# education

**FROM THE JOURNALS** Edited highlights of weekly research reviews on https://bit.ly/2PLtil8

This week we introduce the first of our three new writers of our weekly research reviews. Zackary Berger is an associate professor at Johns Hopkins School of Medicine in Baltimore, US, in the general internal medicine division, and core faculty in the Johns Hopkins Berman Institute of Bioethics. His research focuses on shared decision making, patient centred care, and health justice. He is also a practising physician at a free health clinic for undocumented, predominantly Spanish-speaking immigrants.

## Alcohol use and global burden

Two different purposes underlie this study: to quantify the health effect of alcohol use; and to determine whether in fact there is some small amount of alcohol use which is beneficial.

The authors amassed a large number of data sources and conducted 21 meta-analyses to estimate the influence of alcohol on health outcomes. A limitation of this approach is the issue of self reported alcohol consumption; further, accruing a large number of studies which are potentially biased does not remove the bias in these individual studies. That alcohol confers an important burden of disease is indisputable, and the associations between alcohol and these individual outcomes is an important product of this work—whether causality can be inferred is for epidemiologists, physicians, and patients to discuss.

Whether "the level of consumption that minimizes health loss is zero," depends (as has already been pointed out by many perceptive readers) on how to read figure 5 in the paper, which shows that at one standard drink per day, the relative risk for all attributable causes was 1. Emphasising zero alcohol exposure as a public health priority above, say, treatment of those with alcohol use disorders remains a difficult question. Whether a drink a day leads to a relative risk of 1, or very near 1, might lack relevance compared with higher dose exposures.

*Lancet* doi: 10.1016/S0140-6736(18)31310-2

## Adrenaline in out-of-hospital cardiac arrest

Researchers in the UK undertook a randomised controlled trial of adrenaline (epinephrine) in cardiac arrest, conducted in five NHS ambulance services. Does adrenaline improve survival at 30 days over cardiopulmonary resuscitation and defibrillation alone, when the former are unsuccessful? The short answer is yes, with an absolute difference in 30 day survival of 0.8%—that is, a number needed to treat (NNT) of 125, compared with an NNT of 15 for CPR performed by a bystander and 5 for early defibrillation.

The longer answer, however, is that survivors in the adrenaline group had twice the rate of severe neurological impairment. As the authors point out in their discussion, every intervention is associated with a balance of risks and benefits. Whether the benefit of increased chance of survival is worth the risk of neurological impairment (through what mechanism we can only speculate—perhaps involving the adrenergic receptors and impaired cerebellar blood flow), is something that can be answered only by further studies providing risk stratification. In the moment of cardiac arrest, given these uncertainties, such a decision seems a Sisyphean task for families, and perhaps the system should give a nudge towards a justified default.

*N Engl J Med* doi:10.1056/NEJMoa1806842

## Association between traumatic brain injury and risk of suicide

Like other Scandinavian nations, Denmark registers every individual with a unique identifier, which makes studies like this one possible, or at least more feasible. The researchers assessed the association between "medical contacts" (inpatient, outpatient, or emergency visits) for traumatic brain injury (TBI) as recorded in the national patient register, and suicide as recorded in the Danish cause of death register. Previous studies have examined this association, but few at this scale or with the information necessary to control for a range of variables including other types of fractures besides cranial fracture, psychiatric illness, epilepsy, and several demographic and socioeconomic variables. (Substance use disorder did not seem to be a named covariate, though this might have been included under psychiatric diagnoses.)

Unsurprisingly, TBI was associated with an approximately twofold higher risk of suicide. Other findings in this study to do with severity of TBI and higher suicide rate among those experiencing TBI in young adulthood buttress a dose-response relation. However, the association between suicide and TBI is nothing as simple as direct causality and involves psychiatric illness predisposing to TBI, pre-existing systemic brain disorders, and numerous ways in which psychiatric illness can affect access to medical care. The association laid out here is a potential foundation for more detailed work mapping the highways and byways of these factors.

*JAMA* doi:10.1001/jama.2018.10211

# Patent foramen ovale closure, antiplatelet or anticoagulation for management of cryptogenic stroke? A guideline

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**Options for the secondary prevention of stroke in patients younger than 60 years who have had a cryptogenic ischaemic stroke thought to be secondary to patent foramen ovale (PFO) include PFO closure (with antiplatelet therapy), antiplatelet therapy alone, or anticoagulants. International guidance and practice differ on which option is preferable.**

CPD READING

0.5 HOURS

The *BMJ* Rapid Recommendations panel used a linked systematic review[1] triggered by three large randomised trials published in September 2017 that suggested PFO closure might reduce the risk of ischaemic stroke more than alternatives.[2-4] The panel thought that the studies, when considered in the context of the full body of evidence, might change current clinical practice.[5]

The main infographic, on p 244, presents the recommendations as three paired comparisons, together with an overview of the absolute benefits and harms informing each recommendation, according to the GRADE methodology.

**HOW PATIENTS WERE INVOLVED IN THE CREATION OF THIS ARTICLE.**

The panel included three people with personal experience of cryptogenic stroke and patent foramen ovale (PFO). These panel members identified important outcomes, and led the discussion on values and preferences.

## WHAT YOU NEED TO KNOW

- The recommendations apply to patients under 60 years old with patent foramen ovale (PFO) who have had a cryptogenic ischaemic stroke, when extensive workup for other aetiologies of stroke is negative
- For patients who are open to all options, we make a weak recommendation for PFO closure plus antiplatelet therapy rather than anticoagulant therapy
- For patients in whom anticoagulation is contraindicated or declined, we make a strong recommendation for PFO closure plus antiplatelet therapy versus antiplatelet therapy alone
- For patients in whom closure is contraindicated or declined, we make a weak recommendation for anticoagulant therapy rather than antiplatelet therapy.
- Further research may alter the recommendations that involve anticoagulant therapy

## Current practice

### Management options for patients with patent foramen ovale (PFO) and cryptogenic stroke

Most current guidelines recommend against routine closure of the PFO in patients with cryptogenic stroke and instead recommend antiplatelets or anticoagulation (the latter if indicated for another reason).[6-9]

### Identification of cryptogenic stroke

In about a third of patients in the general population who are diagnosed with an acute ischaemic stroke, investigation finds no clear cause; it is cryptogenic.[10]

Patients diagnosed with cryptogenic stroke are less likely to have classic risk factors for atheroembolic stroke such as older age, hypertension, hyperlipidaemia, and diabetes.[11] They are more likely to have a PFO than patients in the general population.[12]

### Implications of a PFO

Many meta-analyses have addressed whether closure of a PFO reduces the long term risk of subsequent stroke,[12-18] but most have concluded that there is insufficient evidence.[6]

PFO is a communication between the right and left atrium, typically diagnosed by transthoracic echocardiography with observed flow from the left to right atrium by colour Doppler ultrasonography.[19] If the shunt direction reverses, this communication may allow a venous thrombus or right atrial thrombus to travel directly into the arterial circulation and cause a stroke—a phenomenon known as a paradoxical embolism.[20 21]

## Understanding the recommendations

### Absolute benefits and harms

The main infographic, on p 244, explains the recommendations and provides an overview (GRADE summary of findings) of the absolute benefits (reduction in recurrent ischaemic stroke) and harms (see online for absolute numbers).

The panel agreed that, compared with antiplatelet therapy alone, PFO closure followed by antiplatelet therapy:

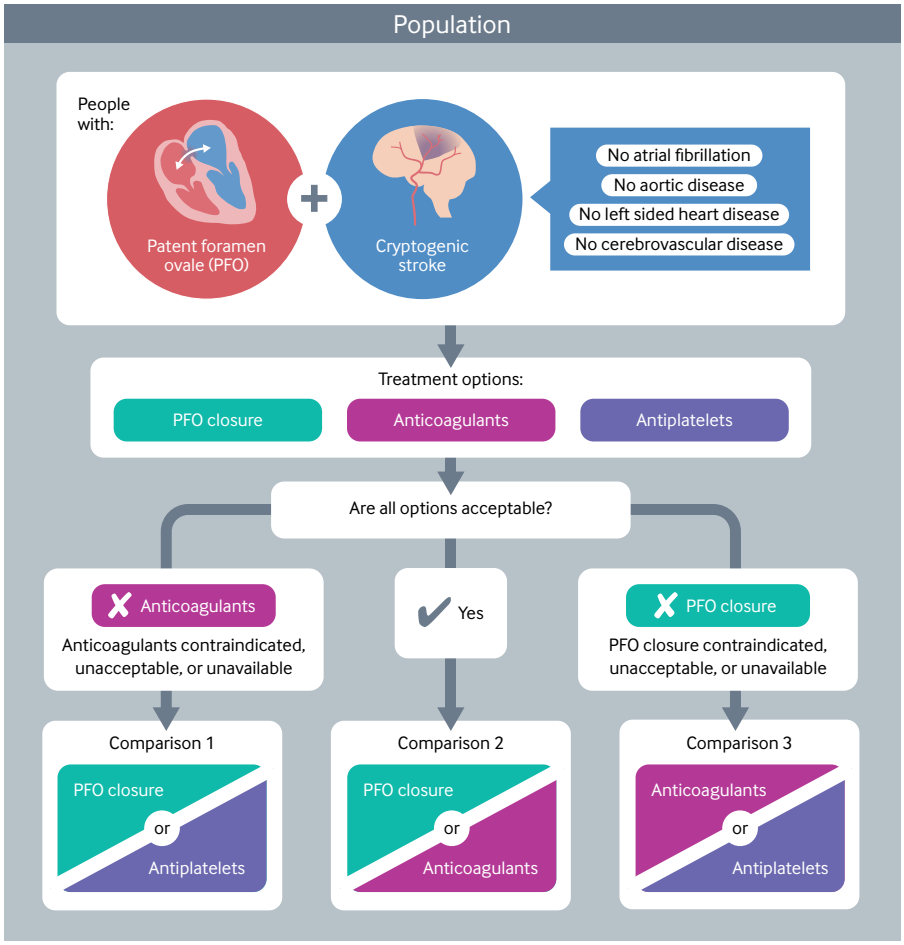
- Probably has a large decrease in ischaemic stroke (8.7% absolute risk reduction, moderate quality evidence) over five years
- Has a risk of device or procedure related adverse events (3.6% absolute risk, high quality evidence) at one year
- Probably has an increase in persistent atrial fibrillation or flutter (1.8% absolute risk increase, moderate quality evidence) and transient atrial fibrillation or flutter (1.2% absolute risk increase, moderate quality evidence) at one year
- Probably has little or no difference in death, major bleeding, pulmonary embolism, transient ischaemic attack, or systemic embolism (moderate to high quality evidence) at five years.

The panel agreed that, compared with anticoagulation, PFO closure followed by antiplatelet therapy:

- May result in little or no difference in ischaemic stroke (1.6% absolute risk reduction, low quality evidence) at five years
- Probably decreases major bleeding (2.0% absolute risk reduction, moderate quality evidence) at five years
- Has a risk of device or procedure related adverse events (3.6% absolute risk, high quality evidence) at one year
- Probably has an increase in persistent atrial fibrillation or flutter (1.8% absolute risk increase, moderate quality evidence) and transient atrial fibrillation or flutter (1.2% absolute risk increase, moderate quality evidence) at one year
- Probably has little or no difference in death, pulmonary embolism, transient ischaemic attack, or systemic embolism (moderate quality evidence) at five years.

The panel agreed that anticoagulation versus antiplatelet therapy at five years' duration:

- May decrease ischaemic stroke (7.1% absolute risk reduction over 5 years, low quality evidence)
- Probably increases major bleeding (1.2% absolute risk increase over 5 years, moderate quality evidence)
- Probably has little or no difference in death, pulmonary embolism, transient ischaemic attack, or systemic embolism (moderate quality evidence).




### Values and preferences

*PFO closure followed by antiplatelet therapy versus antiplatelet therapy alone*

Our strong recommendation for PFO closure for such patients reflects the high value they place on avoiding recurrent ischaemic stroke. Patients are likely to find absolute reduction of stroke with PFO closure of 8.7% in five years important. Although 3.6% experience serious device or procedure related adverse events, these do not usually result in long term disability, and so we considered them less important. Persistent atrial fibrillation after PFO closure procedure might be a concern; however, the main adverse consequence of atrial fibrillation is increased risk of stroke, which was already shown to be substantially lower in patients randomised to PFO closure.

*PFO closure followed by antiplatelet therapy versus anticoagulation*

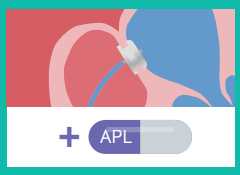
Our weak recommendation for PFO closure reflects (in addition to the low certainty in the estimates of effect) that most serious complications of PFO closure are usually short term, whereas anticoagulation imposes a long term burden and increased risk of major bleeding. Most fully informed patients would probably accept the transient risk of major adverse events rather than the long term bleeding risk, but a substantial minority would probably choose anticoagulation.

*Anticoagulation versus antiplatelet therapy*

Patients to whom PFO closure is unacceptable or contraindicated have to choose between anticoagulant or antiplatelet therapy. A typical patient places a high value in a possible absolute reduction of stroke with anticoagulation of 7.1% over five years and would therefore place higher value on the possible benefit of stroke reduction than the probable increased risk of major bleeding. However, there is substantial uncertainty in our estimates for stroke reduction—how this uncertainty would influence decisions is likely to vary substantially. Therefore, we issue a weak recommendation for anticoagulation.

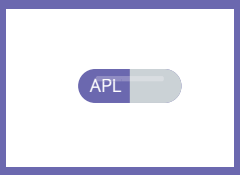
## Comparison 1

**PFO closure**
Percutaneous closure of PFO followed by antiplatelet therapy




or

**Antiplatelets**
Antiplatelet therapy alone




**PFO closure** | **Antiplatelets**

Strong | Weak | Weak | Strong

We recommend PFO closure followed by antiplatelet therapy over antiplatelet therapy alone.

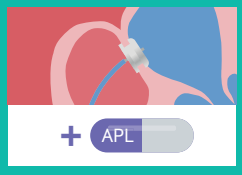
### Comparison of benefits and harms

Favours PFO closure | No important difference | Favours antiplatelets

| | Events per 1000 people | | | Evidence quality |
|---|---|---|---|---|
| **Within 5 years** | | | | |
| Ischaemic stroke | 13 | 87 fewer | 100 | ★★★☆ Moderate |
| Death | 9 | No important difference | 3 | ★★★☆ Moderate |
| Major bleeding | 7 | No important difference | 14 | ★★★☆ Moderate |
| **Within 1 year** | | | | |
| Persistent AF or flutter | 23 | 18 fewer | 5 | ★★★☆ Moderate |
| Device-related adverse events | 36 | 36 fewer | 0 | ★★★★ High |

## Comparison 2

**PFO closure**
Percutaneous closure of PFO followed by antiplatelet therapy




or

**Anticoagulants**
Anticoagulation therapy


**PFO closure** | **Anticoagulants**

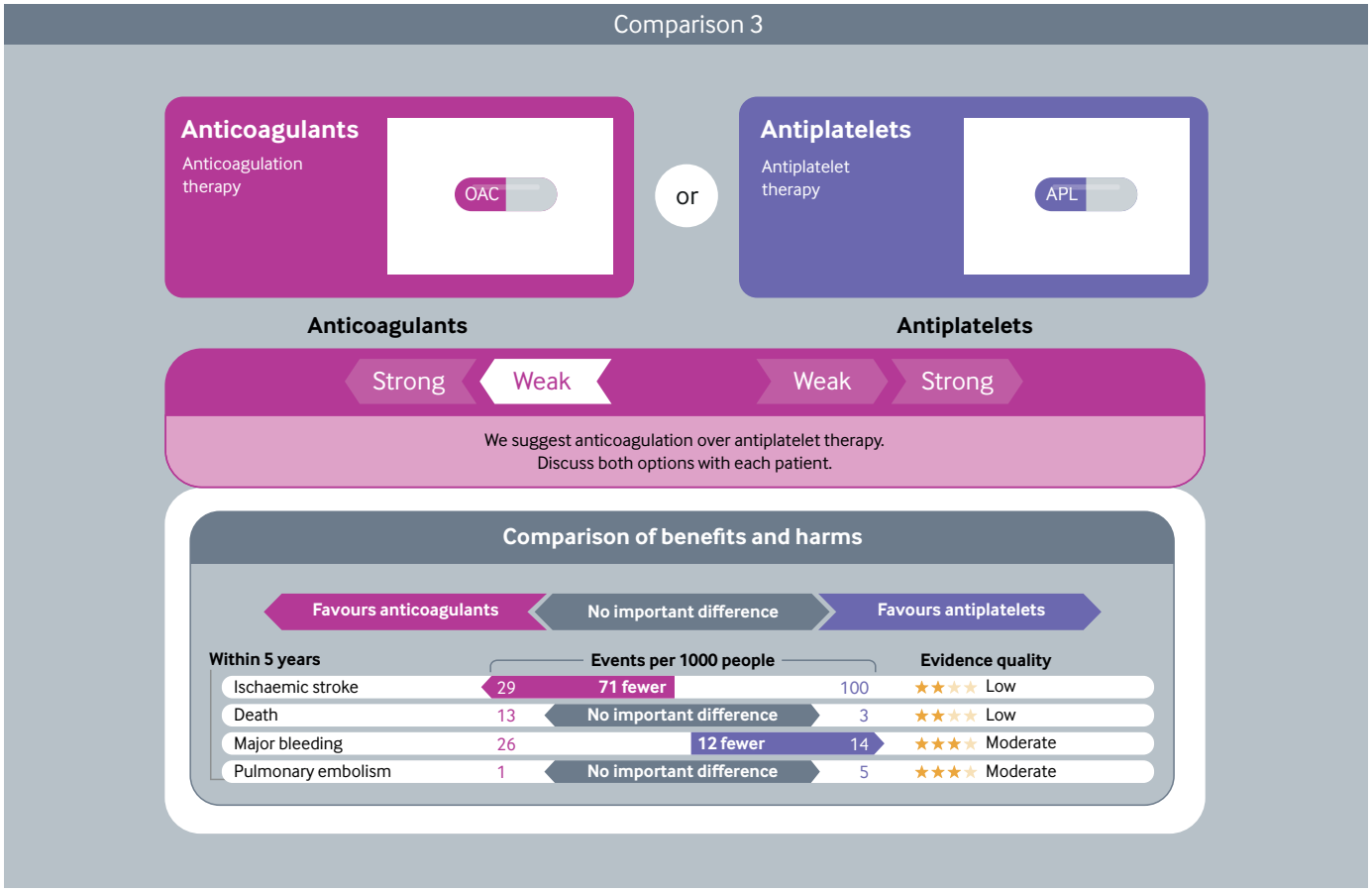
Strong | Weak | Weak | Strong

We suggest PFO closure followed by antiplatelet therapy over anticoagulation therapy. Discuss both options with each patient.

### Comparison of benefits and harms

Favours PFO closure | No important difference | Favours anticoagulants

| | Events per 1000 people | | | Evidence quality |
|---|---|---|---|---|
| **Within 5 years** | | | | |
| Ischaemic stroke | 13 | No important difference | 29 | ★★☆☆ Low |
| Death | 9 | No important difference | 13 | ★★★☆ Moderate |
| Major bleeding | 7 | 20 fewer | 27 | ★★★☆ Moderate |
| **Within 1 year** | | | | |
| Persistent AF or flutter | 23 | 18 fewer | 5 | ★★★☆ Moderate |
| Device-related adverse events | 36 | 36 fewer | 0 | ★★★★ High |




## The panel agreed that compared with antiplatelet therapy alone PFO closure followed by antiplatelet therapy probably has a large decrease in ischaemic stroke over five years

### HOW THE RECOMMENDATION WAS CREATED

Our international panel included general internists, interventional and non-interventional cardiologists, stroke physicians, epidemiologists, methodologists, statisticians, and people with personal experience of cryptogenic stroke and patent foramen ovale (PFO). They decided on the scope of the recommendation and the outcomes that are most important to patients. The panel identified eight patient-important outcomes needed to inform the recommendation: non-fatal ischaemic stroke, death, major bleeding, pulmonary embolism, serious procedure related or device related adverse events, atrial fibrillation, transient ischaemic attack, and systemic embolism.

A parallel team conducted a systematic review addressing the benefits and harms of three patient-relevant clinical questions framed by the panel: (*a*) PFO closure with subsequent antiplatelet therapy versus antiplatelet therapy alone, (*b*) PFO closure with subsequent antiplatelet therapy versus anticoagulation, and (*c*) anticoagulation versus antiplatelet therapy.[1]

Because of a lack of evidence in those with PFO, particularly for the anticoagulation option, the panel asked for a summary of the indirect evidence regarding prevention of thrombosis from trials of venous thromboembolism and atrial fibrillation.

We also performed a systematic search for evidence regarding patients' values and preferences (see appendix 1 on bmj.com).

No panel member had financial conflicts of interest; intellectual and professional conflicts were minimised and managed (for full summary see appendix 2 on bmj.com).

The panel followed the *BMJ* Rapid Recommendations procedures for creating a trustworthy recommendation,[5 28] including using the GRADE approach to critically appraise the evidence and create recommendations (see appendix 3 on bmj.com).[29] The panel considered the balance of benefits, harms, and burdens of the procedure, the quality of the evidence for each outcome, typical and expected variations in patient values and preferences, and acceptability.[30] Recommendations can be strong or weak, for or against a course of action.

### EDUCATION INTO PRACTICE

- Does this article offer you new ways to approach advising patients with cryptogenic ischaemic stroke presumed to be related to a patent foramen ovale (PFO)?
- How might you better respect differences in patients' preferences, particularly their perspective regarding the bleeding risk associated with long term anticoagulation or their feelings about undergoing an invasive procedure?
- What information could you share with your patients to help them reach a decision?
- How might you share this information with colleagues to learn together?

### Practical issues and other considerations

Figure 3 (see bmj.com) outlines the key practical issues for patients and clinicians discussing PFO closure and is based on the content expertise of the panel members.

Competing interests: See bmj.com.

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# Managing scarlet fever

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CPD READING
0.5 HOURS

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

A longer version of this article was originally published in *Drug and Therapeutics Bulletin*, and patients were not involved in the creation of the original article.

**Scarlet fever statistics (England)[4]**

| | 2013 | 2014 |
|---|---|---|
| Notifications | 4 436 | 15 637 |
| GP consultations | 13 200 | 26 500 |
| Hospital admissions within 30 days of scarlet fever onset | 237 | 656 |

**Scarlet fever is an infection caused by toxin producing strains of *Streptococcus pyogenes* (also known as group A streptococcus, or GAS). It was associated with high levels of morbidity and mortality when epidemics were common in the 18th and 19th centuries in Europe and the US.[1] Although the disease nearly disappeared during the 20th century, several countries, including the UK, have recently experienced a re-emergence of scarlet fever.[1-3] In this article, we discuss the management of scarlet fever. In the UK, it is a notifiable disease.**

## How common is scarlet fever?

In England and Wales, the incidence of scarlet fever reduced from 250 notifications in 100 000 population per year in 1944 to less than 5 in 100 000 in the 2000s.[3] In 2013-14, however, there were 25 notifications in 100 000.[3] Around 87% of cases were in children under 10.[2]

In 2014, England experienced the highest number of scarlet fever cases in 45 years (table).[4] In 2015 and 2016, scarlet fever notifications were elevated in all areas in England compared with the same period in the preceding year.[5 6] In the 2016-17 season, weekly scarlet fever notification rates fell below those seen during the previous three seasons.[7]

Peak season for GAS infections, including scarlet fever, occurs between December and April.

## WHAT YOU NEED TO KNOW

- Scarlet fever is usually a mild, self limiting illness, and has become more common
- The typical rash is red, pin point, with a sandpaper texture, and spreads from the trunk and settles in the flexures
- People can be infectious for two to three weeks after the symptoms appear, unless they are treated
- Antibiotics minimise the risk of complications and onward transmission (typically non-infectious in 24 hours)
- Rarely, invasive group A streptococcal infections such as meningitis, pneumonia, and septic arthritis develop

## What causes it?

Scarlet fever is caused by the bacterium *Streptococcus pyogenes* (also known as group A streptococcus, or GAS). It can be found on the skin or in the throat, where it is usually unproblematic in asymptomatic carriers.[8-11] However, certain virulent forms of *S pyogenes* carry genes that code for streptococcal superantigens, including pyrogenic exotoxins, which can cause non-invasive infections such as scarlet fever. The typical rash is caused by the exotoxin.[10-12]

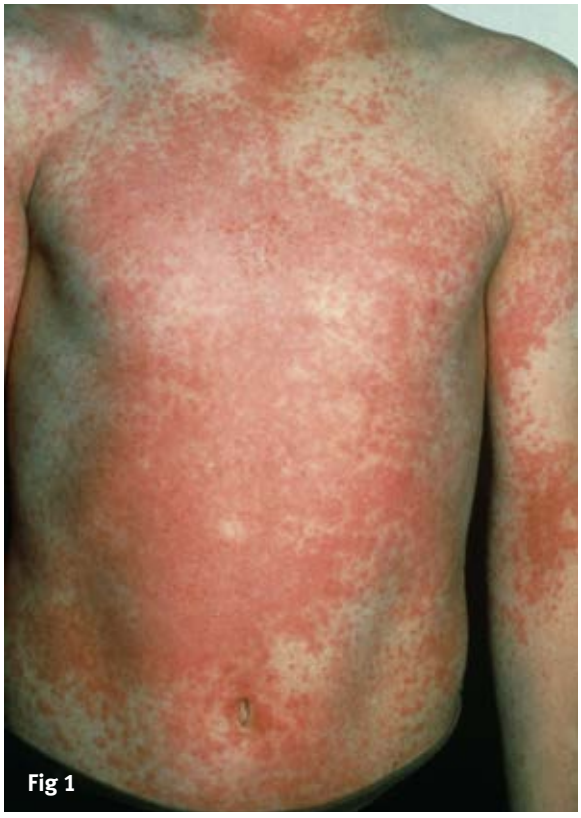
Clinical isolates of *S pyogenes* are differentiated by the emm typing system based on sequencing of the emm gene. No single emm strain seemed to be the cause of the 2016 outbreak.[1]

## What are the symptoms and differential diagnoses?

The symptoms of scarlet fever are non-specific in early illness and may include sore throat, headache, fever, nausea, and vomiting.[8] After 12 to 48 hours, the characteristic red, generalised pinhead rash develops, typically first appearing on the chest and stomach, rapidly spreading to other parts of the body and giving the skin a texture like sandpaper (fig 1). On more darkly pigmented skin, the rash may be harder to see, although still palpable.[8]

Patients typically have flushed cheeks and pallor around the mouth (fig 2). This may be accompanied by a "strawberry tongue" (an initial white coating on the tongue peels, leaving it looking red and swollen) (fig 3).[8 13] The rash is often accentuated in flexures (eg, the antecubital fossae and axillae) and is known as Pastia's lines.[11] The rash usually persists for about a week and may be followed by desquamation at the tips of fingers and toes, and less often over wide areas of the trunk and limbs (fig 4).[8]

Differential diagnoses may include measles, glandular fever, slapped cheek infections, other viral pathogens, Kawasaki disease, staphylococcal toxic shock syndrome, and allergic reactions.[8-11]

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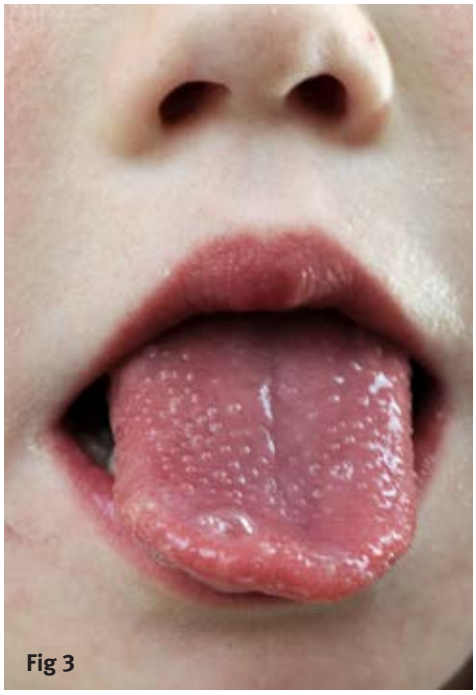


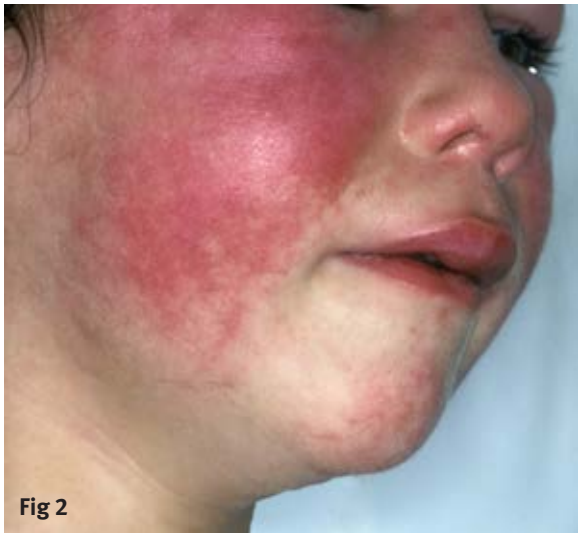

SPL

Fig 1 | The characteristic red, generalised pinhead rash develops, typically first appearing on the chest and stomach, rapidly spreading to other parts of the body

Fig 2 | Reddened cheeks

Fig 3 | Strawberry tongue

Fig 4 | Peeling phase of rash

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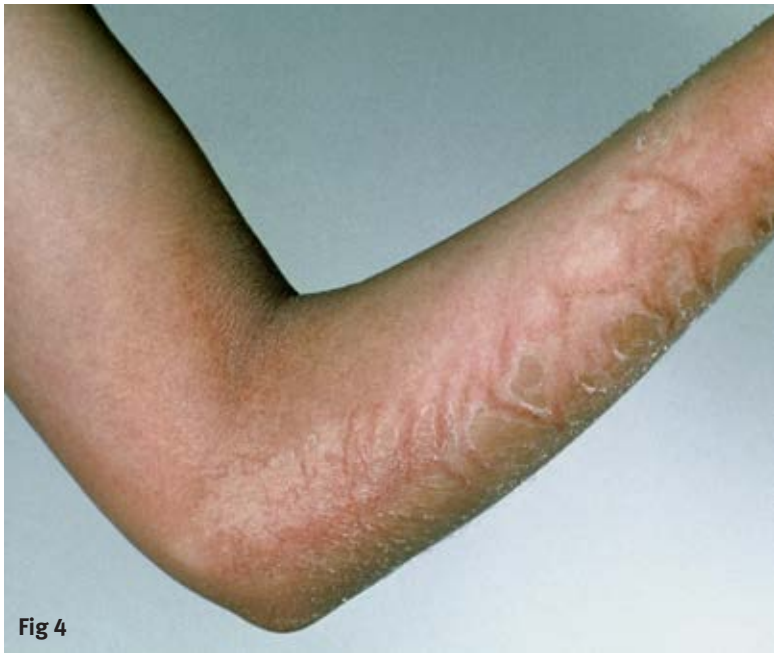


JOHN RADCLIFFE HOSPITAL/SPL

**How is scarlet fever transmitted?**

Scarlet fever is contagious and can be infectious for two to three weeks after the symptoms appear, if untreated.[8] The bacteria spread by contact with mucus or saliva (eg, by breathing infected airborne droplets produced through coughing or sneezing) or by contact with contaminated surfaces. Asymptomatic carriers of streptococcal bacteria are at very low risk of infecting other people.[9 14]

**What are the possible complications?**

Although scarlet fever is usually a mild illness, it can cause the same complications as GAS pharyngitis.[9] Suppurative complications (eg, otitis media, peritonsillar abscess) are caused by local or haematogenous spread of the organism and tend to occur early in the infection.[15] Non-suppurative (autoimmune) complications (eg, acute rheumatic fever, streptococcal glomerulonephritis) tend to occur later in the course of GAS infections, particularly (but not exclusively) in untreated people.[8-15] Permanent kidney damage from streptococcal glomerulonephritis is rare.[15]

**EDUCATION INTO PRACTICE**

- Study the illustrations in this article. How confident are you in recognising typical signs of scarlet fever, including the rash?
- How would you notify your local public health authority about a case of scarlet fever?

### Invasive GAS infection

Invasive GAS infection (iGAS) is an infrequent complication of scarlet fever, in which the bacteria are isolated from a normally sterile body site, such as the blood.[2-18] iGAS infections are acute, frequently life threatening infections ranging from bacteraemia, cellulitis, and pneumonia to meningitis, puerperal sepsis, and septic arthritis.[19 20] Two of the most severe forms of iGAS are necrotising fasciitis and streptococcal toxic shock syndrome.

iGAS infections are most common in older people, the very young, or those with an underlying risk factor such as chickenpox, diabetes, immunosuppression, cancer, alcoholism, injecting drug use, or women in the puerperal period.[8 18] Severe iGAS carries a substantial risk of mortality (around 15-25%) and requires prompt diagnosis and management.[17-20]

In England, Wales, and Northern Ireland, scarlet fever is a notifiable disease. Statutory notifications, based on clinical symptoms consistent with this diagnosis, are submitted to local health protection teams.[8] Cases of iGAS infection should also be notified urgently, so that close contacts can be identified early and advised to be vigilant for symptoms of GAS infection.[2-22]

## What are the principles of management?

General guidance for patients may include advice on rest, drinking plenty of fluids, good hygiene measures to minimise the risk of cross-infection, and the use of paracetamol to reduce discomfort and high temperature.[13-24]

National guidance recommends treating people with scarlet fever with antibiotics regardless of severity of illness to speed recovery, to reduce the length of time the infection is contagious, and to reduce the risk of complications.[8-25] See box for specific drug options.

Overall, the evidence base for the management of scarlet fever is limited, and there is a need for more evidence of the benefits and harms of antibiotics.

Given the increase in scarlet fever in recent years, public health specialists recommend that clinicians are mindful of potential increases in invasive disease and maintain a high index of suspicion with relevant patients.[2]

## Should I test or treat household contacts?

Routine testing of asymptomatic household contacts is not required because of the limited efficacy of antibiotic prophylaxis and potential risks associated with antibiotic use, including adverse effects and promotion of resistance.[8] Antibiotic prophylaxis can be considered in exceptional circumstances, such as in people with severe immunosuppression; the recommended regimen is the same as for treatment.

Advise close contacts to be vigilant for signs or symptoms of scarlet fever or its complications.

Competing interests: Competing interests are in line with *DTB*'s policy on conflicts of interests.

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Find the full version with references at http://dx.doi.org/10.1136/bmj.k3005

### WHAT DO THE GUIDELINES SAY?

#### Guidance from Public Health England (PHE)

PHE interim guidelines were developed by the national incident management team in response to the rise in cases in 2014 and are aimed at addressing outbreaks in schools and nurseries.[8] When a case of scarlet fever is identified, PHE guidelines currently advise clinicians to:

- consider confirming the diagnosis by throat swab (eg, if the case is reported to be part of an outbreak);
- prescribe an appropriate treatment course of antibiotics, without waiting for the culture result if scarlet fever is clinically suspected[8 13];
- advise exclusion from nursery/school/work for 24 hours after starting appropriate antibiotic treatment[8]; and
- notify established local public health teams.[8]

Recommended antibiotics include penicillin V four times per day for 10 days, or azithromycin once daily for five days for patients allergic to penicillin.[8 13] For children in whom compliance with penicillin V is of concern, amoxicillin twice daily may be used as an alternative.[8 13]

The guidelines state that antibiotics speed recovery, substantially lower the risk of complications developing, and that most cases become non-infectious within 24 hours of taking antibiotics.[8]

Patients, or their parents/guardians, should be advised to look out for any symptoms which might suggest complications (eg, persistent high fever, cellulitis, joint pain, and swelling) and to seek medical help immediately if concerned.[8 26]

#### Clinical knowledge summaries from National Institute for Health and Care Excellence (NICE)

The National Institute for Health and Care Excellence (NICE) Clinical Knowledge Summaries guidance for scarlet fever suggests that clinicians arrange admission for urgent assessment and treatment of people with scarlet fever who have pre-existing valvular heart disease or who are substantially immunocompromised (on account of increased risk of complications), or who have a suspected severe complication of scarlet fever (eg, staphylococcal toxic shock syndrome, acute rheumatic fever, or streptococcal glomerulonephritis).[15]

CKS also advise the following:

- If scarlet fever is suspected, the person is well and does not need admission, prescribe antibiotic treatment promptly
- Give advice about symptomatic relief
- Notify the local PHE centre
- Advise the person/family/carers about self care measures
- Consider seeking specialist advice from PHE if a person is at high risk of developing invasive group A streptococcal infection (those who are immunocompromised, have skin lesions, including chicken pox or wounds, have comorbidities such as diabetes mellitus, injecting drug users, and women in the puerperal period)[15]

A 10 day course of penicillin V (or a five day course of azithromycin if allergic to penicillin) is recommended. Amoxicillin (for 10 days) is an option for children if compliance with penicillin is likely to be a problem.[15]

We found no other guidelines on scarlet fever published by NICE, the Scottish Intercollegiate Guidelines Network, or the All Wales Medicines Strategy Group.

## SPOT DIAGNOSIS

### Sudden onset abdominal pain

A 48 year old woman attended the emergency department with a sudden onset of severe abdominal pain, worsening over the few hours before presentation. She underwent a computed tomography scan for further assessment. An axial section through the pelvis is included (fig 1). What radiological sign is present?

Submitted by Rupali D Shah and David Howlett

Patient consent obtained.

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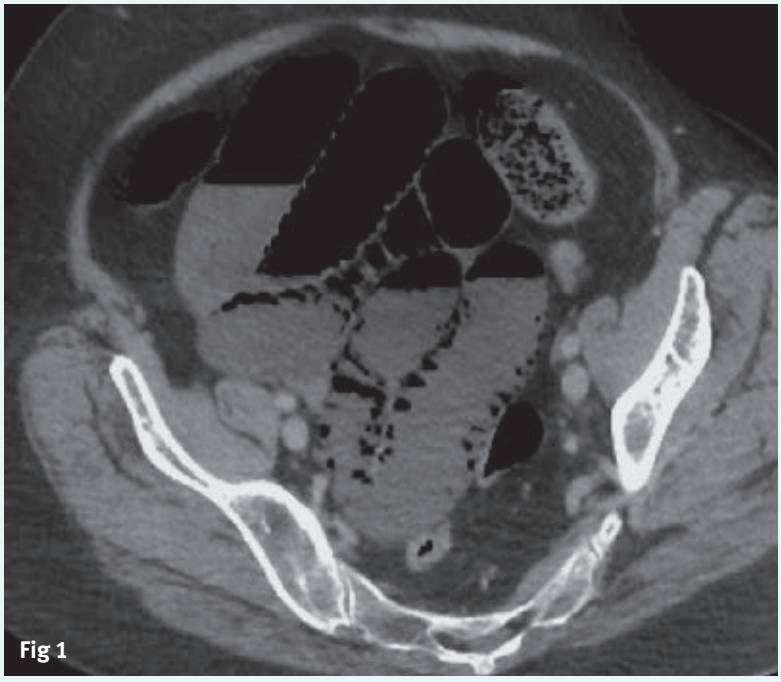

Fig 1

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

## MINERVA WELCOMES SUBMISSIONS

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answer

SPOT DIAGNOSIS **Sudden onset abdominal pain**

Multiple dilated bowel loops of small bowel are seen in the pelvis, with extensive bubbles of air seen within the bowel wall (fig 2, arrows). This sign is known as pneumatosis intestinalis. Most cases occur in the jejunum and ileum. A small number involve the colon (pneumatosis coli). The left side is more commonly affected than the right.

When a patient presents with acute illness, this sign is strongly suggestive of an intra-abdominal catastrophe and loss of sufficient blood supply to the bowel is possible. Intra-abdominal catastrophes include: ischaemia/infarct, bowel perforation, and necrotising enterocolitis (in neonates).

Pneumatosis intestinalis is also seen with indolent conditions, eg, inflammatory bowel disease; infections (*Clostridium difficile*, tuberculosis, AIDS, enterocolitis); pulmonary disorders (chronic obstructive pulmonary disease, asthma, mechanical ventilation); endoscopic procedures; and immunological disturbances.

Emergency exploratory laparotomy is indicated in patients with any of the following:

- Signs of an acute abdomen/peritonism
- Metabolic acidosis
- Raised lactate >2 mmol/L
- Portal venous gas.

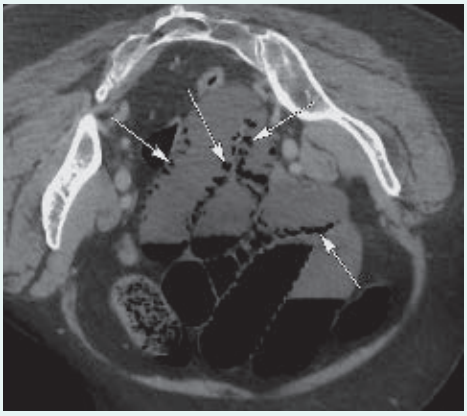

**Fig 2 | Arrows point to extensive bubbles of air within the bowel wall (pneumatosis intestinalis)**

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

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## A giant corneal dermoid

A child of 17 months from a remote region of China presented with a soft and painless mass in his left eye. The mass had been present since birth and had gradually increased in size. It had a skin-like surface (figure) and straddled the entire cornea, protruding outside the palpebral fissure. Ultrasound biomicroscopy showed an unformed anterior chamber and lens. The diagnosis was corneal dermoid.

Corneal dermoids are benign congenital choristomas—proliferations of microscopically normal tissue derived from germ cell layers foreign to that site. They frequently locate at the corneal limbus, but occasionally involve the entire cornea.

The dermoid was excised, and the child underwent lamellar keratoplasty to improve the final appearance. Surgical removal of corneal dermoids at an early age produces better cosmetic results and avoids amblyopia, which is a risk if dermoids involve the visual axis. Systemic examination is recommended to identify possible associated oculoauriculovertebral dysplasia.

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Parental consent obtained.

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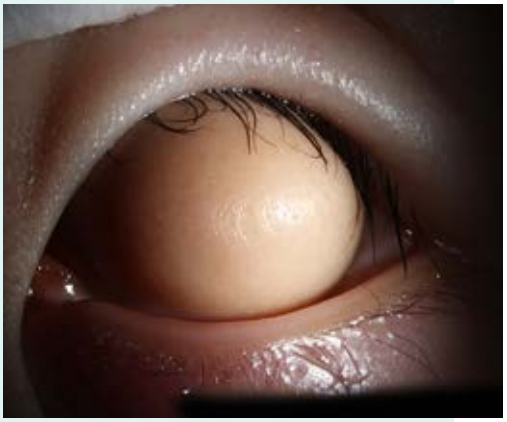

## No benefit of chocolate

Chocolate is rich in flavonoids, which have antiplatelet, antioxidant, and anti-inflammatory effects. Even so, the idea that eating chocolate would protect against heart disease was always likely to be wishful thinking. An analysis of data from the Women's Health Initiative will bring chocolate lovers down to earth (*Am J Clin Nutr*). For 13 years, the study followed more than 80 000 women who were past menopause, and found that those who ate chocolate were no less likely to develop heart disease or stroke than those who never touched the stuff.

## Non-participation

People who agree to take part in epidemiological studies may differ in all sorts of ways from those who don't. If these differences correlate with either the exposures or the outcomes being studied, the findings are likely to be biased. A study of mothers' health within a Danish National Birth Cohort found that participating women tended to be older, healthier, of higher social status, and more likely to have been treated for breast cancer (*Am J Epidemiol*). Taking account of these factors in the analysis helped reduce bias, but it's hard to be sure that it was eliminated.

## Deaths during heat waves

Heat waves are known to bring a transient increase in mortality, but an analysis of 35 years' worth of data from 47 cities in Spain, where average summer temperatures have increased by nearly one degree Celsius since 1980, finds that the number of deaths that could be associated with heat has been gradually falling (*PLoS Med*). The reasons underlying this trend haven't been identified, but it does suggest that climate change isn't inevitably linked to worsening health outcomes and that societies and individuals find ways to adapt.

## Early determinants of frailty in old age

It's well established that the risk of several chronic diseases including heart disease, stroke, and obstructive lung disease is partly determined early in life. A birth cohort study from Finland adds frailty in old age to the list (*Age Ageing*). Assessed at the age of 71, frailty was inversely associated with birthweight and length and body mass index at birth. A 1 kg increase in birthweight roughly halved the relative risk of frailty. Of course, factors operating in later life also made a difference. Frailty was three times commoner in people who had been manual workers than in those in professional occupations.

## Self harm in adolescence

Last year a research report in *The BMJ* drew attention to the rising rates of intentional self harm among adolescents in the UK. A large survey of high schools in the US shows that the prevalence is worryingly high there too. Around one in four girls and one in 10 boys reported deliberately hurting themselves at least once in the previous 12 months. There was considerable geographical variation—rates of self harm among girls in Idaho, for example, were nearly twice as high as they were in Delaware—which raises questions about how self harming behaviour is propagated (*AJPH*).

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