education

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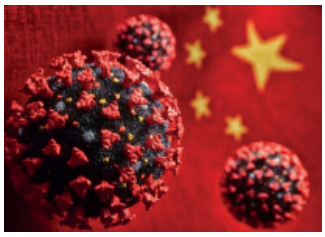
Long covid in China



It's important for us to know about long covid. Huang and colleagues' cohort study of almost 2000 people with covid-19 who had been discharged from a hospital in China six months before sheds a little light, but the study design (single centre, only hospitalised patients, no baseline data, no control group) limits what we can learn. For example, the study excluded people who were unable to move freely due to osteoarthropathy or who were immobile (owing to stroke). Presumably this was because these patients would have been unable to do the exercise testing part of the protocol, but surely their symptoms would still have been worth collecting?

The headline findings were that nearly two thirds of the subjects had fatigue or muscle weakness six months after discharge, a quarter had sleep difficulties, and almost a quarter reported anxiety or depression. These are high rates, but many questions remain. And more questions are raised. For example, how prevalent are these features in people who have been severely unwell with other conditions?

Lancet doi:10.1016/S0140-6736(20)32656-8

Convalescent plasma in early covid-19

I'm going to share a secret. I never thought convalescent plasma would be of any use in any condition, least of all covid-19. In Argentina, 160 people aged over 75 years (or over 65 with comorbidities) with covid symptoms that had started within the past three days and who hadn't already developed severe respiratory disease were randomised to either convalescent plasma or placebo in a double blind fashion. The risk of the progression to severe respiratory disease was reduced by 48%—again, not much fanfare about this, perhaps because the improvement was in reducing disease progression rather than mortality. The higher the donor IgG titre, the greater the reduction in risk. One key point in this study was that early intervention was important.

N Engl J Med doi:10.1056/NEJMoa2033700

New drug effective for covid-19

Does anyone else find it strange how little fanfare there has been about tocilizumab? In this study 389 people hospitalised with covid-19 pneumonia but who weren't receiving mechanical ventilation were randomised to intravenous tocilizumab or placebo in a double blind fashion. There was a 44% reduction in the primary outcome of either mechanical ventilation or death at 28 days. Perhaps people's reservations about this result are that the drug didn't seem to reduce mortality alone. But I think we should be pleased that it reduced progression to ventilation; this finding is resistant to bias given that the trial was blinded.

N Engl J Med doi:10.1056/NEJMoa2030340

Respiratory ruminations

Couturaud and colleagues ask whether we should screen people with chronic obstructive pulmonary disease (COPD) who have been hospitalised with acutely worsening respiratory symptoms for pulmonary embolism? Pulmonary embolism is in the differential diagnosis in such acute scenarios and can be easily missed and labelled as an exacerbation of COPD. The authors assessed the prevalence of pulmonary embolism in a cohort of 740 such patients in seven French hospitals. The prevalence (counted within 48 hours of admission) was 5.9%.

In the study, patients were first classified as suspected or not suspected pulmonary embolism. Then a standarised algorithm was used for their diagnostic investigation based on Geneva score, D-dimer, spiral CT pulmonary angiogram, and leg compression ultrasound. In those pre-classfied as suspected, the prevalence of pulmonary embolism was 10%. In those not suspected, the prevalence was still 3%. One study limitation is that people with COPD but milder symptoms or in whom pulmonary embolism wasn't suspected may not have been admitted and therefore would not have been included. However, this large study lays the groundwork for further studies.

JAMA doi:10.1001/jama.2020.23567

Repurposed sitagliptin

Farag and colleagues studied sitagliptin as a therapy for preventing acute graft versus host disease (GVHD) after allogeneic stem cell transplantation (such as for acute myeloid leukaemia) along with other immunosuppressive therapy. They found a low incidence of acute GVHD in their single arm non-randomised study.

This is certainly good news for 34 of the 36 participants who had not experienced acute GVHD by day 100 and suggests the treatment is worth further investigation. But, without a control group, we don't know what the incidence would have been without the drug. Sitagliptin inhibits dipeptidyl peptidase 4. This enzyme degrades things that stimulate insulin secretion, but also enhances the T cell immune response, so blocking it could help prevent GVHD.

N Engl J Med doi:10.1056/NEJMoa2027372

Alex Nowbar is a clinical research fellow at Imperial College London

PRACTICE POINTER

Returning to physical activity after covid-19

David Salman,[1 2] Dane Vishnubala,[2 3] Peter Le Feuvre,[1 5] Thomas Beaney,[2] Jonathan Korgaonkar,[4] Azeem Majeed,[2] Alison H McGregor[1]

[1]MSk Lab, Imperial College London
[2]Department of Primary Care and Public Health, Imperial College London
[3]Hull-York Medical School, York
[4]Imperial College Healthcare NHS Trust, London
[5]HQ Army Medical Services, Robertson House, Camberley
Correspondence to: D Salman d.salman11@imperial.ac.uk

After mild suspected covid-19, a proportion of people experience a prolonged recovery, particularly when trying to return to exercise. Moreover, there is increasing recognition of potential long term complications of covid-19, including enduring illness ("post-acute" or "long" covid), cardiopulmonary disease, and psychological sequelae in some people.[1-4] This article offers a pragmatic approach to help patients safely return to physical activity after symptomatic SARS-CoV-2 infection, focusing on those who have lost fitness or had a prolonged period of inactivity but who do not have an enduring post-acute covid-19 illness.

The health benefits of being physically active, from cardiovascular to mental health, are well established.[5 6] Before the covid-19 pandemic, over a third of people in the UK were not physically active enough for good health.[8] There is evidence of a further decline in physical activity since the start of the pandemic for people with chronic conditions such as obesity and hypertension[9]; conditions associated with worse outcomes from covid-19.[10] Brief advice in primary care can help people to take up physical activity, with the associated lifelong positive health impacts, and help those recovering from illness to return to previous levels of physical activity or beyond.[11]

WHAT YOU NEED TO KNOW

- Risk stratify patients before recommending a return to physical activity in people who have had covid-19. Patients with ongoing symptoms or who had severe covid-19 or a history suggestive of cardiac involvement need further clinical assessment
- Only return to exercise after at least seven days free of symptoms, and begin with at least two weeks of minimal exertion
- Use daily self-monitoring to track progress, including when to seek further help

CPD READING
0.5 HOURS

What are the risks of returning to physical activity after covid-19?

Current understanding of recovery from covid-19 is limited, but preliminary research has highlighted several key concerns. The first is the potential for cardiac injury, including from viral myocarditis. This is important, as taking exercise in the presence of myocarditis is associated with increased morbidity and mortality.[15]

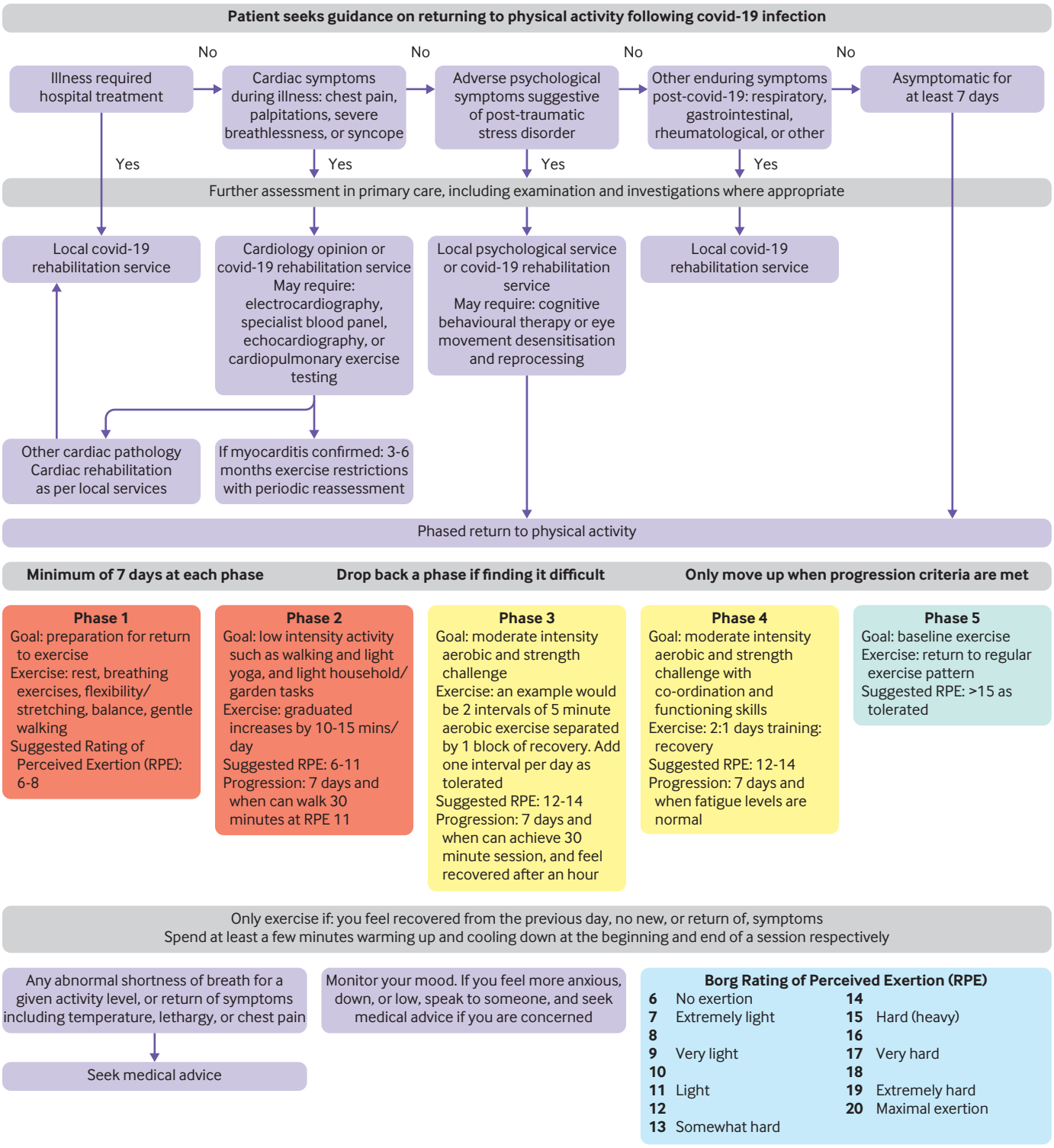
Thromboembolic complications, such as pulmonary emboli, are also associated with covid-19.[18-20] Long term effects on pulmonary function are not currently known, but data from the 2003 severe acute respiratory syndrome coronavirus (SARS-CoV) epidemic suggest persistent impairments in pulmonary function and exercise capacity in survivors.[21]

Finally, primary psychiatric phenomena, such as psychosis, have been identified as a potential presenting feature of covid-19,[22] and psychological sequelae after infection can include post-traumatic stress disorder, anxiety, and depression.[23]

Without evidence from robust studies to inform practice, all current guidance to date is based on consensus or expert opinion. The European Federation of Sports Medicine Associations recommends a review with a sports and exercise medicine physician after mild symptomatic infection, and investigations including echocardiography and lung function testing where cardiopulmonary symptoms were present.[24] The Netherlands Society of Cardiology states that, for those with systemic features including fever, electrocardiography testing should be considered before resumption of activity.[25] The incidence of myocardial injury or thromboembolic complications after mild or moderate covid-19 in the community is currently unknown but thought to be low. Therefore, a balance is needed between obstructing an already inactive population from undertaking physical activity and the potential risk of cardiac or other consequences for a small minority. We advocate a pragmatic approach that enables a gradual return to physical activity while mitigating risks.

How do I know if my patient can safely return to physical activity?

A risk-stratification approach can help maximise safety. Firstly, is the person physically ready to return to activity? In the natural course of covid-19, deterioration signifying severe infection often occurs around a week from symptom onset. Therefore, consensus agreement is that a return to exercise or sporting activity should occur only after an asymptomatic period of at least seven days,[21 24 26 27] and it would be pragmatic to apply this to any strenuous physical activity (figure). English and Scottish Institute of Sport guidance suggests that, before re-initiation of sport for athletes, activities of daily living should be easily achievable and the person able to walk 500 m on the flat without feeling excessive fatigue or breathlessness.[27] However, we



Suggested return to physical activity after covid-19: risk stratification to exclude features suggestive of myocarditis or post-acute covid-19 and phased resumption of physical activity after 7 days without symptoms[28]

recommend considering the person's pre-illness baseline, and tailoring guidance accordingly. Some may not have been able to walk 500 m without breathlessness before their covid-19 illness, and they should not be precluded from starting physical activity (see figure, phases 1 to 3).

The second factor is that ongoing symptoms, regardless of system, may be indicative of a post-acute covid-19 illness. This will require assessment in primary care initially, and potentially liaison with local post-covid-19 rehabilitation services.[1 21] Assessment and management of post-acute covid-19 illness is covered elsewhere.[1] Whether there is a role for graded physical activity as a treatment for this condition is currently unclear.

People who had more severe covid-19 illness, such as those who were hospitalised, are thought to be at higher risk of cardiac complications[12 13 21 24 25 27] and thromboembolic events.[15 20] We recommend that their graduated rehabilitation be managed in conjunction, or after discussion, with local post-covid-19 services. People who did not require hospital treatment but who had symptoms during their illness suggestive of myocardial injury should be assessed with a physical examination and considered for further investigations.

Finally, is the person psychologically ready to embark on a physical activity programme? Psychological sequelae of covid-19 infection can be screened for in the consultation. Ask about mood, sleep, appetite, and motivation. Listen to, acknowledge, and validate the patient's concerns. If further support is needed, people can be directed to self-care resources, community services, and peer support. In some cases, coordination with local psychological support or post-covid-19 rehabilitation services may be needed.[1 21]

How do I guide a patient back to physical activity?

Return to physical activity should be gradual, individualised, and based on subjective tolerance of the activity. Once a patient has been risk stratified and symptom-free for at least seven days, a phased approach can be used to increase physical activity levels to either baseline or guideline levels or beyond.[21] If the person was not physically active before covid-19, this can be an opportune moment to discuss becoming more active. Return, or new development, of symptoms—including cough, abnormal breathlessness, palpitations, fever, and anosmia—indicate the need to stop, seek medical advice if required, and restart the process when symptom-free.[27] A graduated progression includes increases in volume (time doing the activity) and load (intensity).

Begin by asking for permission to discuss the topic, and gauging the person's current levels of activity. Assess their current perspectives and goals regarding physical activity and if they would like to do more. Suggest they set goals and consider monitoring their progress, such as by using a diary. Assist them by helping break down barriers (such as reinforcing that even brief periods of activity are effective for improving health,[31] household and garden tasks all contribute, and that active travel is often a feasible way of incorporating physical activity into a day).

How to start

Phases 1-2

Begin with light intensity activity for at least two weeks.[13 21] The Borg Rating of Perceived Exertion (RPE) scale is a subjective assessment of how hard someone feels they are working and can be helpful to guide people in choosing what activities to do as they progress through the phases of increasing physical activity. They rate their complete subjective feeling of exertion, including shortness of breath and fatigue, on a scale from 6 (no exertion at all) to 20 (maximal exertion).[28] Light intensity exercise is equivalent to an RPE of under 11 (figure), when a person feels minimal to light exertion. They should be able to hold a full conversation without difficulty at this level. Activities might include household and light garden tasks, gentle walking, and balance or yoga exercises.[32] Breathing, stretching, and light strengthening activities can also be incorporated.[21] We recommend spending seven days (phase 1) on extremely light intensity activity (RPE 6-8), including flexibility and breathing exercises, for as long as the person feels able to do them, followed by a further seven days (phase 2) incorporating light intensity activity (RPE 6-11) such as walking and light yoga, with graduated increases at 10-15 minutes per day at the same RPE when tolerated.

Phases 3-4

Progress to more challenging movement activities depending on pre-illness capacity. These might include intervals of two 5-minute blocks of activity such as brisk walking, going up and down stairs, jogging, swimming, or cycling separated by a block of recovery. The person should not feel that the exercise is "hard," and we would suggest working to an RPE of 12-14 (moderate intensity, not out of breath and could hold a conversation). Progress by adding an interval per day as tolerated.

Phase 4 would involve more complex movement that challenges coordination, strength, and balance, such as running but with changes in direction, side steps, shuffles, and circuits of body weight exercises, but again without it feeling hard. After completing phase 4, people should then feel able to return to their baseline (pre-covid) level of activity or more.

We propose a minimum of seven days at each phase to prevent sudden increases in training load. However, people should stay at the phase they feel comfortable with for as long as necessary. They should monitor for any inability to feel recovered at 1 hour after exercise and on the day after, abnormal breathlessness, abnormal heart rate, excessive fatigue or lethargy, and markers of mental ill health. If these occur, or the person fails to progress as expected, they should step back to an earlier phase of activity and seek medical advice when unsure. Keeping a diary of exercise progression can be helpful for monitoring progress.

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EDUCATION INTO PRACTICE

- How often do you feel able to recommend physical activity guidance in clinical practice?
- How do you account for social inequalities when discussing lifestyle factors, such as physical activity or diet, in your practice?

HOW PATIENTS WERE INVOLVED IN THE CREATION OF THIS ARTICLE

We thank the patient who provided their personal story of their illness and recovery (see full article on bmj.com), and how this affected their return to physical activity. Their recollection, together with those of several other patients, created the impetus for writing this guidance, emphasised the importance of this work, and guided its development.

UNCERTAINTIES

What level of immobilisation is necessary for treatment of torus (buckle) fractures of the distal radius in children?

Daniel C Perry,[1 2] Phoebe Gibson,[3] Damian Roland,[4] Shrouk Messahel[2]

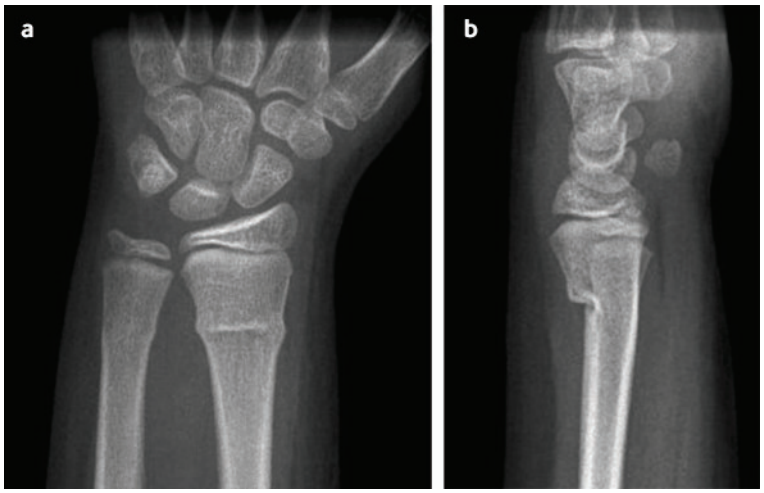
[1]Oxford Trauma, Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences, University of Oxford
[2]Alder Hey Children's Hospital, Liverpool
[3]Alder Hey Clinical Research Facility Parent Carer Forum, Liverpool
[4]University Hospitals of Leicester, Leicester

Correspondence to: D Perry daniel.perry@ndorms.ox.ac.uk

Torus (buckle) fractures are the most common fractures of the wrist in children, involving the distal radius and/or ulna bone (figure).[1] They typically occur in children up to age 14, usually after a low energy fall.[2] The flexibility of immature bone in children enables force to be absorbed as with the "crumple zone" of a car: crushing—or buckling—as it is injured. Such fractures differ from greenstick fractures, in which the bone bends (rather than crushes), resulting in a complete break in one cortex and a bend on the opposite side (akin to snapping a fresh twig from a tree). Torus fractures result in a mild deformity without a break in the bone surface, and pain is the main clinical feature. The child may need assistance with schoolwork, time off physical activities, and help with self-care during the recovery period.

Parents typically expect that any fracture needs plaster cast immobilisation to ensure adequate healing. However, torus fractures heal quickly, with pain almost completely resolved three weeks after the injury,[3] and simple splints that can be removed at home may be safe and effective treatment.[4]

In 2016, the National Institute for Health and Care Excellence (NICE) reviewed the treatment of torus fractures of the distal radius. NICE concluded that the quality of evidence for rigid cast immobilisation was poor, and instead recommended either a removable splint or a bandage (the latter essentially postulating that no treatment may be equally as effective as immobilisation since a bandage offers minimal or no structural support). NICE also recommended that children with torus fractures be discharged from the emergency department without subsequent follow-up.[5] Despite this guidance, however, a 2016 survey of 100 UK based emergency departments found that 40% used casts in the treatment of torus fractures, and 60% routinely planned outpatient follow-up.[3] Likewise, a survey in Ireland identified 70% of responders using traditional casts and clinic follow-up.[6]



Anteroposterior (a) and lateral (b) radiographs of the wrist showing a torus fracture of the distal radius and ulna with compression of the bones dorsally, though no break in the bone surface

Table 1 | Guidelines on the treatment of torus fractures

Country	Guidance	Examples
England and Wales	National NICE recommendation: a bandage or easily removable splint and immediate discharge from the emergency department[5]	NICE Guideline[5]
United States	No national guidance. Colorado Pathway recommends cast or an easily removable splint, and follow-up "as needed" (depending in part upon immobilisation device used)	Colorado Pathway[10]
Canada	No national guidance. Local guidance from Toronto recommends the use of an easily removable splint, and follow-up with a primary care provider	Toronto Pathway[11]
Australia	No national guidance. Melbourne Pathway recommends use of either a cast or an easily removable splint. Immediate discharge from the emergency department is possible when a cast is not used, though orthopaedic follow-up is necessitated if a cast is used	Melbourne Pathway[12]

WHAT YOU NEED TO KNOW

- Evidence suggests that most children with torus fractures of the distal radius make a full recovery within six weeks with no serious problems (including repeat injury) when treated with simple splints
- Splint immobilisation and immediate discharge are recommended in guidelines, such as those from the National Institute for Health and Care Excellence (NICE), however the scientific quality of evidence underpinning the guidelines is rated low or very low
- Health professionals may consider bandage treatment or even no treatment in the management of this injury, though the safety and acceptability of this approach to patients are not yet known

Table 2 | Randomised controlled trials comparing removable splints with cast for torus (buckle) fractures

Study ID	Number of participants/Age	Intervention, duration of use, and follow-up	Key outcomes	Other notable findings
Davidson 2001[4]	201 (85 cast, 116 splint). Mean: 8.9 years; range 2 to 15 years	Splint: prefabricated wrist splint. Cast: short arm cast. Follow-up: outpatient clinic three weeks after injury for all children to remove cast and splint. Outcome: success of treatment at 3 weeks in terms of healing and adverse events	All fractures united clinically and radiologically, with no fracture displacement	Compliance with both types of treatment was good except in two very young patients who tried to remove their splints shortly after they had been applied
Karimi 2013[13]	142 (77 cast, 65 splint). Mean: 9.5 years; range 1.2 to 17 years	Splint: prefabricated wrist splint. Cast: short arm cast. Follow-up: removable splints followed by phone call, with home removal of splint at 3 weeks. Casts followed up in clinic at 3 weeks. Outcome: non-validated score of pain and satisfaction at 3 weeks. Adverse events	No adverse events or skin problems in either group. 28 in the splint group, 24 in the cast group experienced mild to moderate pain with activity (P=0.61). 58 in the splint group and 66 in the cast group found the treatment convenient	
Oakley 2008[14]	95 (47 cast, 48 splint). Mean: 8.5 years; range 9 months to 15 years	Splint: fibreglass backslab. Cast: short arm cast. Follow-up: radiographs at 12 to 16 days after injury. Immobilisation extended by two weeks if significant tenderness or discomfort remained .Outcome: patients given a daily diary, including a visual analogue scale (VAS) assessment of pain	No difference in the median pain scores throughout follow-up. 40 in the cast group, and 28 in the splint group had returned to "full activity" by 2 weeks. No adverse events	Study used a splint which is not a direct comparison with a typical splint used in other studies
Plint 2006[15]	113 (56 cast, 57 splint). Mean: 9.72 years; range 6 to 15 years	Splint: prefabricated wrist splint. Casts: short arm cast. Follow-up: casts were removed in clinic at 3 weeks. Splints were removed at home when child comfortable. Phone contact made at 7, 14, 20, and 28 days post injury to record pain and recovery and postal follow-up to 6 months. Outcome: primary outcome measure was the ASKp (Activities Scales for Kids performance) questionnaire performed by phone at 14 days	Patients in the splint group had a significantly higher ASKp score at day 14 post injury than the cast group (P<0.041). Specifically, the children in the splint group had close to "normal" ASKp scores at day 14, whereas those in the cast group had scores that correlate with mild disability. ASKp score was not significantly different between the groups for days 7, 20, and 28 post injury. Five children in the cast group returned to the emergency department for problems with their casts (four returned for wet casts and one had placed a pencil under the cast). No children in the splint group returned to the emergency department for problems with their splint. There were no re-fractures	
Pountos 2010[16]	50 (24 cast, 26 splint). Mean: 9 years; range 2 to 16 years	Splint: prefabricated wrist splint. Cast: plaster cast (unspecified). Follow-up: outpatient clinic 4-6 weeks after injury for all children. Unclear when the splint was removed. Cast removed at clinic visit. Outcome: all had radiographic assessment at follow-up. "Average" pain in the preceding weeks was determined at the follow-up visit using a VAS. An unvalidated assessment of function was also made	No difference in pain scores was observed, with a score of 3.1 in splint *v* 2.9 in the cast group. No difference was observed in the use of analgesia, and no apparent difference in function. The amount of deformity worsened (all by less than 5 degrees) in three patients (two splint group and one cast group).	Three way trial of plaster cast, splint, and tubigrip bandage
Williams 2013[17]	94 (cast 51, splint 43). Median: 9.5 years (splint) and 9 years (cast); range 2 to 16 years	Splint: prefabricated wrist splint. Cast: short arm cast. Follow-up: all followed up at 3 weeks. Splints removal permitted as the child became more comfortable. Casts removed in clinic at 3 weeks. Phone contact was made at 1, 3, 7, and 21 days post injury to record pain and recovery. Outcome: assessment of pain, convenience, and preference—though unclear if validated tools used	Pain scores were higher in the splint group, though the difference was not statistically significant. The satisfaction was higher in the splint group, with families showing a preference for this treatment	

Guidelines from Melbourne, Australia, and Colorado, US, recommend either a removable splint or rigid cast immobilisation, and studies from the US and Australia have shown high rates of cast immobilisation, outpatient follow-up, and repeated radiographic assessment in practice.[7-9] Canadian guidelines are more similar to NICE in advising treatment with a splint but recommend routine follow-up in primary care (table 1).

It is therefore unclear if children with a torus fracture of the distal radius require cast or splint immobilisation, or would do just as well with a bandage or even no immobilisation at all. Furthermore, the safety and acceptability of immediate discharge after diagnosis is not clear.

What is the evidence of uncertainty?

The 2018 Cochrane review of torus fracture treatments included nine RCTs comprising 695 patients in studies comparing removable splints with rigid casts (table 2) and 237 patients in studies comparing bandages with rigid casts (table 3). The quality of evidence was low or very low in all nine studies, as reflected by the absence of blinding in all trials, a high rate of participant attrition, and imprecise estimates of the effect size owing to low sample sizes. These studies demonstrated no differences in pain, function, or serious events between the different interventions used. There were treatment failures,

Table 3 | Randomised controlled trials comparing bandages with cast for torus (buckle) fractures

Study ID	Number of participants/age	Intervention, duration of use, and follow-up	Outcomes	Other notable findings
Jones 2001[18]	50 (25 cast, 25 bandage) Mean: 6.2 years; range 3 to 10 years	Bandage: a layer of soft wool covered with cotton crepe initially. Cast: short arm cast. Follow-up: removed cast at clinic visit. Wool removal unclear. Outcome: follow-up to determine satisfaction at 3 weeks	High parental satisfaction with both treatments	Unpublished, available only as a conference abstract
Kropman 2010[19]	92 (45 cast, 45 bandage) Mean: 10 years; range 4 to 12 years	Bandage: a layer of soft wool covered with cotton crepe initially. This was converted to a tubigrip at 1 week, to be worn for three weeks. Cast: initially treated in a backslab, which was converted to a full short arm cast at 1 week and removed at 4 weeks. Follow-up: 1 and 4 weeks with radiographs, and at 6 weeks. Outcome: pain diary was completed at home throughout the first three weeks post injury including pain VAS	The mean VAS for pain at 1, 2, and 3 weeks, showed significantly increased pain at week 1 in the bandage group (26 ±19 mm, *v* 20 ±16mm (P=0.03)), though no difference at other time points. None of the fractures showed secondary angulation in either group. No re-fractures were seen during follow-up in either group. No difference between the intake of painkillers was seen between groups (P=0.56). No adverse events	
Pountos 2010[16]	53 (24 cast, 29 bandage) Mean: 9 years; range 2 to 16 years	Bandage: a double tubigrip bandage. Cast: a short arm plaster-of-paris cast. Follow up: outpatient clinic 4-6 weeks after injury for all children. The cast was removed at the clinic visit. Unclear when tubigrip removed. All had radiographic assessment at follow-up. Outcome: "average" pain in the preceding weeks was determined at the follow-up visit using a VAS. An unvalidated assessment of function also made	No difference in pain scores was noted, with a score of 2.3 in bandage *v* 2.9 in the cast group. No difference was noted in the use of analgesia, and no apparent difference in function. The amount of deformity worsened (all by less than 5 degrees) in two patients (1 bandage group and 1 cast group)	Three way trial of plaster cast, splint, and tubigrip bandage
West 2005[20]	42 (21 cast, 18 bandage) (age unclear—though specify children)	Bandage: a layer of soft wool covered with cotton crepe. Cast: initially treated in a backslab, which was converted to a full cast at 1 week. Follow-up: bandages were reviewed in clinic weekly for four weeks, and the bandage changed at each visit. Casts were seen at 1 week and removed at 4 weeks. Outcome: no validated outcome assessment, though reported on process and adverse events	All patients in the bandage group had discontinued its use in week 2. No adverse events or skin problems were noted in either group	Two other children included initially in the bandage group failed to return for their first visit in the fracture clinic and did not make it into the analysis

defined by the need to switch to a rigid cast, but these were at parental request rather than specific clinical need. While these trials point to removable splints and bandages being non-inferior to rigid cast immobilisation, the quality of the studies and lack of transparency in reporting precludes a definitive conclusion to be drawn. The clinical pathway in only two of these trials involved discharging participants without follow-up,[13 15] with just 122 participants randomised to either a removable splint or bandage and discharge without subsequent face-to-face follow-up from the emergency department. While immediate discharge is becoming more widely practised, little robust evidence underpins the safety of this approach, and the acceptability to families and clinicians is inconclusive.

RECOMMENDATIONS FOR FUTURE RESEARCH

Lack of evidence regarding the treatment of torus fractures is indicative of the quality of the evidence in children's trauma, which possibly reflects the difficulty of conducting research in this area. There are many common children's fractures for which notable uncertainties and variation in treatments exist nationally and internationally, which often relate to whether surgery should or should not be undertaken. A desire to address these uncertainties has prompted the development of a research agenda by the British Society for Children's Orthopaedic Surgery.[23] A collaboration of UK paediatric orthopaedic surgeons and emergency clinicians is now engaged in a series of high quality randomised controlled trials in this area—notably for the treatment of medial epicondyle fractures of the elbow (www.SCIENCEStudy.org) and severely displaced fractures of the distal radius in young children (<11 years) (www.CRAFFTStudy.org). This collaboration has become global—extending into the US, Canada, Australia, and New Zealand.

Future trials may investigate the optimal treatment of distal tibial growth plate injuries, and the management of "toddler fractures" of the tibia.

Is ongoing research likely to provide relevant evidence?

We searched the ISRCTN and ClinicalTrials.gov databases to identify ongoing research related to "wrist fractures" and "forearm fractures" in children. Only one related to the treatment of torus fractures: the FORCE (forearm fracture recovery in children evaluation) study. This is a trial investigating the clinical effectiveness—using the primary outcome of pain at day 3—of "the offer of a soft bandage" and immediate discharge versus rigid immobilisation (ie, cast, backslab, or removable splint) and standard follow-up among children with torus fractures of the distal radius.[21] The FORCE study is limited to children in the UK and has so far recruited more than 900 children from emergency departments throughout England; it is expected to report late in 2021. The trial uses text message and email to collect patient reported outcomes, principally pain and functional recovery, from families for up to six weeks from the injury.

Early patient involvement in the FORCE study found poor acceptability among parents of "no treatment" in children with torus fractures. The intervention arm is thus "the offer of a soft bandage" to be applied and used at the discretion of the family, and this is proving acceptable to participants. The sample size is adequate to quantify rarer adverse events (ie, re-fracture), and is inflated to allow for 20% loss to follow-up given the novel method of electronic follow-up. The size and scope of the FORCE study means it is likely to provide high quality evidence to clarify uncertainties related to the need for immobilisation and follow-up described in

SAMUEL ASHFIELD/SPL

this article, but more studies may be needed globally to understand acceptability of interventions in different settings. The inability to blind participants to the intervention will mean the study is prone to observer bias, and the "offer of a bandage" means that "no treatment" is unexamined. A cost effectiveness analysis will also be performed.

WHAT PATIENTS NEED TO KNOW

- Torus (or buckle) fractures of the wrist bones are the most common fractures in children and typically result in pain that resolves within three weeks
- Evidence shows that most patients make a full recovery with no serious problems, including no evidence of repeat injury, when simple splints are used to "rest" the wrist
- Doctors are unsure if these fractures really need to be treated with a splint to "rest" the wrist, or if they are just as well treated more like a sprain with free movement from the outset. Research is ongoing to find the answer to this.

EDUCATION INTO PRACTICE

- What methods of immobilisation would you use in a child with a torus fracture?
- What is the local arrangement for follow-up of children with torus fractures?

HOW PATIENTS WERE INVOLVED IN THIS ARTICLE

Phoebe Gibson is a parent representative and co-author on the management group of the FORCE study and has co-produced this article with the clinical team.

What should we do in light of the uncertainty?

Given the uncertainty, we suggest hospitals and clinical teams develop a protocol for management of children with this injury. The guideline most based in evidence is that produced by NICE, which recommends the use of a removable splint and immediate discharge. Implementation of this pathway requires clinicians to proficiently distinguish between torus fractures and other wrist injuries, and could benefit from a system-wide check (ie, early radiological review of suspected torus fractures by a senior clinician). Any form of removable splint is acceptable, including backslab and prefabricated wrist splint, as the recovery and pain appear similar. Important guidance for parents and patients includes keeping the affected wrist immobilised for three weeks before removing the splint at home, giving simple analgesia as needed, and returning to the clinic if the child has any difficulties with pain or re-injury.

Competing interests: All authors are co-applicants on the National Institute for Health Research FORCE Study.

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Find the full version with references at http://dx.doi.org/10.1136/bmj.m4862

SEARCH STRATEGY AND KEY WORDS

We searched PubMed using the terms "buckle" OR "torus" AND "fracture*" to identify papers between January 2017 and 28 May 2020. A 2018 Cochrane review of randomised controlled trials (RCTs) on interventions for treating wrist fractures in children was also included.[22] For completeness, our search overlapped the period of the Cochrane review (Cochrane search date May 2018). We identified 59 new papers, of which only two were prospective cohort studies, with no new RCTs.

CASE REVIEW **A guttural cough**

A man in his 50s presented to his general practitioner with a four month history of persistent, guttural cough. The cough prevented him from completing sentences. He was a non-smoker and had no other symptoms. Chest examination by his GP was normal.

At a GP follow-up one month later the patient described increasing breathlessness and tiredness. Haemoglobin was measured at 122 g/L (normal adult male range 130-180 g/L) and chest radiography showed clear lungs and pleural spaces.

During this time, the patient attended a National Bowel Scope screening programme for a flexible sigmoidoscopy. This was reported as "all clear." He had no gastrointestinal symptoms.

Two months later, the patient was still unable to speak in full sentences and requested a respiratory consultation. Chest radiography was reported as normal and a computed tomography scan was requested (figure). Haemoglobin was measured at 96 g/L.

1 **What is the most likely diagnosis?**
2 **What are the NICE (National Institute for Health and Care Excellence) referral criteria for this condition?**
3 **What further investigations are required?**

Submitted by Kathryn McCarthy and Shoba Philips

Patient consent obtained.

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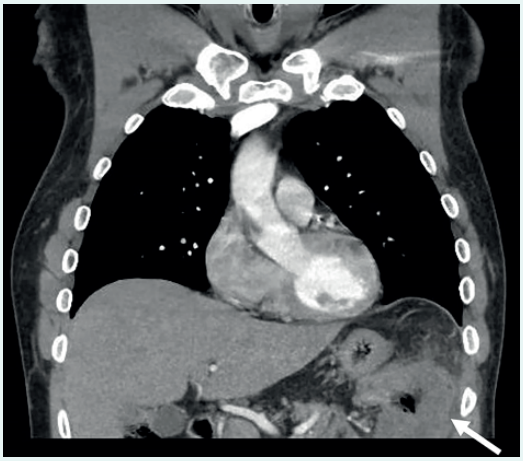


Computed tomography scan of the chest showing an asymmetrical, large, C shaped soft tissue mural thickening involving a short segment of the splenic flexure (arrow) which narrows the lumen. Within this there are areas of hypoattenuation—areas of brighter white

answers

CASE REVIEW **A guttural cough**

1 What is the most likely diagnosis?

Adenocarcinoma of the splenic flexure.

The figure shows mural thickening of the bowel wall that is consistent with colorectal cancer; additionally, areas of hypoattenuation on a computed tomography scan are a classic finding in colonic adenocarcinoma. The diagnosis of colorectal cancer is also supported by the patient's anaemia.

Cough is not a known symptom of colorectal cancer, but it occurred because the tumour was positioned at the splenic flexure and caused irritation to the diaphragm.

One to eight per cent of colorectal cancers involve the splenic flexure; left colon or rectum colorectal cancer is more common.

Ischaemic colitis is common at the splenic flexure; however, this degree of mural thickening is not seen in ischaemic colitis. Additionally, there are no diverticula to suggest an inflammatory pathology like diverticulitis.

2 What are the NICE referral criteria for this condition?

Refer adults within two weeks if:

- They are aged 40 years or older with unexplained weight loss and abdominal pain, or
- They are aged 50 years or older with unexplained rectal bleeding, or
- They are aged 60 years or older with:
  - Iron deficiency anaemia, or
  - Changes in their bowel habit, or
  - Tests show occult blood in their faeces

Consider referral within two weeks in:

- People with a rectal or abdominal mass
- Adults aged under 50 years with rectal bleeding and any of the following:
  - Abdominal pain
  - Change in bowel habit
  - Weight loss
  - Iron deficiency anaemia

3 What further investigations are required?

Urgent colonoscopy and gastroscopy initially. Diagnosis is confirmed with histological biopsy taken during endoscopy.

Repeat colonoscopy (at 12 months) might be needed as endoscopy procedures can miss 9% of colorectal cancers.

A multicentre diagnostic accuracy study suggested that the faecal immunoglobulin test is as sensitive as colonoscopy for detecting colorectal cancer. NICE recommends a faecal immunoglobulin test in primary care to guide referral for people without rectal bleeding who have unexplained symptoms but do not meet criteria for a suspected cancer pathway referral.

LEARNING POINTS

- Refer patients older than 40 with unexplained anaemia for full investigation of the whole gastrointestinal tract with gastroscopy and full colonoscopy (flexible sigmoidoscopy may only assess the anal canal, rectum, sigmoid, and descending colon).
- Consider faecal immunoglobulin testing in primary care while awaiting referral and for patients with gastrointestinal symptoms who do not meet the urgent referral criteria.
- Bowel cancer is common and can present in unusual ways.
- Colonoscopy misses 9% of lower gastrointestinal tumours so consider repeating at 12 months

Persistent pupillary membrane

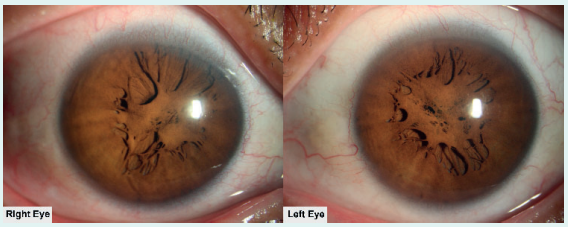
These slit lamp photographs show persistent pupillary membranes (PPM) in a man in his late 30s—both pupils were covered by extensive, dense, pigmented membranes with pinholes that were continuous with the iris.

He had had blurred vision in both eyes since childhood, but it had not concerned him until a routine health examination arranged by his employer. He did not drive.

Best corrected visual acuity was 20/40 in the right eye and finger counting in the left; amblyopia was present in both eyes.

PPM is incomplete degeneration of the tunica vasculosa lentis (fetal fibrovascular tissue) caused by persistent fetal vasculature. Most PPMs appear as fine strands across the pupil. Extensive PPM that covers the pupil, as in this case, is unusual.

Membranectomy is usually performed during childhood.



Yunzhi Xu; Minbin Yu (yuminbin@mail.sysu.edu.cn), Sun Yat-sen University, Guangzhou 510060, China

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

Masks and hearing loss

Face masks muffle the low amplitude, high frequency sounds generated by the pronunciation of consonants, which makes oral communication vulnerable to misunderstanding—especially for people with hearing loss. Masks with clear plastic windows help lip reading at the cost of blocking more of the sound. Disposable surgical masks offer the best acoustic performance. Loosely woven cotton masks also perform well acoustically but they may not be as effective as surgical masks at blocking respiratory droplets (*J Acoust Soc Am* doi:10.1121/10.0002279).

Anti-cholinergic drugs and cognitive impairment

Cholinergic drugs provide modest benefits in cognition for patients with Alzheimer's disease, so perhaps it's not surprising that drugs with anti-cholinergic activity tend to make things worse. A longitudinal study of 700 people, all cognitively normal at the time of recruitment, reports that progression to mild cognitive impairment was more frequent in those who received drugs with anti-cholinergic effects such as metoprolol, atenolol, loratadine, and bupropion (*Neurology* doi:10.1212/WNL.0000000000010643).

Blood gas sampling

A randomised trial in emergency departments in France compared venous with arterial sampling for blood gas measurements. As one might expect, patients found venous sampling less painful than arterial puncture and the person carrying out the procedure found it easier. No difference was seen in the usefulness of the biochemical data obtained either, but bear in mind that patients were only recruited to the trial if pulse oximetry had shown that they weren't hypoxaemic (*Emerg Med J* doi:10.1136/emermed-2019-209287).

Against diagnosis

Diagnosis is a central idea in medicine. By identifying a patient's illness, the collective medical experience of that disease is made available, revealing the likely course of events, as well as potentially effective treatments. However, labelling patients and their illnesses has a harmful side. Quite apart from the problems caused by diagnostic mistakes, the labels are often derogatory and disrespectful. We need to be more sensitive to patients' feelings when they're given a diagnosis of, say, organ failure, multimorbidity, or a personality disorder (*Postgrad Med J* doi:10.1136/postgradmedj-2020-139298).

Casual employment

Conventional wisdom has it that casual employment and temporary work are bad for health and wellbeing. Among other things, they are thought to lead to stress, insecurity, and lack of attention to safety. None of this is borne out by longitudinal data from a large Australian survey. For both men and women, health outcomes for casual workers were no worse than for those in permanent employment for any of the eight SF-36 health attributes. Indeed, for some attributes, scores for casual workers were better (*Occup Environ Med* doi:10.1136/oemed-2020-106568).

Hiding in plain sight

Last year, an aquarium in Chicago let its flock of rockhopper penguins roam freely while it was shut to visitors. Inspired, the e-journal *Nature Briefing* ran a weekly series of spectacular landscape photographs in which a penguin had been cunningly camouflaged. Readers were invited to try to spot the penguin. Minerva wasn't sure whether this was a visual metaphor for the difficulty of picking out patterns in a mass of data or a bit of nonsense to lighten the day. Either way, she enjoyed the photographs (https://twitter.com/shedd_aquarium/status/1239661654629023747) (https://www.nature.com/articles/d41586-020-03610-9).

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