

education

FROM THE JOURNALS Edited highlights of weekly research reviews on <https://bit.ly/2PLtl18>

Convalescent confusion

This Chinese trial on the effect of convalescent plasma therapy for covid-19 had to be stopped early as it ran out of patients. But what did the researchers find in the 103 people with severe covid-19 that they were able to randomise? The primary endpoint was time to clinical improvement in 28 days, with improvement defined as discharged alive or a reduction of 2 points on a disease severity scale ranging from 1 for discharge to 6 for death. In the convalescent plasma group, clinical improvement within 28 days occurred in 51.9%. In the control group, 43.1% had clinical improvement. This difference was not statistically significant. This is no reason to abandon convalescent plasma as a potential therapeutic avenue, because the trial was probably underpowered owing to early termination. However, I would also say that, ideally, this trial would not have been open label.

• *JAMA* doi:10.1001/jama.2020.10044



fully-prospective data are interesting, but there was no control group, let alone randomisation. Therefore, this cannot and should not inform the decision whether to operate in the presence of the virus. For starters, a lot of these operations would probably not have gone ahead during the pandemic unless their clinicians felt that it was absolutely necessary. The authors suggest that death rates would have been lower if surgery had been deferred. But is it even possible to defer “emergency surgery”?

• *Lancet* doi:10.1016/S0140-6736(20)31182-X

Masks, distancing, and more

Has anyone else noticed the surreptitious drift from “mask” to “face covering” lately? Anyway, let’s talk about masks. In their systematic review of 172 observational studies, Chu and colleagues have brought together the evidence on masks, respirators, eye protection, and physical distancing for the pandemic viruses SARS-CoV-2, SARS-CoV, and MERS-CoV. Of the studies, 44 were comparative and thus included in their meta-analysis. They found that masks, including N95 respirators and surgical masks, were associated with a lower risk of infection compared with no mask. They report that N95 respirators might be more protective than surgical masks and that both types might be more protective than a single layer mask.

• *Lancet* doi:10.1016/S0140-6736(20)31142-9

Psychological distress and loneliness

In this survey of almost 1500 US adults, McGinty and colleagues studied levels of psychological distress using the Kessler scale and levels of loneliness. They compared the distress levels with national data from 2018. In 2018, the prevalence of serious psychological distress was 3.9%. In April 2020 it was 13.6%. The authors note a worrying implication of these findings—that, since the Kessler scale is predictive of serious mental illness, the distress during the pandemic could transfer to longer term psychiatric disorders. This is not outside the realms of possibility, especially since the social and economic impact of the pandemic is expected to be felt for years to come. The authors should be commended both for their methodology and for their upfront discussion of its limitations—namely the potential for sampling bias. People might have been more likely to respond to such a survey in April 2020 compared with 2018; therefore, the 2020 figures could be an overestimate.

• *JAMA* doi:10.1001/jama.2020.9740

Observational operating data

The COVIDSurg Collaborative conducted a cohort study spanning 24 countries. They analysed the outcomes for over 1000 patients who underwent surgery in the first three months of 2020 and had confirmed SARS-CoV-2 infection (either seven days before surgery or less than 30 days after). Almost three quarters were emergency surgeries. Half had postoperative pulmonary complications. Almost a quarter of the cohort died within 30 days. Most of the deaths were due to pulmonary complications. Risk factors for death were male sex, older age, and higher ASA grade (that is, comorbidities). These not-even-

Post-exposure prophylaxis with hydroxychloroquine

Boulware and colleagues performed a double blind randomised controlled trial of hydroxychloroquine in the US and Canada. The aim was to see if a five day course of hydroxychloroquine could lower the risk of getting covid-19 if given within four days of the exposure. It didn’t. The authors found no difference in infection rates between those who received the drug compared with placebo. This study had a number of atypical features. Recruitment was primarily via social media, and patients enrolled themselves online. The primary endpoint (illness consistent with covid-19 or confirmed covid-19) was often based on self reported symptoms as PCR testing was not widely available. They randomised 921 people but included only 821 in the final analysis because the others became symptomatic which rendered them ineligible. However, these features do not invalidate the conclusion that this strategy was not effective.

• *N Engl J Med* doi:10.1056/NEJMoa2016638



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Covid-19 and acute kidney injury in hospital: summary of NICE guidelines

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0.5 HOURS

This article summarises key points from the National Institute for Health and Care Excellence (NICE) covid-19 rapid guideline on AKI in hospital.⁸

Recommendations

Communicating with patients

- Communicate effectively with patients, their families, and carers, and support their mental wellbeing to help alleviate any anxiety they may have about covid-19. Signpost to charities and UK government guidance on the mental health and wellbeing aspects of covid-19.⁹

Minimising risk for patients and healthcare workers

- All healthcare workers involved in receiving, assessing, and caring for patients who have known or suspected covid-19 should follow UK government guidance for infection prevention and control.¹⁰
- If covid-19 is later diagnosed in a patient not isolated from admission or presentation, follow UK government guidance on management of exposed healthcare workers and patients in hospital settings.¹¹

Planning treatment and care

- Discuss the risks, benefits, and likely outcomes of treatment options with patients with covid-19, and their families and carers. This will help them make informed decisions about their treatment goals and wishes, including treatment escalation plans where appropriate.
- Find out if patients have advance care plans or advance decisions to refuse treatment, including “do not attempt cardiopulmonary resuscitation” decisions, and take account of these in planning care.
- Monitor patients for the development or progression of chronic kidney disease (CKD) after AKI. Guidance on care after hospital discharge produced jointly by Think Kidneys and the Royal College of General Practitioners is designed to support safer transitions of care and post-discharge monitoring, and is of relevance to both hospital and general practice teams.¹²

Assessing for AKI in patients with suspected or confirmed covid-19

Be aware that, in patients with covid-19, AKI

- may be common, but prevalence is uncertain and depends on clinical setting; the Intensive Care National Audit and Research Centre’s report on

Acute kidney injury (AKI), a sudden reduction in kidney function, is seen in some people with covid-19 infection. A subset of patients develop severe AKI and require renal replacement therapy (RRT). As in many settings, the development of AKI is associated with an increased risk of mortality.^{1,2} Although our understanding is incomplete, a picture is emerging from case reports and autopsy series of covid-19 specific causes of AKI. Intrinsic renal pathology including thrombotic vascular processes, viral mediated tubular cell injury, and glomerulonephritis have been reported, as well as AKI resulting from extrinsic factors such as fluid depletion, multi-organ failure, and rhabdomyolysis.³⁻⁷ Anecdotal reports have emerged of proximal tubular injury with Fanconi syndrome that manifests as hypokalaemia, hypophosphataemia, normal anion gap metabolic acidosis, and hypovolaemia from salt wasting. Importantly, AKI can occur at all stages of covid-19 infection, so clinical vigilance and consideration of risk factors for AKI alongside early detection and diagnosis are essential components of general supportive care. Fluid management is central to this.

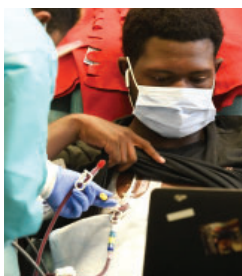
HOW PATIENTS WERE INVOLVED IN THE CREATION OF THIS ARTICLE

Patients were not involved in the creation of this article.

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WHAT YOU NEED TO KNOW

- Acute kidney injury (AKI) may be common in patients with covid-19 and is associated with an increased risk of dying
- AKI associated with covid-19 may be caused by volume depletion, multi-organ failure, viral infection leading directly to kidney tubular injury, thrombotic vascular processes, glomerulonephritis, or rhabdomyolysis
- Maintaining optimal fluid status (euvolaemia) is critical in reducing the incidence of AKI
- Regular assessments of fluid status and fluid management plans are necessary, and in those who need intravenous fluids the choice of replacement fluid should be based on patients’ biochemistry and fluid status
- An increased risk of coagulopathy may cause problems with clotting of the extracorporeal circuit during renal replacement therapy



covid-19 in critical care reported that 31% of patients on ventilators and 4% not on ventilators needed renal replacement therapy for AKI¹³

- is associated with an increased risk of dying¹²
- can develop at any time before or during hospital admission
- causes may include volume depletion (hypovolaemia), haemodynamic changes, viral infection leading directly to kidney tubular injury, thrombotic vascular processes, glomerular pathology, or rhabdomyolysis¹⁴
- may be associated with haematuria, proteinuria, and abnormal serum electrolyte levels (both increased and decreased serum sodium and potassium).¹

Be aware that in patients with covid-19

- maintaining optimal fluid status (euvoemia) is critical in reducing the incidence of AKI, but this can be hard to achieve
- treatments being used to manage covid-19 may increase the risk of AKI—for example, diuretics if they have caused volume depletion (hypovolaemia)
- fever and increased respiratory rate increase insensible fluid loss
- dehydration (often needing correction with intravenous fluids) is common on admission to hospital and may also develop later
- risk of coagulopathy is increased.

On hospital admission or transfer, assess for AKI in all patients.

Record

- medical history and comorbidities, including factors that further increase the risk of AKI (such as CKD, heart failure, liver disease, diabetes, history of AKI, age 65 or over)
- fluid status by clinical examination (for example, peripheral perfusion, capillary refill, pulse rate, blood pressure, postural hypotension, jugular venous pressure, or pulmonary or peripheral oedema)
- fluid status by fluid balance (fluid intake, urine output, and weight)
- full blood count

AREAS OF UNCERTAINTY

Information regarding renal involvement in covid-19 is extremely limited in several areas, and further evidence is required. Some of the most pressing questions include

- What is the incidence of AKI in hospitalised patients with covid-19, both in and outside of the intensive care unit?
- What, if any, are the typical clinical, laboratory, and urinary features that characterise AKI in the setting of covid-19?
- What are the different histological patterns of renal involvement in covid-19 and how do these relate to clinical presentation?
- What are the long term effects of covid-19 on renal function, including the proportion of survivors who require ongoing renal replacement therapy resulting from end stage kidney disease?

AKI can occur at all stages of covid-19 infection; clinical vigilance is essential



GABRIEL KUCHTA/GETTY IMAGES

- serum urea, creatinine, and electrolytes (sodium, potassium, bicarbonate).

Review the use of medicines that can cause or worsen AKI and stop these unless essential.

- Ask a pharmacist for advice about optimising the choice and dosage of medicines, including anticoagulants for treatment or prophylaxis. More detailed information is available in the Think Kidneys guidelines for medicines optimisation in patients with AKI.¹⁵

Continue to assess for AKI. Record and monitor fluid status by clinical examination and fluid balance daily. Measure serum urea, creatinine, and electrolytes (sodium, potassium, bicarbonate) at least every 48 hours or more often if clinically indicated (eg, in those at increased risk of AKI, in those who have sustained AKI, and those with electrolyte abnormalities).

Composition of commonly used fluids, adapted from NICE guideline (CG174)¹⁸

Content	Plasma	Sodium chloride 0.9%	Sodium chloride 0.18%/4% glucose	Sodium chloride 0.45%/4% glucose	5% glucose	Hartmann's	Lactated Ringer's	Ringer's acetate	Alternative balanced solutions for resuscitation†	Alternative balanced solutions for maintenance†
Na ⁺ (mmol/L)	135-145	154	31	77	0	131	130	130	140	40
Cl ⁻ (mmol/L)	95-105	154	31	77	0	111	109	112	98	40
Na ⁺ :Cl ⁻ ratio	1.28-1.45:1	1:1	1:1	1:1	-	1.18:1	1.19:1	1.16:1	1.43:1	1:1
K ⁺ (mmol/L)	3.5-5.3	*	*	*	*	5	4	5	5	13
HCO ₃ ⁻ (mmol/L)	24-32	0	0	0	0	29 (lactate)	28 (lactate)	27 (acetate)	27 (acetate)23 (gluconate)	16 (acetate)
Ca ²⁺ (mmol/L)	2.2-2.6	0	0	0	0	2	1.4	1	0	0
Mg ²⁺ (mmol/L)	0.8-1.2	0	0	0	0	0	0	1	1.5	1.5
Glucose (mmol/L)	3.5-5.5	0	222	222	278	0	0	0	0	222
pH	7.35-7.45	4.5-7	4.5		3.5-5.5	5-7	6-7.5	6-8	4-8	4.5-7
Osmolarity (mOsm/L)	275-295	308	284		278	278	273	276	295	389

*These solutions are available with no potassium or differing quantities of potassium already added.

†Alternative balanced solutions are available commercially under different brand names and composition may vary by preparation.



Use an early warning score for patients whose clinical condition is deteriorating or who have suspected sepsis:

- NEWS2 has been endorsed by NHS England.
- When using NEWS2 be aware of the Royal College of Physicians' warning that any increase in oxygen requirements should be escalated for clinical review and increased observations.¹⁶

Detecting and investigating AKI in patients with suspected or confirmed covid-19

Detect AKI using NHS England's AKI algorithm¹⁷ or any of the following criteria:

- an increase in serum creatinine of $\geq 26 \mu\text{mol/L}$ in 48 hours
- an increase of $\geq 50\%$ in serum creatinine, known or presumed to have occurred in the past seven days
- a fall in urine output to $\leq 0.5 \text{ mL/kg/h}$ for more than six hours.

Do urinalysis for blood, protein, and glucose to help identify the cause of AKI. Record the results and take action if these are abnormal (including referral if needed; see section below on referral in patients with suspected or confirmed covid-19).

Perform imaging if urinary tract obstruction is suspected.

Managing fluid status in patients with suspected or confirmed covid-19

- Aim to achieve and maintain optimal fluid status (euvoalaemia) in all patients.
- If there is volume depletion (hypovolaemia) and fluid needs cannot be met orally or enterally, give patients intravenous fluids as part of a protocol to restore and maintain optimal fluid status (euvoalaemia).

- Ensure patients have an intravenous fluid management plan that is reviewed daily.
- Base choice of fluids on biochemistry results and fluid status. The composition of commonly used fluids is summarised in the table.
- Do not routinely offer loop diuretics to treat AKI but consider them for treating fluid overload.

Managing hyperkalaemia in patients with suspected or confirmed covid-19

- Be aware of the risk of hyperkalaemia and manage according to local protocols.
- The potassium binders patiromer and sodium zirconium cyclosilicate can be used alongside standard care for the emergency management of acute life threatening hyperkalaemia (these agents have been approved by NICE for this indication).^{19,20}

Referral in patients with suspected or confirmed covid-19

Refer patients with AKI for further specialist advice if

- there is diagnostic uncertainty about the cause of AKI, which may need further tests or imaging
- they have abnormal urinalysis results, which may be a sign of covid-19 induced kidney damage or other intrinsic renal disease
- fluid management needs are complex
- AKI is worsening despite initial management or has not resolved after 48 hours
- the patient has usual indications for renal replacement therapy, particularly if there is no urine output, such as
 - life threatening hyperkalaemia
 - refractory fluid overload
 - severe metabolic acidosis.

Renal replacement therapy in patients with suspected or confirmed covid-19

The scope of the guideline did not include a detailed review of the technical aspects of provision of renal replacement therapy (RRT) in covid-19. Resources were signposted as follows:

- NHS England has produced a clinical guide on renal replacement therapy options in critical care during the coronavirus pandemic for options for patients with usual indications for RRT based on local availability, equipment, supplies, staffing, and local expertise.²¹
- The Renal Association has collated a set of covid-19 resources, which include protocols for RRT.²²
- Be aware of the anecdotal reports of RRT circuit clotting because of the increased risk of coagulopathy in patients with covid-19.
- No evidence was found on how best to provide anticoagulation during RRT in patients with covid-19.

Competing interests: NICE has obtained disclosures of interests from all authors.

Cite this as: *BMJ* 2020;369:m1963

Find the full version with references at <http://dx.doi.org/10.1136/bmj.m1963>

HOW THIS GUIDELINE SUMMARY WAS PREPARED

The guideline is part of a series of rapid guidelines on coronavirus (covid-19), developed using interim methods.²³ The guidelines are based on evidence available when the guideline was published on 6 May 2020 plus expert opinion, and have been verified as far as possible by NICE. Recommendations will be reviewed and updated as the knowledge base and expert experience develops. Readers should refer to the full guideline on the NICE website for the latest version of the guidance (<https://www.nice.org.uk/guidance/ng175>) and see the NICE coronavirus page (<https://www.nice.org.uk/covid-19>) for additional NICE rapid guidelines on covid-19.

GUIDELINES INTO PRACTICE

- Can you identify patients with covid-19 who are at particular risk of sustaining AKI?
- Do you know which patients with covid-19 associated AKI should be referred for specialist advice, and do you know your local referral pathway?
- How should patients who have sustained covid-19 associated AKI be followed up in primary care, and do you know where to find RCGP guidance on AKI care after hospital discharge?

EASILY MISSED?

Fractures of the scaphoid

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0.5 HOURS



See <http://learning.bmj.com> for linked learning module

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A 25 year old man sustains an extension injury of his right wrist while playing football as a goalkeeper, and presents to the emergency department the same day with wrist pain. Examination reveals tenderness over the radial side of the wrist, including within the anatomical snuffbox, as well as tenderness over the tubercle of the scaphoid. However, he has no pain on longitudinal compression of his thumb. Standard posteroanterior and lateral wrist radiographs are performed (fig 1) and as no fracture is seen, he is discharged. He re-attends six weeks later with ongoing pain, and a series of scaphoid radiographs (fig 2) show a fracture of the proximal third of the scaphoid.

EDUCATION INTO PRACTICE

- Consider the last time that a patient presented with wrist pain after a fall. What clinical signs did you seek?
- How would you proceed if a set of scaphoid radiographs was reported as normal, but the patient's anatomical snuffbox tenderness persisted?

HOW PATIENTS WERE INVOLVED IN THE CREATION OF THIS ARTICLE

A patient had the opportunity to review and comment on the draft manuscript. She did not think any changes to the manuscript were needed but did share her own experiences of having a delayed diagnosis of a scaphoid fracture and needing surgery to treat the injury.

HOW THIS ARTICLE WAS MADE

We undertook a focused search strategy on Pubmed, using the search term "scaphoid fracture" combined with other specific search terms including "epidemiology", "litigation", and "imaging".

WHAT YOU NEED TO KNOW

- The most sensitive clinical sign of scaphoid fracture is anatomical snuffbox tenderness, but it has low specificity (ie, a high rate of false positives)
- The first line investigation is a four-view scaphoid radiograph series, but negative radiography does not rule out fracture
- For patients with a clinically suspected scaphoid fracture but normal radiographs, the next step is wrist immobilisation and further imaging, preferably a magnetic resonance imaging scan
- Patients with scaphoid fractures that are missed are more likely to develop a non-union, and potentially post-traumatic osteoarthritis of the wrist

What is a scaphoid fracture?

It is a break in one of the carpal bones, the scaphoid, which sits between the radius proximally, and the trapezium and trapezoid distally (fig 1). The mechanism of injury is typically forced hyperextension of the wrist, such as when falling on to an outstretched hand. Less common mechanisms of injury include forced hyperextension by impact against a steering wheel in a road traffic incident or from a ball.¹ Scaphoid fractures can be classified in many ways. One method, based on the site of the fracture, is illustrated in fig 3.²

How common is it?

Estimates of the incidence of scaphoid fracture in the UK have ranged from 12.4 per 100 000 to 29 per 100 000 per year.^{3,4} Incidence is higher in young men and in people of lower socioeconomic status.³

Why is it missed?

Scaphoid fractures can be missed if patients with symptoms of wrist pain after trauma are not appropriately examined, and if appropriate imaging is then not carried out. A common clinical sign of a scaphoid fracture is tenderness in the anatomical snuffbox of the wrist (fig 4a), with 87-100% sensitivity but low specificity for scaphoid fracture (eg, <40% in one meta-analysis⁵). A full series of four scaphoid radiographs should be carried out in patients with this or other relevant signs (see How is it diagnosed? below). Missed diagnoses can also occur because the sensitivity of scaphoid radiographs in the first week after injury is only 80%, meaning that negative radiographs cannot reliably rule out a fracture.⁶ Finally, patients do not always seek medical attention right away, as their wrist pain can improve after a few days, giving the impression of a resolving sprain.

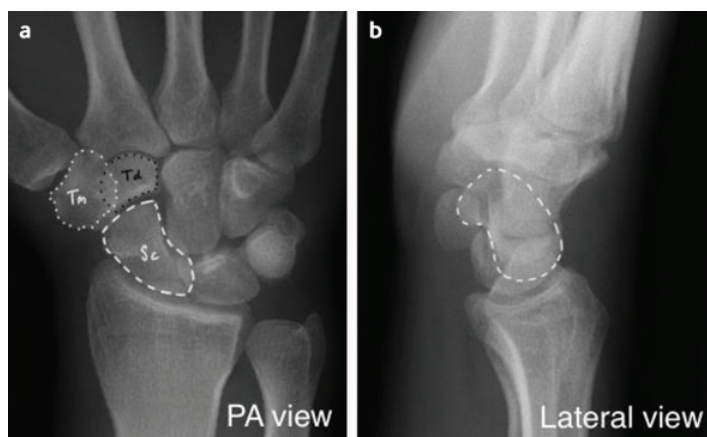


Fig 1 | Initial radiographs obtained in the emergency department with and without labels. These only included standard (a) posteroanterior and (b) lateral views of the wrist. No scaphoid fracture was visible on these views. Scaphoid (Sc) marked with a broken white line; trapezium (Tm) marked with dotted white line, and trapezoid (Td) marked with dotted black line

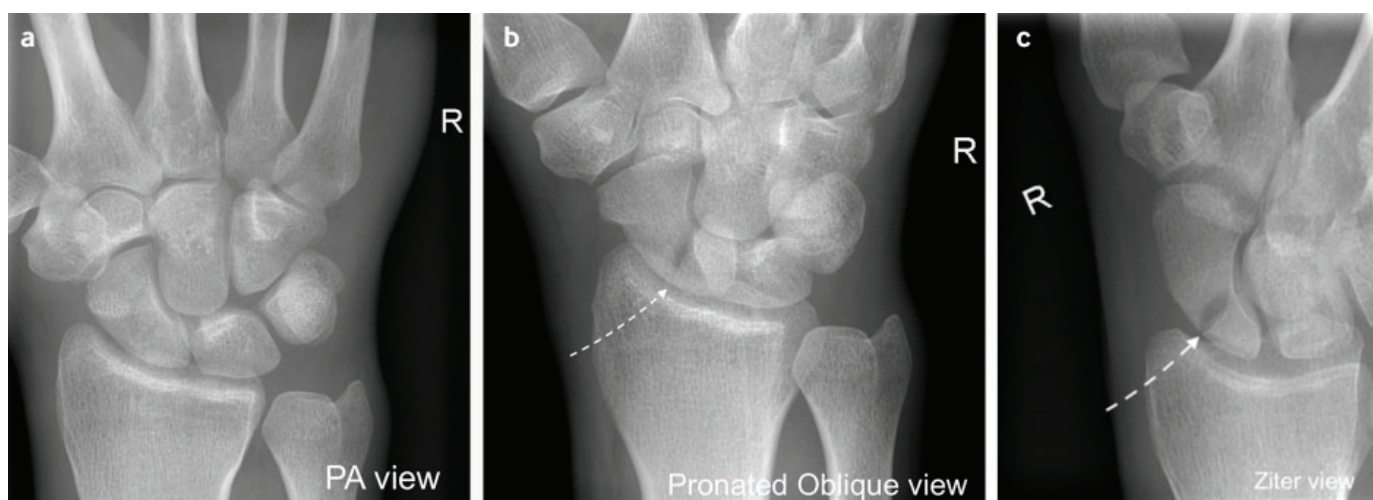


Fig 2 | Scaphoid views performed six weeks after the injury. Three of the standard scaphoid series are presented including (a) posteroanterior, (b) pronated oblique, and (c) Ziter views. A proximal pole fracture is clearly seen on the pronated oblique and the Ziter views. The fracture is still not visible on the posteroanterior view, similar to the equivalent radiograph taken at day 1 (fig 1a). Arrow indicates fracture site

Why does this matter?

Fractures of the scaphoid that are not diagnosed or treated promptly, and certainly within four weeks of injury, are more likely to progress to a non-union.⁷ Most non-unions are symptomatic and require surgical treatment, usually with screw fixation and often with bone grafting. If a non-union persists for a significant duration, either through lack of treatment or unsuccessful treatment, the risk of post-traumatic osteoarthritis of the wrist is high, with up to 75% of patients with scaphoid non-union presenting with radioscaphoid degenerative changes within four years of sustaining a scaphoid fracture.⁸ Post-traumatic osteoarthritis can lead to pain, stiffness, and loss of function, and can have a broader impact on quality of life. Additionally, post-traumatic avascular necrosis (AVN) of the scaphoid is a complication that is associated with non-union. AVN occurs in the proximal fragment and is caused by interruption of the retrograde blood supply of the scaphoid. The supply is mainly from branches of the radial artery entering via a dorsal ridge on the scaphoid.⁹ Patients with osteonecrosis of the scaphoid would typically present with symptoms related to their non-union.

A recent review of NHS Litigation Authority data from 1995 to 2012 revealed that wrist and scaphoid fractures together made up 36% of all claims pertaining to hand and wrist surgery, and that the leading reason for claims was “incorrect, missed, or delayed diagnosis.”¹⁰ A similar study looking specifically at the cost of successful claims related to scaphoid fractures between 1995 and 2010 showed that, of 85 settled cases within the NHS over that period, 57 claims were brought for reasons of missed diagnosis.¹¹

How is it diagnosed?

The timely diagnosis of a scaphoid fracture in a patient with an injured wrist is achieved through careful physical examination and accurate interpretation of the appropriate imaging tests. Common clinical examination findings include anatomical snuffbox tenderness (fig 4a), scaphoid tubercle tenderness (fig 4b), and a positive thumb longitudinal compression test (fig 4c). Anatomical snuffbox tenderness is the most sensitive test but lacks specificity.⁵ Palpating the scaphoid within the anatomical snuffbox is easier with the wrist held in ulnar deviation. Combining these three clinical tests can improve diagnostic

sensitivity and specificity: a prospective clinical study combining snuffbox tenderness, scaphoid tubercle tenderness, and pain on longitudinal compression of the thumb within 24 hours of the injury showed 100% sensitivity and 74% specificity for scaphoid fracture.¹² In other words, a patient without any of these signs within 24 hours of injury is very unlikely to have sustained a fracture. These clinical signs resolve quickly, however, such that they are no longer reliable 48 to 72 hours after the injury.¹² A 2014 meta-analysis found that the sensitivity and specificity of clinical tests to diagnose scaphoid fracture were variable, but also supported the combination of these three tests to improve specificity.⁵

Clinical suspicion of scaphoid fracture should prompt a four-view series of scaphoid radiographs at the earliest opportunity. The radiographic series should include a posteroanterior (PA) view, lateral wrist view, an oblique view with the wrist pronated 45°, and a “Ziter view,” which is a PA view with the wrist in ulnar deviation and the beam angulated at 20° (fig 2c). Radiographs can supplement examination findings but cannot alone rule out a fracture. In one study, the four-view series described above failed to show a fracture in 16% of cases.¹³

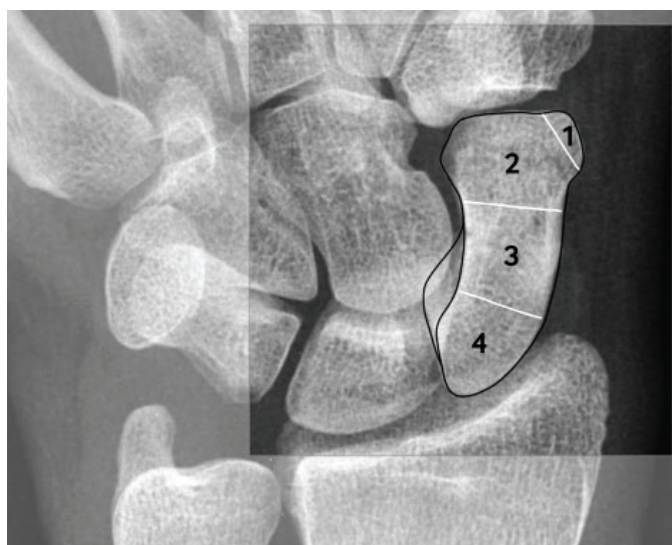


Fig 3 | A common classification system for scaphoid fractures.² (1) scaphoid tubercle fracture, (2) distal pole, (3) waist, (4) proximal pole

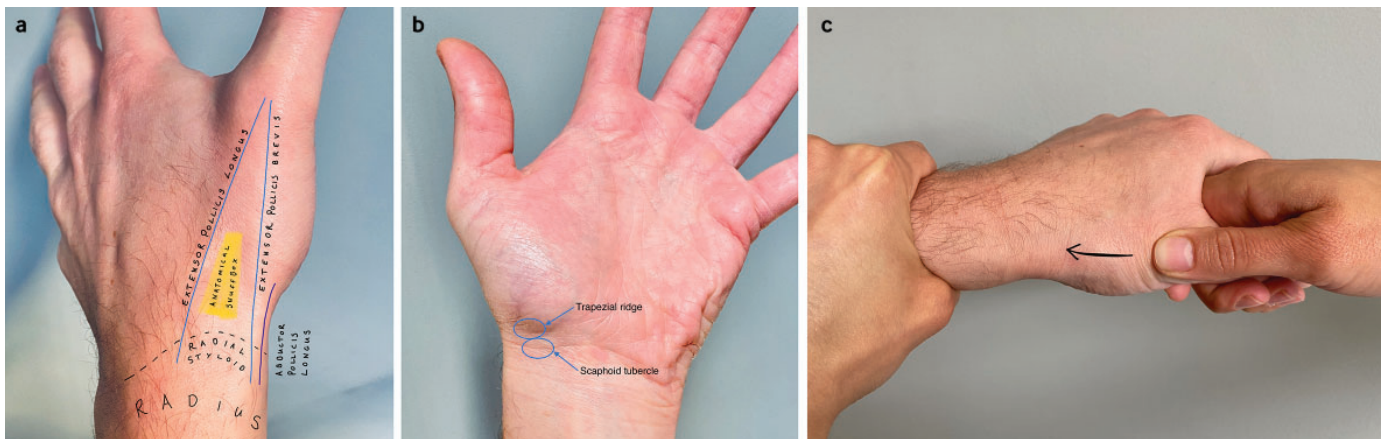


Fig 4 | Surface markings of (a) the anatomical snuff box (yellow triangle) and (b) the scaphoid tubercle. The trapezial ridge is also indicated to highlight the close proximity of the two anatomical features. (c) The thumb longitudinal compression test

Further imaging is essential if radiographs are normal and clinical suspicion of scaphoid fracture remains. It has been common practice to carry out a second set of radiographs one week to 10 days after the first, which often coincides with the first fracture clinic appointment. However, negative radiographs still cannot rule out the presence of a fracture. Cross sectional imaging is then required. This is usually obtained at or just after the first fracture clinic appointment. Either a computed tomography or magnetic resonance imaging (MRI) scan can be carried out, depending on local availability. MRI wrist scans are preferable as they have a higher sensitivity and specificity of 94.2% and 97.7%, respectively (compared with 81.5% and 96.0% for computed tomography), with the added advantages of avoiding exposure to ionising radiation and of identifying other associated bone and soft tissue injuries.¹⁴

A 2019 study of patients presenting to the emergency department with clinical signs suggestive of scaphoid fracture but negative radiographs found the use of an immediate abbreviated MRI scan in the emergency department to be cost saving of £266 at six months post-injury, compared with splintage and fracture clinic follow-up.¹⁵ The UK National Institute for Health and Care Excellence (NICE) also recommends an MRI scan for investigating clinically suspected scaphoid fractures where the initial radiographs are normal.¹⁶ The diagnosis of a scaphoid fracture in children should follow the same principles as for adults, as currently there is insufficient evidence to suggest otherwise.¹⁷

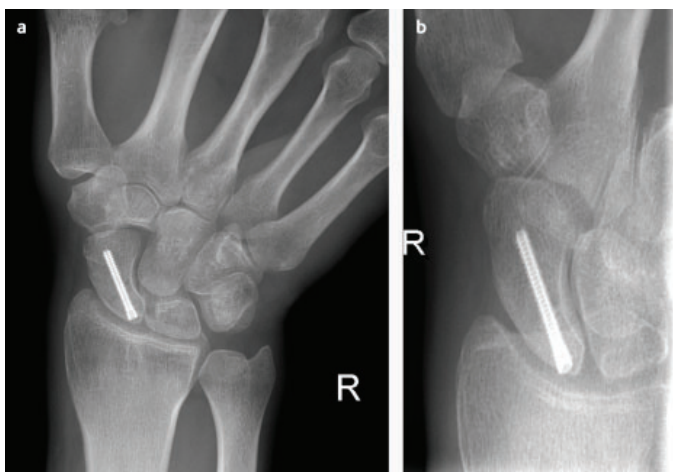


Fig 5 | (a) Posteroanterior and (b) Ziter view radiographs, nine months after surgery, showing the scaphoid fracture union with a headless screw in situ

A PATIENT'S PERSPECTIVE

I went to the emergency department seven months ago after falling off my bike and injuring my wrist. Two x rays were taken of my wrist, instead of four, and the x rays that were done did not show a fracture. I had agonising pain for the following few months and found it difficult to do basic things like getting dressed, brushing my hair, cooking, or typing. I went to see my GP to ask for an MRI scan, but was told that I had to be referred to a physiotherapist. I underwent physiotherapy treatment for around four months but my pain didn't really improve, and I was only able to continue working by using a mixture of painkillers and anti-inflammatory gels. When I finally got to see a specialist, the full set of x rays was taken and they showed an obvious fracture that had not healed. I ended up needing to have a computed tomography scan and then an operation two weeks later to encourage the fracture to heal. I can't help but feel that I should have had the full set of x rays in the first place, or an MRI when I asked for one, and if these things had been done I would not have had to experience pain and frustration over the last seven months, and maybe would not have needed an operation at all.

How is it managed?

Primary management of a suspected or confirmed scaphoid fracture in the emergency department setting is immobilisation with a Futuro splint or standard below-elbow backslab, and onward referral to the local fracture clinic or orthopaedic doctor. The subsequent treatment of the fracture is dependent on both patient and fracture characteristics. Undisplaced fractures of the waist of the scaphoid, and most distal pole fractures are usually treated in a cast for six to eight weeks, with high rates of union (>95%).¹⁸ Plaster immobilisation for undisplaced fractures does not need to include the thumb or elbow.¹⁹

A small cohort of patients with undisplaced or minimally displaced waist fractures—including athletes—may benefit from early surgical intervention to aid return to work.²⁰ The outcomes of early fixation compared with cast treatment for minimally displaced fractures are being further examined in the multi-centre SWIFFT study.²¹ Displaced scaphoid waist fractures (≥ 1 -2 mm) are more unstable and require fixation to avoid non-union.²² It is generally accepted that all proximal pole fractures should be treated operatively, as non-union rates for cast immobilisation can be as high as 34%.²³ The gold standard test for the assessment of fracture union is a computed tomography scan.²⁴ Figure 5 shows radiographic scans of fracture union, nine months after surgery.

Competing interests: None declared.

Cite this as: *BMJ* 2020;369:m1908

Find the full version with references at <http://dx.doi.org/10.1136/bmj.m1908>

MINERVA

Pulsus paradoxus

Pulsus paradoxus is an exaggeration of the normal fall in stroke volume and systolic pressure that occurs during inspiration. It's paradoxical only because it is possible to detect heart beats by chest auscultation that can't be palpated at the wrist. Once a classic sign of cardiac tamponade, pulsus paradoxus isn't often looked for these days. However, a study from a children's hospital in Singapore reports that it can be detected by inspection of the output of a pulse oximeter and that it's a useful sign in children with asthma (*Arch Dis Child* doi:10.1136/archdischild-2019-318043). Children in whom pulsus paradoxus persisted beyond initial treatment were likely to require admission to intensive care.



Noise as a risk factor for vestibular schwannoma

Vestibular schwannoma is a benign tumour arising from the nerve sheath of the vestibular branch of the 8th cranial nerve. Epidemiological investigations have suggested that loud noise is a risk factor but, in people whose symptoms include loss of hearing and tinnitus, it's hard to rule out recall bias. A Swedish study that used a job exposure matrix to estimate occupational noise exposure rather than rely on self-report reckons that this is the likely explanation (*Am J Epidemiol* doi:10.1093/aje/kwaa091). The investigators found no link between occupational noise and vestibular schwannoma, even for prolonged high intensity exposures.



Being under water

When on patrol, submariners spend several months submerged and isolated. They work shifts, endure a disrupted pattern of sleep, and eat a restricted diet. Space for physical activity is limited and there is no exposure to natural sunlight. Surprisingly, none of these seems to have a deleterious effect on biomarkers of cardiometabolic risk. A study among Royal Navy submariners found that during a voyage there was a tendency to lose weight and for serum lipids levels to improve (*Occup Environ Med* doi:10.1136/oemed-2019-106292).

Inappropriate visits to emergency departments

A large survey in France explored reasons for attendance at emergency departments. Judged by criteria that included the opinion of the emergency doctor and whether the problem could have been managed by a general practitioner, about 20% of visits were categorised as inappropriate. However, many of the people attending emergency departments inappropriately came from socioeconomically vulnerable sections of society, and the researchers ended up doubting the usefulness of what they were trying to do (*BMJ Qual Saf* doi:10.1136/bmjqs-2019-009396). Among people without other ways to access healthcare, asking if an emergency department visit is appropriate is the wrong question.

Rickets in the UK

Nutritional rickets in the UK is rare but by no means extinct, according to a survey by paediatricians. Over a two year period, 125 children met the case definition, which is equivalent to an annual incidence of around 1 per 200000 children (*Arch Dis Child* doi:10.1136/archdischild-2019-317934). Boys were more likely to be affected than girls, and most of the affected children were of black or South Asian ethnicity. Complications included delayed motor development, fractures, and hypocalcaemic seizures. Two deaths occurred from dilated cardiomyopathy.

Arthritis in a single joint

A longitudinal study from Norway followed 347 patients who had presented acutely with arthritis affecting a single joint. In most cases the arthritis resolved, but a substantial minority, around 25%, went on to develop a chronic inflammatory arthritis—either rheumatoid arthritis or psoriatic arthritis (*Arthritis Care Res* doi: 10.1002/acr.23334). Patients with monoarthritis of the wrist, shoulder, or the small joints of the hand were at highest risk of developing rheumatoid arthritis, while monoarthritis affecting the ankle carried the lowest risk.

Inactivated probiotic bacteria

People with irritable bowel syndrome may have an abnormal or unusual gut microbiome. There's evidence that oral ingestion of probiotic bacteria is of benefit, and a placebo controlled trial of capsules containing a strain of *Bifidobacterium bifidum* reports a reduction in abdominal pain and other symptoms in the group receiving the active treatment (*Lancet Gastroenterol Hepatol* doi:10.1016/S2468-1253(20)30056-X). It's worth noting, however, that the bifidobacteria used in this trial had been killed by heat. Why non-viable organisms should have beneficial effects is a puzzle.

The microbiome in irritable bowel syndrome

Where gut bacteria and irritable bowel syndrome are concerned, the evidence is far from consistent. A study from Sweden investigated the faecal and mucosa associated microbiome using 16S rRNA gene sequencing on sigmoid biopsy samples. Patients with irritable bowel syndrome showed a greater degree of heterogeneity than that observed in healthy individuals, but no distinct microbial signature that characterised the condition was identified (*Gut* doi:10.1136/gutjnl-2019-318717).

Cite this as: *BMJ* 2020;369:m2207

