community, as well as in closed settings.

During an outbreak, consider isolation of residents of closed settings for the duration of the infectious period (five days after symptom onset) to limit spread to others. Cohorting of patients (that is, in separate hospital bays or on separate floors of a residential home) may be necessary.

Competing interests: None declared.

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SPOT DIAGNOSIS

Constitutional symptoms in a young person

A 25 year old woman presented to her general practitioner with recent weight loss and night sweats. On examination she had palpable cervical lymphadenopathy, and a chest radiograph was obtained. What does this radiograph show? What is the differential diagnosis?

Submitted by Sarah Hancox and David Howlett

Patient consent obtained.

Cite this as: *BMJ* 2016;355:i5781

CASE REVIEW

An adolescent with disabling abdominal pain

A previously healthy teenager was taken to a paediatric emergency department with abdominal pain, nausea, and fatigue. The pain had started four months earlier and had increased in severity and frequency, occurring daily in the past month and resulting in her missing three weeks of school and preventing her from participating in other activities. Painkillers had not helped. The results of repeated diagnostic tests were all normal, including complete blood cell count; blood and faecal inflammatory markers; renal, hepatic, and pancreatic function; urine analysis; and serial abdominal ultrasound scans. Despite repeated medical evaluations, there was no defined diagnosis.

The girl reported a dull discomfort in the periumbilical area. She had no fever, vomiting,

stool alteration, weight loss, nocturnal pain, or sleep problems. Her parents were concerned that this was a serious illness, given the worsening of symptoms over the past month, the lack of response to drug treatment, and the absence of a clear diagnosis. On examination, the girl appeared well, although she rated her pain 8 out of 10. Vital signs were normal and cardiorespiratory and abdominal examinations were unremarkable.

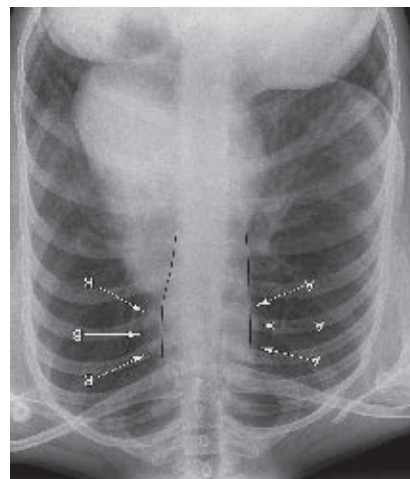
1. What is the most likely diagnosis?
2. What clinical information is available to support the diagnosis?
3. How is the condition managed?

Submitted by Marta Minute, Giorgio Cozzi, and Egidio Barbi

Patient consent obtained.

Cite this as: *BMJ* 2016;355:i6101

If you would like to write a Case Review for Endgames, please see our author guidelines at <http://bit.ly/29HCBAL> and submit online at <http://bit.ly/29yyGSx>



An adolescent with disabling abdominal pain

CASE REVIEW

The chest radiograph shows an anterior mediastinal mass with changes to aortopulmonary soft tissue (A and B)—consistent with mediastinal lymphadenopathy. The differential diagnosis would include tuberculosis, sarcoidosis, and lymphoma. Computed tomography (CT) confirmed the finding and nodular sclerosing Hodgkin's disease was diagnosed by cervical node biopsy.

- 1 Somatic symptom disorder: a condition in which a patient's subjective report of physical symptoms is associated with distress, disruption of day to day functioning, or disproportionate thoughts, feelings, and behaviour regarding the symptoms.
- 2 Progressive social withdrawal and school absenteeism; long lasting symptoms with no red flags; and unremarkable physical examination, imaging findings, and biochemical data.
- 3 Explain the diagnosis to the patient. Avoid further physical investigations and instead look for detectable stressors. Consider a psycho-educational assessment by a child and adolescent psychiatrist, and share the outcome with the child's general practitioner. Encourage the patient to resume school and social life as soon as they are able.

SPOT DIAGNOSIS

Constitutional symptoms in a young person

answers

Bitot's spot

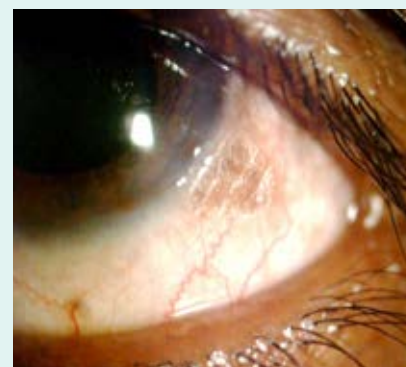
A 35 year old alcoholic Indian man noticed a lesion in his left eye (figure). He had no visual problems and showed no signs of malnutrition or gastrointestinal disease. The temporal inter-palpebral bulbar conjunctiva of his left eye showed a triangular lesion with a base towards the cornea (Bitot's spot). Serum vitamin A level was 0.27 $\mu\text{mol/L}$ (reference range

0.70-3.50 $\mu\text{mol/L}$). Bitot's spot signifies vitamin A deficiency and is histopathologically characterised by a loss of goblet cells, accumulation of Gram positive bacilli, and keratinisation of the conjunctival epithelium. Most Bitot's spots disappear after the patient receives systemic vitamin A, but up to a quarter may not respond completely. This patient

received oral vitamin A (200 000 IU on days 1, 2, and 14). His clinical response was noted at one month follow-up, and the spot had disappeared after three months.

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Patient consent obtained.

Cite this as: *BMJ* 2016;355:i6032



Inhaled steroids and adrenal function

The Canadian Paediatric Surveillance Program surveyed more than 2500 paediatricians each month from April 2010 to March 2012 and uncovered 46 new cases of symptomatic adrenal suppression (*Arch Dis Child* doi:10.1136/archdischild-2016-311223). The most common presentations were failure to grow (35%), non-specific symptoms (28%), or both (13%). Adrenal crisis occurred in six cases (13%). Four fifths of these children were using inhaled corticosteroids, mostly in the upper part of the normal dose range. Important adrenal suppression from these commonly prescribed drugs may be more prevalent than we realise.



Patterns of glycaemia after bariatric surgery

Laparoscopic Roux-en-Y gastric bypass surgery is usually successful in reducing body weight and often succeeds in reversing type 2 diabetes in people who are obese. But not always. A Danish follow-up study (*BMC Endocr Disord* doi:10.1186/s12902-016-0140-8) looked at patterns of glycaemic response in relation to loss of body mass after Roux-en-Y gastric bypass surgery in 741 patients with or without type 2 diabetes. They identified at least 11 different patterns of response, suggesting once again that the relation between diabetes and body fat is far from simple.

Livers with hepatitis C can be donated

Over the past two decades, the numbers of livers that test positive for the hepatitis C virus and are used in organ transplantation have tripled. About 10% of patients who are themselves carriers of the hepatitis C virus now receive livers from donors who have tested positive for the virus, and a survey of 33 668 liver transplant recipients with hepatitis C (on the Scientific Registry of Transplant Recipients) shows that they have outcomes identical to those who received organs that tested negative (*BMC Gastroenterol* doi:10.1186/s12876-016-0551-z).

Just a quick sniff and you won't feel a thing

Ninety patients who presented to an emergency department in Israel describing moderate to severe pain due to trauma were randomised to receive intramuscular or intravenous morphine, or ketamine by nasal spray (*BMC Emerg Med* doi:10.1186/s12873-016-0107-0). Intranasal ketamine at a sub-dissociative dose provided good pain relief

and was comparable with morphine given intravenously or intramuscularly in onset of action and effectiveness.

Simple laparoscopy for adhesions

In a randomised trial, 100 patients with abdominal pain that was attributed to adhesions were assigned to laparoscopic adhesiolysis or to a placebo group with laparoscopy alone (*Surgery* doi:10.1016/j.surg.2016.08.014). In the 73% of patients who could be traced for follow-up at 12 years, the laparoscopy only group were using fewer painkillers and having fewer consultations for abdominal pain. Laparoscopy may be a good treatment for adhesions, provided you take the instruments out without doing anything.

PSU in China

Prostate specific urgency? Pre-systolic ululation? Persistently suppurating umbilicus? No, PSU stands for problematic smartphone use. A sample of 1062 Chinese undergraduate users of smartphones was recruited between April and May 2015 (*BMC Psychiatry* doi:10.1186/s12888-016-1083-3). Using the Problematic Cellular Phone Use Questionnaire, the prevalence of problematic smartphone use among Chinese undergraduates was estimated to be 21.3%. Minerva prefers the Christmas Table Cellphone Use Test (XTCUT). On this basis, 98% of Britons between the ages of 7 and 65 suffer from PSU.

Cite this as: *BMJ* 2016;355:i6485



Go home, your appendix is out

Californians who are covered by care consortium Kaiser Permanente and who have laparoscopic surgery for simple appendicitis are likely to be home within 24 hours, and are then less likely to be readmitted within 30 days than similar patients. These are the findings of a retrospective review that compared the records of 6710 patients who were discharged on the same day as their procedure with 5993 patients who were admitted overnight (*J Am Coll Surg* http://dx.doi.org/10.1016/j.jamcollsurg.2016.10.026). Within the Kaiser system, 60% of patients who have laparoscopic surgery for non-perforated appendicitis are now discharged straight from the recovery room.