# education

**FROM THE JOURNALS** Edited highlights of weekly research reviews

## Target practice

NICE recommends that we prescribe atorvastatin 80 mg for secondary prevention of cardiovascular disease. An open-label randomised trial set in Japan asked whether a treat-to-target approach starting with a moderate intensity statin dose may be as effective as a high intensity dose for preventing death, myocardial infarction, stroke, or coronary revascularisation at three years in people with coronary artery disease. The treat-to-target approach—where the dose of statin is titrated to low density lipoprotein cholesterol (LDL-C) levels—was found to be non-inferior to a fixed dose of atorvastatin 40 mg or rosuvastatin 20 mg.

Although the study found the primary outcomes from the two approaches were similar, the treat-to-target approach seems to be more resource intensive (needing more blood tests and appointments for titrating doses). Only 60% of the treat-to-target group achieved their target level of LDL-C.

*JAMA* doi:10.1001/jama.2023.2487

## Active monitoring of prostate cancer trial continues

The headline news from the latest publication from the Prostate Testing for Cancer and Treatment (ProtecT) trial is that, after 15 years, there was no difference in prostate cancer-specific mortality in men found to have localised prostate cancer after PSA screening, regardless of whether they were randomised to active monitoring, prostatectomy, or radiotherapy. There's a striking figure in this paper that shows how prostate cancer-specific survival stayed close to 100% for the whole 15 year follow-up, only falling to around 97% in each arm of the trial.

Active monitoring didn't mean no radical therapy, however: by 10 years, around half of patients had received radiotherapy or prostatectomy. Advances in treatments for metastatic disease likely contributed to the finding that 86% of those in the active monitoring group diagnosed with metastasis at 10 years survived to 15 years. The study's authors conclude that men with newly diagnosed localised prostate cancer can take the time needed to consider each of these treatment options in relation to their own circumstances, values, and preferences.

*N Engl J Med* doi:10.1056/NEJMoa2214122

## Non-hormone options for vasomotor symptoms

Non-hormone based medication for vasomotor symptoms as a result of the menopause can include selective serotonin reuptake inhibitors (SSRIs), clonidine, and the prescriber's version of clutching at straws—gabapentin. Might the neurokinin-3 receptor antagonist fezolinetant offer a more effective option? A phase 3, placebo controlled trial shows promise in women with seven or more moderate to severe hot flushes a day. Those randomised to receive fezolinetant 30 mg once daily experienced a reduction in the number of hot flushes from an average of 10.7 to 4.5 per 24 hours after 12 weeks (versus a reduction from 10.5 to 6.9 per 24 hours in the placebo group). As ever, more studies are needed to establish the drug's long term efficacy and safety.

*Lancet* doi:10.1016/S0140-6736(23)00085-5

## In the loop

A study of a closed loop insulin system in children aged between 2 and 6 years old with type 1 diabetes opened my eyes to how challenging it must be to manage. Not only are kids at this age unpredictable in what they eat—from my experience, a mealtime could be over after anything from a few peas to four helpings of pasta—but their insulin requirements are apparently small, making dosing difficult.

Unsurprisingly, perhaps, many children in this age group have blood glucose levels above their target range. Children in the closed loop system arm of the study, in which an insulin pump adjusts insulin delivery in response to continuous glucose monitoring, saw an average increase in the time that glucose levels were within the target range of about 3 hours a day (from 57% to 69%), whereas those in the control group (standard care) didn't see any meaningful improvement in this measure (55% to 56%).

*N Engl J Med* doi:10.1056/NEJMoa2210834

## Chair pose

I'm not one for eavesdropping on people's conversations, but whenever I do happen to overhear what people talk about—in a cafe or at the school gate, for instance—they're usually talking about when they last saw their GP. And often not in a good way: "I went to the doctor about my back, and they just told me to do some yoga." I've made many a misjudged or mistimed suggestion to try a non-medical approach and no doubt have been the subject of many such conversations.

A systematic review of randomised controlled trials of yoga based interventions on measures of frailty gives some more evidence to keep going. It found moderate certainty evidence that yoga improved gait speed, lower extremity strength, and endurance compared with education or inactive controls. For yogis out there, most of the studies used hatha yoga and Iyengar or chair-based methods.

*Ann Intern Med* doi:10.7326/M22-2553

Tom Nolan, clinical editor, *The BMJ*, London; sessional GP, Surrey

**Cite this as: *BMJ* 2023;380:p661**

# Online cognitive behavioural therapy for post-traumatic stress disorder is as effective as face-to-face therapy

CPD READING
0.5 HOURS

NIHR | National Institute for Health and Care Research

NIHR Alerts are summaries of NIHR-funded research with novel findings and implications for practice. They are intended for health and care professionals, commissioners, researchers and members of the public.

To read the full NIHR Alert, go to: bit.ly/3LqEMJX

The study

**Guided, internet based, cognitive behavioural therapy for post-traumatic stress disorder: pragmatic, multicentre, randomised controlled non-inferiority trial (RAPID)**

Bisson JI, Ariti C, Cullen K, et al

*BMJ* 2022;377:e069405

## Why was this study needed?

In every three people who have an extremely traumatic experience, one goes on to develop post-traumatic stress disorder (PTSD). Symptoms can last for many years if not treated, and the condition is linked with poor physical and mental health.

Face-to-face, trauma focused cognitive behavioural therapy (CBT-TF) is the main treatment recommended in UK guidelines. Waiting lists for therapy are long (sometimes a year or more) because of a shortage of professionals trained and available to deliver it. Supported online therapy requires less time from trained professionals and could therefore allow more people to receive treatment.

Researchers wanted to see if CBT-TF was as successful delivered online (via desktop or smartphone) as face-to-face sessions for people with PTSD.

## What did this study do?

The UK study included 196 people with mild to moderate PTSD (a score of less than 50 on the PTSD scale, CAPS-5). Most (92%) were white. Half received supported online CBT-TF (an eight-step online programme, with up to three hours' contact with a therapist, plus four brief telephone or email check-ups). The other half received up to 12 face-to-face CBT-TF sessions, each lasting 60 to 90 minutes.

All participants had the severity of their PTSD assessed at the start of the study, 16 weeks later (at the end of treatment), and again at one year.

## What did it find?

- At 16 weeks, PTSD symptoms improved equally after both treatments (in the face-to-face group, symptoms improved from a mean score of 35.6 to 13.0 on CAPS-5; in the online group, from 34.6 to 13.1)
- Symptom improvements were sustained for up to one year in both groups (in the face-to-face group, mean CAPS-5 score at 12 months was 10.9; in the online group, 12.9)
- Online therapy was cheaper to deliver (£277 per person) than face-to-face sessions (£729 per person)
- Online sessions were generally acceptable and dropout rates were low (10%).

Researchers asked 19 participants and 10 therapists about their experience during the trial. People who received online therapy appreciated the flexibility it offered. One said: "When you go to an appointment you usually have to put aside like two to three hours. But with a phone call, you can do the phone call and then carry on with your day." Some people felt they had limited connection with and support from their therapist, and that treatment was too short.

Some therapists thought online therapy was a good option for people who did not want traditional face-to-face therapy. They also said people with complex symptoms might need more sessions.

## Why is this important?

In this study, people with mild-to-moderate PTSD benefited from therapist supported online therapy as much as from face-to-face sessions. An online course was cheaper than face-to-face therapy.

Therapist supported online therapy takes up less therapist time than face-to-face therapy. This frees up therapists to treat people with more complex or severe symptoms. Online therapy may be available to people sooner, and is more flexible than face-to-face sessions; it can accommodate their work and childcare commitments. It might also be more acceptable to people with PTSD who struggle to leave their homes.

Most participants in the study were white, and all had mild-to-moderate PTSD. Further research is needed to assess online CBT-TF in people of different ethnicities, and among those with more severe PTSD.

## What's next?

Supported online CBT-TF is now being offered by all seven health boards in Wales. The authors have presented their research to mental health commissioners across England and are discussing it with digital mental health services in Scotland.

The intervention is being formally assessed by the National Institute for Health and Care Excellence.The pandemic led to a shift towards digital therapy, but online approaches are not suitable for everyone. More research could explore whether people with complex PTSD, or those who had specific trauma experiences, still need face-to-face therapy.

**Competing interests**: *The BMJ* has judged that there are no disqualifying financial ties to commercial companies.
Further details of other interests, disclaimers, and permissions can be found on bmj.com

**Cite this as: *BMJ* 2023;380:p266**

EASILY MISSED?

# Aortic stenosis

CPD READING
0.5 HOURS

LEARNING MODULE
See http://learning.bmj.com for linked learning module

Harriet Hurrell,[1] Michael Redwood,[2] Tiffany Patterson,[1] Christopher Allen[1]

[1]Department of Cardiology, St Thomas' Hospital, London
[2]Bourn Surgery, Bourn, Cambridge

Correspondence to: H Hurrell h.e.l.hurrell@doctors.org.uk

This is one of a series of occasional articles highlighting conditions that may be more common than many doctors realise or may be missed at first presentation. To suggest a topic for this series, please email us at practice@bmj.com.

**A woman in her 80s presents with progressive reduction in her exercise tolerance. Twelve months earlier, she could comfortably complete a round of golf on foot; now she needs to stop and catch her breath after walking 100 yards. A soft systolic murmur is heard on auscultation, and blood tests show a mild microcytic anaemia. As the murmur is quiet, it is assumed the anaemia is causing her symptoms, and oral iron is prescribed. Over the next 12 months, she develops progressive breathlessness on exertion but respiratory causes are excluded. Six months later she has an episode of syncope while shopping. A quiet second heart sound is noted.**

**Symptoms are usually associated with severe disease and are non-specific, including ischaemic chest pain, exertional dyspnoea, fatigue and presyncope or syncope**

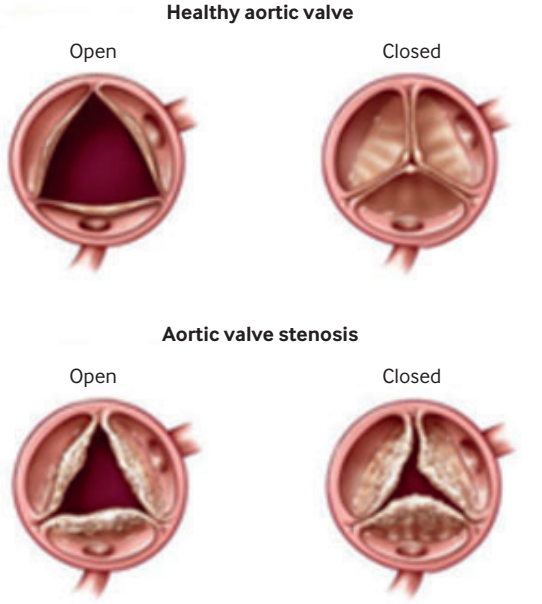



Fig 1 | Appearances of healthy and stenotic tricuspid aortic valves

### HOW PATIENTS WERE INVOLVED IN THE CREATION OF THIS ARTICLE

This article was reviewed by a group of patients who have undergone treatment with transcatheter aortic valve implantation for aortic stenosis. They read and provided feedback on the draft of this article and contributed their personal experience to the case.
The article was also reviewed by an external patient reviewer, who stressed the importance of appropriate anticoagulation after valve replacement.

### WHAT YOU NEED TO KNOW

- Auscultate for a systolic murmur (it can be soft) when patients present with chest pain, breathlessness, presyncope, syncope, palpitations, or unexplained functional deterioration
- Clinically relevant aortic stenosis is underdiagnosed—consider transthoracic echocardiography and specialist assessment if there are cardiac or respiratory symptoms associated with an audible murmur
- Arrange urgent cardiology assessment (within 2 weeks) or acute admission for syncope and/or rapidly deteriorating symptoms in suspected aortic stenosis
- Transcatheter procedures are suitable for many patients who might previously have been deemed unfit for open valve replacement surgery

## What is aortic stenosis?

Aortic stenosis is narrowing of the aortic valve (fig 1). The resulting obstructed blood flow from the left ventricle to the aorta causes increased left ventricular afterload, compensatory left ventricular hypertrophy, reduced compliance, and impaired diastolic function.[1 2] Severe disease carries a poor prognosis,[3-5] yet many patients remain undiagnosed.[6 7]

Symptoms are usually associated with severe disease and are non-specific, including ischaemic chest pain (reported in up to 63% of patients), exertional dyspnoea (53-77%), fatigue (8%), and presyncope or syncope (2%).[3 8-11] Patients might also initially present with acute heart failure.[2] The characteristic murmur is an ejection systolic murmur heard at the right upper sternal edge, often radiating to the carotids, with an associated quiet second heart sound (fig 2) and reduced carotid volume.[8]

The only definitive treatment is valve replacement. The development of transcatheter technologies (including transcatheter aortic valve implantation (TAVI)) in the past two decades offers less invasive treatment options than open heart surgery and has been shown to be safe and effective, including for patients deemed high or prohibitive surgical risk.[5]

However, whether intervention at an earlier stage, before the development of symptoms, may improve outcomes is the subject of ongoing research.[12 13]

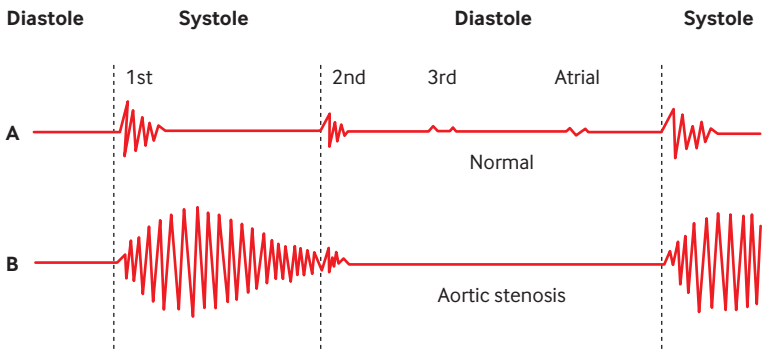



**Fig 2 | The characteristic ejection systolic murmur heard in aortic stenosis. (A) denotes a normal 1st and 2nd heart sound occurring in early systole and early diastole respectively with no added heart sounds. (B) denotes the characteristic ejection (crescendo-decrescendo) murmur heard in systole in severe aortic stenosis with a soft 2nd heart sound due to reduced leaflet mobility**

### Who is affected?

Aortic stenosis mainly affects older adults (after the age of 70 years), when it is most commonly caused by a degenerative, progressive, calcified aortic valve.[4 14] When aortic stenosis presents at younger ages, a bicuspid valve (the most common congenital cardiac abnormality, with a prevalence of 0.2-0.8%.[15]) that predisposes patients to premature valve degeneration[14] is the usual cause. Rheumatic heart disease is rare in developed countries but remains an important cause of aortic stenosis in young adults in middle and low income countries.[4] The causes in all age groups are summarised in the table.

## How common is it?

Across Europe and the US, prevalence is <1.3% in patients under 65 years old but is estimated to be 4-9% in patients over 70 years.[6 17] In these regions, it is the second most common valvular lesion (after mitral regurgitation) and the commonest among patients referred for treatment. Prevalence data from other countries is limited, but rheumatic heart disease is the most common cause in countries where rheumatic fever is endemic, with the highest rates in South-east Asia, India, sub-Saharan Africa, and the South Pacific.[4]

## Why is it missed?

Aortic stenosis is often not picked up until late on in the disease course. Reasons for this include:

- Symptoms are often non-specific and develop after a long asymptomatic latent period, with patients often remaining asymptomatic until the aortic valve has become severely stenosed (as defined on transthoracic echocardiogram)[3 18]
- Symptoms such as exertional dyspnoea or fatigue can be mistaken for other or concomitant cardiac or respiratory conditions (such as chronic obstructive pulmonary disease, ischaemic heart disease, or asthma)
- Cross-sectional studies have demonstrated clinical signs can be unreliable and hard to interpret in isolation.[19] For example, while an absent or soft second heart sound is highly predictive of severe aortic stenosis (specificity 89%), its overall sensitivity is low (43%).[19] In some patients (such as those with a high body mass index or low flow across the aortic valve) the systolic murmur may be subtle and not detected on auscultation[20 21]
- More generally, cardiac auscultation has low diagnostic yield for valvular heart disease of all forms, with a cardiac murmur having an overall sensitivity and specificity of 44% and 81% respectively[20]
- Patients often adjust their workload or activities and attribute symptoms to comorbid conditions or general slowing down associated with older age[18]
- In some countries, including where there is high prevalence of rheumatic heart disease, access to echocardiographic screening and treatment can be limited.[22]

### Evidence that it is missed

A large cohort study of echocardiographic screening in 4000 subjects in a primary care setting across Oxfordshire detected undiagnosed, clinically significant valve lesions (moderate to severe disease) in 6.9% of their population (over the age of 65). Of these patients, 1.3% had aortic stenosis.[23] European postmortem studies looking at aortic stenosis have suggested a missed diagnosis in up to half of cases.[24]

## Why does it matter?

Symptomatic, severe aortic stenosis carries a poor prognosis. Patients may develop heart failure, and their first presentation may be with sudden cardiac death.[3] In regions where prevalence of rheumatic heart disease is high, there may be limited access to treatment and patients often present in refractory heart failure.[4]

The PARTNER I trial suggests symptomatic severe aortic stenosis has a mortality of 50% at one year if untreated,[5] but this trial included inoperable patients, so frailty and comorbidities are likely to have contributed to the poor prognosis of some patients. The trial demonstrated a 19% absolute risk reduction in mortality in inoperable patients with severe aortic stenosis treated with TAVI over conservative (medical) therapy.[3 5]

**Causes of aortic stenosis in all age groups**

| Condition | Typical initial presentation |
|---|---|
| Calcified aortic valve[4 14] | >70 years old |
| Rheumatic heart disease[4] | Childhood and young adulthood |
| Bicuspid valve[14 15] | Presenting and requiring intervention in the fifth or sixth decade of life |
| Thoracic radiotherapy[16] | 2-3 decades after exposure |

**EDUCATION INTO PRACTICE**

- When would you consider asking patients over 70 years old about their exercise tolerance, ability to perform day to day activities, and whether they have noticed a periodic decline?
- What symptoms and clinical findings would prompt you to offer further investigation for aortic stenosis?

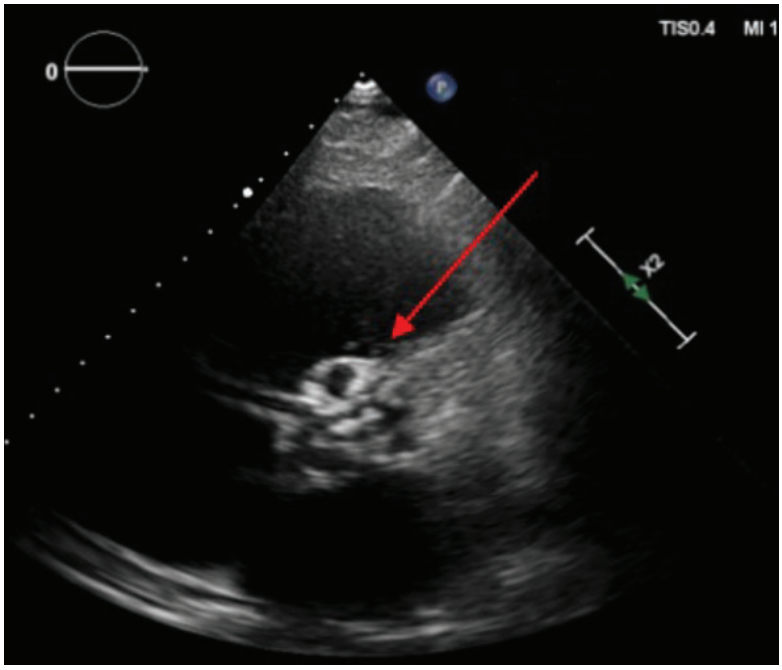



**Fig 3** | Transthoracic echocardiogram of a heavily calcified aortic valve (arrow) causing severe aortic stenosis

**When would you refer for specialist assessment?**

- Arrange cardiovascular assessment within six weeks for all patients who report exertional symptoms (dyspnoea or chest pain) and have an audible cardiac murmur,[25-27] and for patients with exertional symptoms but seemingly only moderate aortic stenosis according to a transthoracic echocardiogram[28]
- Arrange urgent cardiology assessment (within 2 weeks) for symptoms of syncope, left ventricular failure, or loss of the second heart sound
- Arrange acute admission for rapidly deteriorating symptoms

## How is it diagnosed?

The presence of a systolic murmur (with varied intensity) has been demonstrated in nearly all patients with moderate to severe aortic stenosis, and its absence can often exclude severe aortic stenosis (negative predictive value of 92%).[20 25] However, transthoracic echocardiography is the optimal means for diagnosis, and when there is high clinical suspicion or in cases of ambiguity you should maintain a low threshold for investigation with transthoracic echocardiography and/or referral for specialist assessment (box).

### Clinical

Perform cardiac auscultation in all patients presenting with chest pain, breathlessness, presyncope, syncope, palpitations, and/or unexplained functional deterioration (such as progressive deterioration in exercise tolerance or day-to-day activity).[25 26] Cross-sectional studies have demonstrated a strong positive predictive value of 86% for moderate or severe aortic stenosis associated with the presence of an ejection systolic murmur, a quiet second heart sound, and reduced carotid volume in combination.[19]

### Investigations

Transthoracic echocardiography has a high sensitivity (92%) and specificity (99%) for severe aortic stenosis (fig 3).[31] Consider it for all patients who report cardiac or respiratory symptoms associated with an audible murmur[26] to ascertain the diagnosis and to assess for severity, left ventricular function, and any other valvular lesions. For patients with mild aortic stenosis, arrange biennial echocardiograms to monitor their valve function.[32]

## How is it managed?

### Medical management

There is no established medical therapy to prevent disease progression, although symptoms of heart failure may be managed with diuretics. Manage common coexisting conditions (such as left ventricular impairment and hypertension) in line with established guidelines and specialist support.[34 35]

### Further specialist investigation

Patients diagnosed with mild or moderate aortic stenosis on echocardiography or asymptomatic severe aortic stenosis will have valve function monitoring by serial specialist clinical and echocardiographic assessments.[36] Cardiac computed tomography can also be useful in cases of diagnostic discrepancy on echocardiography.[15 37]

### Valve replacement

Consensus guidelines recommend considering valve replacement for patients with severe symptomatic aortic stenosis or patients with severe aortic stenosis and evidence of left ventricular decompensation on echocardiography (ejection fraction <50%) regardless of symptom status.[38] For patients older than 75 years or those at high risk for conventional valve surgery, TAVI is recommended by the European Society of Cardiology as first line treatment.[38]

A major limitation is the cost of valve prosthesis. Where patients don't have access to valve replacement, balloon aortic valvuloplasty may be available to alleviate symptoms temporarily, but often treatment is limited to palliative care.[4 22]

Medication considerations to address after surgical intervention include angiotensin converting enzyme inhibitors[39 40] and antiplatelets or anticoagulation.[38 41 42]

## Case outcome

An echocardiogram is performed, demonstrating severe aortic stenosis. The patient is referred to cardiology and ultimately undergoes successful TAVI. On discharge, two days after TAVI, she notices an immediate improvement in her symptoms of breathlessness and increased exercise tolerance.

Competing interests: None declared.

Cite this as: *BMJ* 2023;380:e070511

Find the full version with references at doi: 10.1136/bmj-2022-070511

# What is the test for, and isn't that a lot of blood for a child?

CPD READING
0.5 HOURS

**Audrey Chia** shares her experience as a parent supporting her child in giving consent for a test

It started with a general itch, and after several hours, my 5 year old child's whole body was swollen and covered in hives. We went to an emergency department near our home in Singapore. She was quickly seen and moved to a paediatric ward where we would spend the night.

ROSE LLOYD

### Lots of questions

They investigated, starting with a blood test. I consented, giving permission on behalf of my child. But when they approached her, my daughter began to ask lots of questions. She wanted to know what the test was for, why they had to take so much blood, and what happened to her blood once the test was done. The doctors seemed both amused and flummoxed, but briefly answered her questions.

I tried to respond to some of my child's questions in more detail, but she wanted to hear the answers from a doctor. Later, another two health professionals asked to speak with her. After a lively conversation, she still did not want to have the test, but I felt they had understood and responded to her concerns. They also said they would give her time to consider, which reassured me.

**It would have helped if the team had encouraged my daughter to take an active part in resolving her illness**

### Getting on the same page

Later, three more health professionals asked to speak to my child alone. I agreed because I assumed they were there to check her condition. After some discussion, they told me my child was now happy to have the test. They mentioned they had asked about her preschool and found out about her upcoming birthday party. They had suggested to my child that it would be a shame to miss the party if she were to have another flare-up.

By morning, my child's symptoms had subsided. She was running all over the playroom when the discharge papers were signed.

### Collaboration

I was initially relieved that this approach had worked, but later felt uneasy. I felt they had used my child's party as a way to persuade her to do the test, rather than having an open and honest conversation with her. I wish they had been able to take the opportunity to educate her, gain her trust, and to encourage patient-doctor collaboration.

It would have been helpful if the medical team had instead suggested to my daughter that she take an active part in resolving her illness. Together, she and they had to fight a common enemy—the allergic reaction. She could provide a blood sample, which they would use to devise a treatment. I believe this would have helped satisfy my daughter's curiosity and signalled that patients have a role to play in their own treatment.

Correspondence to: bizchiaa@nus.edu.sg

Competing interests: None declared.

Cite this as: *BMJ* 2023;380:o2915

## WHAT YOU NEED TO KNOW

- Parents can give consent, but include children in the conversation whenever possible
- Allow children time to process and communicate their feelings of fear or discomfort before non-urgent tests or procedures
- When children ask questions, respond with respect and care to ensure they feel included in decision making. This may involve sharing more information with them or getting to know them to build trust

## EDUCATION INTO PRACTICE

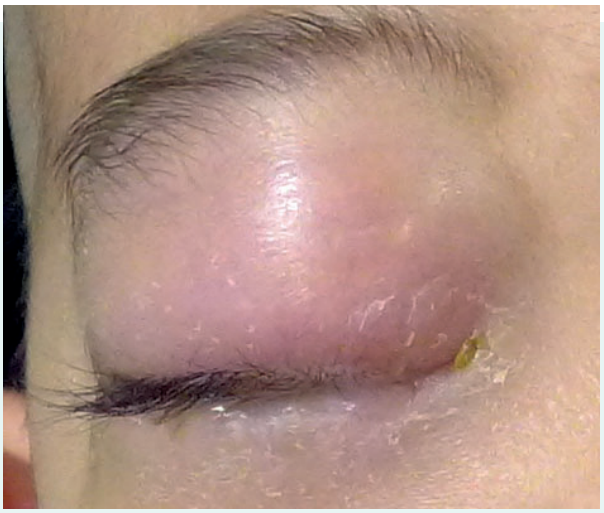
- What could you do to ensure a child feels their thoughts, questions, and feelings are heard?
- How could you involve them in decision making?
- What could you do to develop trust with a child you are seeing?

## CASE REVIEW **Acute unilateral proptosis**

A 15 month old child presented with 12 days of right sided, purulent nasal discharge and six days of progressively worsening bulging, excess fluid/tearing, and eyelid redness of the right eye. Examination revealed pronounced proptosis, chemosis, eyelid erythema, and yellow crusting in the corner of the right eye (figure), with no signs on the left. Pupil diameter and pupillary light reflexes were normal in both eyes. The patient was unable to cooperate with further visual examination, so it was not possible to assess visual acuity or eye movements.

Three days earlier, intravenous infusion of ceftriaxone sodium had been started, as we suspected acute rhinosinusitis causing orbital inflammation, but this had no effect. The child's temperature was 40°C, white blood cell count $18.65\times10^9$/L (nomal range $4\text{-}10\times10^9$/L), and a culture of the nasal discharge grew *Streptococcus viridans* and coagulase-negative *Staphylococcus aureus*. Orbital infection caused by acute rhinosinusitis was suspected.

1 **What are the differential diagnoses?**
2 **What are the potential manifestations and complications of orbital infection?**
3 **What is the most likely clinical diagnosis?**



**Clinical photograph of patient's right eye**

Submitted by Zhenxiao Huang and Bing Zhou
Parental consent obtained.
Cite this as: *BMJ* 2023;380:e068579

answers

CASE REVIEW **Acute unilateral proptosis**

**1 What are the differential diagnoses?**

Orbital infection, conjunctivitis, dacryocystitis/dacryoadenitis, inflamed insect bites, orbital trauma, orbital tumours.

**2 What are the potential manifestations and complications of orbital infection?**

Orbital infection can lead to preseptal (periorbital) cellulitis, where there is oedema, erythema, orbital pain, fever, eyelid oedema, and/or upper eyelid tenderness. If untreated, preseptal cellulitis can rapidly progress to orbital cellulitis, subperiosteal abscess, or orbital abscess, which is a medical emergency (red flags are chemosis, proptosis, visual impairment, and ophthalmoplegia). Same-day ophthalmology/otolaryngology referral is required for consideration of imaging, intravenous antibiotics, and/or surgical drainage. If proptosis is marked and intravenous antibiotics have failed, or if eye findings deteriorate, it is a same-day surgical emergency. Untreated abscess may progress to cavernous sinus thrombosis, which may cause vision loss, meningitis, and death.

If preseptal cellulitis is suspected and there are no signs of abscess formation (no proptosis and no eye movement limitation), oral antibiotics can be considered in primary care with frequent documentation and re-examination of the eyes.

A classic early warning sign of impending visual loss is loss of colour vision as tested with Ishihara colour plates.

**3 What is the most likely clinical diagnosis?**

Unilateral sinonasal-related orbital infection (caused by acute rhinosinusitis) with preseptal and/or orbital cellulitis, and pronounced proptosis that is likely to be indicative of abscess formation. The proximity of the orbits to the sinuses makes them susceptible to spread of sinus infection. Approximately 3-20% of paediatric patients with acute rhinosinusitis experience some form of orbital inflammatory disease.

The yellow crusting indicates dried purulent discharge. This is not a typical sign of orbital infection but can be present.

Causes of orbital infection not due to acute rhinosinusitis include eyelid or facial cellulitis and haematogenous spread from distant locations.

**PATIENT OUTCOME**

Sinus computed tomography (CT) was suggestive of two right abscesses (potentially preseptal and potentially subperiosteal). A Chandler classification of stage III orbital complication was assigned. Inflammatory changes without bone destruction in the adjacent ethmoid and maxillary sinuses on CT supported the assumption that this was secondary to acute rhinosinusitis and preseptal cellulitis.

Emergency open surgical drainage of the subperiosteal and preseptal abscesses was performed by a paediatric ophthalmologist. At follow-up 30 days postoperatively, the symptoms had completely resolved.

**LEARNING POINTS**

- If you are unable to assess for visual impairment and ophthalmoplegia in a child with chemosis and proptosis, refer for same-day ophthalmology/otolaryngology assessment.

CPD READING
0.5 HOURS

You can record CPD points for reading any article. We suggest half an hour to read and reflect on each.

LEARNING MODULE

Articles with a "learning module" logo have a linked BMJ Learning module at learning.bmj.com.

## MINERVA

### Nail lesions in generalised pustular psoriasis

These nail lesions are in a woman in her 50s with generalised pustular psoriasis. This is a rare form of pustular psoriasis characterised by recurrent flares, and which can have systemic involvement. This woman had painful erythematous papules over her whole body, including her fingers and toes, which developed into pustules over four months, aspirates of which had no bacterial or fungal growth on culture. She was systemically unwell with fever, fatigue, and vomiting with elevated inflammatory markers on blood tests.

Early diagnosis of generalised pustular psoriasis can prevent life threatening complications in the acute phase, including associated infection, heart failure, or respiratory failure. This patient recovered clinically within weeks of monoclonal antibody therapy with lesions gradually improving over the following six months.

Jiong Zhou; Xiao-Yong Man (manxy@zju.edu.cn), Second Affiliated Hospital, Zhejiang University School of Medicine, Hangzhou, China

Patient consent obtained.

Cite this as: *BMJ* 2023;380:e073447

If you would like to write a Minerva picture case, please see our author guidelines at bit.ly/29HCBAL and submit online at bit.ly/29yyGSx

### Chylopericardium

Chyle is the milky, triglyceride rich lymph formed in the lacteals of the gut lymphatics during fat digestion. Accumulation of this fluid in the pericardial space is rare. It sometimes results from damage to the thoracic duct but more often it's idiopathic. Cardiac tamponade occurs in a third of cases. Treatments include total parenteral nutrition, a very low fat diet, and octreotide, which increases splanchnic arteriolar resistance and reduces lymphatic flow. If they fail, surgical intervention is required (*Heart* doi:10.1136/heartjnl-2022-321798).

### Engineering legumes

Unlike cereal crops such as rice, wheat, and maize, no green revolution has occurred in legumes. Part of the reason is their large genomes. The broad bean genome, for example, is a humongous 13 gigabases long—four times larger than the human genome—and it has only recently been sequenced. This opens the way to the development of new cultivars with improved disease resistance, better climate resilience, and the potential to provide high protein food in regions where other options are lacking (*Nature* doi:10.1038/s41586-023-05791-5).

**The broad bean genome is a humongous 13 gigabases long—four times larger than the human genome**

### Bradyarrhythmias

Data collected during a trial of implantable loop recorders to detect atrial fibrillation in people over 70 with risk factors such as hypertension, diabetes, heart failure, or history of stroke showed that bradyarrhythmias affected more than a fifth of participants. The arrhythmias were usually asymptomatic and most commonly caused by sinus node dysfunction or atrioventricular block. Although people diagnosed with bradyarrhythmias were likely to be given an implanted pacemaker, this had no beneficial effect on their subsequent risk of syncope or sudden death (*JAMA Cardiol* doi:10.1001/jamacardio.2022.5526).

### Inflammatory bowel disease after normal biopsy

A registry study from Sweden identified 200 000 people who had a normal lower gastrointestinal mucosal biopsy between 1965 and 2016. During a median of 10 years' follow-up, more than 2% were diagnosed with inflammatory bowel disease—a rate six times higher than that in a population control group. The increased risk of inflammatory bowel disease persisted for many years following the biopsy, suggesting both a long symptomatic period of disease before diagnosis and defective diagnostic investigation in patients with early disease (*PLoS Med* doi:10.1371/journal.pmed.1004185).

**In women with MS, relapse rates decline during pregnancy only to rebound in the postpartum period**

### Postpartum relapse in multiple sclerosis

A systematic review confirms the widely held belief that, in women with multiple sclerosis, relapse rates decline during pregnancy only to rebound in the postpartum period. Data on nearly 3000 pregnancies show that relapses roughly double in frequency in the first three months after delivery before declining to preconception rates by 10 to 12 months. Exclusive breastfeeding substantially reduces the risk of postpartum relapse (*J Neurol Neurosurg Psychiatry* doi:10.1136/jnnp-2022-330533).

### Bony fracture in people with diabetes

A few weeks ago, Minerva noted a Swedish report that any increase in risk of osteoporotic fracture in people with type 2 diabetes was so small that it could be ignored. By contrast, a longitudinal study from Denmark reports a higher incidence of fracture in people with both type 1 and type 2 diabetes. The discrepancy can probably be explained by changing patterns of fracture over time. Over the past 20 years, fracture rates in Denmark have been decreasing and current incidence in people with type 2 diabetes is no higher than in people without diabetes (*Diabetes Care* doi:10.2337/dc22-1004).

Cite this as: *BMJ* 2023;380:p608