Management of coexisting conditions in the context of COVID-19

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**Introduction**

This page summarises important considerations for the care of people with co-existing medical conditions during the COVID-19 pandemic. Key points from guidance and position statements are summarised for each condition, and there is a link to the main BMJ Best Practice topic. This overview topic is continually reviewed and updated, and more conditions will be added to this list.

Our full topic on Coronavirus disease 2019 (COVID-2019) includes information on diagnosis and management, as well as prevention, differential diagnosis, epidemiology, aetiology, prognosis, and complications.

**Considerations for perinatal care**

There is no evidence to suggest that pregnant women are more likely to contract COVID-19 compared with the general population; however, they are at risk of more severe infection and should take extra precautions, especially those above 28 weeks' gestation.[1] [2] [3] [4]

Pregnancy increases the risk of hospitalisation, intensive care admission, and receipt of mechanical ventilation. A report from MBRRACE-UK (Mothers and Babies: Reducing Risk through Audits and Confidential Enquiries across the UK) advises that all pregnant or post-partum women who have COVID-19 receive multidisciplinary team care and obstetric leadership with daily review and are given advice about when to seek urgent medical attention.[5] In the UK, a study of pregnant women admitted to hospital with confirmed severe acute respiratory distress coronavirus 2 (SARS-CoV-2) infection found that a high proportion were from black or other ethnic minority groups.[6] Maternity units in the UK have been encouraged to take measures to minimise the additional risk to pregnant black, Asian, and minority ethnic (BAME) women by increasing support, tailoring communications, discussing vitamins, supplements, and nutrition, and ensuring records are up to date, to identify those most at risk of poor outcomes.[7] In the US, Hispanic and non-Hispanic black women seem to be disproportionately affected by SARS-CoV-2 infection during pregnancy.[8]

Maternal COVID-19 is associated with a higher risk of pre-eclampsia/eclampsia, preterm birth, birth by emergency caesarean section, prolonged maternal admission following birth, venous thromboembolism, and myocardial infarction.[9] [10] [11] [12] Pre-existing comorbidities, high maternal age, pre-pregnancy obesity, gestational diabetes, pre-eclampsia, and non-white ethnicity are associated with more severe COVID-19 disease during pregnancy.[3] [13] [14] Disease severity is associated with higher rates of preterm birth, caesarean delivery, maternal intensive care admission, neonatal intensive care admission, and maternal death.[3] [15] [16] Maternal SARS-CoV-2 status does not appear to affect postnatal haemorrhage, infant 5-minute APGAR score, or birth weight for gestational age.[9] [17] Infants born to mothers who test positive for SARS-CoV-2 have an increased risk of admission for neonatal care, prolonged neonatal admission, hyperbilirubinaemia, respiratory distress syndrome, and any other respiratory disorder.[17] [18] [12]

Pregnant women should be advised to take up the influenza vaccine.[19] Guidance is available on use of COVID-19 vaccines during pregnancy. In the US, the Centers for Disease Control and Prevention and the American College of Obstetricians and Gynecologists advise that COVID-19 vaccines should be offered to pregnant individuals who meet criteria for vaccination.[20] [21] In the UK, guidance now advises that pregnant women should be offered vaccination at the same time as non-pregnant women, based on their age and clinical risk group.[22] Women who are breastfeeding may also be offered any suitable COVID-19 vaccine.[22] Local guidance should be followed. A study using data from vaccine safety monitoring systems in the US found no major safety concerns for women or their infants following vaccination with mRNA vaccines (BNT162b2 [Pfizer–BioNTech ] or mRNA-1273 [Moderna]) given in the third trimester.[23] Transfer of SARS-CoV-2 antibodies to cord blood and breast milk after maternal vaccination has been described.[24] [25] [26]

Pregnant women have reported higher levels of distress and psychiatric symptoms during the COVID-19 pandemic.[27] A report from the UK’s Centre for Mental Health and the Maternal Mental Health Alliance completed a rapid evidence review of the impact of COVID-19 on mental health during pregnancy and after...
Some elements of routine perinatal care may be amended during the COVID-19 pandemic.

Antenatal care:

- Women are advised to continue routine antenatal care, and the nationally recommended schedule of antenatal care should be offered in full wherever possible.[1][19] Ideally, antenatal appointments should be offered in-person, particularly to women from BAME communities, with communication difficulties, or whose medical, social, or psychological conditions put them at higher risk of complications or adverse outcomes during pregnancy.[19]
- If there is concern about the patient or fetus, a face-to-face appointment should be advised. Women should be encouraged to attend pregnancy assessment services if they have any concerns for their or their baby’s well-being.[19]
- Before face-to-face consultations, patients should be contacted to screen for symptoms of COVID-19. Patients who report symptoms of COVID-19 should be assessed to determine if an urgent antenatal appointment is needed, or if the appointment can be delayed.[2][29] A home appointment may be offered instead.[29]
- Investigations such as blood tests and ultrasound scans should be arranged with other in-person maternity appointments to limit repeat clinic attendance.[19]
- Anaemia should be monitored and managed proactively so that women are not anaemic at the beginning of labour.[30]
- Remote consultations by telephone or video call may replace some face-to-face appointments in low-risk pregnancies.[2] Women may be advised to check their blood pressure at home if possible, and given advice on when to seek medical assistance.[2]

Intrapartum care:

- Women and their birth partners should be screened for symptoms of COVID-19 on contact or attendance of the maternity unit.[19][31]
- Scheduled induction and caesarean delivery may continue if indicated, but if the patient screens positive for suspected COVID-19 infection, individual assessment should be made to determine if it is safe to reschedule.[19][32] COVID-19 status alone is not an indication for caesarean delivery.[33]
- Continuous fetal monitoring using cardiotocography during labour is not indicated for asymptomatic women who test positive for SARS-CoV-2, unless there is another indication for monitoring (e.g. previous caesarean delivery). Women with confirmed or suspected symptomatic COVID-19 should be offered continuous fetal monitoring during labour and vaginal birth.[19]
- Home birth may still be considered for low-risk pregnancies, where appropriate support can be provided.[32][34]
- Active management of the third stage of labour is recommended for all deliveries.[30]

Postnatal care:

- As with antenatal care, the number of postnatal visits may be limited, and some may be done remotely rather than face-to-face, depending on the needs of mother and baby.[29][32] The first visit after birth and the day 5 blood spot should be prioritised for a face-to-face visit.[29]
- Long-acting contraception should be offered.
- Liberal use of intravenous iron is recommended, with the aim of reducing intensive care admissions for obstetric haemorrhage.[30]

Considerations for newborn care

The American Academy of Pediatrics has published guidance on the care of babies born to mothers who have COVID-19. Clinicians should wear airborne, droplet, and contact precautions-level personal protective equipment to attend deliveries from mothers with COVID-19. Suctioning, positive pressure ventilation, and intubation may all generate infant virus aerosols.[35]
Observational cohort studies have found that the risk of the newborn acquiring SARS-CoV-2 infection is low when contact and droplet precautions are taken to protect the newborn from maternal respiratory secretions.[36] [37] [38] A mask should be worn, and meticulous breast and hand hygiene performed, for direct skin-to-skin contact between mother and child.[2] [35] The mother should maintain a reasonable distance from the infant where possible; an isolette may be used to facilitate distancing and provide additional protection from respiratory droplets.[35] A cohort study has shown that maternal SARS-CoV-2 immunoglobulin G antibodies can transfer across the placenta. Antibody transfer increases as time between maternal infection and delivery increases. Transfer is independent of disease severity.[39]

Breastfeeding is encouraged. Mothers may also express breast milk after appropriate hand hygiene for uninfected carers to feed the infant. [35]

Infants requiring neonatal intensive care and respiratory support optimally should be admitted to a single patient room with the potential for negative room pressure.[35]

Where testing capacity is available, newborns should be tested for SARS-CoV-2 infection at 24 hours and 48 hours after birth. Infants should be bathed after birth to remove virus particles potentially present on the skin surface.[35]

In the UK, the Royal College of Paediatrics and Child Health and the Resuscitation Council have published guidelines for neonatal settings during the COVID-19 pandemic. Suctioning of the lower respiratory tract, bag-valve-mask ventilation, and intubation of the newborn are considered aerosol-generating procedures. Clinicians should don PPE if the mother is clinically suspected or confirmed to have SARS-CoV-2 infection.[40]

Clinicians should attend deliveries according to their normal institutional policies; maternal COVID-19 infection alone is not an indication to attend. If possible, the neonatal team should be in a separate room and the baby brought to them, to avoid exposure of the neonatal team to the mother.[41] Neonatal resuscitation should follow current national and European guidelines. Where possible, use of a video-laryngoscope should be considered for intubation, because this may help to reduce exposure to the virus, if it is present, by reducing the clinician’s proximity to the baby’s airway. Uncuffed tracheal tubes should be used.[41] The newborn can be dried as usual while the cord is still intact. Deferred cord clamping is recommended in the absence of other contraindications.[35]

Well babies born to mothers with suspected or confirmed COVID-19 and who do not require medical intervention may remain with their mother in their designated room.[35] Babies should only be tested for SARS-CoV-2 if unwell. Early discharge should be facilitated where possible, in conjunction with community midwifery services. Neonatal and infant physical examination screening (NIPE), including visualisation of the soft palate, should be completed before discharge. NIPE is not considered an aerosol-generating procedure.[40]

Breastfeeding should be encouraged; the benefits substantially outweigh the risks of transmission.[33] There is currently no evidence that COVID-19 can be transmitted through breast milk.[19] [32] [42] [43] A mask should be worn, and meticulous hand hygiene performed, for breast or formula feeding. For babies born to mothers with suspected or confirmed COVID-19 who require to be admitted to a neonatal unit, clinical investigations should be minimised while maintaining standards of care. Babies requiring respiratory support should be nursed in an incubator if the mother has clinically suspected or confirmed COVID-19.[40]

The World Health Organization recommends that mothers and their infants room in together and practise skin-to-skin contact, especially immediately after birth and when establishing breastfeeding. Babies should not wear face masks or other face coverings because this may risk suffocation.[19]

**Considerations for patients with dermatological conditions receiving drugs that affect the immune response**

A cohort study of 500,000 people in the UK found that autoimmune disease and history of oral corticosteroid were associated with increased risk of fatal COVID-19.[44] Guidelines recommend that non-essential face-to-face consultations with patients with dermatological conditions should be avoided, with appointments either rescheduled or done using telemedicine.[45] [46]
Patients taking drugs that affect the immune response may have atypical presentations of COVID-19: for example, they may not develop a fever.\[46\]

UK guidelines recommend that patients with known or suspected COVID-19 infection continue on topical treatments and that new-onset dermatological conditions are treated with topical treatments if possible, rather than systemic treatments that act on the immune system.\[46\] If the patient is already taking systemic treatment, they should be advised they can continue hydroxychloroquine, chloroquine, mepacrine, dapsone, and sulfasalazine, and advised that they should not suddenly stop taking oral corticosteroids. All other oral immunosuppressive therapies, biologicals, and monoclonal antibodies could be temporarily stopped during COVID-19 infection. The risks and benefits of stopping should be carefully considered with the patient or their carer, including considering the effect that stopping treatment may have on other comorbid conditions; guidelines highlight the importance of patients not stopping their medications without first speaking with their providers.\[46\] [47] [48] The half-life of some drugs means that immunosuppression will continue for some time after stopping treatment. The International Psoriasis Council, the European Association of Dermatology and Venerology (EADV), and the International Eczema Council recommend discontinuing or postponing the use of immunosuppressive medications in patients diagnosed with COVID-19.\[49\] [50] [51] UK guidelines recommend that for patients not known to have COVID-19 infection, the risks and benefits of starting or continuing a drug that affects the immune system need to be carefully considered, including considering whether the required monitoring is possible, whether the patient has had COVID-19 vaccination, and whether there are changes that could make hospital attendance or admission less likely.\[46\] Advice on COVID-19 vaccination for patients having or scheduled to have immunosuppressive therapy is available and should be consulted.\[22\] [52] The International Psoriasis Council advises that the benefits and risks of using immunosuppressive therapy should be carefully weighed for each patient who is at higher risk of severe illness because of their age or comorbidities.\[49\] The US National Psoriasis Foundation COVID-19 Task Force does not recommend that patients stop their biological or oral therapies for psoriasis and/or psoriatic arthritis; any decision to start or stop a biological or oral systemic therapy should be individualised and involve a healthcare provider.\[53\]

Expert recommendations are available for the management of autoimmune bullous disease (pemphigus, pemphigoid, dermatitis herpetiformis)\[54\] and atopic dermatitis (eczema) during the pandemic.\[55\]

The British Association of Dermatologists has produced a risk stratification table, for use with patients taking different drugs that affect the immune response, giving recommendations for different levels of shielding against COVID-19.\[56\]

**Considerations for patients with dermatological conditions receiving oral retinoids**

The UK Medicines and Healthcare products Regulatory Agency has published guidance to assist safe prescribing of oral retinoids during the pandemic. Consultations for considering a first prescription of oral retinoids should take place face-to-face, where possible. If this is not possible, a remote appointment must include the same full risk-benefit discussion as a face-to-face appointment. If the patient is <18 years, a parent or guardian should be involved for part of the initial consultation. Advice is given for home pregnancy testing to fulfil the requirements of the Pregnancy Prevention Programme, and for monitoring blood tests and psychiatric symptoms.\[57\]

**Considerations for patients with gastrointestinal or liver conditions treated with drugs that affect the immune response**

Clinicians should be aware that deteriorating liver function tests and gastrointestinal symptoms could be associated with COVID-19. Patients with decompensated liver disease may be at higher risk of severe COVID-19 when taking drugs that affect the immune response. A cohort study of 500,000 people in the UK found that autoimmune disease and history of oral corticosteroid were associated with increased risk of fatal COVID-19.\[44\]

Patients taking drugs that affect the immune response may have atypical presentations of COVID-19: for example, they may not develop a fever.\[58\]
UK guidelines recommend that patients should not stop or change their medication without discussion with their gastroenterology or hepatology team, to reduce the risk of a disease flare. Similarly, the American Association for the Study of Liver Diseases (AASLD) European Association for Study of the Liver (EASL) advise against making anticipatory adjustments to immunosuppressive drugs in patients without COVID-19. Patients may continue taking aminosalicylates; these drugs do not affect the immune response. Dosage, route of administration, and mode of delivery should be considered for patients who take drugs that affect the immune response, with the aim of minimising face-to-face contact. The risks and benefits of starting a new drug, including need to start treatment during the COVID-19 pandemic, risk profile, feasibility of monitoring and review, route of administration, and whether the patient has had a COVID-19 vaccination should be considered. Advice on COVID-19 vaccination for patients having or scheduled to have immunosuppressive therapy is available and should be consulted.

The AASLD advises that immunosuppressive therapy should be commenced in patients with liver disease, with or without COVID-19, if there is a strong indication for treatment, (e.g., graft rejection, autoimmune hepatitis). Patients with symptoms of COVID-19 should not suddenly stop oral or rectal corticosteroids. Urgent specialist advice should be sought before stopping or changing medications that affect the immune response in patients with COVID-19. The AASLD advises that clinicians consider reducing doses of immunosuppressants, particularly azathioprine and mycophenolate, based on general principles for managing infections in immunosuppressed patients and to decrease the risk of superinfection.

Considerations for patients with lower gastrointestinal symptoms

UK guidance on the investigation and triage of patients with suspected colorectal cancer has been published. Patients should undergo urgent colonoscopy or computed tomography if they:

- have early signs of large bowel obstruction
- are aged 40 or over with unexplained weight loss and abdominal pain, a faecal immunochemical test (FIT) result >100 micrograms/gram and they have not had a colonoscopy in the last 3 years
- are aged 50 or over with unexplained rectal bleeding, FIT >100 micrograms/gram and they have not had a colonoscopy in the last 3 years
- are aged 60 or over with iron deficiency anaemia or changes in bowel habit, FIT >100 micrograms/gram and they have not had a colonoscopy in the last 3 years
- have symptoms that a specialist considers to need urgent investigation.

Quantitative FIT should be offered to adults without rectal bleeding who are aged 50 and over with either unexplained abdominal pain or weight loss, are aged under 60 with changes in their bowel habit or with iron-deficiency anaemia, or are aged 60 and over and have anaemia even in the absence of iron-deficiency.

If patients have symptoms of weight loss, abdominal pain, changes to bowel habit or iron deficiency anaemia, and either FIT 10-100 micrograms/gram or FIT >100 micrograms/gram and a colonoscopy requiring no further investigation within the last 3 years, they should undergo prioritised colonoscopy or computed tomography.

Patients with lower gastrointestinal symptoms and FIT <10 micrograms/gram are suitable for deferred evaluation and should receive clear advice on who to contact for further clinical assessment should their symptoms change or worsen.

Considerations for endoscopy

Upper gastrointestinal (GI) endoscopy is a high-risk procedure for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) transmission. Lower GI endoscopy also carries a risk of SARS-CoV-2 infection. European and Asia-Pacific guidelines make recommendations for upper and lower GI endoscopy during the COVID-19 pandemic.

Patients should be triaged as high or low risk one day before endoscopy and the triage assessment should be repeated on the day of the procedure. High-risk patients include those with symptoms of COVID-19.
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(partially cough, fever, shortness of breath, or diarrhoea), or travel/residence in an area reporting high community transmission of COVID-19 during the previous 14 days, or contact with an individual confirmed, or very likely, to have COVID-19.

Relatives and carers should not accompany the patient in the endoscopy unit. During endoscopic pre-assessment, clinicians and patients should wear surgical masks, maintain a distance of at least 1 to 2 metres, and if possible use a physical barrier (e.g., face shield). The patient’s temperature should be checked before endoscopy. Separate recovery areas or time slots should be available for patients at particularly high risk of COVID-19.

During the endoscopy procedure, only essential personnel should be present and they should use full personal protective equipment. This should always include shoe coverings, a disposable hairnet, protective eyewear, and a waterproof disposable gown. For low-risk patients, gloves and a surgical mask should be used. For high-risk patients, two pairs of gloves and a filtering face mask should be used.

GI endoscopy should only be performed for patients with suspected or confirmed COVID-19 where medically necessary, ideally in a negative pressure room.

GI endoscopy should always be performed for:

- Acute upper/lower GI bleeding with haemodynamic instability
- Anaemia with haemodynamic instability
- Capsule endoscopy/enteroscopy for urgent or emergent bleeding
- Foreign body in oesophagus
- High-risk foreign body in stomach
- Obstructive jaundice
- Acute ascending cholangitis.

The guidance advises on prioritisation and deferral of procedures for other indications.

The American Gastroenterological Association (AGA) Institute have published a rapid review and recommendations on the role of SARS-CoV-2 testing prior to endoscopy.[67] The AGA Institute suggests pre-procedure testing where there is an intermediate prevalence of asymptomatic SARS-CoV-2 infection (0.5%-2%). They recommend against testing where the prevalence of asymptomatic infection is low (<0.5%) due to the high number of false positives and suggest that availability of personal protective equipment (PPE) may drive decision-making. In areas of high prevalence, pre-procedure testing is not recommended due to the number of false negatives, and again, availability of PPE may drive decision-making. In areas with a surge in COVID-19 patients, endoscopy may be reserved for emergency or time-sensitive procedures.[67]

The North American Society for Pediatric Gastroenterology, Hepatology, and Nutrition (NASPGHAN) recommend that all paediatric endoscopic procedures are done in a negative pressure room with all staff using airborne, contact, and droplet precautions regardless of patient risk stratification. To optimise healthcare delivery and minimise risk, NASPGHAN have proposed stratifying procedures as emergent, urgent (assess benefits and risks before proceeding), or elective.[68]

Transient elastography may reduce the need for endoscopic screening for varices in some patients with cirrhosis. Non-invasive assessments including the Baveno VI criteria, platelet-to-liver stiffness measurement ratio, liver stiffness measurement and spleen stiffness measurement have good predictive value for clinically significant varices and to identify patients at risk of bleeding. Screening for varices should balance the risks of SARS-CoV-2 transmission from endoscopy against the risk of bleeding. Elective upper GI endoscopy to screen for varices in patients with no history of bleeding can be deferred until the COVID-19 outbreak is controlled. Endoscopic eradication of oesophageal varices should be performed following a variceal bleed.[69]
Considerations for patients receiving systemic anti-cancer therapy

Patients with cancer are at higher risk of severe disease and death than patients with no comorbid conditions.[70] [71] An observational study of patients referred to oncology services in Europe reported that mortality from COVID-19 was 33.6% and was associated with male sex, age ≥65 years, ≥2 comorbidities and active malignancy. Nearly 60% of patients developed acute respiratory failure. Delivery of cancer therapy (chemotherapy, immunotherapy and targeted therapy) was not associated with case severity or mortality.[72] An observational study from the US also found that administration of cytotoxic chemotherapy was not associated with severe or critical COVID-19. Patients with active lung or haematological malignancies, baseline neutropenia, or lymphopenia at COVID-19 diagnosis had worse outcomes.[73] Data from the UK Coronavirus Cancer Monitoring Project (UKCCMP) found that patients with haematological malignancies had increased susceptibility to severe acute respiratory syndrome coronavirus 2 and also had more severe COVID-19 disease compared with patients with solid organ tumours; recent chemotherapy conferred an additional risk.[74] A US case-control study found that patients with cancer and COVID-19 were at significantly increased risk of hospitalisation and death than patients without cancer.[75] Non-Hodgkin's lymphoma, lung cancer, and recent diagnosis of leukaemia were most associated with an increased risk of COVID-19 infection. Analysis of US health-insurance claims data found that lung cancer, leukaemias, and lymphomas were significant risk factors for fatal COVID-19 in patients <70 years.[76] Among patients with a recent cancer diagnosis, African-American patients had a significantly higher risk of COVID-19 than white patients.[75]

The most common presenting symptoms of COVID-19 in patients with cancer are fever, cough and acute dyspnoea.[72] However, patients may present with atypical symptoms of COVID-19, and other conditions, notably neutropenic sepsis and pneumonitis, can mimic COVID-19.[77] [78] Patients with a fever or other symptoms of infection should have a comprehensive evaluation.[79]

UK guidelines recommend that systemic anti-cancer treatment should be deferred, if possible, in patients who have COVID-19 until at least 10 days have elapsed since a positive test for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and any significant symptoms have resolved.[77] Systemic anti-cancer treatment may be continued if necessary for urgent control of the cancer; a shared decision should be reached with the patient.[77]

UK guidelines recommend that the highest priority for systemic anti-cancer treatments should be:[77]

- Curative treatment with a high (more than 50%) chance of success
- Adjuvant or neoadjuvant treatment that adds at least 50% chance of cure to surgery or radiotherapy alone or treatment given at relapse.

NHS England has made recommendations for treatment change options for systemic anti-cancer therapy. These take into account the degree of immunosuppression caused by the treatment, the ability to administer treatment in a setting that reduces exposure to COVID-19, resource availability, feasibility, and capacity.[80]

The European Society for Medical Oncology (ESMO) has published guidance on management of cancer patients during the COVID-19 pandemic and recommends that the benefit/risk ratio may need to be reconsidered in some patients. ESMO considers patients receiving chemotherapy and those who have received chemotherapy in the last 3 months to be at risk. ESMO suggests that decisions for starting or continuing cancer therapy are discussed for both patients who do not have COVID-19 infection, and those who do have COVID-19 infection but are asymptomatic or paucisymptomatic, and are still fit and willing to be treated after explanation of the risks and benefits.[81] Cancer care prioritisation and intensity should be adapted to the pandemic scenario.[82]

ESMO suggests the following patient prioritisation:[81]

- High priority: patient condition is immediately life threatening, clinically unstable, and/or the magnitude of benefit qualifies the intervention as high priority (e.g., significant overall survival gain and/or substantial improvement in quality of life [QoL])
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• Medium priority: patient situation is non-critical but delay beyond 6 weeks could potentially impact overall outcome and/or the magnitude of benefit qualifies for intermediate priority

• Low priority: patient’s condition is stable enough that services can be delayed for the duration of the COVID-19 pandemic and/or the intervention is non-priority based on the magnitude of benefit (e.g., no survival gain with no change nor reduced QoL).

ESMO advise that where feasible, all cancer patients admitted to hospital for cancer treatment should be tested for SARS-CoV-2, irrespective of chest radiographic findings or symptoms, if considered at high risk of mortality from SARS-CoV-2 infection. Clinicians should rapidly review the patient’s clinical presentation, their clinical, travel and epidemiological history and planned procedures to ascertain their risk of infectiousness. Healthcare professionals should use personal protective equipment meticulously. Clinicians should consider giving granulocyte colony stimulating factor to elderly patients with comorbidities and patients with an intermediate or high risk of febrile neutropenia, to reduce the risk of febrile neutropenia. Prophylaxis against venous thromboembolism is recommended for patients with cancer and COVID-19. Immune checkpoint inhibitors should not be delayed or withheld in the adjuvant/neoadjuvant setting where there is a significant survival benefit. If a patient receiving immune checkpoint inhibitor therapy for an approved indication tests positive for SARS-CoV-2, the immune checkpoint inhibitor therapy should be withheld until recovery. Tyrosine kinase inhibitors may be withheld until recovery in patients who develop COVID-19 and have oncologically stable disease.[82]

The American Society for Clinical Oncology (ASCO) has published recommendations for oncologists regarding ethics and resource scarcity. ASCO advises that allocation of scarce resources should be based on health benefits and that a fair and consistent allocation policy should be developed before allocation becomes necessary. Given that cancer is a heterogeneous disease that differs in its prognosis, progression, and treatment between individuals, patients with cancer should not unconditionally be denied access to scarce resources. Cancer diagnoses and prognoses should be considered individually, with input from the treating oncologist, and the oncologist caring for a patient should not make scarce resource allocation decisions about that patient. Allocation plans and decisions should be communicated honestly and compassionately to patients. Oncologists and patients should discuss advance care planning, including care goals and end-of-life treatment preferences.[83]

The US National Institutes of Health Coronavirus Disease (COVID-19) Treatment Guidelines provide recommendations for treatment of COVID-19 in adults and children with cancer.[84] The recommendations for treating COVID-19 in patients with cancer are the same as for the general population; however, clinicians should be aware of potential drug interactions and overlapping toxicities. A haematologist or oncologist should be consulted before adjusting cancer-directed medications. Molecular diagnostic testing for SARS-CoV-2 is recommended in patients who develop signs and symptoms of COVID-19 and in asymptomatic patients prior to procedures that require anaesthesia and before initiating cytotoxic chemotherapy and long-acting biologic therapy.

The American College of Cardiology has made recommendations for alterations to routine cardiac surveillance for patients with breast cancer receiving systemic anti-cancer therapy who are at low risk for cardiotoxicity. Patients at higher risk should receive usual care.[85]

Guidelines for SARS-CoV-2 vaccination for patients receiving systemic anti-cancer therapy are available.[86][87]

Considerations for patients receiving radiotherapy

The National Institute for Health and Care Excellence in the UK has issued guidelines for the delivery of radiotherapy during the COVID-19 pandemic. Patients with known or suspected COVID-19 may still receive radiotherapy, provided that national guidance on infection prevention and control can be followed. Patients who are immunosuppressed and develop a fever, with or without respiratory symptoms, should be assessed in secondary or tertiary care for neutropenic sepsis.[88]

When prioritising radiotherapy treatments, clinicians should take into account patient-specific risk factors (including comorbidities and risk of immunosuppression), the risk of untreated cancer versus the risk of severe illness caused by COVID-19, and service capacity issues.
The highest-priority treatments are:[88]

- Radical radiotherapy or chemoradiotherapy with curative intent, if the patient has a rapidly proliferating tumour and treatment has already started and there is little or no possibility of compensating for treatment gaps
- External beam radiotherapy with subsequent brachytherapy, if the patient has a rapidly proliferating tumour and external beam radiotherapy treatment has already started
- Radiotherapy that has not started yet, if the patient has a rapidly proliferating tumour and they would normally start treatment
- Urgent palliative radiotherapy for patients with malignant spinal cord compression who have salvageable neurological function.

The European Society for Medical Oncology (ESMO) has published guidance on management of cancer patients during the COVID-19 pandemic and recommends that the benefit/risk ratio may need to be reconsidered in some patients. ESMO considers patients receiving extensive radiotherapy to be at risk. ESMO suggests that decisions for starting or continuing cancer therapy are discussed for both patients who do not have COVID-19 infection, and those who do have COVID-19 infection, are asymptomatic or paucisymptomatic, and are still fit and willing to be treated after explanation of the risks and benefits.[81] [82]

ESMO suggests the following patient prioritisation:[81]

- High priority: patient condition is immediately life threatening, clinically unstable, and/or the magnitude of benefit qualifies the intervention as high priority (e.g., significant overall survival gain and/or substantial improvement in quality of life [QoL])
- Medium priority: patient situation is non-critical but delay beyond 6 weeks could potentially impact overall outcome and/or the magnitude of benefit qualifies for intermediate priority
- Low priority: patient's condition is stable enough that services can be delayed for the duration of the COVID-19 pandemic and/or the intervention is non-priority based on the magnitude of benefit (e.g., no survival gain with no change nor reduced QoL).

The International Lymphoma Radiation Oncology Group has published emergency guidelines for radiotherapy in haematological malignancies, should radiotherapy be necessary. Alternative dose fractionations may be given.[89]

The European Society for Radiotherapy and Oncology (ESTRO) and the American Society for Radiation Oncology (ASTRO) have published guidance on radiotherapy for lung cancer in the current COVID-19 pandemic.[90] They highlight that the prognosis of lung cancer patients should not be compromised by departing from guideline-recommended radiotherapy practice; however, delaying or interrupting treatment is generally recommended for patients with COVID-19. An international group of experts in the management of lung cancer have also published recommendations for optimising lung cancer radiotherapy during the pandemic.[91]

Further oncology resources are available at:

**Considerations for patients with head and neck cancer**

A European observational study reported an unadjusted mortality rate of 44.8% for patients with head and neck cancer and COVID-19. Overall mortality was higher in male patients, patients ≥ 65 years and patients with ≥2 comorbidities.[72]

An international consensus has made recommendations for head and neck surgical oncology practice in the context of the COVID-19 pandemic. Flexible nasendoscopy should be performed for patients with symptoms or signs suggestive of new cancer or recurrence, or patients with concern for critical airway obstruction, only if adequate personal protective equipment (PPE) is available. Suspicious findings on imaging are not sufficient to confirm a diagnosis of cancer; a core biopsy or fine needle aspiration of a suspicious lymph node is also required. Panendoscopy is not required if a biopsy can be performed under local anaesthesia. Non-emergent surgery should be deferred in patients with confirmed or strongly suspected COVID-19. Tracheostomies should be avoided in patients with oral cancer undergoing transoral surgery; tracheostomies should not be avoided in patients with advanced T2 or T3 oral cancer requiring a free flap. Treatment protocols are given for oral, laryngeal and differentiated thyroid cancer.[92]

**Considerations for patients with neuromuscular diseases**

The World Muscle Society has published advice for management of patients with neuromuscular disease during the COVID-19 pandemic. Patients with neuromuscular diseases are likely to be at high or very high risk of a severe course of illness if they develop COVID-19. Patients should follow government advice on infection prevention and control measures in their country. Patients should make sure they have enough medication and ventilatory support for at least one month. Patients on ventilatory support should be contacted to ensure they have adequate equipment and information. Patients should continue taking corticosteroids and may require a dose increase if they become unwell. Corticosteroids should not be stopped if a patient becomes ill. Immunosuppressive treatment should not be stopped preemptively unless advised otherwise by a specialist. If a patient taking immunosuppressive medication becomes ill, an individual decision regarding temporary withdrawal or a change of immunosuppressive agent should be made with their neuromuscular specialist. When initiating immunosuppressants, the risk of becoming severely ill with COVID-19 should be balanced against the risk of deferring treatment.[93]

Where possible, treatments for neuromuscular diseases should be given in a non-hospital setting and subcutaneous immunoglobulin used instead of intravenous immunoglobulin. Intravenous immunoglobulin, plasma exchange and complement inhibitor treatment is not expected to affect the risk of COVID-19 infection or of severe disease. Chloroquine and azithromycin should not be given to patients with myasthenia gravis unless ventilatory support is available.[93]

**Use of ACE inhibitors and angiotensin-II receptor antagonists**

People with cardiovascular disease are at higher risk of severe complications and death from COVID-19; however, there is currently no evidence that use of ACE inhibitors or angiotensin-II receptor antagonists should be discontinued in these patients.[94] [95] [96] [97] [98] [99] Cohort studies have reported that ACE inhibitor or angiotensin-II receptor antagonist use does not alter risk of intensive care admission or mortality.[100] [101] [102] Randomised controlled trials of patients admitted to hospital with COVID-19 found that continuation of renin-angiotensin system (RAS) inhibitors had no overall effect on survival, progression of COVID-19, need for intensive care, need for invasive mechanical ventilation, shock, cardiovascular events, or length of hospitalisation compared with discontinuation.[103] [104] In another randomised controlled trial of patients with recent-onset symptomatic SARS-CoV-2 infection (median age 75 years), discontinuation of chronic RAS inhibition did not significantly affect the maximum severity of disease within 30 days, but lower rates of organ dysfunction were detected, suggesting a potential benefit of RAS discontinuation in the course of COVID-19.[105]

British, European, American, and Asian heart groups advise that patients should continue to take ACE inhibitors and angiotensin-II receptor antagonists as prescribed.[106] [107] [108] [109] Any change in medication should be based on individual patient risk assessment.
Use of proton-pump inhibitors

A meta-analysis found an association between current use of proton-pump inhibitors (PPIs) and severe clinical outcomes of COVID-19. Past use of PPIs was not associated with more severe outcomes from COVID-19 infection. Neither current nor past PPI use was associated with increased risk of severe acute respiratory syndrome coronavirus 2 infection.[110] Researchers recommend that clinicians reassess the risks and benefits of PPI use and exercise caution when treating patients taking PPIs during the pandemic.[110]

Routine immunisation

The World Health Organization recognises immunisation as a core health service that should be prioritised and safeguarded during the COVID-19 pandemic, where feasible, to prevent morbidity and mortality from vaccine-preventable non-COVID-19 diseases.[111]

The ability to maintain routine immunisation will differ between countries and locations, depending on factors such as health system capacity and the need for physical distancing; local guidelines should be consulted.[111][112] Priority may be given to vulnerable people at higher risk of morbidity and mortality.[113]

Data from the US show a fall in childhood immunisation rates since the declaration of a national emergency in March 2020.[114] Although immunisation rates increased after the lifting of lockdown restrictions, the increase was insufficient to provide catch up immunisation to all children who missed vaccines during the pandemic.[115] Clinicians are encouraged to identify children who have missed well-child visits and/or recommended vaccinations and work with families to bring children up to date as quickly as possible.[116]

The US Centers for Disease Control and Prevention recommend influenza vaccination of persons aged ≥6 months for the 2020-2021 influenza season. The 2020-2021 influenza season is expected to coincide with continued or recurrent circulation of severe acute respiratory syndrome coronavirus 2. Vaccination is expected to reduce prevalence of influenza, thus reducing symptoms which might be confused with those of COVID-19 and reducing the burden on the healthcare system.[117]

In the UK, clinical guidance is available, providing practical advice for maintaining the routine immunisation programme and information that can be given to parents, carers, and patients who have concerns.[118] Clinicians are encouraged to achieve maximum uptake of influenza vaccination in existing eligible groups, particularly during the pandemic. The UK 2020-2021 influenza immunisation programme has been expanded to include household contacts of shielding patients, children in school year 7, and health and social care workers who deliver domiciliary care.[119] Depending on availability following immunisation of currently eligible groups, the influenza vaccine will also then be offered to all 50-64 year olds in the UK.[119] The priority for the human papillomavirus vaccine programme is delivering the first dose to all eligible children, including those who missed their scheduled first dose due to school closures. The interval between the first and second dose can be extended without compromising protection or the effectiveness of the second dose.[120]

In the UK, the criteria for passive immunisation against respiratory syncytial virus will be temporarily widened to include a larger population of at-risk pre-term infants, with the aim of decreasing hospitalisation and intensive care admission rates.[121]

[Vaccination guidance during a pandemic (Centers for Disease Control and Prevention).] (https://www.cdc.gov/vaccines/pandemic-guidance/index.html)

Considerations for patients who require anticoagulation

The Anticoagulation Forum advises that if a patient is taking warfarin, the indication should be reviewed to establish whether anticoagulation is still necessary. If so, clinicians should consider whether patients can switch to a direct oral anticoagulant (DOAC) or whether the patient could self-monitor their INR. Patients may be switched from warfarin to a DOAC if they are suitable candidates and consent to switching.[122] Warfarin treatment should be stopped before DOACs are started.[123] Stable patients who take warfarin can be offered extended INR testing; an interval of up to 12 weeks is appropriate.[122]

Anticoagulation may need to be switched if the patient is hospitalised for any reason, including a diagnosis of COVID-19. US guidelines recommend that patients who are receiving anticoagulant or antiplatelet therapies for underlying conditions should continue these medications if they receive a diagnosis of COVID-19.[124]
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Continued INR monitoring is important in patients taking warfarin or other vitamin K antagonists if they have suspected or confirmed COVID-19 infection. Adjustments to usual anticoagulation may be indicated, especially if the patient receives antibiotics or antivirals. An online tool to check potential COVID-19 drug interactions has been developed:


UK guidelines state that patients who are admitted to hospital with COVID-19 and are receiving anticoagulation for another condition should continue their current anticoagulant at the current dose, unless a change in clinical circumstances contraindicates this. If their clinical condition is deteriorating, and the current anticoagulant is not low-molecular-weight heparin (LMWH), clinicians can consider switching to LMWH.

An anticoagulation service in the UK reported a six-fold increase in the odds of having a supratherapeutic INR (>8.0) during the initial period of lockdown in March and April 2020, compared with the same dates in 2019. COVID-19 infection, antibiotic therapy, other interacting drugs, inpatient hospital admission, recent hospital discharge, entering an end-of-life care pathway, and prolonged testing interval were all identified as risk factors for elevated INR.

UK guidance states that the Pfizer-BioNTech COVID-19 vaccine may be given intramuscularly to patients who are taking warfarin, provided they are up-to-date with INR testing and their latest INR is below the upper limit of the therapeutic range. Patients who are stabilised on a DOAC may also receive the Pfizer-BioNTech vaccine. The risk of haematoma formation may be reduced by using a 23-gauge or 25-gauge needle and applying firm pressure to the injection site for 2 minutes, without rubbing.

**Considerations for management of patients in community psychiatry services**

Psychiatrists are advised to contact patients remotely, using telemedicine where possible, ideally by live video-conferencing in the patient's home. Psychosocial support can be offered via video-conferencing.

The US Center for the Study of Traumatic Stress advises that patients with delusions, obsessive-compulsive thoughts and behaviours, a predominance of somatic symptoms, other active or uncontrolled symptoms, or those previously exposed to severe trauma may be particularly vulnerable in the current pandemic, and that frequent clinical contact may help avoid exacerbations and hospitalisations.

Patients should have adequate supplies of prescribed medication to avoid interruptions in treatment. Some treatment programmes have been amended in response to this: for example, the Substance Abuse and Mental Health Services Administration in the US has introduced flexibility in the Opioid Treatment Program, depending on stability of the patient. In the UK, prescribing and supervision arrangements for all patients on opioid substitution treatment should currently be reviewed as normal, and future arrangements should be based on repeat individual assessments.

The Royal College of Psychiatrists in the UK has provided guidance on provision of medication during the current pandemic; clinicians should consider additional factors when prescribing benzodiazepines/rapid tranquilisation, lithium, clozapine, and depots/long-acting injectables. Longer intervals between drug monitoring may be appropriate for some patients who have been stable on treatment. Individual patient needs should be carefully reviewed, but it is likely that many patients should remain on their regular medication until face-to-face consultation is possible. Patients taking psychotropic drugs may be at risk of significant drug-drug interactions with experimental treatments for COVID-19. Financial insecurity and job loss caused by the pandemic may exacerbate symptoms of depression, anxiety, and distress, and psychosomatic symptoms. Proactive screening for suicidality is recommended.

A study of patients hospitalised with COVID-19 in the US found that those with a prior psychiatric diagnosis had a higher mortality rate compared with those with no psychiatric diagnosis. The reasons for this are unclear. A cohort study in South Korea found that patients with severe mental illness and COVID-19 had a slightly higher risk of intensive care unit admission, invasive ventilation, or death compared with patients without severe mental illness. Another cohort study in South Korea found that psychiatric disorders are not associated with an increased risk of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection but may be associated with an increased risk of mortality in those with COVID-19.
Considerations for mental health of adults

A survey carried out among adults across the US during June 24-30 2020 assessed mental health, substance use, and suicidal ideation during the pandemic.[141] Overall, 40.9% of respondents reported at least one mental or behavioural health condition related to the pandemic, including symptoms of anxiety or depression (30.9%), symptoms of trauma- and stressor-related disorder (26.3%), starting or increasing substance use to cope (13.3%), and seriously considering suicide (10.7%). Adults aged 18-24 years, minority racial and ethnic groups, unpaid carers for adults, and essential workers reported experiencing disproportionately worse mental health outcomes, increased substance use, and higher suicidal ideation. Another US study reported that parents of children <18 years and unpaid carers for adults had a 5-fold increase in risk for adverse mental-health symptoms and an 8-fold increase in risk for serious suicidal ideation during the COVID-19 pandemic compared with people who were neither parents nor carers.[142] A third US study reported a 3-fold increase in prevalence of depression symptoms during the COVID-19 pandemic, compared with before the pandemic. Lower income, having less than $5000 in savings and exposure to more stressors were associated with a higher risk of depression symptoms.[143] In February 2021, 41.5% of adults in the US reported recent symptoms of an anxiety or depressive disorder compared with 36.4% in August 2020.[144]

A case-control study from the Netherlands found that symptoms of depression, worry, and loneliness increased during the pandemic in patients with depression, anxiety, and obsessive-compulsive disorder.[145]

A study of older adults (aged 60 years or older) in Hong Kong found significant increases in loneliness, anxiety, and insomnia during the pandemic. Women, individuals who live alone, and those with more than four chronic conditions were more likely to experience increased loneliness, and women were also more likely to have increased anxiety and insomnia.[146]

In April and May 2020, adults in 14 countries reported significant decreases in mental wellbeing during pandemic restrictions. Female sex, high physical-activity levels pre-restrictions, decreased vigorous physical activity during restrictions, and working partially outside the home (versus working remotely) were associated with clinically relevant decreases in mental wellbeing.[147]

Data from the UK COVID-19 Social Study found that reported frequency of abuse, self-harm and thoughts of suicide/self-harm between March and April 2020 was higher among women, Black, Asian and minority ethnic (BAME) groups and people experiencing socioeconomic disadvantage, unemployment, disability, chronic physical illnesses, mental disorders and COVID-19 diagnosis.[148] In the UK, self-reported mental health and wellbeing worsened during the first national lockdown in 2020, with levels of anxiety, depressive symptoms, and psychological distress peaking in April 2020.[149][150] Young adults, women, people identifying as ‘non-white’, and those with higher income experienced larger increases in distress compared with other demographic groups.[149] Another study tracking mental health in the UK found that between April and October 2020, the mental health of most UK adults remained resilient or returned to prepandemic levels; however, around one in nine adults had deteriorating or consistently poor mental health.[151] Individuals with poor or deteriorating mental health were more likely to have pre-existing mental or physical ill health, to live in deprived neighbourhoods, and be of Asian, Black, or mixed ethnicity.[151] Predictors of subsequent deterioration in mental health were SARS-CoV-2 infection, local lockdown, and financial difficulties.[151]

There was a significant reduction in the incidence of depression, anxiety, first antidepressant prescription, and self-harm recorded by UK general practitioners in April 2020 compared with expected rates. There was a 75% reduction in referral to mental health services, raising concerns that patients may present later with more severe illness.[152]
A French study of university students who experienced quarantine found that 42.8% of students reported suicidal thoughts, severe distress, a high level of perceived stress, severe depression, or a high level of anxiety. Female or non-binary gender, loss of income, low-quality housing, social isolation, history of psychiatric follow-up, and low quality of information received were risk factors for reporting one or more mental health outcomes.[153]

One study of suicide rates in 21 countries found that in the early months of the pandemic, numbers of suicides remained unchanged or declined in high-income and upper-middle-income countries compared with expected levels before the pandemic, which may be a result of additional mental health support and financial safety nets provided by these countries.[154]

**Mental health of children and adolescents**

Most children with pre-existing mental health needs have reported that their mental health has worsened during the pandemic, citing concerns about their family’s health, school closures, loss of routine, loss of social connection and anxiety about the future. Transition to telemedicine for mental health support presents challenges for children and young people, including lack of access to technology, lack of privacy at home and long wait times.[155] Lockdown restrictions and social isolation may cause loneliness and affect the mental health of previously healthy children.[156] One study reviewing changes in mental-health scales before and during lockdown in the UK found that there was an increase in depression symptoms in children during the lockdown.[157] Children and adolescents are probably more likely to experience depression and anxiety during and after enforced isolation. Preventative support and early intervention should be offered where possible.[158]

In England, pandemic-related anxiety has been reported to be higher in girls than boys (aged 11-22 years) and there is a greater prevalence of anxiety in people aged 17-22 compared with those aged 11-16 years.[159]

In Iceland, adolescents aged 13-18 years reported worse mental wellbeing and increased depressive symptoms compared with peers of the same age before the COVID-19 pandemic. Girls were affected more than boys. Alcohol intoxication, cigarette smoking, and e-cigarette use declined among 15-18 year olds of both sexes.[160]

In the US, the proportion of mental health-related emergency department visits for children increased in April to October 2020 compared with the same time period in 2019. Compared with 2019, the proportion increased approximately 24% for children aged 5-11 years and 31% for those aged 12-17 years.[161] Emergency department visits for suspected suicide attempts in children aged 12-17 years increased by 22.3% during summer 2020 and by 39.1% during winter 2021 compared with corresponding periods in 2019.[162] Most of the suicide attempts were made by females.

Schooling changes during the pandemic may also impact children's mental health and wellbeing. A survey of 1290 parents of children aged 5-12 years in the US found that those receiving virtual instructions only were more likely than parents of those receiving in-person instruction to report worsened mental or emotional health.[163]


**Considerations for the mental health of healthcare workers**

Healthcare workers managing novel viral outbreaks are at risk from adverse psychological events.[164] Frontline healthcare workers are at highest risk for developing anxiety, depression, acute stress and insomnia.[165] They may experience burnout or secondary traumatic stress, developing stress reactions and symptoms after exposure to another individual's traumatic experience. One study reported that 45% of frontline clinical staff in Italy experienced physical symptoms of burnout during the peak of the COVID-19 outbreak. Increased irritability, altered food habits, difficulty falling asleep and increased muscle tension were the most common symptoms.[166] In the UK, the 2020 NHS Staff Survey found that 50% of those who had worked on a COVID-19 specific ward or area reported feeling unwell as a result of work-related stress.[167]

Specific advice for healthcare professionals and first responders from the CDC and World Health Organization includes:[168] [169] [170]
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• Recognise that it is normal to feel under pressure in this situation, and that caring for their mental health and psychosocial wellbeing is as important as caring for their physical health

• Learn the symptoms of secondary traumatic stress, including: excessive worry and fear about something bad happening; being easily startled or feeling ‘on guard’ all of the time; physical signs of stress - for example, heart racing; nightmares or recurrent thoughts about the traumatic situation; and the feeling that other people’s trauma is theirs

• Learn the symptoms of burnout, including: sadness, depression, or apathy; feeling easily frustrated, irritable, or blaming others; feeling indifferent, isolated, or disconnected from others; poor hygiene; feeling tired, exhausted, or overwhelmed; feeling like a failure, that nothing they can do will help, or that they are not doing their job well; or feeling they need alcohol or drugs to cope

• Follow general measures to reduce stress, including: taking breaks from reading, watching, or listening to news stories; taking care of mental and physical health: for example, through meditating, eating well-balanced meals, taking regular exercise, getting plenty of sleep; avoiding alcohol and drugs; ensuring sufficient rest between shifts; spending time doing activities they enjoy; and connecting with family and friends

• Keep a journal

• Work in teams and limit the amount of time working alone

• Develop a ‘buddy system’, where two partners support each other and monitor each other’s stress, workload, and safety

• Allow time for themselves and their family to recover from helping with the pandemic

• Ask for help if they feel unable to care for family and patients as they did before the pandemic.

Clinicians can help colleagues by being alert to symptoms of burnout or secondary traumatic stress, offering the opportunity to talk (but not forcing them to do so), signposting them to useful resources, being kind and reassuring, encouraging them to maintain good self-care, and escalating concerns if necessary. Healthcare organisations are encouraged to provide proactive, comprehensive mental health support.[165]

• [Support the Workers] (https://www.supporttheworkers.org)
• [COVID trauma response working group] (https://www.traumagroup.org)
• [NHS Practitioner Health] (https://www.practitionerhealth.nhs.uk)
• [CDC: emergency responders - tips for taking care of yourself] (https://emergency.cdc.gov/coping/responders.asp)
• [SAMHSA (US): disaster preparedness, response, and recovery] (https://www.samhsa.gov/disaster-preparedness)
• [NHS Supporting our people (UK)] (https://people.nhs.uk)
• [Physician support line] (https://www.physiciansupportline.com)

Considerations for immunocompromised children and young people

The National Institute for Health and Care Excellence (NICE) has published guidelines on the general management of children and young people who are immunocompromised, including those with primary immunodeficiencies, those with secondary or acquired immunodeficiencies from a condition or treatment, and those with chronic disease associated with immune dysfunction.[171]

The guideline says that patients and their parents and carers can be reassured that COVID-19 usually causes a mild, self-limiting illness in children and young people, even in those who are immunocompromised. Patients should not avoid their usual appointments unless they have been told to, as this may be harmful. However, face-to-face contact should be reduced where safely possible and replaced with telephone, video, or email consultations.
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Patients can continue with their usual treatment and monitoring at home. When deciding whether to start treatments that affect the immune system, risks and benefits should be discussed with the patient and their carers, considering whether it is safe to delay, if the required monitoring and review can be done, and if there are options that may make hospital attendance less likely. Watchful waiting is recommended if it is deemed safe to delay treatment. Patients already taking treatments that affect the immune response should continue to take them, to minimise risk of graft rejection, a relapse, or flare-up, and should continue to be monitored and reviewed.

Patients and their parents and carers are advised to contact their specialist team straight away if they think the patient may have symptoms of COVID-19, or any other medical concerns, to ensure that symptoms, underlying conditions, and immunosuppressant medicines are appropriately assessed. COVID-19 infection may be difficult to diagnose, as symptoms overlap. Patients taking drugs that affect the immune response may have atypical presentations of COVID-19: for example, they may not develop a fever. Patients and carers should be advised to keep a list of their medicines and the conditions they have, as well as a copy of a recent clinic letter, to give to healthcare staff if they need treatment for COVID-19. For patients with complex needs, a plan should be in place for what should happen if their parents or carers become ill with COVID-19 and are unable to provide care.

Safeguarding children and young people

The COVID-19 pandemic presents challenges for the safeguarding of children and young people. There is an increased risk of child abuse, owing to increased stress affecting parents and carers, loss of social contact with friends, teachers, and extended family, loss of financial or caring support from community resources or schools, increased exposure of children to parents or carers with substance misuse disorders, and decreased access to mental health services.[172] One hospital in London, UK, reported a 1493% increase in cases of suspected abusive head trauma among young children in March to April 2020, compared with the same period over the prior 3 years (10 vs. 0.67 cases per month).[173]

Experts advise that parents and friends can reduce the risk of child abuse in several ways, including: maintaining virtual contact with friends and extended family; establishing and following a family schedule; and researching the community resources and financial aid available.[172]

The American Academy of Pediatrics (AAP) strongly supports the continued provision of child healthcare during the pandemic, unless community circumstances require necessary adjustments. Well child care should occur in person if possible.[116] The AAP has also published specific guidance for the care of children and youth with special health care needs during the pandemic, as they are more likely to experience disruption to health care, education, and community life, and some are more likely to experience more severe COVID-19 infection.[174] Interim guidance on supporting the emotional and behavioural needs of children and families during the pandemic has also been provided by the AAP.[156]

The International Paediatric Association has published a position statement providing recommendations on children’s healthcare during the pandemic, with guidance on routine care and immunisation, prevention of acquiring and transmitting infection, addressing social isolation and disruption of education, and provision of remote care.[175]

The Royal College of Paediatric and Child Health emphasises that paediatricians should continue to make decisions based on the best interests of the child. The College recognises that redeployment of staff may reduce paediatricians’ ability to contribute to multi-agency safeguarding processes and advises that paediatricians should liaise with colleagues in the police and social care to discuss the different levels of support available for vulnerable children, depending on local health resources. Well children and young people should not be admitted to hospital as a place of safety unless there is no alternative. Contingency plans should be made in case the carers of vulnerable children become ill and cannot look after the children in their care or acquire food and medicine.[176]

Further information is available at:
Use of valproate

Valproate (or its derivatives such as valproic acid, divalproex sodium, valproate semisodium) is harmful if used during pregnancy as it increases the risk of congenital malformations and neurodevelopmental disorders. In the UK it is contraindicated in girls and women of child-bearing potential unless conditions of the Pregnancy Prevention Programme are met. The UK Medicines and Healthcare products Regulatory Agency has published interim guidance stating that initiation of valproate in girls of any age and women of child-bearing potential requires face-to-face consultation (with appropriate physical distancing), except where the patient is shielding due to other health conditions. A remote consultation can be considered based on individual risk assessment if the patient is shielding.[177]

If a pregnancy test is required and a face-to-face appointment is not possible then a home pregnancy test could be acceptable, but this is at the discretion of the clinician. Minimum criteria for home pregnancy testing need to be met: the test, and at least one spare, should be sent by the clinic to the patient; the test should meet minimum required sensitivity; and the test result should be verified by the prescriber, ideally by the patient sending a photograph of the test.

The annual review of existing patients taking valproate (that is part of the licence terms) should not be delayed during the current pandemic, and this should be done by video or telephone consultation. Patients should not stop taking it without consulting their doctor.[177]

Considerations for cardiac investigations

The American College of Cardiology, American Heart Association and Heart Rhythm Society have published joint guidance on the management of arrhythmias during the COVID-19 pandemic.

Non-urgent or elective procedures should be postponed. This requires an individual risk assessment and discussion with the patient. In general, electrophysiological procedures that are unlikely to directly impact clinical care or outcomes over the next several months may be considered for deferral. Emergent, urgent, and semi-urgent procedures include those where there is a risk to the patient's life, risk of permanent dysfunction of an extremity or organ system, or risk of severe or rapidly worsening symptoms if the procedure is not performed. Specific examples from each category are discussed in the guidance.[178]

Wherever feasible, clinic visits should be performed using telehealth, and in-person cardiac implantable electronic device checks should be performed remotely. Measures should be taken to protect patients and staff from infection, including social distancing and use of personal protective equipment (PPE).[178]

When assessing patients, clinicians should maintain a high index of suspicion for COVID-19 and should enquire about symptoms, travel history, and contact with infected individuals. Patients with fever, cough, and upper respiratory symptoms should be immediately isolated and tested. Ideally, test results should be available before the procedure to conserve resources.[178]

Guidelines from Australia and New Zealand state that cardiac stress testing and trans-oesophageal echocardiography (TOE) pose significant viral transmission risk. TOE should only be performed if all other investigations have been exhausted, or after exclusion of COVID-19. If TOE is performed, it should be performed in a negative pressure room or with patient intubation and with appropriate PPE.[179] Ambulatory Holter monitoring should be deferred for 1 to 3 months or until the pandemic passes, unless it is expected to detect an arrhythmia that would change management or prevent an emergency department presentation.
Requests for Holter monitoring should be triaged. When clinically essential, use of ambulatory monitors that can be mailed to patients should be considered.[180]

**Considerations for patients with cardiac implantable electronic devices (CIEDs)**

Australian guidelines recommend that remote monitoring is used wherever possible for patients with CIEDs. Routine in-hospital and in-person device interrogations should be deferred wherever possible, if the patient has a chronic indication for the device and there is at least 9 months’ remaining battery life. Video or telephone consultations should be used where possible. If an in-person visit is essential, the patient should be screened for symptoms or exposure to COVID-19 prior to the procedure and clinicians should don appropriate PPE. Wireless technology should be used where possible for in-person checks of CIEDs to allow staff to maintain a distance of >1.5 metres from the patient. Implantable cardiac defibrillators (ICDs) cannot be deactivated remotely. If a patient with an ICD is receiving end of life care, the treating clinical team should secure a magnet to the skin over the ICD where possible, rather than using the programmer. Advice is given for device management during magnetic resonance imaging and surgery. Indications for urgent and semi-urgent elective procedures are listed.[180]

**Considerations for laparoscopy**

Elective laparoscopic surgery is re-starting in the UK for urgent procedures. Initially, surgery should be performed on younger (<70 years) patients with fewer comorbidities, aiming for day or short overnight hospital visits. Steps should be taken to minimise the risk of COVID-19 infection, including: routine testing and self-isolation of patients; use of personal protective equipment; a designated ‘clean’ area for elective surgery; performance of surgery by senior, trained surgeons; use of a closed circuit smoke evacuation system or ultra-low particulate air filtration system; minimising aerosolisation from port sites (e.g., by selecting the correct port size, careful insertion techniques, and minimising instrument exchanges); contained extraction systems; use of the lowest abdominal insufflation pressure for safe progress; minimal use of energy devices during procedures; and routine closed evacuation of all gas at the end of the procedure, before specimen and port removal.[181] There are no studies investigating transmission of severe acute respiratory syndrome coronavirus 2 through laparoscopy, tissue extraction, carbon dioxide deflation, or through surgical smoke.[182] [183]

**Considerations for gastrointestinal motility tests**

The Asian Neurogastroenterology and Motility Association has produced a position statement based on current available evidence and consensus opinion providing guidance for safe practice of gastrointestinal motility tests during the pandemic.[184] Oesophageal manometry, pH-impedance monitoring, urea breath test and hydrogen/methane breath tests are considered to be high-risk procedures for transmission of COVID-19; anorectal physiology tests and treatment are potentially high-risk procedures. Patients should be triaged; procedures for high-risk patients should be decided by a multi-disciplinary team or postponed. Urgent or time-sensitive procedures may be considered for low-risk patients if there are no alternatives. All elective non-urgent procedures should be postponed.

**Considerations for elective surgery**

As more elective surgical procedures resume, guidelines are being published advising on how procedures may go ahead while minimising the risk of severe acute respiratory disease coronavirus 2 (SARS-CoV-2) transmission.[185] Considerations include local SARS-CoV-2 prevalence, staffing capabilities, supply of personal protective equipment, and potential impact of delaying surgery. Patients should be screened for SARS-CoV-2 before elective surgery, and surgery should be postponed for any patient with confirmed or suspected infection. Risk of contracting COVID-19 while in hospital, possible scarcity of intensive care or ventilator resources and the importance of advance directives should be discussed as part of the consent process. [186] [187] [188] [189] [185] [190]

**Considerations for emergency surgery**

The American College of Surgeons has published guidance for the triage of emergency general surgery.[191] Non-operative management is preferred for patients with confirmed or high clinical suspicion
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of COVID-19 infection, where this is feasible and safe for the patient. Where surgery is required for these patients, appropriate precautions should be taken to protect the healthcare team. Generally, procedures should go ahead if delaying is likely to prolong hospital stay, increase likelihood of hospitalisation, or cause harm to the patient. The guidelines provide considerations for some specific conditions. An audit of emergency laparotomy procedures performed during the COVID-19 pandemic in the UK reported that patients with COVID-19 had a longer length of hospital stay and higher 30-day mortality compared with patients without COVID-19.[192]

Considerations for patients with eating disorders

Patients with eating disorders may have atypical responses to infections, for example, malnourished patients may not develop fever. Clinicians should discuss the best way to reduce risk of COVID-19 infection and other physical health complications with patients, taking into account the potential impact of the approach on their mental health and eating disorder. Factors to consider when advising patients about shielding include: [193]

- severe malnutrition (body mass index <15kg/m² in adults or below 5th centile in children and young people)
- severe obesity (>40kg/m²)
- electrolyte imbalances due to purging
- bone marrow suppression (including low lymphocyte levels)
- physical comorbidities such as diabetes, severe asthma, kidney disease or pancreatitis
- male gender
- potential harm to mental health caused by isolation of shielding.

New symptoms of fatigue or lack of energy should be evaluated, even if temperature and cough are absent. Clinicians should be aware that lockdown measures might exacerbate patients’ eating disorder symptoms for many reasons, including anxiety about the pandemic, changes in food availability, exercise restrictions, loss of social support, financial stresses and worry about job and accommodation security and increased alcohol consumption.[193]

Assessment, psychological services and medication reviews should be provided using video consultations wherever possible. Physical examination is an important part of assessment, especially for malnourished patients; clinicians should wear appropriate personal protective equipment. Blood tests and ECGs may be performed in primary or secondary care depending on local arrangements and level of risk. An individual care plan for weighing should be developed depending on whether the patient is cooperative or is likely to falsify their weight.[193]

Measures should be taken to reduce the risk of COVID-19 transmission between patients, including cohort wards for patients with and without confirmed COVID-19, providing single rooms with ensuite facilities for patients who have been advised to take shielding precautions and following national recommendations for infection control precautions.[193]

The American Academy of Pediatrics recommends that all patients should be assessed for the onset of obesity during the pandemic. Obesity and related comorbidities should be treated without delay. Clinicians should screen for disordered eating (e.g., binge eating, purging, and restrictive eating) in patients with obesity.[194]

Further online resources:

- [BEAT (UK Eating Disorder Charity)](https://www.beateatingdisorders.org.uk)
- [National Eating Disorders Association (NEDA)](https://www.nationaleatingdisorders.org)

Considerations for patients with hyperthyroidism

European guidance makes recommendations for the management of patients with hyperthyroidism during the pandemic.[195] Diagnosis should be made based on clinical suspicion supported by biochemistry
testing. TSH-receptor antibodies should be checked where possible. Determination of malignancy risk associated with palpable thyroid nodules can usually be postponed, unless there is rapid growth, or highly suspicious features on palpation or imaging. Uncontrolled thyrotoxicosis may be associated with more severe COVID-19. Block-and-replace regimens are preferred for newly diagnosed hyperthyroidism to reduce the number of blood tests required. Recommended regimens are detailed in the guidance. Symptoms of neutropenia induced by antithyroid drugs (sore throat, mouth ulceration, fever, and flu-like illness) may be indistinguishable from symptoms of COVID-19. Antithyroid drugs should be discontinued in patients with symptoms of neutropenia and an urgent full blood count should be performed.[196]

### Potential impact of COVID-19 pandemic on diagnosis and management of other conditions

Concerns have been raised that diagnosis and treatment of other medical conditions may be delayed during the COVID-19 pandemic. Emergency department attendance in five US states decreased by between 41.5% and 63.5% in early March 2020.[197] One study reported a 42% reduction in hospital admissions, including significant reductions in the number of admissions for stroke, myocardial infarction, heart failure, COPD, and appendicitis.[198] In primary care studies in the UK, diagnosis of physical and mental health conditions between March and May 2020 decreased substantially compared with previous years.[199] [152] Women and people with a chronic illness experienced significantly more cancelled medical or surgical appointments and procedures during the first 2020 lockdown in the UK.[200] Another study reported a 47% decrease in new cases of atrial fibrillation during the first 3 weeks of lockdown in Denmark, compared with the number of cases diagnosed in 2019. The adjusted odds ratio of ischaemic stroke or all-cause mortality during lockdown, compared with the corresponding weeks in 2019, was 1.41 (95% CI 0.93 to 2.12).[201] An analysis of hospital admissions in England found a 40% reduction in weekly acute coronary syndrome admissions between mid-February 2020 and the end of March 2020, compared with 2019 rates; by the end of May 2020, admission rates for acute coronary syndrome were 16% lower than the baseline average.[202] Percutaneous coronary intervention procedures for ST-elevation myocardial infarction (STEMI) in England decreased by 43% in April 2020, compared with average monthly procedures in 2017 to 2019. Overall symptom-to-hospital time and door-to-balloon time increased after the lockdown, but no significant differences in major adverse cardiac events or in-hospital mortality were observed between the pre- and post-lockdown patient groups.[203] A study of acute cardiovascular deaths in England and Wales found an increase in cardiovascular deaths during the pandemic, with most unrelated to COVID-19 infection, and nearly half occurring in the community.[204] However, there was no significant decrease in hospital admissions with acute myocardial infarction, or acute stroke alerts, in the October 2020 to January 2021 surge.[205] In the US, cardiovascular deaths increased during the early phase of the COVID-19 pandemic (339,076 heart disease and 76,767 cerebrovascular disease deaths from March to August 2020 compared with 321,218 and 72,190 deaths during the same months in 2019), with Black, Hispanic, and Asian populations experiencing a disproportionate increase compared with the non-Hispanic white population.[206] In France, admissions for acute myocardial infarction (MI) decreased following the nationwide lockdown.[207] In Sweden, there was a significant decrease in the number of patients with MI who were referred for coronary angiography, but there was no change in mortality.[208] Similarly, a global literature search and meta-analysis found that there was a significant reduction in hospital admissions for patients with STEMI during the pandemic, but this was not associated with an increase in hospital mortality.[209] One US study reported a 3 fold increase in symptoms of depression during the COVID-19 pandemic, compared with before the pandemic.[143] In Denmark, hospital admissions for non-COVID-19 diseases decreased during national lockdowns compared with prepandemic baseline admissions. Mortality rates were higher for patients admitted to hospital with respiratory diseases, cancer, pneumonia, and sepsis.[210] In Germany, there was a significant increase in the proportion of children and adolescents with newly diagnosed type 1 diabetes who had diabetic ketoacidosis (DKA) during the COVID-19 pandemic compared with the same months in 2018 and 2019.[211] In Italy, there were 23% fewer new diagnoses of type 1 diabetes between 20 February and 14 April 2020, compared with the same period in 2019, and children presenting with DKA had more severe DKA.[212] A region of the UK reported an increase in the number of new cases of type 1 diabetes in children diagnosed during April and May 2020, compared with the previous 5 years, and over half of the children presented with severe DKA.[213] One study in the UK looking at the indirect effects of the COVID-19 pandemic on type 2 diabetes between March and December 2020 found reductions in diagnosis and monitoring of type 2 diabetes. Those aged 65 years and older, men, and people from deprived areas had the greatest reductions in diagnosis rates.[214]
Management of coexisting conditions in the context of COVID-19

In the US, incidence of croup, bronchiolitis, and influenza in children decreased significantly after the introduction of social distancing measures, and influenza activity overall in the US is reported to be historically low.[215] [216] Screening and diagnosis of cancer has declined during the pandemic. One study found that weekly incidence of newly identified cancers in the US fell by 46.4% in March to April 2020.[217] Another study in the US found that from March to July 2020, there was a substantial decrease in cancer screening, visits, therapy, and surgeries, compared with the same period in 2019. The study found that in April, screening for breast, colon, prostate, and lung cancer were lower by 85%, 75%, 74%, and 56% respectively.[218] In England, analysis of data from January 2019 to June 2020 found a decline in urgent referrals and chemotherapy attendances during the pandemic.[219] The number of referrals for suspected colorectal cancer, number of colonoscopies, and number of surgeries for colorectal cancer were significantly reduced during April 2020. There was a decrease in laparoscopic procedures and a greater proportion of stoma-forming procedures relative to 2019.[220]

In the US, rates of central line-associated bloodstream infections increased by 51% during the COVID-19 pandemic compared with the pre-pandemic period. Infection rates were higher in hospitals where >10% of monthly admissions were patients with COVID-19 compared with hospitals where <5% of monthly admissions were patients with COVID-19. Infections with coagulase negative Staphylococci and candida species increased during the pandemic compared with the pre-pandemic period.[221]

In the UK, the Royal College of Paediatrics and Child Health has produced guidance for parents and carers to help them know when and where to access help when their child is unwell or injured, to minimise delays in accessing care during the pandemic.[222]

A study of the potential impact of disruptions in health services for major infectious diseases in low-income and middle-income countries suggested that there could be a substantial increase in HIV, tuberculosis, and malaria deaths in settings with high burdens of those diseases.[223] Maintaining core treatment and prevention services are suggested as a priority to minimise the impact of the pandemic.

Resources

Related conditions

◊ Coronavirus disease (COVID-19)

» see our comprehensive coverage of Coronavirus disease (COVID-19) (https://bestpractice.bmj.com/topics/en-gb/3000168)

Our full topic on Coronavirus disease 2019 (COVID-19) includes information on diagnosis and management, as well as prevention, differential diagnosis, epidemiology, aetiology, prognosis, and complications.

◊ Abnormal uterine bleeding

» see our comprehensive coverage of Abnormal uterine bleeding (https://bestpractice.bmj.com/topics/en-gb/658)

A Cochrane review has evaluated the effectiveness and safety of treatments for heavy menstrual bleeding that are commonly available during pandemics.[224] Treatments evaluated included non-steroidal anti-inflammatory drugs (NSAIDs), antifibrinolytics, combined hormonal contraceptives, and progestogens. The review found that there is moderate-certainty evidence that antifibrinolytics and combined hormonal contraceptives reduce heavy menstrual bleeding compared with placebo; there is low-certainty evidence that NSAIDs reduce heavy menstrual bleeding compared with placebo; and there is low-certainty evidence that antifibrinolytics are more effective in reducing heavy menstrual bleeding when compared with NSAIDs and short-cycle progestogens. The authors were unable to draw conclusions about the effects of antifibrinolytics compared with long-cycle progestogens and no conclusions could be made about quality of life, patient satisfaction with treatment, or serious adverse events. The review’s authors suggest that within the context of a pandemic when treatment is selected remotely, antifibrinolytics (e.g., tranexamic acid), NSAIDs, and combined hormonal contraceptives can be offered. They also emphasise the importance of providing a complete face-to-face assessment (physical examination, blood tests, ultrasound) when services are available.

◊ Acute cholecystitis

» see our comprehensive coverage of Acute cholecystitis (https://bestpractice.bmj.com/topics/en-gb/78)

A multisociety position statement advises that laparoscopic cholecystectomy remains the treatment of choice for acute cholecystitis during the COVID-19 pandemic. Early cholecystectomy (performed as soon as possible after the onset of symptoms) is preferred. Air exiting the peritoneum should be filtered through ultra-low particulate air filters to remove viral particles. If surgery needs to be postponed because of a COVID-19 outbreak, patients must be closely monitored for signs of sepsis and pain progression. If patients are not fit for surgery and have not improved with antibiotic therapy, percutaneous gallbladder drainage may be considered.[225]
Management of coexisting conditions in the context of COVID-19

◊ Acute kidney injury

» see our comprehensive coverage of Acute kidney injury (https://bestpractice.bmj.com/topics/en-gb/83)

Patients with COVID-19 may develop acute kidney injury (AKI). Age $\geq$ 60 years and severe COVID-19 are independent risk factors for mortality.[226] Patients who have severe COVID-19 are more likely to require continuous renal replacement therapy compared with patients who have non-severe COVID-19. AKI significantly increases the risk of in-hospital death in patients with COVID-19.[227] One cohort study of patients with in-hospital AKI in the US found that COVID-19-associated AKI was associated with a greater rate of estimated glomerular filtration rate decrease after discharge compared with AKI in patients without COVID-19, and this was independent of underlying comorbidities or AKI severity.[228]

UK guidelines note that in people with COVID-19, AKI can develop at any time (before, during, or after hospital admission), and that maintaining euvoalaemia (optimal fluid status) is critical to reducing AKI incidence.[125]

The treatment of AKI in patients with COVID-19 appears to be the same as in other populations, including continuous renal replacement therapy if necessary.[229] Medications that can cause or worsen AKI should be stopped unless essential. Some treatments for COVID-19 may increase the risk of AKI.[125] Patients with elevated body temperature and increased respiratory rate will have greater insensible fluid losses.[230] [125] Intravenous fluids are required in many cases, and choice should be guided by biochemistry. The goal of intravenous fluid therapy is to maintain a euvoalaemic state. Hypernatraemia is common at presentation and can also develop later.[230] Potassium binders can be used as part of the emergency management of life-threatening hyperkalaemia, alongside standard care.[125] These agents may have a role in preventing or delaying the need for renal replacement therapy if resources are limited.[230] [231]

◊ Acute lymphocytic leukaemia

» see our comprehensive coverage of Acute lymphocytic leukaemia (https://bestpractice.bmj.com/topics/en-gb/273)

Analysis of US health-insurance claims data has shown that leukaemia is a significant risk factor for fatal COVID-19.[76] An international expert panel and the American Society of Hematology have made recommendations for the treatment of adult acute lymphocytic leukaemia.[232] [233] Clinicians should consider minimising corticosteroid exposure and reducing doses of daunorubicin and pegaspargase (pegylated asparaginase) during treatment induction in older people and people at high risk for complications of COVID-19.[232] [233] Anti-CD20 monoclonal antibodies reduce immunoglobulin levels; treatment with these agents should be deferred if possible. Second-generation tyrosine kinase inhibitors with reduced dose corticosteroids should be considered in Philadelphia chromosome-positive disease.[232] [233]

Clinicians should consider blinatumomab if patients are positive for minimal residual disease after two cycles of chemotherapy. If patients are negative for minimal residual disease and have received most of their chemotherapy, they may be advanced to maintenance. During maintenance, clinicians should consider reducing corticosteroids and avoiding vincristine in patients $>$ 65 years. Recommendations are given for relapsed or refractory disease and transplantion. Growth factor support should be considered in patients without COVID-19 to facilitate neutrophil count recovery and maintain absolute neutrophil count above 1000 cells per microlitre during all phases of treatment. Growth factors should probably be avoided in patients with moderate-to-severe severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection because there is a potential risk of exacerbating inflammatory pulmonary injury.[232]

Trials of SARS-CoV-2 vaccination in patients with haematological conditions are lacking. Such patients are likely to have an attenuated response to vaccination. Additional measures, such as early vaccination of household contacts, may be considered.[234]
Acute myelogenous leukaemia

Analysis of US health-insurance claims data has shown that leukaemia is a significant risk factor for fatal COVID-19.[76] Acute myelogenous leukaemia (AML) is associated with worse survival in patients with COVID-19.[235] Patients with AML should be screened for COVID-19 before starting induction or consolidation chemotherapy.[236] Patients receiving intensive therapy should, ideally, be barrier nursed in a COVID-19-negative ward with enhanced screening and protection measures. Chemotherapy should be delayed until the resolution of symptoms and the patient has a negative polymerase chain reaction test. Cytogenetics and nucleophosmin-1 (NPM1) and fms-related tyrosine kinase-3 (FLT3) status will guide choice of chemotherapy. Venetoclax and gilteritinib have been granted emergency approval from NHS England for use in selected patient groups.[236]

Growth factors should probably be avoided in patients with moderate-to-severe COVID-19 because there is a potential risk of exacerbating inflammatory pulmonary injury.[232]

Trials of severe acute respiratory syndrome coronavirus 2 vaccination in patients with haematological conditions are lacking. Such patients are likely to have an attenuated response to vaccination. Additional measures, such as early vaccination of household contacts, may be considered.[237]

Addison's disease

Patients with adrenal insufficiency are at an increased risk of infection, which may be complicated by developing an adrenal crisis. Guidance on prevention of adrenal crisis in patients with confirmed or suspected COVID-19 is available.[238] Patients should be given support to help them self-manage their condition safely and should be educated in the use of sick day rules. The guidelines recommend that patients with symptoms of COVID-19 should seek medical advice, and should take oral hydrocortisone or prednisolone as directed. Patients are also advised to take paracetamol for fever, and to drink regularly, monitoring how concentrated their urine appears. If there are signs of clinical deterioration (such as dizziness, intense thirst, shaking uncontrollably, drowsiness, confusion, lethargy, vomiting, severe diarrhoea, increasing shortness of breath, respiratory rate >24/min, difficulty speaking) the patient or carer should inject hydrocortisone intramuscularly and call for emergency medical assistance.[238] Hospitalised patients should receive intravenous hydrocortisone and continuous intravenous fluid resuscitation with isotonic saline; fludrocortisone should be temporarily stopped.

Age-related macular degeneration

UK guidelines recommend that diagnosis of wet age-related macular degeneration should be confirmed with optical coherence tomography (OCT) and OCT angiography if available. Patients with newly diagnosed disease should be treated with a loading phase of 3 injections of a vascular endothelial growth factor (VEGF) inhibitor, followed by injections every 8 weeks with no clinic review. Patients already established on VEGF inhibitor treatment can continue to receive injections every 8 weeks without clinic review, unless there has been a significant drop in vision since their last injection visit. In this situation, repeat assessment of visual acuity and repeat OCT may be needed. As lockdown restrictions begin to be lifted, pre-pandemic protocols may be implemented.[239]
Management of coexisting conditions in the context of COVID-19

**Related conditions**

◊ **Allergic rhinitis**

» see our comprehensive coverage of Allergic rhinitis (https://bestpractice.bmj.com/topics/en-gb/232)

Statements from the British Society for Allergy and Clinical Immunology and the Italian Society of Pediatric Allergy and Immunology advise that patients with allergic rhinitis should continue usual treatment, including topical intranasal corticosteroids and antihistamines. Uncontrolled allergic rhinitis may lead to sneezing and increased hand-eye and hand-nose contact, facilitating severe acute respiratory syndrome coronavirus-2 transmission.[240] [241] Skin testing for aeroallergens, sublingual immunotherapy, and subcutaneous immunotherapy should be deferred. Post-dose observation may be decreased and intervals between doses may be increased for patients already taking subcutaneous immunotherapy.[240]

◊ **Amblyopia**

» see our comprehensive coverage of Amblyopia (https://bestpractice.bmj.com/topics/en-gb/1162)

UK screening for amblyopia has stopped during the pandemic. Clinical judgement should be used to determine the urgency of treating suspected amblyopia; delaying treatment until the pandemic has passed is justifiable given the risk of virus transmission and pressure on health resources. Atropine treatment requires follow-up visits to monitor for reversal of amblyopia. Therefore, atropine should be discontinued and changed to patching. Parents should be supported to reattempt occlusion if patching has previously failed. Follow up for children receiving patching should be with video or telephone call. Reduction or cessation of patching treatment may be appropriate for certain patients.[242]

◊ **Aortic stenosis**

» see our comprehensive coverage of Aortic stenosis (https://bestpractice.bmj.com/topics/en-gb/325)

A position statement from the American College of Cardiology and the Society for Cardiovascular Angiography and Interventions provides recommendations for the triage of patients referred for transcatheter aortic valve replacement (TAVR) during the pandemic.[190] For patients with severe symptomatic aortic stenosis (AS), TAVR should be considered to decrease the risk for clinical deterioration, prolonged hospital stay, or repeat hospitalisation. Data are not robust enough for clear recommendations for patients with minimally symptomatic severe to critical AS; however, urgent TAVR or close outpatient virtual monitoring may be considered. Particularly high peak or mean gradient, very small calculated aortic valve area and very low dimensionless index warrant consideration of TAVR. For asymptomatic patients, consideration of TAVR may be postponed for 3 months or until elective procedures are resumed. Close outpatient monitoring should continue for all patients with severe AS.

The British Heart Valve Society has published recommendations for the outpatient management of heart valve disease following the COVID-19 pandemic. They recommend that patients with severe symptomatic AS and advanced heart failure, impaired ventricular function (left ventricular (LV) ejection fraction of <50%) or syncope are the highest clinical priority and ideally require valve intervention within 2 weeks and no more than 4 weeks. Interventions for AS include surgical aortic valve replacement (sAVR) or transcatheter aortic valve implantation (TAVI), and currently the benefits of sAVR versus TAVI should be considered for each patient, taking into account the requirement for general anaesthesia and intensive care unit admission, length of stay in hospital and risk of peri-procedural exposure to COVID-19.[243]
◊ Aplastic anaemia

» see our comprehensive coverage of Aplastic anaemia (https://bestpractice.bmj.com/topics/en-gb/96)

The definitive treatment options for severe aplastic anaemia (AA) are stem cell transplant or immunosuppressive therapy. The American Society of Hematology advise that for patients with absolute neutrophil count (ANC) <200/microlitre (very severe AA) the risk of delaying transplant or immunosuppressive therapy outweighs the risks of exposure to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) during hospitalisation or the impact of immunosuppression on the course of infection, but that optimal management may not currently be practical.[244]

Immunosuppressive treatment options are antithymocyte globulin (ATG), ciclosporin, and eltrombopag; administration of ATG requires hospitalisation. The American Society of Hematology, the European Society for Blood and Marrow Transplantation, and NHS England have released statements recommending the use of eltrombopag, with or without ciclosporin, as bridging treatment to stem cell transplant or immunosuppressive therapy with ATG for patients with severe or very severe AA during the COVID-19 pandemic.[244] [245] [246]

Trials of SARS-CoV-2 vaccination in patients with haematological conditions are lacking. Such patients are likely to have an attenuated response to vaccination. Additional measures, such as early vaccination of household contacts, may be considered.[237] The American Society of Hematology advises that the benefits of COVID-19 vaccination outweigh the risks in patients with AA, particularly those with additional risk factors for severe COVID-19 disease, though some patients receiving immunosuppressive therapies may not mount an appropriate immune response to the vaccine.[244]
Asthma

The Global Initiative for Asthma (GINA) reports that people with asthma do not appear to be at increased risk of acquiring COVID-19 and that people with well-controlled, mild-to-moderate asthma are not at increased risk of severe COVID-19.\[247\] GINA also reported that people with well-controlled asthma are not at increased risk of death from COVID-19 overall; however, people who recently needed oral corticosteroids for their asthma did have an increased risk of COVID-19-related death.\[247\] Additional studies have found that patients with severe asthma (treated with 3 different classes of medication) have an increased risk of hospitalisation, intensive care admission, and death from COVID-19.\[248\]\[249\] A rapid systematic review by the World Health Organization found that the current evidence on association between asthma and increased risk of COVID-19 infection or severe outcomes was unclear and that more studies are needed.\[250\] Among people with asthma and COVID-19, risk factors for worse outcomes were comorbid chronic obstructive pulmonary disease, non-allergic asthma, non-white ethnicity, and older age.\[250\]

Patients should continue taking their prescribed asthma medication as usual, including inhaled and oral corticosteroids and biological therapy.\[247\]\[251\]\[252\]\[241\]\[253\]\[254\] GINA advises that all patients should have a written action plan so they know how to recognise worsening asthma, how to increase reliever and controller medications, and when to seek medical help.\[247\] GINA advises that nebulisers should be avoided for acute attacks due to the risk of transmitting respiratory viral particles, and that a pressurised metered-dose inhaler and spacer with mouthpiece or tightly fitting face mask can be used to deliver a short-acting beta-2 agonist instead.\[247\] The US Centers for Disease Control and Prevention advises that nebuliser administration may generate infectious aerosols; however, it is unclear whether association between nebuliser administration and infection is due to the generation of infectious particles or the close contact between the patient and healthcare professional administering the nebuliser.\[255\]

However, UK guidelines advise that nebulisers may continue to be used, as the aerosol comes from the fluid in the nebuliser chamber and will not carry virus particles from the patient.\[251\] GINA advises that where community transmission of SARS-CoV-2 is occurring, spirometry and peak-flow measurement within healthcare facilities are postponed unless there is an urgent need.\[247\] UK guidelines currently advise that bronchoscopy and most pulmonary function tests such as spirometry should only be done for urgent cases and if the results will have a direct impact on patient care.\[251\] Strict infection control precautions should be followed if spirometry is urgently required.\[247\]

Patients should ensure they have a sufficient supply of medication at home, but should not stockpile. Patients may be reminded that they should not share inhalers or spacers with others. Clinicians should encourage smoking cessation.\[241\]

Advise patients that COVID-19 may present with symptoms similar to an asthma attack (e.g., cough, shortness of breath); however, additional symptoms such as fever, fatigue, and change in taste or smell are more likely to suggest COVID-19 infection.\[256\] A large prospective cohort study reported that 1 in 7 patients aged 16-49 years with COVID-19 presented with wheeze.\[257\]

In studies of patients hospitalised with COVID-19, asthma does not appear to be an independent risk factor for intubation.\[258\] Patients with asthma who are aged 16 years and older have more severe disease on presentation to hospital, and are more likely to require critical care, non-invasive ventilation, and oxygen, compared with patients without asthma. In patients aged 50 years and older with asthma, ICS use within 2 weeks of hospital admission was associated with decreased mortality compared with patients without an underlying respiratory condition.\[248\]

GINA reports that in 2020, there was a reduction in asthma exacerbations in many countries.\[247\] Emergency department attendances and hospital admissions for asthma decreased significantly in Scotland and Wales during the first 2020 lockdown. Prescriptions for inhaled and oral corticosteroids increased significantly before lockdown in Wales, suggesting that improved adherence to preventative treatment and self-management of exacerbations may have contributed to this change. Reduced circulation of other respiratory viruses, decreased air pollution and changes in smoking habits during lockdown may also have contributed to the decrease.\[259\] In England, primary care attendances for asthma exacerbations decreased during the first 2020 lockdown, but there was no significant decrease in exacerbations requiring a hospital visit.\[260\]

GINA recommends COVID-19 vaccination for people with asthma, following the usual vaccine precautions.\[247\] For people with severe asthma receiving biological therapy, the COVID-19 vaccine and the biological therapy should not be given on the same day.\[247\]
Management of coexisting conditions in the context of COVID-19

Related conditions

◊ **Attention deficit hyperactivity disorder (ADHD)**

» see our comprehensive coverage of Attention deficit hyperactivity disorder (ADHD) (https://bestpractice.bmj.com/topics/en-gb/142)

The European ADHD guidelines group have published guidance for management of patients with ADHD during the COVID-19 pandemic. Service provision should continue using telehealth where possible. Parents or carers are encouraged to use behavioural parenting strategies and schools are advised to prioritise monitoring of students with ADHD. Patients should be offered the opportunity to start on medication, if indicated, following an initial assessment. Patients who are already established on medication should continue taking it as prescribed. Parents and patients should not increase medication doses above the dose prescribed to manage the stress of confinement. Routine cardiovascular examination and face-to-face monitoring can be deferred for individuals without any cardiovascular risk factors. Home blood pressure and heart rate monitoring is recommended.[261]

◊ **Autoimmune hepatitis**

» see our comprehensive coverage of Autoimmune hepatitis (https://bestpractice.bmj.com/topics/en-gb/130)

A cohort study of 500,000 people in the UK found that autoimmune disease and history of oral corticosteroid were associated with increased risk of fatal COVID-19.[44] UK, European, and US guidelines advise against making anticipatory adjustments to immunosuppressive drugs in patients without COVID-19.[58] [59] [60] Doing so may cause a flare of autoimmune hepatitis (AIH). Budesonide may be considered to induce remission in patients without cirrhosis who have a flare of AIH, to minimise systemic corticosteroid exposure.[60]

The American Association for the Study of Liver Disease (AASLD) advises that immunosuppressive therapy should be commenced in patients with AIH, with or without COVID-19.[59] The risks and benefits of starting a new drug (including need to start treatment during the COVID-19 pandemic, risk profile, feasibility of monitoring and review, and route of administration) should be considered.[59]

If a patient develops COVID-19, the AASLD advises that clinicians consider reducing doses of immunosuppressants, particularly azathioprine and mycophenolate, based on general principles for managing infections in immunosuppressed patients and to decrease the risk of superinfection.[59] Adjustment should be individualised and will depend on the severity of COVID-19. If a patient is taking corticosteroids and develops COVID-19, corticosteroid dosing must be sufficient to prevent adrenal insufficiency.[60] Corticosteroids should not be stopped suddenly.[58]

COVID-19 may cause abnormal liver function tests in patients with AIH; these should not be attributed to a disease flare without biopsy confirmation.[59]

A joint statement from the British Society of Gastroenterology, British Association for the Study of the Liver, NHS Blood & Transplant, and British Liver Trust advises that patients with autoimmune hepatitis should consider SARS-CoV-2 vaccination with any of the available vaccines.[262]
Management of coexisting conditions in the context of COVID-19

◊ Breast cancer

» see our comprehensive coverage of Breast cancer (https://bestpractice.bmj.com/topics/en-gb/716)

A European observational study reported an unadjusted mortality rate of 15.2% for patients with breast cancer and COVID-19. Overall mortality in patients with cancer and COVID-19 was higher in male patients, patients ≥ 65 years and patients with ≥2 comorbidities.[72] Among newly diagnosed patients, African-American patients are more likely to develop COVID-19 than white patients.[75]

The American Society of Breast Surgeons has released recommendations for the prioritisation, treatment, and triage of patients with breast cancer during the COVID-19 pandemic.[263] The highest-priority conditions for treatment during the pandemic are:

- Potentially unstable breast disease (e.g., haematoma, infection): assessment and surgery
- New diagnosis of invasive breast cancer (may be suitable for telemedicine)
- Surgery: revision of ischaemic mastectomy flap; revascularisation/revision of autologous tissue flap
- Chemotherapy: neoadjuvant/adjuvant chemotherapy for triple-negative and HER2-positive breast cancer; early chemotherapy likely to improve outcomes in metastatic disease; completion of adjuvant/neoadjuvant chemotherapy that has already started; adjuvant or metastatic endocrine therapy
- Radiotherapy for painful, inoperable breast masses; continuation of radiotherapy that has started; treatment for critical metastatic lesions (e.g., brain metastasis, spinal cord compression).

UK guidelines recommend giving highest priority to patients receiving:[77]

- Curative systemic anti-cancer treatment with a high (more than 50%) chance of success
- Adjuvant or neoadjuvant systemic anti-cancer treatment that adds at least 50% chance of cure to surgery or radiotherapy alone or treatment given at relapse.

The UK Association of Breast Surgery has published recommendations for delivering breast services during the pandemic. New referrals should be triaged and patients should be contacted before clinic attendance. Patients with COVID-19 symptoms should self isolate for 7 days and their appointment deferred until after self isolation. Patients should be seen in person where there is a strong suspicion of cancer; patients with low suspicion of cancer (e.g., breast pain, or bilateral nipple discharge in a woman <30 years) may be contacted by telephone and considered for deferred imaging. Frail, older patients with comorbidities or who require residential care are at highest risk from COVID-19. Therefore, these patients should not be seen in person. Empirc letrozole treatment may be considered. Follow-up for existing patients should be performed by telephone where possible.[264]

Capacity for surgery is limited in many hospitals. The Association of Breast Surgery suggests prioritising patients in the following order:[264]

- Oestrogen receptor (ER) negative
- Human epidermal growth factor receptor 2 (HER2) positive
- Pre-menopausal patients
- Post-menopausal, ER positive patients with high risk disease (grade 3 or node positive)
- Large areas of high grade ductal carcinoma in situ (DCIS)
- Post-menopausal, ER positive patients with lower risk disease
- Remaining patients with DCIS

Neoadjuvant chemotherapy should only be given where it is clear that chemotherapy is indicated, and would be given in the adjuvant setting. Neoadjuvant chemotherapy should be routinely supported with granulocyte-colony stimulating factor during the pandemic. Multidisciplinary team discussion is recommended for all cases.[265] [82]

COVID-19 vaccination is associated with a higher incidence of axillary lymphadenopathy on breast MRI. Guidelines have been published to help avoid biopsies of reactive nodes. MRI-detected, unilateral, axillary lymphadenopathy ipsilateral to the vaccination arm is most likely to be COVID-19 vaccination-related if within 4 weeks of either dose. A follow-up ultrasound 6 to 8 weeks after the second vaccine dose is recommended.[266]

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Further oncology resources are available at:

Management of coexisting conditions in the context of COVID-19

**Bronchiolitis**

» see our comprehensive coverage of Bronchiolitis (https://bestpractice.bmj.com/topics/en-gb/28)

UK guidance recommends optimising preventative treatment, including influenza vaccination and palivizumab for eligible children.[267] Key features of assessment are oxygenation, hydration, and nutrition, irrespective of the child’s potential COVID-19 status. High-flow nasal cannula oxygen is an aerosol-generating procedure; a senior clinician should be consulted if its use is being considered. Children who require admission to hospital should be tested for respiratory viruses, including severe acute respiratory syndrome coronavirus (SARS-CoV-2), influenza, and respiratory syncytial virus. Children who require intensive/high-dependency care or surgery should be prioritised for rapid SARS-CoV-2 testing.

In the UK, the criteria for passive immunisation against respiratory syncytial virus will be temporarily widened to include a larger population of at-risk pre-term infants, with the aim of decreasing hospitalisation and intensive care admission rates.[121]

**Carcinoid syndrome**

» see our comprehensive coverage of Carcinoid syndrome (https://bestpractice.bmj.com/topics/en-gb/296)

Interim guidance for the management of patients with neuroendocrine tumours is available from the UK and Ireland Neuroendocrine Tumour Society.[268] Patients already receiving somatostatin analogue therapy should continue on their treatment, but delivery of medication and dose intervals may change in order to minimise hospital visits; this is highly individual and decided on a patient-by-patient basis. Patients with highly functional tumours due to start treatment will need initiation of therapy to control their condition. Initiation of therapy in patients with non-functioning tumours may be delayed depending on patient fitness and tumour characteristics; again, this is decided on a patient-by-patient basis. Use of chemotherapy and peptide receptor radiotherapy should also be individualised, with the risks and benefits of starting or continuing considered for eligible patients. Surgery may be considered where it is life-saving or potentially curative.
◊ Cardiopulmonary resuscitation (CPR)

» see our comprehensive coverage of Cardiopulmonary resuscitation (CPR) (https://bestpractice.bmj.com/topics/en-gb/283)

Giving CPR poses a high risk to healthcare workers in the context of COVID-19 due to the aerosol-generating procedures, close proximity of multiple healthcare workers and the patient, and the need to work quickly.

If cardiac arrest is recognised (patient is unresponsive and breathing abnormally) look for breathing, but do not open the airway or listen/feel for breathing by placing the face close to the patient's mouth.\[269\] \[270\] \[271\]

In acute hospital settings, full Aerosol Generating Procedure (AGP) Personal Protective Equipment (PPE) must be worn by all members of the resuscitation team before entering the room; no chest compressions or airway procedures should be started without full AGP PPE. The number of staff in the room should be restricted, and airway interventions should be done by experienced staff, minimising aerosolisation risk.\[269\] \[270\] \[271\] \[272\]

In first aid and community settings, lay-rescuers should perform compression-only resuscitation and defibrillation (where there is access); a cloth may be placed over the patient's mouth and nose if there is a perceived risk of infection. Paediatric cardiac arrest is more likely to be caused by a respiratory problem, and ventilation is vital; lay-rescuers may consider that the risk of not giving rescue breaths could be greater than the risk of transmission of COVID-19.\[269\] \[270\] \[271\] \[272\]

In-water mouth-to-mouth resuscitation should not be performed on drowned patients. Rescuers should prioritise removal from water where PPE and first aid equipment can be used. Rescuers should wear gloves, facemask and eye protection for all resuscitations. Two-person bag-filter-mask ventilation using a high-efficiency particulate air filter (HEPA) filter is preferred. If this is not possible, mouth-to-mask ventilation with HEPA filter is the second line technique and passive oxygenation is third line. If rescuers cannot follow this guidance, they should provide compression only CPR and cover the patient’s nose and mouth with a cloth.\[273\]

Brazilian guidelines recommend beginning continuous chest compressions to deliver CPR to adults. The patient’s oral cavity should be sealed with a cloth or a mask providing low flow (6-10 litres/minute) oxygen before starting chest compressions; the seal should be kept in place until an invasive airway is secured. Bag-valve-mask or bag-valve tube ventilation should be avoided if possible; if it is needed, two rescuers should provide ventilation (to allow a two-handed seal around the mask) and an oropharyngeal airway should be used. A HEPA filter should be placed between the mask and bag. If the patient is prone at the time of cardiac arrest and does not have an invasive airway, they should be repositioned supine. If the patient is intubated, chest compressions should be delivered while prone. Resuscitation of children should ideally be with chest compressions and use of a bag-valve-mask apparatus with a HEPA filter until a definitive airway is established.\[274\]

### Cerebellar ataxia

» see our comprehensive coverage of Cerebellar ataxia ([https://bestpractice.bmj.com/topics/en-gb/1097](https://bestpractice.bmj.com/topics/en-gb/1097))

Patients with cerebellar ataxia (CA) may be at higher risk from serious COVID-19 infection as they are likely to be older, and also because of the neurological complexities of their underlying disorder and comorbid medical illnesses.[275] Recommendations suggest that patients with immune ataxias continue their therapies (including intravenous immunoglobulin, corticosteroids, plasma exchange), but they are considered high risk and should follow local advice on physical distancing.[275] Patients with symptoms of infection may be instructed to stop immunosuppressive therapies until they have fully recovered. Starting patients on immunotherapies may also be delayed, but balanced against the risk of not starting, particularly in patients with rapidly progressive immune-mediated ataxias.[275] Decisions for patients with CA who are hospitalised with COVID-19 should involve the ataxiologist.

### Chronic congestive heart failure

» see our comprehensive coverage of Chronic congestive heart failure ([https://bestpractice.bmj.com/topics/en-gb/61](https://bestpractice.bmj.com/topics/en-gb/61))

Patients with heart failure have a significantly increased risk of death if they develop COVID-19.[76] One cohort study investigated outcomes for patients with a history of heart failure (≥1 hospitalisation or ≥2 outpatient visits for heart failure) who were admitted to hospital with COVID-19. In-hospital mortality was 24.2%. Male sex, class III obesity, and increasing age were associated with increased risk of in-hospital mortality.[276]

Patients with chronic heart failure are prone to developing acute heart failure after a diagnosis of COVID-19.[277] European guidelines recommend using the same treatment strategy for acute heart failure in patients with COVID-19 as for patients without COVID-19.[278] One observational study reported that discontinuation of medical therapy for chronic heart failure (ACE inhibitors, beta-blockers, and mineralocorticoid receptor antagonists) in patients with COVID-19 was associated with increased mortality. The authors recommend that even if these medications are reduced or discontinued during the acute illness, they should be reintroduced at discharge whenever possible.[277]
Chronic kidney disease

People of any age with chronic kidney disease (CKD) are at increased risk of severe illness and death from COVID-19. One meta-analysis reported a hazard ratio of 3.6 for COVID-19-related mortality in patients with chronic kidney disease. The UK National Institute for Health and Care Excellence has published guidelines for managing patients with CKD during the COVID-19 pandemic. Patients should be advised to continue taking their usual medications, even if they have symptoms of COVID-19, unless directed otherwise by a healthcare professional. This includes ACE inhibitors, angiotensin-II receptor antagonists, immunosuppressants, and diuretics. Patients should be advised to keep a list of their medications, other medical conditions, and allergies and a copy of a recent clinic letter to give to healthcare staff if they need treatment for COVID-19. Clinicians should review the medication of any patients diagnosed with COVID-19, taking into account whether any have the potential to adversely affect renal function. When deciding whether to admit a patient who has CKD and COVID-19 to hospital, clinicians should consider the patient's wishes, the severity of CKD, any comorbidities, whether the patient is taking any immunosuppression, the risks and benefits of admission, and how the care that can be offered in hospital compares with care that can be offered at home. All patients with advanced CKD should have the opportunity to participate in advance care planning.

After recovery from COVID-19, renal function should be reassessed. The urgency of assessment should be based on the patient's glomerular filtration rate (eGFR) category, comorbidities, and clinical circumstances.

Urgent outpatient appointments are needed for: patients with accelerated progression of CKD (a sustained decrease in GFR of 25% or more and a change in GFR category in the preceding 12 months, or a sustained decrease in GFR of 15 mL/min/1.73 m² per year); nephrotic syndrome or very severe proteinuria (urinary albumin:creatinine ratio >300 mg/mmol; or a new diagnosis of GFR category G5 (GFR <15 mL/ min/1.73 m²). Clinicians should seek specialist advice if the urgency of referral is unclear. Renal ultrasound should be performed if the result might change immediate management, for example, in patients with accelerated progression of CKD, visible or persistent invisible haematuria, symptoms of urinary tract obstruction or a nephrologist has identified an urgent need for renal biopsy. Patients who will be starting dialysis should have procedures to establish vascular or peritoneal access.

Patients who have stable renal function may be able to increase the interval between blood and urine testing, depending on comorbidities and whether their CKD is progressive. Clinicians should encourage self-monitoring and self-management where patients are able to do so, for example, patients may monitor their blood pressure at home and access parts of their medical record online. If patients are self-monitoring or self-management, they should receive clear instructions on when to seek help and who to contact. Non-urgent referrals, for example, patients with mild to moderate proteinuria and a stable GFR, may be delayed to reduce risk from COVID-19. Renal ultrasound may be deferred if the result is unlikely to change management immediately, for example, exclusion of polycystic kidney disease in patients with a family history of the condition, if a nephrologist has identified a possible need for non-urgent renal biopsy or the patient has a GFR of <30 mL/min/1.73m² that has been stable for at least 6 months.

US and international guidelines recommend that patients with fever or respiratory symptoms should be asked to contact the unit before arrival and should be isolated and tested for COVID-19 on arrival. Patients should also report any close contact with persons with severe acute respiratory syndrome coronavirus 2 infection in the past 14 days. Each patient should have their temperature monitored on arrival and confirm the absence of symptoms of COVID-19. Patients should wear their own mask while in the facility. If they are not wearing their own on arrival, they should be offered a medical face mask as supplies allow.

UK guidelines recommend that patients should be screened before each episode of dialysis to assess whether they are known or suspected to have COVID-19, or have been in contact with someone who has confirmed COVID-19. Patients who might have COVID-19 should be tested, ideally using a rapid turnaround test. They should be assessed for alternative causes for their symptoms and whether dialysis could be delayed until their test results are known.

US guidelines advise that a distance of 6 feet should be maintained between patients in the waiting area and during dialysis, especially in areas of moderate to substantial community transmission. Patients may prefer to wait in their vehicle and receive a message when it is their turn to enter the dialysis unit. Patients with fever should receive dialysis in the last shift of the day until COVID-19 infection is excluded. Consideration should be given to cohorting patients with suspected or confirmed COVID-19 with the same healthcare professional, in the same section of the unit, at the same time.
Management of coexisting conditions in the context of COVID-19

◊ Chronic lymphocytic leukaemia

» see our comprehensive coverage of Chronic lymphocytic leukaemia (https://bestpractice.bmj.com/topics/en-gb/275)

Analysis of US health-insurance claims data has shown that leukaemia is a significant risk factor for fatal COVID-19.[76] Older age is associated with increased severity of COVID-19 in patients with chronic lymphocytic leukaemia (CLL).[287] The American Society of Hematology recommends postponing treatment initiation for CLL in areas where COVID-19 is active. If immediate therapy is needed, treatments that can be provided in an outpatient setting with fewer clinic visits are preferred. Treatment with monoclonal antibodies should be avoided, especially in combination with targeted agents, and initiation of venetoclax should be avoided if possible.[288] Immunoglobulin replacement may be continued in highly selected patients where the potential benefits are outweighed by the risks of visiting a clinic for the infusion. Intravenous immunoglobulin can be continued in those who have COVID-19, but requires close monitoring for thromboembolic events. Patients who are already receiving treatment for CLL and have COVID-19 with mild symptoms should generally not have their treatment modified. Treatment may be modified in patients with more severe symptoms depending on the aggressiveness of CLL, history of infections, and the risk of more severe COVID complications; decisions are made on a case-by-case basis, but generally monoclonal antibodies are withheld in patients with COVID-19. Treatment with ibrutinib and acalabrutinib should be continued in patients diagnosed with CLL and COVID-19.[288]

Recommendations from Australia and New Zealand also advise delaying therapy where possible during the pandemic.[289] If therapy is considered essential, then oral therapies should be considered where available.

There are limited data on trials of severe acute respiratory syndrome coronavirus 2 vaccination in patients with haematological conditions. Such patients are likely to have an attenuated response to vaccination. One study of the BNT162b2 mRNA COVID-19 vaccine in patients with CLL found the antibody response was reduced compared with healthy controls and affected by disease activity and treatment.[290] Relatively low antibody responses were seen in patients treated with Bruton's tyrosine kinase inhibitors or venetoclax alone or in combination with anti-CD20 antibody. Additional measures, such as early vaccination of household contacts, may be considered.[237]

◊ Chronic myelogenous leukaemia

» see our comprehensive coverage of Chronic myelogenous leukaemia (https://bestpractice.bmj.com/topics/en-gb/276)

Analysis of US health-insurance claims data has shown that leukaemia is a significant risk factor for fatal COVID-19.[76] The American Society of Hematology has published recommendations on the management of chronic myelogenous leukaemia (CML) during the COVID-19 pandemic.[291] Treatment with tyrosine kinase inhibitors (TKI) is not immunosuppressive and should not be interrupted in patients without COVID-19 infection receiving treatment, or delayed in those with newly diagnosed CML. Some TKIs may have pulmonary side effects and stopping therapy may be considered in affected patients who have COVID-19. Patients in remission should be monitored as normal where possible. Remote monitoring or less-frequent monitoring may be considered where local conditions change. Patients in the chronic phase of CML are not at higher risk of COVID-19 infection, and those that do have COVID-19 infection may not be at higher risk of more severe disease. Possible drug-drug interactions should be reviewed in patients being treated for COVID-19.

Trials of severe acute respiratory syndrome coronavirus 2 vaccination in patients with haematological conditions are lacking. Such patients are likely to have an attenuated response to vaccination. Additional measures, such as early vaccination of household contacts, may be considered.[237]
Management of coexisting conditions in the context of COVID-19

◊ Chronic obstructive pulmonary disease (COPD)

» see our comprehensive coverage of Chronic obstructive pulmonary disease (COPD) (https://bestpractice.bmj.com/topics/en-gb/7)

Patients with COPD are at higher risk for severe COVID-19 illness and death, and should carefully follow public health advice.[280] [292] [248] [293] The Global Initiative for Chronic Obstructive Lung Disease (GOLD) recommends that patients with COPD who have new or worsening respiratory symptoms, fever, and/or any other possible COVID-19-related symptoms should be tested for severe acute respiratory disease coronavirus 2 (SARS-CoV-2), even if the symptoms are mild.[294] A large prospective cohort study found that patients aged 50 years and older with COPD, with or without asthma, were more likely to require supplemental oxygen and non-invasive ventilation, but less likely to receive invasive mechanical ventilation or critical care compared with patients without a respiratory condition. Mortality in this group exceeded 40%.[248]

National and international respiratory organisations advise that patients should maintain their regular treatment and that there is currently no evidence to recommend avoiding corticosteroids (inhaled or oral) in patients with COPD during the COVID-19 pandemic.[253] [295]

UK guidelines also advise that patients established on inhaled corticosteroids should delay any planned withdrawal.[296]

Exacerbations of COPD should be managed by the patient following their individualised plan, and there should be no change to advance prescribing of rescue antibiotics and corticosteroids. Patients should not start rescue antibiotics and corticosteroids to treat symptoms of COVID-19, and should not start prophylactic antibiotics to reduce risk.[296] [297] Canadian guidelines recommend that patients with COPD who develop COVID-19 should continue their usual inhaled maintenance therapy and that acute exacerbations of COPD should be treated with prednisolone if needed, irrespective of whether the exacerbation is triggered by SARS-CoV-2.[252] Patients already taking prophylactic antibiotics should continue to take them as prescribed (unless there is a new reason to stop, such as side effects).[296]

To reduce the risk of acute exacerbations, and a poorer outcome from COVID-19 infection, strongly encourage patients who are still smoking to stop.[296] [297]

Patients receiving oxygen therapy should continue as advised, and those using airway clearance techniques should also continue but should take additional precautions to protect family members, as inducing sputum may generate infectious aerosols.[296] Precautions are also advised for those receiving non-invasive ventilation at home, as this is also a potentially infectious aerosol-generating procedure.[296] UK guidelines advise that nebulisation is not considered a viral aerosol-generating procedure and may continue to be used, as the aerosol comes from the fluid in the nebuliser chamber and will not carry virus particles from the patient.[296] However, GOLD does consider nebulisation to have an increased risk of droplet generation and disease transmission.[295] The US Centers for Disease Control and Prevention advises that nebuliser administration may generate infectious aerosols, however it is unclear whether association between nebuliser administration and infection is due to the generation of infectious particles or the close contact between the patient and healthcare professional administering the nebuliser.[255]

GOLD recommends that during periods of high COVID-19 prevalence, spirometry is restricted to patients requiring urgent diagnosis of COPD, and/or to assess lung function prior to interventional procedures or surgery.[295]

The British Thoracic Society has developed online pulmonary rehabilitation resources for patients to use while face-to-face meetings are not possible and a resource pack for patients who survive COVID-19.[298]

One study in Singapore reported a significant and sustained decrease in hospital admissions for acute exacerbations of COPD, including respiratory virus infection-associated acute exacerbations, during the pandemic, which coincided with the introduction of public health measures such as social distancing and universal mask-wearing.[299]
◊ Chronic pain

» see our comprehensive coverage of Chronic pain (https://bestpractice.bmj.com/topics/en-gb/694)

A panel of experts from North America and Europe has developed recommendations to guide management of chronic pain during the pandemic.[300] The panel recommend the use of telemedicine as the first approach and exclusively in most cases. Opioids may continue to be prescribed or initiated and patients should be informed of the potential risks and impact of long-term opioid use on the immune system. Patients who regularly use non-steroidal anti-inflammatory drugs (NSAIDs) should continue, while being monitored for adverse effects, and patients should promptly report any mild fever or new myalgia. Use of corticosteroids increases the potential for adrenal insufficiency and altered immune response; clinicians should consider the risks and benefits of corticosteroid injections and use a decreased dose.[300] Insertion of new intrathecal pumps should be avoided, except for highly selected cancer patients where the benefit outweighs the risk. New neurostimulator trials or implants should also be avoided.

Studies have found no association between use of NSAIDs and worse outcomes in patients with COVID-19; one prospective multicentre study in the UK in patients hospitalised with COVID-19 found that those taking NSAIDs before admission had the same outcomes as those who did not.[301]

◊ Chronic sinusitis

» see our comprehensive coverage of Chronic sinusitis (https://bestpractice.bmj.com/topics/en-gb/15)

The European Academy of Allergy and Clinical Immunology advise that patients with chronic rhinosinusitis should continue to take intranasal corticosteroids at their individually prescribed dose and should not modify or stop treatment without consulting their physician.[302] There is no evidence that the use of intranasal corticosteroids in the approved dose and indications leads to increased risk of COVID-19 infection or a more severe disease course. Discontinuation of intranasal corticosteroids can lead to worsening of chronic sinusitis. Systemic corticosteroids should be used with caution during the pandemic and in patients with severe symptoms and no therapeutic alternative. Patients with severe chronic rhinosinusitis with nasal polyps should be considered for systemic corticosteroids if surgery is not possible; patients should quarantine themselves during the course of treatment, and for one week afterwards.[302]

Physicians should assess the risks and benefits of initiating biologics in low-risk patients; biologic therapy may be deferred in high-risk patients during the pandemic. Patients who do not have COVID-19 and are already receiving biologic therapy may continue following a risk/benefit assessment; there is insufficient evidence to recommend discontinuation. Physicians should discontinue or postpone biologic therapy in patients who test positive for COVID-19.[302] [303]
Management of coexisting conditions in the context of COVID-19

◊ Cirrhosis

» see our comprehensive coverage of Cirrhosis (https://bestpractice.bmj.com/topics/en-gb/278)

Patients with chronic liver disease have a higher mortality rate from COVID-19 infection, and mortality is associated with liver disease severity.[59] [60] European guidelines advise that patients who have cirrhosis and COVID-19 should be admitted to hospital for inpatient care. Such patients are at high risk of new or worsening hepatic decompensation, severe COVID-19, and death.[60] Patients with cirrhosis and portal hypertension should avoid non-steroidal anti-inflammatory drugs. Care should be taken to avoid paracetamol overdosing in patients with cirrhosis.[304] Guidelines to prevent complications should be followed closely for patients with decompensated cirrhosis. Vaccination against *Streptococcus pneumoniae* and influenza is recommended. Treatment for complications (e.g., spontaneous bacterial peritonitis, hepatic encephalopathy, ascites) should be continued.[60] Organ donations and transplants are likely to be reduced in many countries.Liver transplant services should be restored following the peak of the pandemic, wherever possible. Where resources remain limited, listing for transplantation should be restricted to patients with poor short-term prognosis, including those with acute liver failure, acute-on-chronic liver failure, a high model for end-stage liver disease (MELD) score, and hepatocellular carcinoma at the upper limits of the Milan criteria.[60]

Transient elastography may reduce the need for endoscopic screening for varices in some patients with cirrhosis. Non-invasive assessments including the Baveno VI criteria, platelet-to-liver stiffness measurement ratio, liver stiffness measurement and spleen stiffness measurement have good predictive value for clinically significant varices and to identify patients at risk of bleeding. Screening for varices should balance the risks of severe acute respiratory disease coronavirus 2 (SARS-CoV-2) transmission from endoscopy against the risk of bleeding. Testing for SARS-CoV-2 is recommended before endoscopy. Endoscopy should not be delayed if the patient is negative for SARS-CoV-2 and the burden of COVID-19 in the local area is low.[60] Endoscopic eradication of oesophageal varices should be performed following a variceal bleed.[69] Patients with cirrhosis are likely to have an attenuated response to SARS-CoV-2 vaccination; nevertheless, experts recommend priority vaccination for these patients because of the high COVID-19-related mortality in patients with decompensated cirrhosis.[305] A joint statement from the British Society of Gastroenterology, British Association for the Study of the Liver, NHS Blood & Transplant, and British Liver Trust advises that patients with chronic liver disease should consider SARS-CoV-2 vaccination with any of the available vaccines.[306]

◊ Clostridium difficile-associated disease

» see our comprehensive coverage of Clostridium difficile-associated disease (https://bestpractice.bmj.com/topics/en-gb/230)

As there is a potential risk of transmission of severe acute respiratory disease coronavirus 2 (SARS-CoV-2) via faecal microbiota transplantation (FMT), the US Food and Drug Administration (FDA) has made the following new recommendations for stool donated after 1 December 2019:[307]

- Screen donors to identify those who may be currently or recently infected with SARS-CoV-2.
- Test donors and/or donor stool for SARS-CoV-2, if possible.
- Patients should give informed consent after being advised about the potential risk of transmission of SARS-CoV-2 via FMT.

Stool used for FMT should have been donated before 1 December 2019 if these criteria are not met.
Management of coexisting conditions in the context of COVID-19

**Related conditions**

◊ **Coeliac disease**

» see our comprehensive coverage of Coeliac disease (https://bestpractice.bmj.com/topics/en-gb/636)

The European Society for Paediatric Gastroenterology, Hepatology and Nutrition (ESPGHAN) advises that a biopsy-sparing approach to diagnosis can be used in more children with suspected coeliac disease during the pandemic, to mitigate potential delays in diagnosis and treatment caused by reduced access to endoscopy. A biopsy-sparing approach can be used for children who have positive endomysial antibodies and a tissue transglutaminase IgA titre between 5 and 10 times the upper limit of normal.[308]

◊ **Colorectal cancer**

» see our comprehensive coverage of Colorectal cancer (https://bestpractice.bmj.com/topics/en-gb/258)

The National Health Service in England has approved use of the immunotherapies nivolumab and pembrolizumab as alternatives to chemotherapy during the pandemic. Nivolumab and pembrolizumab may be used in patients with metastatic colorectal cancer with high levels of microsatellite instability or deficient mismatch repair in order to reduce number of hospital visits and the risk of neutropenia.[80] Intermittent treatment with chemotherapy regimens containing cetuximab or panitumumab may be used to reduce the need for immunosuppressive treatment.[80]
Management of coexisting conditions in the context of COVID-19

◊ Community-acquired pneumonia

» see our comprehensive coverage of Community-acquired pneumonia (https://bestpractice.bmj.com/topics/en-gb/17)

Antibiotics should be started as soon as possible for patients in the community with suspected or confirmed secondary bacterial pneumonia. Patients should be advised to seek urgent medical help if their symptoms do not improve as expected, or rapidly or significantly worsen, regardless of whether they are taking an antibiotic. Antibiotics should not be used to prevent secondary bacterial pneumonia.[125]

There are no validated tests for assessing dyspnoea by telephone or video consultation.[309] UK guidelines recommend that you should assess the need for hospital admission based on the patient's symptoms and signs. Indicators of more severe illness include: severe shortness of breath at rest or difficulty breathing; haemoptysis; cyanosis; cold, clammy, pale, or mottled skin; syncope; new confusion or difficult to rouse; and little or no urine output.[125]

Tests including respiratory and blood cultures, severe acute respiratory disease coronavirus 2 (SARS-CoV-2) polymerase chain reaction (PCR), throat samples for respiratory viral and atypical pathogen PCR, chest imaging, full blood count, and urinary legionella and pneumococcal antigen tests are recommended for patients admitted to hospital, to help identify secondary bacterial pneumonia and guide decisions about antibiotic use.[125] High C-reactive protein (CRP) levels do not distinguish between bacterial and COVID-19 pneumonia, but low CRP levels make secondary bacterial pneumonia less likely.[125]

Empirical antibiotics should be started if there is clinical suspicion of secondary bacterial infection in patients with COVID-19 in hospital.[125] Antibiotic treatment should be started within 4 hours of diagnosis and within 1 hour if the patient has suspected sepsis.[125] Choice of antibiotic will depend on local resistance data and availability. Specialist advice on antibiotic choice is recommended for patients who are immunocompromised, pregnant, in critical care, or who have a history of infection with resistant organisms or repeated infective exacerbations of lung disease.

Use of antibiotics should be reviewed at 24-48 hours, or as soon as test results are available. A narrower spectrum antibiotic should be used, if appropriate. Antibiotic treatment should stop after five days, unless there is an indication to continue.[125] Patients should be reassessed if they do not improve as expected, or if symptoms become significantly or rapidly worse. Specialist advice should be sought if there is clinical or microbiological evidence of infection and the person’s condition does not improve after 48-72 hours antibiotic treatment, or if an infection with multidrug-resistant bacteria is suspected. [125]

Where possible, clinicians should discuss the benefits, risks, and likely outcomes of any treatment with the patients, their relatives, and carers. The patient's preference about treatment and escalation plans should be sought, and clinicians should enquire about any advance care plans, advance decisions to refuse treatment, or 'do not attempt resuscitation' decisions.[125]

World Health Organization guidelines advise that antibiotics should not be prescribed for patients with mild COVID-19 and should only be prescribed for patients moderate COVID-19 if there is clinical suspicion of a bacterial infection.[33]

Fever, cough, and shortness of breath may be symptoms of fungal pneumonias, including coccidioidomycosis, histoplasmosis, and blastomycosis. Fungal pneumonias may be indistinguishable from COVID-19 and bacterial pneumonias. The diagnosis should be considered if SARS-CoV-2 testing is negative, although coinfection with fungi and SARS-CoV-2 may occur.[310]
Management of coexisting conditions in the context of COVID-19

◊ Congenital heart disease

» see our comprehensive coverage of Congenital heart disease (https://bestpractice.bmj.com/topics/en-gb/1308)

People with congenital heart disease (CHD) may be at increased risk for more severe COVID-19 infection, particularly those with more severe anatomical and physiological features of CHD.[311] [312] Additional considerations for management have been recommended during the current pandemic with strategies for prevention and management of COVID-19 in adults with CHD based on risk stratification.[313] [312]

For example, patients in the low risk category (e.g., those with normal ventricular function, normal exercise capacity, no relevant arrhythmia, no pulmonary hypertension) can be advised to take general prevention measures against COVID-19. Low risk patients with mild COVID-19 infection may be cared for at home with remote follow-up, but there should still be a low threshold for hospital admission if there is deterioration/progression or dyspnoea. Adults with CHD in the high risk category (e.g., those with cyanotic conditions, univentricular palliated conditions, severe stenosis or regurgitation, severe ventricular dysfunction, or pulmonary arterial hypertension) are advised to follow stricter prevention measures, such as physical distancing. High risk patients with COVID-19 infection generally require hospital admission and involvement of a CHD specialist.

It is recommended that cardiac medications, including aspirin, ACE inhibitors, angiotensin-II receptor antagonists, beta-blockers, diuretics, and antiarrhythmic medications are continued during COVID-19 illness, unless there is a clear contraindication.[311] Clinicians should be aware of the QT-prolonging effects of some COVID-19 medications (e.g., chloroquine or hydroxychloroquine, azithromycin, lopinavir/ritonavir).

Adults with CHD at high risk are advised to follow meticulous physical distancing.[312]

◊ Contraception - existing users

» see our comprehensive coverage of Contraception - existing users (https://bestpractice.bmj.com/topics/en-gb/418)

UK guidelines advise that a 6- to 12-month course of combined hormonal contraception can be provided without re-checking body mass index and blood pressure.

A 12-month course of a progestogen-only pill can be issued without a face-to-face review.[314]

Users of depot medroxyprogesterone may be offered ongoing contraception with desogestrel (if it is available as a progestogen-only pill).

Routine removals of long-acting contraception should be postponed and users counselled on contraceptive efficacy past the duration of licensed use.[314]

◊ Contraception - new users

» see our comprehensive coverage of Contraception - new users (https://bestpractice.bmj.com/topics/en-gb/418)

Many new patients can be safely screened and offered a prescription for contraception remotely.[314]

UK guidance recommends that patients who wish to start contraception may be assessed remotely and offered a 6- to 12-month course of desogestrel (as a progestogen-only pill). If desogestrel is not suitable, complete remote assessment of medical eligibility and accurate self-reported blood pressure and body mass index is needed to prescribe combined hormonal contraception.[314]

Provision of long-acting reversible contraception for women who cannot tolerate oral contraception or who take teratogenic drugs should adhere to local infection control protocols.[314]
**Management of coexisting conditions in the context of COVID-19**

### Contraception - emergency

> see our comprehensive coverage of Contraception - emergency (https://bestpractice.bmj.com/topics/en-gb/418)

The Faculty of Sexual and Reproductive Healthcare in the UK recommends that a copper intrauterine device (Cu-IUD) should continue to be offered as first-line emergency contraception, where possible, to eligible patients. If Cu-IUD provision is delayed, additional oral emergency contraception should be offered. If a Cu-IUD is unsuitable or declined, clinicians should perform a remote assessment to determine the most suitable oral emergency contraception. In addition to this, clinicians should prescribe 3 months’ supply of desogestrel (as a progestogen-only pill) and provide clear instructions about starting contraception and taking a pregnancy test.[314]

### Contraception - termination of pregnancy

> see our comprehensive coverage of Contraception - termination of pregnancy (https://bestpractice.bmj.com/topics/en-gb/)

Guidelines emphasise that timely access to abortion should not be compromised during the COVID-19 outbreak. Assessment, consent, and follow-up can be performed remotely, and medication for medical abortion can be self-administered at home.[315]
A cohort study of 500,000 people in the UK found that autoimmune disease and history of oral corticosteroid were associated with increased risk of fatal COVID-19.[44] Patients should be advised to continue their current medications. Medication should only be stopped or reduced in discussion with a specialist. Preventing disease flares is a priority to reduce the risk of corticosteroid use and hospitalisation.[316] UK guidelines recommend reviewing the dose, route of administration, and mode of delivery for drugs that affect the immune response to minimise face-to-face contact.[58]

Patients may continue taking aminosalicylates; these drugs do not affect the immune response.[58] Patients receiving immunosuppressive medication may develop atypical symptoms of COVID-19 (e.g., patients who take an oral corticosteroid may not develop fever). Patients who take an oral or rectal corticosteroid should not stop suddenly if they develop COVID-19, due to the risk of adrenal crisis.[58] Patients taking at least 20 mg/day of prednisolone should observe shielding precautions.[316] Urgent specialist advice should be sought before stopping or changing medications that affect the immune response in patients with COVID-19.[58]

Testing for COVID-19 is recommended before starting medication for a presumptive inflammatory bowel disease (IBD) flare, because COVID-19 can present with gastrointestinal symptoms and administration of higher-dose corticosteroids to these patients could be detrimental.[317] Testing for COVID-19 is also recommended before initiating biologicals, although where possible, initiation should be postponed.[318] Blood tests to monitor response to therapy should be performed at the minimum safe frequency.[58][316]

International guidelines recommend that patients should stop taking methotrexate, thiopurines, or tofacitinib if they develop COVID-19. Detailed recommendations are given depending on the level of inflammatory bowel disease activity and severity of COVID-19 infection.[319]

If a patient has stopped taking their IBD medication because they have COVID-19, medication can be restarted when at least 10 days have elapsed since symptom onset and at least 3 days have elapsed since recovery. Recovery is defined as the resolution of fever, without use of antipyretics, and an improvement in respiratory symptoms. In patients with severe or critical COVID-19, restarting medication 7-14 days after recovery may be appropriate, depending on the severity of their IBD. If a patient has laboratory confirmed severe acute respiratory disease coronavirus 2 (SARS-CoV-2) infection but has not had symptoms, IBD medication can be restarted 10 days after the first test, providing that no symptoms have developed in the interim.[320] Viral shedding may persist after recovery, particularly in immunocompromised patients, therefore experts recommend making decisions to restart medication based on symptoms rather than repeat testing.[320]

Infliximab use is associated with impaired serological response to SARS-CoV-2 infection in patients with inflammatory bowel disease. Concomitant use of methotrexate or a thiopurine further attenuated the serological response.[321]

Elective endoscopic procedures should be deferred, but urgent or emergent endoscopy should continue. This includes cases of IBD where endoscopy would urgently change management: for example, establishing the diagnosis in a patient with signs of moderate to severe inflammation, investigating subacute obstruction if imaging suggests a fibrotic or neoplastic stricture, and therapeutic endoscopic retrograde cholangiopancreatography in patients with primary sclerosing cholangitis who have worsening cholangitis and jaundice.[322][323] International guidelines recommend that surgical management of IBD should be considered in some patients, as delay may result in significant downstream morbidity and mortality; decisions on surgery should be individualised for each patient with a multidisciplinary team.[324]

The British Society of Gastroenterology has published a position statement strongly supporting SARS-CoV-2 vaccination for patients with IBD.[325]
Management of coexisting conditions in the context of COVID-19

◊ Cushing syndrome

» see our comprehensive coverage of Cushing syndrome (https://bestpractice.bmj.com/topics/en-gb/205)

Management of Cushing syndrome is complex and recommendations for clinical practice during the COVID-19 pandemic have been developed by an international group of experts.[326] They advise that patients with active Cushing syndrome are immunosuppressed, and should follow public health advice to minimise their risk of infection.[326] Patients with active Cushing syndrome who develop COVID-19 may not develop fever, and symptoms of dyspnoea may be more severe.[327] Cushing syndrome is a hypercoagulable state and anticoagulation with low molecular weight heparin is recommended for hospitalised patients with COVID-19 and Cushing syndrome.[328] Patients with active Cushing syndrome are at risk of prolonged viral infection and secondary bacterial and fungal infection. Prolonged antiviral treatment and empirical antibiotic prophylaxis should be considered for hospitalised patients.[328]

Diagnosis of Cushing syndrome is considered to be challenging at all times, and during the pandemic the guidance recommends prioritising those with key clinical features, investigating those for whom diagnosis is more likely. Patients with moderate and severe clinical disease require urgent investigation and management as they are prone to developing comorbidities that require hospitalisation and have immunosuppression that may make them vulnerable to infection. Investigation should be deferred if clinical features are mild or in doubt; however, treatment of comorbidities such as diabetes and hypertension should be optimised.[326] The guidelines recommend avoiding salivary cortisol/cortisone tests due to potential for viral contamination, until it is known how long severe acute respiratory disease coronavirus 2 (SARS-CoV-2) remains infectious in salivary samples. The usual approach to investigating the cause of Cushing syndrome is significantly modified: immediate computed tomography (CT) scan of thorax, abdomen, and pelvis should be done once Cushing syndrome is confirmed or highly likely to identify cancer, the source of ectopic adrenocorticotrophic hormone syndrome, and any major comorbidities; the presence of Cushing disease can be predicted using a combination of clinical factors, such as age, onset of symptoms, and increases in urinary free cortisol and adrenocorticotrophic hormone; pituitary imaging by magnetic resonance imaging or CT should be done if there is visual field compromise or severe headaches; all other investigations should usually be avoided during periods of high SARS-CoV-2 viral prevalence as they will not affect specific management.[326] The guidelines recommend that surgery for Cushing syndrome is avoided or altered during periods of high SARS-CoV-2 viral prevalence. Comorbidities should be treated with medical therapy as standard. The guidelines recommend avoiding initiating ACE inhibitors or angiotensin-II receptor antagonists for treatment of hypertension until their influence on susceptibility to SARS-CoV-2 infection is clarified; however, patients established on these should continue. Most patients will have steroidogenesis inhibitors. Patients with severe Cushing syndrome should receive prophylaxis for Pneumocystis jirovecii; symptoms of COVID-19 may be similar to infections such as Pneumocystis jirovecii pneumonia, and differentiation is needed to ensure appropriate treatment.[326]

◊ Cutaneous T-cell lymphoma

» see our comprehensive coverage of Cutaneous T-cell lymphoma (https://bestpractice.bmj.com/topics/en-gb/1025)

The European Organisation for Research and Treatment of Cancer has published guidelines on the management of patients with primary cutaneous lymphoma.[329] Patients with indolent or low-risk lymphomas who are on topical or systemic treatment should be consulted remotely to avoid trips to hospital. In some centres, phototherapy may be postponed.[329]

Patients with aggressive or late-stage lymphoma should be treated, because patients with controlled disease have fewer infections. Systemic therapy and radiation should be started if indicated. Treatment with medications including brentuximab vedotin, rituximab, gemcitabine, and extracorporeal photopheresis should be continued. Treatment should not be stopped prophylactically and risk/benefit discussion should take place for each patient. Patients in partial remission, particularly older patients or those with comorbidities, may consider stopping treatment or reducing its frequency.[329]
Management of coexisting conditions in the context of COVID-19

**Cystic fibrosis**

» see our comprehensive coverage of Cystic fibrosis ([https://bestpractice.bmj.com/topics/en-gb/403](https://bestpractice.bmj.com/topics/en-gb/403))

Patients with cystic fibrosis (CF) are at higher risk for severe COVID-19 illness and should carefully follow public health advice.

UK guidance advises that patients and their families and carers should continue with all usual self-care, including airway clearance, regular medication, and home exercise. Exacerbations should be managed as previously advised, including taking rescue medication and contacting their CF team. Patients should be advised to contact their CF team if they have symptoms of COVID-19. It may be difficult to differentiate COVID-19 from pulmonary disease exacerbations at initial presentation.

If the patient is known or suspected to have COVID-19, airway clearance should be done in a well-ventilated room, separate from other people if possible, as it is a potentially infectious aerosol-generating procedure.

UK guidelines advise that nebulisers will not generate infectious aerosols, as the aerosol comes from fluid in the nebuliser chamber, not the patient, so may be used as normal; however, carers should use appropriate hand hygiene when helping patients with masks. However, the Global Initiative for Asthma (GINA) does consider nebulisation to have aerosol-generating potential - see Asthma, above.

The US Centers for Disease Control and Prevention advises that nebuliser administration may generate infectious aerosols; however, it is unclear whether association between nebuliser administration and infection is due to the generation of infectious particles or the close contact between the patient and healthcare professional administering the nebuliser.

Patients are managed remotely where possible. Lung function tests should only be done in hospital if the results will have a direct impact on management; home spirometry should be used where possible.
Management of coexisting conditions in the context of COVID-19

**Related conditions**

◊ **Dementia**

» see our comprehensive coverage of Dementia (https://bestpractice.bmj.com/topics/en-gb/317)

Patients with dementia, especially vascular dementia, have increased odds of developing COVID-19 compared with patients without dementia. Black patients with dementia are more likely to develop COVID-19 than white patients with dementia.[331] A US case control study reported that, for patients with COVID-19 and dementia, the risk of hospitalisation is almost 60% and 6-month mortality is almost 21%.[331]

The European Academy of Neurology has published advice for healthcare professionals who look after patients with dementia.[332] Infection with COVID-19 may cause worsening confusion and precipitate delirium or acute cognitive decline.[332][139] A significant change in daily routine during the pandemic may trigger behavioural disturbances, and patients with dementia may be less able to comply with infection prevention measures such as washing hands or wearing a face covering. The following measures may be helpful: looking at old photographs, objects, or newspaper clippings, singing old songs, keeping to a regular schedule, simple exercise such as climbing a flight of stairs, using lighting appropriate to the time of day, going outside to orient a person to the time of day, assisting with hand hygiene, facilitating telephone and video calls from relatives, asking directly about symptoms of infection, and accounting for an individual’s cognitive impairment when explaining the pandemic.[332]

Further resources are available at:

Management of coexisting conditions in the context of COVID-19

**Related conditions**

◊ Diabetes (type 1)

» see our comprehensive coverage of Diabetes (type 1) (https://bestpractice.bmj.com/topics/en-gb/25)

Patients with type 1 diabetes are at higher risk for severe illness.[279] [333] They are more likely to need hospitalisation, intensive care, and mechanical ventilation if they develop COVID-19, compared with patients who do not have diabetes, and have a higher case fatality rate and increased odds of inhospital death with COVID-19.[334] [335] [336] [337] [338] [282] [71] [339] [340] Poor glycaemic control, hypertension, recent diabetic ketoacidosis, previous stroke, previous heart failure, renal impairment, body mass index <20 kg/m² or ≥40 kg/m², male sex, older age, non-white ethnicity, and socioeconomic deprivation are associated with increased mortality from COVID-19.[341] [342] [343] Although prevalence of diabetes is lower in patients <50 years, one study found that younger patients with diabetes have an increased relative risk of fatal outcomes compared with older patients.[344] Patients with COVID-19 infection are at greater risk of hyperglycaemia with ketones, including patients with newly diagnosed diabetes. Patients with type 1 diabetes are more likely to require intensive care admission than patients with type 2 diabetes due to the presence of diabetic ketoacidosis.[340] COVID-19 disease can precipitate atypical presentations of diabetes emergencies (e.g., mixed diabetic ketoacidosis and hyperosmolar states).[345] At admission hyperglycaemia may also be an independent factor associated with poor prognosis for those hospitalised with COVID-19.[346] [347]

UK guidance advises checking blood glucose and ketones in all patients with diabetes who are admitted to hospital.[345] Out of hospital, patients should follow their usual sick day rules, taking care to continue insulin, remain hydrated, and monitor blood glucose and ketones as appropriate.[348] [349] Clinicians may need to prescribe additional blood glucose and ketone testing equipment to support increased monitoring. Patients admitted to intensive care may have insulin resistance and increased insulin requirements. There is a risk of hypoglycaemia if feeding is interrupted (e.g., if the patient is nursed prone).[345] Specialist advice may be needed, particularly for patients who have severe illness on admission or if infusion pumps for insulin are not available.[345]

A panel of international experts has published practical recommendations for the management of diabetes in patients with and without COVID-19.[350] They advise that those with diabetes who have not been infected with severe acute respiratory disease coronavirus 2 (SARS-CoV-2) should intensify their metabolic control as a measure to prevent COVID-19 infection, including blood pressure and lipid control, and patients should reduce their risk of exposure by having remote healthcare consultations where possible and following public health advice on hand hygiene and physical distancing. The panel recommends that patients with diabetes and COVID-19 require continuous and reliable glycaemic control and that they continue antihypertensive and lipid-lowering treatments. The panel also advises that patients without diabetes are monitored for new-onset diabetes triggered by SARS-CoV-2 infection, particularly those at high risk for metabolic disease. People with type 1 diabetes are more susceptible to infection and require more intensive monitoring and supportive therapy to reduce the risk of metabolic decompensation, including diabetic ketoacidosis; the panel advised that patients are made aware of this and reminded about typical symptoms, home-measurement of urine or blood ketones, sick day rules, and seeking medical advice early if concerned.[350] Guidelines for the management of dexamethasone-related hyperglycaemia in patients with diabetes and COVID-19 have also been published.[351]

Further diabetes resources are available at:

- [282]
Diabetes (type 2)

Patients with type 2 diabetes are at higher risk for severe illness. They are more likely to need intensive care and mechanical ventilation if they develop COVID-19, compared with patients who do not have diabetes, and have a higher case fatality rate and increased odds of in-hospital death with COVID-19. Poor glycaemic control, hypertension, previous stroke, previous heart failure, renal impairment, cancer, body mass index <20 kg/m² or ≥40 kg/m², male sex, older age, non-white ethnicity, socioeconomic deprivation and elevated C-reactive protein are associated with increased mortality from COVID-19. Although prevalence of diabetes is lower in patients <50 years, one study found that younger patients with diabetes have an increased relative risk of fatal outcomes compared with older patients. Medications for diabetes may also impact the course of COVID-19 illness. Use of insulin is associated with poor prognosis (progression to severe or critical illness, and in-hospital death). In one study, use of beta-blockers was associated with increased mortality, and use of dipeptidyl peptidase-4 (DPP4) inhibitors was associated with decreased mortality. In another study, glucagon-like peptide-1 receptor agonist use and sodium-glucose co-transporter-2 (SGLT2) inhibitor use were associated with lower odds of mortality and other adverse outcomes compared with DPP4 inhibitors. Patients with COVID-19 infection appear to have a greater risk of hyperglycaemia with ketones, including patients with type 2 diabetes and those with newly diagnosed diabetes. COVID-19 disease can precipitate atypical presentations of diabetes emergencies (e.g., mixed diabetic ketoacidosis and hyperosmolar states). Admission hyperglycaemia may also be an independent factor associated with poor prognosis for those hospitalised with and without COVID-19.

Patients taking SGLT2 inhibitors should be advised to stop these if they become unwell, to reduce their risk of developing diabetic ketoacidosis. Metformin may need to be temporarily stopped if patients are at risk of dehydration. UK guidance advises temporarily stopping SGLT2 inhibitors and metformin in all patients admitted to hospital. Blood glucose and ketones should be checked in all patients with diabetes who are admitted to hospital.

Patients should follow their usual sick day rules, taking care to continue insulin, remain hydrated, and monitor blood glucose and ketones as appropriate. Clinicians may need to prescribe additional blood glucose and ketone testing equipment to support increased monitoring. Patients admitted to intensive care may have insulin resistance and increased insulin requirements. There is a risk of hypoglycaemia if feeding is interrupted (e.g., if the patient is nursed prone). Specialist advice may be needed, particularly for patients who have severe illness on admission or if infusion pumps for insulin are not available.

A panel of international experts has published practical recommendations for the management of diabetes in patients with or without COVID-19. They advise that those with diabetes who have not been infected with severe acute respiratory disease coronavirus 2 (SARS-CoV-2) should intensify their metabolic control as a measure to prevent COVID-19 infection, including blood pressure and lipid control, and patients should reduce their risk of exposure by having remote healthcare consultations where possible and following public health advice on hand hygiene and physical distancing. The panel recommends that patients with diabetes and COVID-19 require continuous and reliable glycaemic control and that they continue antihypertensive and lipid-lowering treatments. The panel also advises that patients without diabetes are monitored for new-onset diabetes triggered by SARS-CoV-2 infection, particularly those at high risk for metabolic disease. People with type 2 diabetes and comorbid conditions such as obesity and fatty liver disease may be at increased risk for more severe COVID-19 disease, and those with fatty liver disease may be screened for hyperinflammation using trends in laboratory tests to determine where immunosuppression might improve the outcome. Guidelines for the management of dexamethasone-related hyperglycaemia in patients with diabetes and COVID-19 have also been published.

One study in the UK looking at the indirect effects of the COVID-19 pandemic on type 2 diabetes between March and December 2020 found reductions in diagnosis and monitoring of type 2 diabetes. Those aged 65 years and older, men, and people from deprived areas had the greatest reductions in diagnosis rates.

Further diabetes resources are available at:
Management of coexisting conditions in the context of COVID-19

**Related conditions**

◊ **Eczema**

» see our comprehensive coverage of Eczema (https://bestpractice.bmj.com/topics/en-gb/87)

The British Association of Dermatologists has issued advice to patients with eczema affecting the hands. Patients should adhere to national advice to wash hands with soap and water. Patients should be advised to pat the skin dry and apply emollient generously after handwashing and when the skin feels dry. Patients should be advised that applying emollient before sleep and covering the hands with cotton gloves may help their condition. Patients should protect their hands using gloves if they need to handle detergent for purposes other than handwashing (e.g., washing a child’s hair, washing dishes, or cleaning).[358] Patients with facial dermatitis are advised to apply a barrier cream before wearing a face mask and to avoid masks containing metal wires in case of nickel allergy.[241]

For information on managing patients with eczema who take drugs that affect the immune response, please see the section ‘considerations for patients with dermatological conditions receiving drugs that affect the immune response’ in the introduction to this topic.

◊ **Endometriosis**

» see our comprehensive coverage of Endometriosis (https://bestpractice.bmj.com/topics/en-gb/355)

The World Endometriosis Society has provided advice for the management of endometriosis during the pandemic.[359] Appointments should be offered by telephone or video call, and in person when considered safe. Medical management should be optimised in the absence of surgical interventions. Complementary and alternative treatment options may also be considered. In addition, healthcare providers are encouraged to consult with other specialists, such as those who manage chronic pain. When surgical and fertility treatments can be restarted, patients should be triaged based on disease severity and treatment response.

◊ **Epilepsy**

» see our comprehensive coverage of Epilepsy (https://bestpractice.bmj.com/topics/en-gb/112)

The European Academy of Neurology has published advice on the management of epilepsy during the COVID-19 pandemic.[360] Patients with epilepsy should be advised to continue taking their medication, and regular follow-up should continue using telephone or video consultations. Face-to-face appointments should be arranged if required. Fever can trigger seizures in some people with epilepsy, and experts recommend using antipyretics if people with epilepsy develop COVID-19. Coronavirus infection per se is not known to trigger seizures. Patients should be advised to avoid stockpiling medication.[361]

◊ **Epistaxis**

» see our comprehensive coverage of Epistaxis (https://bestpractice.bmj.com/topics/en-gb/421)

ENT UK has published guidance on the management of epistaxis, aiming to reduce the number of patients admitted to hospital while ensuring safety of patients and staff. Personal protective equipment should be worn, including a level 2 gown, gloves, filtering face-piece (FFP)-3 mask, visor, and hat. Nasal pressure should be applied for 15 minutes and tranexamic acid given. Factors that could promote bleeding, for example elevated blood pressure or use of antiplatelet agents or anticoagulants, should be sought and controlled. A unilateral bioresorbable dressing should be inserted. If the bleeding stops, patients may be discharged from the emergency department with instructions to take 48 hours’ bed rest and use a suitable topical antibiotic preparation; if the bleeding does not stop, the patient should be reviewed by an ear, nose, and throat specialist. Silver nitrate cauterity and non-absorbable packing should be attempted by a specialist before admitting the patient to hospital.[362]
**Management of coexisting conditions in the context of COVID-19**

◊ **Essential hypertension**

» see our comprehensive coverage of Essential hypertension (https://bestpractice.bmj.com/topics/en-gb/26)

Hypertension is associated with an increased risk of severe COVID-19 and death; this association is stronger in younger populations.[281] [282] [71]

There is no evidence that patients with hypertension should discontinue ACE inhibitors or angiotensin-II receptor antagonists.[94] [95] [96] [97] [98] [100] [363] Cohort studies have reported that ACE inhibitor or angiotensin-II receptor antagonist use does not alter risk of intensive care admission or mortality.[101] [102] Randomised controlled trials of patients admitted to hospital with COVID-19 found that continuation of renin-angiotensin system inhibitors had no overall effect on survival, progression of COVID-19, need for intensive care, need for invasive mechanical ventilation, shock, cardiovascular events, or length of hospitalisation compared with discontinuation.[103] [364] British, European, American, and Asian heart groups advise that patients should continue to take ACE inhibitors and angiotensin-II receptor antagonists as prescribed.[106] [107] [108] [109] Any change in medication should be based on individual patient risk assessment.

◊ **Food allergy**

» see our comprehensive coverage of Food allergy (https://bestpractice.bmj.com/topics/en-gb/639)

The British Society for Allergy and Clinical Immunology has recommended modifications to paediatric allergy services during the pandemic. Most new patient and follow-up visits can be performed using telehealth. Allergy testing, and most food challenges, can be deferred. Priority for hospital testing should be given to food challenges where there is a critical nutritional need and it would be unsafe for the parent or carer to perform the food challenges: for example, in infants with milk/soya/hydrolysate food protein enterocolitis syndrome. Where possible, dieticians should contact patients on multiple food exclusions to establish whether food shortages are a concern; additional vitamins, supplements or formulas may be needed. Initiation and updosing of food immunotherapy should be deferred.[365] Sublingual and subcutaneous immunotherapy should be continued as usual in patients who have no symptoms of COVID-19 and have not been exposed to infected individuals within the last 14 days, in patients who have had a negative reverse-transcriptase polymerase chain reaction (RT-PCR) test and in patients who have serum IgG antibodies to severe acute respiratory disease coronavirus 2 (SARS-CoV-2) without virus-specific IgM. Patients who develop COVID-19, have been exposed to infected individuals, or have a positive RT-PCR test should discontinue allergen immunotherapy, independent of disease severity, until symptoms have resolved or adequate quarantine has been performed.[366]

A consensus statement from the Italian Society of Pediatric Allergy and Immunology advises that it may be more difficult for children to access specialty allergy foods during the pandemic, and the potential requirement to try new products increases the risk of an allergic reaction. The society recommends that children have a written action plan with emergency drug doses and have two available adrenaline (epinephrine) autoinjectors.[241]
**Giant cell arteritis**

» see our comprehensive coverage of Giant cell arteritis (https://bestpractice.bmj.com/topics/en-gb/177)

A cohort study of 500,000 people in the UK found that autoimmune disease and history of oral corticosteroid were associated with increased risk of fatal COVID-19.[44] Experts recommend that patients taking long-term glucocorticoids for giant cell arteritis (GCA) should titrate the dose down to the lowest possible dose that achieves symptom control. Patients at risk of adrenal insufficiency who develop COVID-19 may require additional doses of glucocorticoid to prevent an adrenal crisis. Adjuvant immunosuppression should be considered at an early stage, since major relapse of GCA might require in-person consultation and/or significant glucocorticoid dose increases.[367] The UK criteria for use of tocilizumab have been temporarily altered to permit treatment beyond 12 months in order to reduce the risk of relapse.[368]

Clinicians are advised to engage patients with rheumatic disease in a shared decision-making process to discuss receiving a severe acute respiratory disease coronavirus 2 (SARS-CoV-2) vaccine. The response to vaccination is likely to be blunted in patients receiving systemic immunomodulatory therapies compared with the general population. The American College of Rheumatology advises that, beyond known allergies to vaccine components, there are no additional contraindications to SARS-CoV-2 vaccination for patients with autoimmune and inflammatory rheumatic diseases. Vaccination should ideally occur when rheumatological disease is well controlled.[369]
Management of coexisting conditions in the context of COVID-19

◊ Haematopoietic stem cell transplantation

» see our comprehensive coverage of Haematopoietic stem cell transplantation (https://bestpractice.bmj.com/topics/en-gb/)

UK guidelines advise that for at least 2 weeks before receiving haematopoietic stem cell transplantation (HSCT), patients should follow professional advice on how to minimise their risk of respiratory infection, including COVID-19.[370] All patients receiving HSCT should be tested for severe acute respiratory disease coronavirus 2 (SARS-CoV-2) and have a negative test before starting conditioning.[370] [371] Polymerase chain reaction testing is preferred.[371] Patients should also be tested if they have any symptoms of COVID-19.

If COVID-19 is confirmed, HSCT should be deferred. The length of deferral is guided by the patient’s risk of disease progression, morbidity and mortality, and their symptom burden from COVID-19.[370] [371] Patients with confirmed or suspected COVID-19 should have repeat echocardiography, pulmonary function tests, and chest x-ray before starting treatment.[370]

UK guidelines advise that for at least 2 weeks before HSCT, donors should follow government advice on social distancing.[370] Donors should be tested at the initial assessment, before stem cells or donor lymphocytes are harvested, and 72 hours before starting conditioning if fresh cell donations are needed. Donors who test positive should defer donations for 2 weeks after their symptoms resolve; however, if less than 2 weeks has passed and donation is urgent, this should be referred for risk assessment.[370] If the donor tests positive for COVID-19 on the day of donation after cryopreservation of cells, a shared decision should be made over use of the cells. Donors with known or suspected COVID-19 should not donate other blood products (including lymphocytes) for at least 2 weeks after symptom resolution.[370]

HSCT should be deferred if possible, particularly for myeloma, low-grade lymphoproliferative conditions, chronic haematological conditions, and non-malignant indications.[372]

Following transplantation, patients are at high risk of severe illness and should follow the national recommendations for protecting themselves.[279] [370] [371] [373]

Clinicians in Italy have reported assessing patients within 3 months of transplantation and without symptoms of COVID-19 in-person. Patients who are 3 to 24 months post-transplantation may be screened for symptoms of infection or graft-versus-host disease and triaged to in-person or telehealth consultations as appropriate.[374]

Patients who are profoundly immunosuppressed following HSCT may shed viable SARS-CoV-2 virus for up to 78 days after the onset of symptoms.[375]

Further haematology resources are available at:


◊ Hepatic steatosis

» see our comprehensive coverage of Hepatic steatosis (https://bestpractice.bmj.com/topics/en-gb/796)

Patients with non-alcoholic fatty liver disease (NAFLD) are at higher risk of disease progression if they contract COVID-19, compared with people without NAFLD.[376] European guidelines recommend that early hospital admission should be considered for patients with NAFLD.[60] It is unclear whether NAFLD is an independent risk factor for poor COVID-19 prognosis or whether observations are confounded by the presence of obesity, hypertension, or type 2 diabetes. Treatment for arterial hypertension should be continued.[60] Clinicians should also optimise diabetes management, promote weight loss, and give nutritional guidance, which may prevent a severe disease course in future severe acute respiratory syndrome coronavirus 2 infection. People with type 2 diabetes and fatty liver disease may be screened for hyperinflammation using trends in laboratory tests to determine where immunosuppression might improve the outcome.[350]
**Hepatitis B**

» see our comprehensive coverage of Hepatitis B (https://bestpractice.bmj.com/topics/en-gb/127)

Usual treatment should be continued for patients with chronic hepatitis B (HBV) infection who are established on treatment. In patients without COVID-19, treatment should be initiated according to local or national guidelines.[60] The impact of interferon alpha on systemic inflammation in patients with COVID-19 is not known. European Association for the Study of the Liver (EASL) guidelines recommend that alternative agents should be considered when starting treatment for HBV during the pandemic.[60]

Patients who have chronic, occult, or resolved HBV infection and COVID-19 should be considered for antiviral therapy to avoid HBV reactivation and hepatitis flare if they receive immunosuppressive agents for treatment of COVID-19.[69] [60] EASL guidelines advise that initiation of antiviral therapy is usually not warranted in patients with HBV and COVID-19, and may be deferred until recovery. In patients with suspected severe acute HBV hepatitis or a flare of disease activity, a specialist should be consulted to decide whether to initiate antiviral therapy.[60] Asia-Pacific guidelines recommend that patients who are newly diagnosed with HBV infection at the time of presentation with COVID-19 should be started on antiviral therapy.[69] Use of tenofovir with lopinavir/ritonavir is relatively contraindicated as the concentration of tenofovir might be increased when these drugs are used together.[69]

**Hepatocellular carcinoma**

» see our comprehensive coverage of Hepatocellular carcinoma (https://bestpractice.bmj.com/topics/en-gb/369)

European and Asia-Pacific position papers recognise that screening for hepatocellular carcinoma (HCC) using ultrasound may need to be deferred during the COVID-19 pandemic, depending on local resources (including availability of treatment options) and individual patient risk assessment. Patients at highest risk should be prioritised for screening, including patients with: elevated alpha-fetoprotein levels, chronic hepatitis B, advanced cirrhosis, and non-alcoholic steatohepatosis/diabetes.[69] [60] HCC surveillance can be deferred until after recovery in patients who develop COVID-19.[60] The European Association for the Study of the Liver recommends that guidelines for treatment of patients with HCC should be followed, including multidisciplinary board review to make treatment recommendations, systemic treatments, and evaluation for liver transplant.[60] The Asia-Pacific Working Group for Liver Derangement during the COVID-19 Pandemic recommends that patients with HCC who have COVID-19 should have treatment for HCC deferred until after recovery from COVID-19. For those who have had surgical resection deferred, bridging transarterial chemoembolisation, radiofrequency ablation, or systemic chemotherapy might be considered in selected patients.[69]

Organ donations and transplants are likely to be reduced in many countries. Listing for transplantation should be restricted to patients at the upper limit of the Milan criteria.[60] Guidelines emphasise the importance of vaccination against *Streptococcus pneumoniae* and influenza.[60]

Recommendations for the management of patients with primary hepatic malignancies during the COVID-19 pandemic have also been developed by an international group of experts.[377] They propose treatment recommendations for different stages of HCC (according to the Barcelona Clinic Liver Cancer classification system), specifically surgery, locoregional, and systemic therapy, and suggest strategies to modify risk and assist with multidisciplinary treatment decision-making.

**Hip fracture**

» see our comprehensive coverage of Hip fracture (https://bestpractice.bmj.com/topics/en-gb/387)

Concomitant COVID-19 infection is associated with a threefold increase in 30-day mortality in patients with hip fractures.[378] Nevertheless, surgical management remains the preferred treatment because non-operative management is also associated with higher 30-day mortality.[379] Measures should be taken to shield patients from potential COVID-19 infection in the perioperative period.
HIV infection

» see our comprehensive coverage of HIV infection (https://bestpractice.bmj.com/topics/en-gb/555)

There is currently little evidence that the COVID-19 infection rate is different in people living with HIV compared with those without HIV infection in European and North American populations, after accounting for demographic factors.[380] [381] [382] [383] [384] One cohort study conducted in the US reported lower prevalence of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) immunoglobulin G (IgG) amongst people living with HIV compared with people without HIV (3.7% and 7.4% respectively), which may reflect increased shielding precautions taken by people living with HIV. SARS-CoV-2 IgG titres were lower in people living with HIV with a history of PCR-confirmed SARS-CoV-2 infection compared with people without HIV with previous SARS-CoV-2 infection.[385]

People living with HIV who are diagnosed with COVID-19 have an increased risk of hospitalisation, compared with people without HIV, and hospitalisation is associated with progression of HIV disease stage.[384] A UK cohort study reported that patients with HIV who had COVID-19 had a higher mortality than the general population (hazard ratio 2.59), even after adjusting for deprivation, ethnicity, smoking, and obesity.[386] A US cohort study reported higher 30-day mortality in patients with HIV who developed COVID-19 compared with patients without HIV, but found that this was attributable to the comorbidity burden in this population rather than HIV per se.[387] The clinical course of COVID-19 in the African population is under investigation; one study reports that patients with HIV in South Africa had a higher risk of death compared with people without HIV, irrespective of viral suppression.[388] A study conducted in Zambia reported that HIV status alone was not associated with COVID-19 infection severity or mortality. However, patients with severe HIV disease (haemoglobin <8.0 g/dL, CD2 <200 cells/microlitre, active TB, or body mass index <18.5 kg/m²) were more likely to develop severe COVID-19 and were at increased risk of death from COVID-19.[389]

Guidance from the US, UK, and Europe recognises that many people living with HIV are older and have comorbid chronic medical conditions such as cardiovascular disease or lung disease, which increase the risk for severe COVID-19 infection. The guidelines recommend that until more is known, additional caution is advised for all people with HIV, especially if advanced (i.e., CD4 cell count <200/microlitre) or poorly controlled. Influenza and pneumococcal vaccinations should be kept up to date.[390] [391] US guidelines also recommend that patients maintain an adequate supply of antiretroviral therapy (ideally a 90-day supply).[390] Advice from the Infectious Diseases Society of America and HIV Medicine Association states that people with HIV have a normal life expectancy and a readily treatable infection, therefore HIV status and current HIV control should not be factors in decision-making regarding potentially life-saving interventions or enrolment into clinical trials. Antiretroviral therapy should be continued in hospital without interruption. Changes in antiretroviral therapy are generally not recommended. Routine viral load monitoring in patients with suppressed HIV and no adherence concerns can be delayed for up to 6 months to reduce the burden on testing laboratories. Viral load testing should be prioritised for patients with adherence concerns, patients whose HIV is not fully suppressed, patients starting a new drug regimen, and pregnant patients.[392] Pre-exposure prophylaxis to prevent HIV infection should be taken as directed; there is no evidence that it is effective against COVID-19.[393] The Centers for Disease Control and Prevention recommends that people with HIV can receive the Pfizer-BioNTech and Moderna vaccines if they have no contraindications. It is not yet known whether the level of protection is as strong for people with HIV as people without HIV. [392]

Further resources are available at:

Hodgkin's lymphoma

Analysis of US health-insurance claims data has shown that lymphoma is a significant risk factor for fatal COVID-19. Interim treatment guidelines for the management of adult patients during the pandemic have been provided by experts from the UK and also from Australia and New Zealand. Hodgkin's lymphoma is curable in most patients and delivery of dose- and time-intensive treatment remains a high priority; recommendations are given for patients with early-stage and advanced-stage disease, elderly Hodgkin's, relapsed Hodgkin's, and nodular lymphocyte-predominant Hodgkin's.

The American Society of Hematology has also published advice on the treatment of Hodgkin's lymphoma. Chemotherapy followed by interim staging positron emission tomography/computed tomography (PET/CT) is usually preferred to chemotherapy plus radiotherapy for early and advanced-stage disease because fewer hospital visits are needed. The International Lymphoma Radiation Oncology Group has published emergency guidelines for radiotherapy in haematological malignancies, should radiotherapy be necessary. Alternative dose fractionations may be given. Bleomycin should be omitted following a negative PET/CT to reduce the risk of bleomycin pneumonitis. Many experts recommend increased use of granulocyte-colony stimulating factor to reduce neutropenia and use of prophylactic antibiotics when neutropenia is expected. Recommendations are also given for older adult and paediatric patients and those with relapsed or refractory disease. In general, it is considered safe and appropriate for people with Hodgkin's lymphoma to be vaccinated against severe acute respiratory syndrome coronavirus 2.
Management of coexisting conditions in the context of COVID-19

◊ Hospital-acquired pneumonia

Hospital-acquired bacterial pneumonia (defined as developing at least 48 hours after hospital admission and not incubating at admission) can be difficult to distinguish from COVID-19 pneumonia. UK guidelines state that bacterial co-infection occurs in less than 8% of people with COVID-19, and infection rates may be lower in people in hospital with COVID-19.[125] The risk of hospital-acquired pneumonia increases with length of hospital stay and with immunosuppression.[125]

Where possible, clinicians should discuss the benefits, risks, and likely outcomes of any treatment with the patients, their relatives, and carers. The patient's preference about treatment and escalation plans should be sought, and clinicians should enquire about any advance care plans, advance decisions to refuse treatment, or 'do not attempt resuscitation' decisions.[125]

Tests including respiratory and blood cultures, severe acute respiratory disease coronavirus 2 (SARS-CoV-2) polymerase chain reaction (PCR), throat samples for respiratory viral and atypical pathogen PCR, chest imaging, full blood count, and urinary legionella and pneumococcal antigen tests are recommended to help diagnosis and guide decisions about antibiotic use.[125] High levels of C-reactive protein (CRP) do not distinguish between bacterial and COVID-19 pneumonia, but low CRP levels make secondary bacterial pneumonia less likely.[125]

Empirical antibiotics should be started if there is a strong clinical suspicion of bacterial infection. Antibiotic treatment should be started within 4 hours of diagnosis and within 1 hour if the patient has suspected sepsis. Antibiotics should not be used to prevent secondary bacterial pneumonia.[125]

World Health Organization guidelines advise that antibiotics should not be prescribed for patients with mild COVID-19 and should only be prescribed for patients with moderate COVID-19 if there is clinical suspicion of a bacterial infection.[33]

Choice of antibiotic will depend on local resistance data and availability. Specialist advice on antibiotic choice is recommended for patients who are immunocompromised, pregnant, in critical care, or who have a history of infection with resistant organisms or repeated infective exacerbations of lung disease. Use of antibiotics should be reviewed at 24-48 hours, or as soon as test results are available, and treatment switched to a narrower spectrum antibiotic if appropriate.[125] Antibiotic treatment should stop after 5 days, unless there is an indication to continue. Seek specialist advice if patients do not improve as expected after 48-72 hours of antibiotic treatment, if there is a suspicion of infection with multidrug-resistant bacteria, or if symptoms become significantly or rapidly worse.[125]

COVID-19-associated pulmonary aspergillosis may occur in patients with severe COVID-19 who are receiving mechanical ventilation. Symptoms may be non-specific. The diagnosis should be considered when patients with severe COVID-19 have sepsis or worsening respiratory function, even in the absence of typical risk factors. Lower respiratory tract specimens should be obtained for fungal culture and Aspergillus galactomannan antigen testing.[310]
**Idiopathic pulmonary fibrosis**

» see our comprehensive coverage of Idiopathic pulmonary fibrosis (https://bestpractice.bmj.com/topics/en-gb/446)

Patients with idiopathic pulmonary fibrosis are at increased risk of hospitalisation and death due to COVID-19.[293] The UK National Institute of Health and Care Excellence and the Canadian Thoracic Society have published guidelines for the management of patients with interstitial lung disease, including idiopathic pulmonary fibrosis, during the pandemic.[396] [397] Clinicians should discuss with patients whether the benefits of attending medical appointments outweigh the potential risks. Patients should be advised to keep a list of their medications, other medical conditions, and allergies and a copy of a recent clinic letter to give to healthcare staff if they need treatment for COVID-19. Clinicians should determine whether patients have advance care plans or advance decisions to refuse treatment, including 'do not attempt resuscitation' decisions, and take these into account when planning care.[396]

Patients who take drugs that affect the immune response may have atypical presentations of COVID-19; for example, patients taking corticosteroids may not develop fever. Assessment can also be challenging because the symptoms of interstitial lung disease and side effects of medication used to manage the condition may be similar to the symptoms of COVID-19.[396] Decisions about stopping, adjusting, and re-starting treatment in patients who develop COVID-19 should be made in conjunction with the patient's specialist team.[396] [397] The half-life of some medicines means that the immunosuppressive effect will continue for some time after stopping treatment. Patients who are taking maintenance prednisolone should not stop if they develop COVID-19; they may be at risk of adrenal crisis and require a temporary dose increase if they develop COVID-19. Initiation of immunotherapy should be deferred in patients with newly diagnosed or suspected COVID-19.[396] [397] Antifibrotic drugs may be continued if the patient's blood parameters are in the acceptable range and there is no other reason to stop (e.g., significant adverse effects).[396] [397] If patients with COVID-19 develop acute kidney injury or deranged liver function tests, medicines should be adjusted as recommended by your local drug formulary or prescribing information.[396]

In patients without COVID-19, UK guidelines advise that clinicians should consider, and discuss with patients, temporarily stopping treatment with immunosuppressants unless the benefits outweigh the risk of aggravating the patient’s lung condition.[397] Canadian guidance advises that clinicians use the lowest effective dose of immunomodulatory therapy.[397]

When deciding whether to start or continue an immunosuppressant in patients who do not have COVID-19, clinicians should take into account whether the patient's condition is stable, which treatment has the best risk profile, the likely consequences of delaying the start of treatment, feasibility of monitoring and dose adjustments, frequency and route of treatment, and whether treatment could be reduced or stopped. Patients who are established on immunosuppressive therapy should continue their treatment as prescribed to minimise the risk of their condition worsening. It may be safe to increase the interval between monitoring blood tests if a patient's condition is stable and they have been advised to shield. If the patient's condition is responsive to immunosuppressants and they cannot attend for blood tests, prednisolone alone may be used at the lowest possible dose. Antifibrotic therapy does not increase the risk of getting COVID-19 or make severe disease more likely. Patients who are already taking antifibrotic therapy should continue. Patients with a new diagnosis of idiopathic pulmonary fibrosis may start antifibrotic therapy if a multidisciplinary team confirms the diagnosis, usual eligibility criteria are satisfied, and the appropriate blood monitoring can be performed.[397]

New outpatient appointments should be telephone or video appointments if suitable. Unless the patient's condition has altered considerably, blood tests from the past 6 weeks, lung function tests from the past 6 months, and computed tomography scans from the last 12 months can be used to guide diagnosis and treatment. New tests should be performed if these test results are not available but are needed urgently to inform care. In particular, bronchoscopy and lung function testing have the potential to spread COVID-19, so these should only be performed if they are urgent and will directly influence patient care. Patients who require face-to-face appointments should be screened before arrival (by telephone) for symptoms of COVID-19. On arrival, they should be screened for symptoms again and have their temperature checked.[396] Canadian guidance advises testing for severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) 1 to 2 days before bronchoscopy or lung biopsy, if resources are available. Elective bronchoscopy or lung biopsy should be deferred in patients with SARS-CoV-2 infection.[397]

Long-term oxygen assessments should take place in the patient's home, if possible. Assessments may be deferred, according to clinical need, and reassessments may be deferred if the patient's symptoms are stable. Patients should be referred for lung transplantation according to usual protocols. Patients should be referred for pulmonary rehabilitation or directed to the British Thoracic Society's online pulmonary rehabilitation resources if there are no local services available.[396]

Patients with persistent respiratory symptoms following recovery from COVID-19 should be evaluated for COVID-19 or make severe disease more likely. Patients who are already taking antifibrotic therapy should continue. Patients with a new diagnosis of idiopathic pulmonary fibrosis may start antifibrotic therapy if a multidisciplinary team confirms the diagnosis, usual eligibility criteria are satisfied, and the appropriate blood monitoring can be performed.[397]
Management of coexisting conditions in the context of COVID-19

**Roelike thrombocytopenia**

- see our comprehensive coverage of Immune thrombocytopenia (https://bestpractice.bmj.com/topics/en-gb/138)

The American Society for Hematology has published advice on management of immune thrombocytopenia (immune thrombocytopenic purpura [ITP]) during the pandemic. Hospital visits should be minimised and treatment guided by symptom management rather than frequent platelet counts. Viral infections can trigger acute ITP or trigger exacerbations in patients with stable disease, so testing for severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) is recommended in these patients.[398]

Treatment of new patients should be individualised depending on: urgency of need to increase the platelet count, amount of bleeding, comorbidities, minimising exposure to SARS-CoV-2, and usual practice. Most patients with immune thrombocytopenia do not experience severe bleeding with platelet counts above 20,000/microlitre, in the absence of comorbidities. Intravenous immunoglobulin (IVIG) or oral thrombopoietic agents (e.g., eltrombopag or avatrombopag) are first line because they are not immunosuppressive. No change to treatment is recommended for patients who are stable on low doses of immunosuppressive drugs. Treatment change may be considered for patients taking higher doses of immunosuppressive drugs or corticosteroids; however, this must be balanced against the increased monitoring requirements and risk of relapse. If indicated, IVIG or oral thrombopoietic agents may allow dose reduction or cessation of immunosuppressive medication or corticosteroids. Rituximab should be avoided if possible.[398]

If a patient with immune thrombocytopenia develops COVID-19, IVIG should be given to maintain the platelet count above 10,000-20,000/microlitre; platelet transfusion should be reserved to treat bleeding or cover procedures with a high bleeding risk. If the patient already takes a thrombopoietic agent, the dose can be increased or a second agent may be started. Treatments for COVID-19 illness should be given as appropriate. If the patient has had a splenectomy, intravenous antibiotics should be administered until bacterial cultures are documented negative, even if COVID-19 is strongly suspected as the cause.[398]

The guidance advises that vaccine administration in general can occasionally result in a drop in the platelet count in stable ITP patients; however, current knowledge suggests that the expected benefits of receiving the SARS-CoV-2 vaccine likely outweigh the risks.[398] Taking baseline and post-vaccination platelet counts may be considered, particularly in those with ongoing thrombocytopenia or a history of unstable platelet counts.
Management of coexisting conditions in the context of COVID-19

◊ Influenza

» see our comprehensive coverage of Influenza (https://bestpractice.bmj.com/topics/en-gb/6)

The 2020-2021 influenza season is expected to coincide with continued or recurrent circulation of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Signs and symptoms of influenza infection and COVID-19 infection are similar and can be difficult to distinguish clinically; only testing can distinguish between them. The US National Institutes of Health (NIH) COVID-19 Treatment Guidelines recommend testing for both SARS-CoV-2 and influenza viruses in all hospitalised patients with acute respiratory illness when both viruses are co-circulating.[84] The guidelines advise that treatment of influenza is the same in all patients, regardless of SARS-CoV-2 co-infection, and that hospitalised patients should be started on empiric treatment for influenza as soon as possible without waiting for influenza testing results (antiviral treatment for influenza can be stopped when influenza has been ruled out by nucleic acid detection assay in upper respiratory tract specimens for non-intubated patients, and in both upper and lower respiratory tract specimens for intubated patients).[84]

Vaccination against influenza is recommended to reduce prevalence of influenza infection, thus reducing symptoms that might be confused with those of COVID-19 and reducing the burden on the healthcare system.[117] The US Centers for Disease Control and Prevention recommend influenza vaccination of persons aged ≥6 months.[117] [399] On the basis of practice for other acute respiratory infections, the NIH COVID-19 Treatment Guidelines recommend that people with COVID-19 should receive an inactivated influenza vaccine.[84] There is no data on the optimal timing of influenza vaccination in people with COVID-19 or recovering from COVID-19. Timing of vaccination should be guided by the individual's risk of medical complications due to influenza, and the degree of influenza circulating in their community.[399] The UK 2020-2021 influenza immunisation programme has been expanded to include household contacts of shielding patients, children in school year 7, and health and social care workers who deliver domiciliary care.[119] Depending on availability following immunisation of currently eligible groups, the influenza vaccine will also then be offered to all 50-64 year olds in the UK.[119] Clinicians are encouraged to achieve maximum uptake of influenza vaccination in existing eligible groups.

One study found that influenza infection was associated with a lower risk of SARS-CoV-2 infection, indicating that there may be pathogenic competition between them. Co-infection with influenza and SARS-CoV-2 was associated with an increased risk of death or severe disease.[400]

◊ Learning disability

» see our comprehensive coverage of Learning disability (https://bestpractice.bmj.com/topics/en-gb/884)

People with learning disabilities (LDs) are at higher risk of death from COVID-19 than the general population. Analysis of US health-insurance claims data found that intellectual disability was associated with a 2.75-fold increase in the odds of death from COVID-19.[76] In the UK, people with learning disabilities were over-represented threefold amongst people who died from COVID-19, with a larger disparity in younger age groups.[401] In the US, a study of nearly 65,000,000 patients across 547 healthcare organisations found that having an intellectual disability was the strongest independent risk factor for a COVID-19 diagnosis and the strongest independent risk factor for COVID-19 mortality other than age.[402]

Guidance recommends ensuring that patients with LDs have a handheld summary of their medical information, activities, and preferences to support staff in caring for them if admitted to hospital. Community LD teams are encouraged to work with people in their care and their families to develop COVID-19 care plans, which should include any issues associated with diagnostic overshadowing, views of parents, carers and family members, any reasonable adjustments required, communication needs, specialist mental health support, anticipatory care plans, and any end-of-life or do not attempt cardiopulmonary resuscitation discussions.[403] Stringent social distancing should be followed and community services should use tele- and video conferencing to contact patients and carers where appropriate.[404]
Management of coexisting conditions in the context of COVID-19

◊ Liver dysfunction

- see our comprehensive coverage of Liver dysfunction (https://bestpractice.bmj.com/topics/en-gb/1122)

Patients with COVID-19 may have abnormal liver function tests, including elevated aminotransferases and mildly elevated bilirubin. Low serum albumin on admission to hospital is a marker of COVID-19 severity. Recommendations from the American Association for Study of Liver Diseases (AASLD), the American Gastroenterological Association (AGA), and the Asia-Pacific Working Group for Liver Derangement during the COVID-19 Pandemic all advise regular monitoring of liver biochemistries in all hospitalised patients with COVID-19, particularly those treated with remdesivir or tocilizumab, regardless of baseline values.[59] [69] [405] The Asia-Pacific Working Group advises that while the optimal interval for liver tests is uncertain, it would be reasonable to monitor liver tests twice weekly in patients on potentially hepatotoxic medication and patients with pre-existing liver disease, and more frequently in any patients with abnormal liver function.[69] The AASLD also advises that abnormal liver biochemistries should not be a contraindication to using investigational or off-label therapeutics for COVID-19, although aspartate aminotransferase (AST) or alanine aminotransferase (ALT) levels >5 times the upper limit of normal (ULN) may exclude patients from consideration of some investigational agents.[59] The Asia-Pacific Working Group recommends that off-label COVID-19 therapies may be used with caution and close monitoring in those with abnormal liver function; the treatment should be stopped in those with moderate-to-severe liver injury (ie, ALT >5 times ULN or alkaline phosphatase >2 times ULN, and total bilirubin >2 times ULN or presence of coagulopathy or clinical decompensation).[69] Other causes of abnormal liver function tests, including viral hepatitides, should be considered in patients with COVID-19 and abnormal liver biochemistries.[69] [405] In patients with autoimmune hepatitis or liver transplant recipients who develop COVID-19, suspected disease flare or acute cellular rejection should be confirmed on biopsy.[59] The Asia-Pacific Working Group recommends screening for hepatitis B surface antigen (HBsAg) in patients who are receiving systemic corticosteroids or other potent immunosuppressants for 7 days or longer as COVID-19 therapy. Tocilizumab has been associated with HBV reactivation. European guidelines recommend screening with HBV serology before initiating treatment with tocilizumab.[60] In patients with hepatitis C virus (HCV) infection, concomitant use of a protease inhibitor-containing direct-acting antiviral regimen with lopinavir/ritonavir is contraindicated, as protease inhibitor concentrations may increase when these drugs are used together, risking ALT elevations.[69]

A joint statement from the British Society of Gastroenterology, British Association for the Study of the Liver, NHS Blood & Transplant, and British Liver Trust advises that patients with chronic liver disease, autoimmune hepatitis, and those post-liver transplant should consider SARS-CoV-2 vaccination with any of the available vaccines.[306]

◊ Migraine

- see our comprehensive coverage of Migraine (https://bestpractice.bmj.com/topics/en-gb/10)

The European Academy of Neurology has published advice on the management of migraine during the COVID-19 pandemic.[406] Patients with migraine should be encouraged to continue managing lifestyle and dietary triggers: for example, stress, diet, alcohol consumption, and sleep. Social isolation, anxiety, and depression may negatively affect medication overuse, and medications for treatment of acute migraine should be limited to less than two times per week. Non-steroidal anti-inflammatory drugs should be used as needed: they have established efficacy in the treatment of acute migraine, and there is no evidence that they can exacerbate symptoms of COVID-19. Paracetamol and triptans may also be used as required for acute attacks. Ongoing care should be delivered using telemedicine where possible.
Mitral regurgitation

» see our comprehensive coverage of Mitral regurgitation (https://bestpractice.bmj.com/topics/en-gb/322)

A position statement from the American College of Cardiology and the Society for Cardiovascular Angiography and Interventions provides recommendations for the triage of patients referred for structural heart disease interventions during the pandemic.[190] The recommendations suggest that percutaneous mitral valve repair (edge-to-edge repair) can be safely deferred in the majority of patients with mitral regurgitation (MR), but some high risk patients should be considered for edge-to-edge repair during the pandemic. Patients who are deferred should be contacted on a weekly basis to monitor for decompensation. Valve-in-valve transcatheter mitral valve replacement (TMVR) is resource-intensive and should be deferred if the patient can be sufficiently managed on medical therapy in the interim. Valve-in-valve TMVR should be considered for patients with severe bioprosthetic mitral stenosis or mitral regurgitation who are inpatients with congestive heart failure or outpatients who have had hospitalisations for congestive heart failure within 30 days despite optimised guideline-directed medical therapy.

The British Heart Valve Society has published recommendations for the outpatient management of heart valve disease following the COVID-19 pandemic. They recommend that patients with severe symptomatic MR should be considered for urgent surgical repair; transcatheter mitral valve therapies may be considered in decompensated MR when timely access to surgical repair/replacement is not possible.[243]
**Multiple myeloma**

◊ see our comprehensive coverage of Multiple myeloma ([https://bestpractice.bmj.com/topics/en-gb/179](https://bestpractice.bmj.com/topics/en-gb/179))

The American Society of Hematology (ASH) and European Myeloma Network (EMN) advise that patients who have multiple myeloma with active disease need treatment during the COVID-19 pandemic, but this can be adapted for each patient to reduce additional COVID-19 exposure.[372] [407] For patients who require treatment, ASH advises giving 6-12 cycles of bortezomib, lenalidomide, and dexamethasone (RVD), followed by lenalidomide maintenance (with the addition of bortezomib every 2 weeks for high-risk patients). Older myeloma patients may start treatment with RVD or daratumumab, lenalidomide, and dexamethasone (DRd) depending on cytogenetic risk and other comorbidities, and if necessary can continue on lenalidomide and dexamethasone (Rd) only after achieving best response.[372]

Patients should continue on maintenance therapy to reduce the risk of relapse. Lenalidomide can be provided for up to 2 months, with telemedicine visits and home phlebotomy as needed. Higher-risk patients on RVD should continue taking RVD, although if appropriate this could be changed to Rd. If a patient develops COVID-19, maintenance therapy should be interrupted until the infection resolves. Haematopoietic stem cell transplantation may be delayed if resources are limited; otherwise eligible patients should proceed to stem cell based transplant, particularly if they have high-risk myeloma.[372]

The EMN provides recommendations for transplant-eligible and transplant ineligible patients. Autologous stem cell transplantation should be postponed in patients with standard-risk disease and may be considered in patients with high-risk disease after 6-8 cycles of induction treatment. Either RVD, bortezomib with thalidomide and dexamethasone, (VTD), or daratumumab with VTD are the preferred induction therapies.[407] Patients not eligible for transplant should be given all-oral regimens (e.g., Rd), with the addition of bortezomib or daratumumab considered for patients with high-risk disease or for those without sufficient response to Rd.[407]

Guidelines from Australia and New Zealand advise that treatment during the pandemic may depend on available resources, but that management should be guided by the need for disease control in high-risk patients and avoiding unnecessary immune suppression in low-risk patients.[289] Treatment decisions should be individualised, taking into account factors such as newly diagnosed versus relapsed disease, stage, disease burden and rate of progression, and patient factors such as age, frailty, and comorbidities.[289]

The UK Myeloma Forum has released guidance to assist clinical decision making during the COVID-19 pandemic. Newly diagnosed patients with hypercalcaemia, renal impairment, or bone disease should be offered primary treatment. If the patient is eligible for a stem cell transplant, treatment should include bortezomib and dexamethasone with either thalidomide (VTD) or cyclophosphamide (VCD). For patients who are ineligible for a transplant, lenalidomide and dexamethasone should be given for 9 cycles followed by single agent lenalidomide. Patients with clinical relapse should be offered second- and third-line therapy if the expected benefit outweighs the risk. Autologous haematopoietic stem cell transplant should be deferred unless the patient has clinically high-risk disease, in which case clinicians should judge the likelihood of progression without transplant. Allogeneic haematopoietic stem cell transplant should be deferred.[408]

The UK Medicines and Healthcare products Regulatory Agency has agreed temporary modifications to the pregnancy prevention programmes for patients taking thalidomide, lenalidomide, and pomalidomide. A home pregnancy test is sufficient, provided the patient has adequate support and instruction, the test meets the minimum sensitivity requirements and the result is verified by the prescriber. If the clinician deems it appropriate, these medications can be initiated during a remote consultation.[409]

There are limited data on trials of severe acute respiratory syndrome coronavirus 2 vaccination in patients with haematological conditions. Such patients are likely to have an attenuated response to vaccination. One study of the BNT162b2 mRNA COVID-19 vaccine in elderly patients with multiple myeloma found the antibody response was reduced compared with healthy controls after the first dose.[410] Additional measures, such as early vaccination of household contacts, may be considered.[237]
Management of coexisting conditions in the context of COVID-19

**Multiple sclerosis**

The Association of British Neurologists (ABN) has produced guidance on the use of disease-modifying therapies in patients with multiple sclerosis (MS) during the pandemic.[411] The ABN advises that the effect of disease-modifying therapies on the risk of COVID-19 remains uncertain. Disease-modifying treatments should be offered to patients, provided that the benefits of treatment outweigh the risks. The local rate of COVID-19 infection, the patient's general health, and their exposure to the virus all influence this risk/benefit decision. Patients should be advised if their disease-modifying therapy might affect the efficacy of a future vaccine or the severity of COVID-19. Patients should also be informed if use of their treatment means they should be shielding. Self-isolation may be appropriate following use of high-dose corticosteroids for a relapse of MS. The guidance provides information on considered level of risk for specific disease-modifying therapies.[411] The US National MS Society also recommends that decisions on the use of disease-modifying therapies are individualised and should consider disease factors, risks and benefits of therapies, and risks associated with COVID-19.[412] The National MS Society recommends that people currently taking disease-modifying therapies should continue, and if they develop symptoms of COVID-19 or test positive, their therapies should be reviewed with someone familiar with their care.

Observational studies of patients with MS have found that risk factors for severe forms of COVID-19 are older age, increased levels of disability (Expanded Disability Severity Scale [EDSS] score ≥6, requiring assistance to walk, or being unable to walk), black race, cardiovascular disease, diabetes, obesity, and corticosteroid treatment within the previous 2 months.[413] [414] One study found no association between use of disease-modifying therapies and severity of COVID-19.[413] Another study found that patients taking rituximab had an increased risk of hospitalisation compared with patients who did not take any disease-modifying therapy, but there was no significantly increased risk of intensive care unit admission, need for mechanical ventilation, or death among the patients taking rituximab.[415]

**Non-Hodgkin's lymphoma**

Analysis of US health-insurance claims data has shown that lymphoma is a significant risk factor for fatal COVID-19.[76] Indolent and aggressive non-Hodgkin's lymphomas are associated with worse survival in patients with COVID-19.[235] [75] Interim treatment guidelines for the management of adult patients during the pandemic have been provided by experts from the UK and also from Australia and New Zealand.[394] [289] For most patients with aggressive non-Hodgkin's lymphoma subtypes, treatment is delivered with curative intent and this remains the clinical priority. Recommendations are given for patients with Burkitt lymphoma, diffuse large B-cell lymphoma (DLBCL), primary mediastinal B cell lymphoma, central nervous system (CNS) lymphoma, peripheral T cell lymphoma, and relapsed/refractory aggressive lymphoma. For patients with low-grade non-Hodgkin's lymphoma and not requiring immediate treatment, watchful waiting may be considered; initiation of treatment should be based on a risk–benefit discussion between the patient and physician.

The American Society for Hematology has published advice for the management of aggressive lymphomas. R-CHOP (rituximab plus cyclophosphamide, doxorubicin, vincristine, and prednisolone) remains the standard of care for diffuse large B cell lymphoma. For older patients, R-mini-CHOP (a reduced dose regimen) with growth factor support is recommended. Subcutaneous rituximab may be considered for patients who have tolerated a first intravenous dose. Recommendations are also given for double-hit and primary mediastinal B cell lymphomas, patients at higher risk of CNS involvement, and patients with relapsed or refractory disease.[416] The International Lymphoma Radiation Oncology Group has published emergency guidelines for radiotherapy in haematological malignancies, should radiotherapy be necessary. Alternative dose fractionations may be given.[89]

Trials of severe acute respiratory syndrome coronavirus 2 vaccination in patients with haematological conditions are lacking. Such patients are likely to have an attenuated response to vaccination. Additional measures, such as early vaccination of household contacts, may be considered.[237]
Management of coexisting conditions in the context of COVID-19

◊ Non-ST-elevation myocardial infarction (NSTEMI)

» see our comprehensive coverage of Non-ST-elevation myocardial infarction (NSTEMI) (https://bestpractice.bmj.com/topics/en-gb/151)

The European Society of Cardiology has published guidance on the diagnosis and management of cardiovascular disease during the COVID-19 pandemic, and the European Association of Percutaneous Cardiovascular Interventions (EAPCI) has issued a position statement on invasive management of acute coronary syndromes.[278] [417]

Patients presenting with non-ST-elevation acute coronary syndrome should be risk stratified into four groups: very high, high, intermediate, and low risk. Very high-risk patients include patients with cardiogenic shock, haemodynamic instability, recurrent or persistent chest pain refractory to medical therapy, life-threatening arrhythmias, cardiac arrest, mechanical complications of myocardial infarction, acute heart failure, and recurrent intermittent ST-elevation. High-risk patients are those with an established diagnosis of NSTEMI based on cardiac troponins and at least one of: dynamic ST/T changes, or recurrent symptoms.

Testing for severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) should be performed as soon as possible after first medical contact. However, patients who are very high risk require immediate invasive management as per ST-elevation myocardial infarction (STEMI) protocols. High-risk patients should have early intervention (ideally within 24 hours) after their SARS-CoV-2 test results are known. Intermediate- and low-risk patients should initially be managed with non-invasive testing once their SARS-CoV-2 test results are known. Coronary computed tomography angiography (CCTA) is the favoured investigation for intermediate-risk patients where equipment and expertise are available. Non-invasive imaging using CCTA may speed up risk stratification, avoid an invasive approach, and allow early discharge.[278] [417]

UK guidance advises using ECG and measuring high-sensitivity troponin and N-terminal pro B-type natriuretic peptide in patients hospitalised with COVID-19 who have signs or symptoms of acute myocardial injury. In patients with severe COVID-19, elevated troponin levels may result from cardiac inflammatory response rather than acute coronary syndrome. Patients with suspected or confirmed acute myocardial injury should receive continuous ECG monitoring, as well as blood pressure, heart rate, and fluid monitoring, in a setting where deterioration can be quickly identified. Where diagnosis is not clear, ECG should be monitored daily and high-sensitivity troponin measurements should be repeated.[125]

Guidelines from Australia and New Zealand state that reliance on troponin measurements to diagnose acute coronary syndrome in patients with COVID-19 can be misleading, and greater emphasis should be given to high risk clinical features: recurrent chest pain, dynamic ECG changes, heart failure, haemodynamic instability, major arrhythmias, and the presence of regional wall motion abnormalities on echocardiography. Invasive investigations should be deferred in stable patients, particularly if they are COVID-19 positive.[179]

A cohort study from the UK reported that black and minority ethnic (BAME) patients had higher rates of hospitalisation for acute myocardial infarction and longer time to coronary angiography for NSTEMI than white patients during the pandemic, compared with the same pre-pandemic period. BAME patients were more likely than white patients to present with out-of-hospital cardiac arrest and cardiogenic shock during the COVID-19 pandemic compared with the period before the pandemic. In-hospital and 7-day mortality was higher in BAME patients (relative to white patients) during the COVID-19 pandemic compared with the pre-pandemic period.[418]
Management of coexisting conditions in the context of COVID-19

◊ Obesity in adults

» see our comprehensive coverage of Obesity in adults (https://bestpractice.bmj.com/topics/en-gb/211)

Obesity (body mass index [BMI] ≥30kg/m²) is associated with increased risk of a positive COVID-19 test, hospitalisation, severe COVID-19 requiring admission to intensive care, mechanical ventilation, and death.[279] [281] [419] [420] [421] [422] [339] The association is strongest in patients <65 years.[281] [423] Patients with obesity who develop COVID-19 are also at higher risk for venous thromboembolism and dialysis.[420]

Being overweight (BMI >25kg/m² and <30kg/m²) might increase the risk of severe illness from COVID-19, and is associated with increased risk of mechanical ventilation.[279] [423] [339] [424]

A study in the US found a non-linear (J-shaped) relationship between BMI and risk of hospitalisation, intensive care admission, and death.[423] A study in the UK also found non-linear associations between BMI and hospital admission and death due to COVID-19, and a linear association between BMI and intensive care admission due to COVID-19.[424] In the UK study, the relative risk due to increasing BMI was particularly notable in people younger than 40 years and of black ethnicity.

There is currently no high-quality research on the effects of weight loss on COVID-19, but that the role of excess weight as a risk factor for serious COVID-19 complications warrants further consideration.[419] For those living with obesity, weight loss has been shown to bring general long-term health benefits.

Patients with obesity who recover from COVID-19 may be at increased risk of post-acute sequelae. One study found that patients with obesity who did not require ICU admission and survived the acute phase of COVID-19 had an increased risk of hospital admission and needing diagnostic tests over the subsequent 8 months compared with patients with normal BMI.[425]

◊ Obesity in children

» see our comprehensive coverage of Obesity in children (https://bestpractice.bmj.com/topics/en-gb/1085)

The American Academy of Pediatrics advises that children and adolescents with obesity are at increased risk for COVID-19 and worsening of their obesity during the pandemic. Disruption to routine, sleep dysregulation, decreased physical activity, food insecurity, and increased screen time may all contribute. Clinicians should continue to provide obesity treatment and should identify and treat obesity-related comorbidities during the pandemic. Clinicians should counsel patients and their families about the risk of COVID-19, screen for disordered eating (e.g., binge eating, purging, and restrictive eating), and connect families to resources to address social determinants of health.[194]

◊ Obstructive sleep apnoea

» see our comprehensive coverage of Obstructive sleep apnoea (https://bestpractice.bmj.com/topics/en-gb/215)

Obstructive sleep apnoea (OSA) may increase the risk of developing COVID-19 infection, and may also increase the risk of having more severe COVID-19 infection.[426] In a study of people with diabetes who were hospitalised for COVID-19, treated OSA was independently associated with an increased risk of death.[427] One systematic review noted that many of the risk factors for OSA (such as age, hypertension, cardiovascular disease, lung disease, diabetes, and obesity) are associated with worse outcomes for COVID-19 infection.[428] The review also found that the COVID-19 pandemic has had a large effect on the diagnosis and treatment of OSA, and that new diagnosis and treatment pathways may be necessary (e.g., using disposable sleep study kits).
### Olfactory loss

◊ **Olfactory loss**

Olfactory loss (anosmia) may be a presenting symptom of COVID-19. The European Rhinologic Society advises against prescribing intranasal or systemic corticosteroids for patients with sudden olfactory loss. Patients should be advised to continue their usual medications, including intranasal corticosteroids prescribed for other indications.[429]

### Open-angle glaucoma

◊ **Open-angle glaucoma**

Many patients with open-angle glaucoma will be vulnerable to severe COVID-19. UK guidelines advise that clinicians should weigh the risks of visual loss from glaucoma against the population spread of COVID-19 by clinic attendance and the risk of death from COVID-19. Priority for surgery should be given to those on maximum tolerated medication whose intraocular pressure (IOP) remains high and is likely to cause significant vision loss in the short term. If possible, additional medication, diode laser or selective laser trabeculoplasty can be used to postpone the need for surgery. Where possible, procedures should be performed as day cases under local anaesthetic. Procedures requiring intensive postoperative follow up, antimetabolite injections or suture adjustment should be avoided if possible.[430]

Empirical treatment can be started for patients referred to the glaucoma clinic following an assessment of their symptoms, referral information, medical and drug history. Telephone or video consultation should be used to explain the diagnosis, explain how to use medication and assess side effects.[430]

Patients with mild glaucoma and well-controlled IOP, patients with ocular hypertension and patients with suspected glaucoma are considered low risk. Review appointments may be deferred but patients should be advised whom to contact if their symptoms deteriorate. Patients with moderate to advanced glaucoma and controlled IOP are considered medium risk and should be offered a telephone appointment; medication changes may be initiated remotely and face-to-face review arranged if needed. High risk patients include: children, people with advanced glaucoma or secondary glaucoma who have a significant risk of avoidable vision loss in the short term, and patients with uncontrolled IOP (>30mmHg, or 20-30 mmHg with advanced disc changes). Patients should be offered face-to-face or telephone/video appointments depending on their comorbidities and severity of glaucoma.[430]
Management of coexisting conditions in the context of COVID-19

**Osteoporosis**

Guidelines from an international group of experts suggest altering the approach to management of osteoporosis during the current pandemic:[431]

- Zoledronic acid can be delayed for 6 to 9 months during the pandemic.
- Patients established on 6-monthly denosumab should continue without any delay and self-administration can be considered where appropriate. Pre-treatment checking of serum vitamin D and calcium levels can be waived and empirical treatment with colecalciferol (vitamin D3) can be considered for all patients.
- Patients established on teriparatide, abaloparatide, or romosozumab should continue; however, periods of discontinuation for many weeks are unlikely to affect the long-term beneficial effects on fracture risk reduction.
- No new patients should be started on zoledronic acid, teriparatide, abaloparatide, or romosozumab due to the risk of confusion from potential adverse effects of the therapies and symptoms of COVID-19.
- If not contraindicated, alternative treatment, such as continuing with an oral bisphosphonate, should be considered.

The American Society of Bone and Mineral Research (ASBMR) has also published recommendations for the management of osteoporosis during the pandemic.[432]

The American College of Rheumatology advises that the denosumab dosing interval can be extended if necessary to minimise healthcare encounters, but should not exceed 8 months.[433]

Patients should be educated on the importance of continuing with calcium and vitamin D through supplements or diet, and lifestyle measures such as regular exercise and healthy diet.

**Paediatric rheumatic diseases**

The American College of Rheumatology (ACR) has published guidance for the management of paediatric rheumatic disease (PRD) during the pandemic.[434] Currently, the evidence does not suggest that children with PRD and children receiving immunomodulatory therapies for PRD have a higher risk of severe COVID-19 infection, and general preventative measures are advised. The ACR guidance provides recommendations for ongoing treatment of patients during the pandemic, including for those who have been exposed to severe acute respiratory syndrome coronavirus (SARS-CoV-2), and for those with probable or confirmed infection.
Management of coexisting conditions in the context of COVID-19

◊ Palliative care

» see our comprehensive coverage of Palliative care (https://bestpractice.bmj.com/topics/en-gb/1020)

The National Institute for Health and Care Excellence in the UK has published guidelines for managing symptoms at the end of life during the COVID-19 pandemic. Where possible, clinicians should discuss the benefits, risks, and likely outcomes of any treatment with the patients, their relatives, and carers. The patient’s preference about treatment and escalation plans should be sought, and clinicians should enquire about any advance care plans, advance decisions to refuse treatment, or ‘do not attempt resuscitation’ decisions. Patients with COVID-19 can deteriorate rapidly; treatment escalation plans should be put in place as soon as possible.[125]

Cough should initially be managed with non-pharmacological measures if possible. Patients should be discouraged from lying on their back because this makes coughing ineffective. Simple measures, such as honey, may be used. Persistent, distressing cough can be managed with opioids.[125] [435]

If patients have fever and other symptoms, paracetamol or a non-steroidal anti-inflammatory drug (NSAID) may be used as antipyretics. They should only be taken while both the fever and other symptoms are present.[125]

Reversible causes, such as pulmonary embolism, pulmonary oedema, or exacerbation of airway disease, should be sought and treated.[125] Relaxation and breathing techniques, changing body positioning, maintaining a cool environment, and opening a window or door may help ease symptoms of breathlessness.[125] A trial of oxygen may given if hypoxia is the likely cause of the breathlessness.[125]

A combination of opioids and benzodiazepines may be considered for patients who have moderate or severe breathlessness, are distressed, and are in the last days or hours of life.[125] [435] An antiemetic and regular stimulant laxative should be considered concomitantly.

Benzodiazepines may also be considered to manage symptoms of anxiety and agitation.[435] [125] Oral haloperidol may be considered if a patient has delirium.[125]

Consider whether the sublingual, rectal, or subcutaneous route is appropriate for administration for medication; this may be easier for relatives or carers to administer if there are fewer healthcare staff.[125]

In the UK, hospices and care homes may run a medicines re-use scheme during the COVID-19 pandemic, following a strict standard operating procedure to ensure safety.[436]

Implantable cardiac defibrillators (ICDs) cannot be deactivated remotely. If a patient with an ICD is receiving end of life care, the treating clinical team should secure a magnet to the skin over the ICD where possible, rather than using the programmer.[180]

Further resources are available at:

- [The World Hospice and Palliative Care Alliance: COVID-19 resources](https://www.thewhpca.org/covid-19)
**Pancreatic cancer**

» see our comprehensive coverage of Pancreatic cancer (https://bestpractice.bmj.com/topics/en-gb/265)

A UK consensus statement recommends that endoscopic therapy for malignant biliary obstruction, with biopsy or cytology specimen collection if indicated, should continue during the COVID-19 pandemic. Urgent (2 week wait) cancer referrals and endoscopic ultrasound requests should be considered on a case-by-case basis.[437]

Surgery for resectable pancreatic cancer remains the standard of care and should be performed whenever possible. If surgery is not available, systemic anticancer therapy (SACT) or hypofractionated chemoradiotherapy should be offered. Fluorouracil, folinic acid, irinotecan, and oxaliplatin (FOLFIRINOX) is the preferred SACT regimen. Radiotherapy may be given as 35-45 Gy in 5 fractions, depending on centre expertise, or 36 Gy in 15 fractions with concurrent capecitabine.[437] FOLFIRINOX is most appropriate in patients with a good performance status without significant comorbidities. Dose modification, use of prophylactic antibiotics and growth factors and physical distancing measures should be used to reduce the risk of severe COVID-19 infection.

Patients with locally advanced pancreatic cancer are usually treated with upfront SACT, with or without radiotherapy. Hypofractionated radiotherapy or chemoradiotherapy may reduce risk of severe COVID-19 infection and allow a deferral or break from SACT; this should be balanced against the risk of metastasis without upfront chemotherapy. The risks of treatment in patients aged over 80 years are likely to outweigh the benefits. For fit patients with no significant comorbidities, treatment options include four cycles of modified FOLFIRINOX with or without hypofractionated radiotherapy or five cycles of radiotherapy alone.[437]

The median improvement in survival with palliative chemotherapy for metastatic disease is <6 months so the risks of treatment are likely to outweigh the benefits for many patients. The decision to treat should be taken on a case-by-case basis. Early response assessment should be considered, depending on radiology capacity, because this may allow a shorter duration of chemotherapy. A break from chemotherapy may be appropriate for patients with low volume disease or good disease control. Second-line palliative chemotherapy should not be offered.[437]

**Parkinson’s disease**

» see our comprehensive coverage of Parkinson’s disease (https://bestpractice.bmj.com/topics/en-gb/147)

Patients with Parkinson’s disease who are treated with deep brain stimulation (DBS) require ongoing outpatient visits and surgical care and may not tolerate interruption or cessation of therapy, with some experiencing life-threatening DBS-withdrawal syndrome.[438] In the current pandemic, many elective procedures are being deferred; however, practical recommendations are available to guide management of DBS device complications or battery replacement. Patients who are at high risk for severe or life-threatening symptoms or hospitalisation with DBS cessation would be considered the highest priority for DBS replacement; patients at lower risk may be able to have replacement postponed.[438]
Prostate cancer

Radiation oncologists from the US and the UK have agreed upon recommendations to safely manage patients with prostate cancer during the COVID-19 pandemic. Visits should be conducted as video consultations whenever possible. In most cases, routine measurement of prostate-specific antigen (PSA) following treatment can be safely deferred for ≥3 months. Radiotherapy for very low-, low-, and favourable-intermediate-risk disease may be deferred until pandemic restrictions are lifted (assuming the pandemic wanes over the next 12 months).[439]

Remote telehealth visits should continue for patients with unfavourable-intermediate, high-risk, very high-risk, post-prostatectomy, clinical node-positive, oligometastatic, and low-volume metastatic disease. Androgen deprivation therapy may allow radiotherapy to be deferred. If androgen deprivation therapy cannot be delivered, the benefits of radiotherapy should be weighed against the risk of COVID-19, taking into account the patient's age, comorbidities, and immunosuppression.[439]

If treatment is deemed necessary and the benefits outweigh the risks, the shortest fractionation schedule that has evidence of efficacy and safety should be followed. If treatment needs to be performed during the peak of the pandemic, brachytherapy is not recommended given its reliance on anaesthesia staff and personal protective equipment. Brachytherapy performed with use of local anaesthesia may be a suitable option for those experienced with this method and if resources are available.[439]

Psoriasis

A cohort study of 500,000 people in the UK found that autoimmune disease and history of oral corticosteroid were associated with increased risk of fatal COVID-19.[44] The National Psoriasis Foundation has published guidance for the management of psoriatic disease during the COVID-19 pandemic. Patients with psoriasis seem to have similar rates of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection and COVID-19 outcomes as the general population. However, patients with psoriasis, particularly those with severe disease, are more prone to comorbidities associated with poor COVID-19 outcomes.[53]

Patients and clinicians should make shared decisions regarding use of systemic therapies during the pandemic. The risks and benefits of starting or continuing a drug that affects the immune system need to be carefully considered, including considering whether the required monitoring is possible, whether the patient has had COVID-19 vaccination, and whether there are changes that could make hospital attendance or admission less likely.[46] In most cases, it is recommended that patients who do not have SARS-CoV-2 infection should continue biological or oral therapies.[53] Chronic systemic corticosteroids should be avoided if possible. If used, the dose should be tapered to the lowest therapeutic dose.[53] Patients who are already taking systemic corticosteroids should not stop them suddenly.[46] Initiation of systemic therapies should be discussed with patients who are newly diagnosed with psoriasis, because untreated psoriatic disease may lead to permanent joint damage and disability. Newly diagnosed patients, patients with unstable disease or flares, patients requiring a thorough skin and/or joint examination, and patients at risk for skin cancer should receive in-person care where pandemic conditions allow.[53]

The International Psoriasis Council recommends discontinuing or postponing the use of immunosuppressive medications in patients diagnosed with COVID-19.[49] Patients with psoriasis who become infected with SARS-CoV-2 should receive evidence-based therapies and supportive care. Systemic corticosteroids should not be withheld due to concern about a psoriasis flare following withdrawal. Dermatology and/or rheumatology consultation may be needed for hospitalised patients. Decisions about restarting treatments for psoriasis and psoriatic arthritis after recovery from COVID-19 should be made on a case-by-case basis.[53]

The National Psoriasis Foundation recommends that in most cases, patients should take the first vaccine for which they are eligible and they are offered. Systemic medication for psoriasis or psoriatic arthritis is not a contraindication to any of the available SARS-CoV-2 vaccines.[53]
Pulmonary embolism

The American Society of Hematology advises that normal D-dimer can be used to effectively rule out pulmonary embolism (PE) in patients with COVID-19. Radiological imaging is not necessary if the D-dimer is normal in the context of low pre-test probability. Elevated D-dimer may have many causes, including COVID-19, myocardial infarction, coagulopathy, and renal failure; new symptoms or signs of PE should be sought, and if possible patients should be investigated for PE with computed tomography pulmonary angiogram and/or bilateral compression ultrasonography of the legs. Clinical features that increase the likelihood of PE include symptoms or signs of deep vein thrombosis, unexplained hypotension or tachycardia, unexplained worsening respiratory status, and risk factors for thrombosis. If pulmonary imaging is not feasible to confirm or refute the diagnosis of PE, bilateral compression ultrasonography of the legs, echocardiography, or point-of-care ultrasonography may be considered. These tests may identify thrombus in situ or in transit, but cannot exclude PE if no clot is detected.[440]

Empirical anticoagulation is discouraged, but may be given in the following circumstances if there is a very high clinical suspicion of thrombosis, no possibility of performing diagnostic imaging studies, and there are no contraindications:[440]

- Intubated patients who suddenly develop clinical and laboratory findings highly consistent with PE. These may include desaturation, tachycardia, increased central venous or pulmonary wedge pressure, or evidence of right heart strain on echocardiogram, particularly if their inflammatory markers and chest radiograph findings are improving.
- Patients with physical findings consistent with thrombosis, such as superficial thrombophlebitis, peripheral ischaemia or cyanosis, thrombosis of dialysis tubing, or retiform purpura.
- Patients with respiratory failure in whom PE is highly suspected and other causes are not identified, particularly when D-dimer and/or fibrinogen levels are very high.

Patients who have documented or presumed PE should continue therapeutic anticoagulation for 3 months. Anticoagulation may then cease if the patient has fully recovered from COVID-19 and there are no other risk factors for thrombosis or indications for anticoagulation.[440]
Renal transplant

◊ see our comprehensive coverage of Renal transplant (https://bestpractice.bmj.com/topics/en-gb/)

UK guidelines advise that renal transplant recipients are clinically extremely vulnerable to COVID-19 and should follow current government guidance on shielding. Clinicians should consider whether less frequent blood monitoring is appropriate for patients who are stable on immunosuppressive treatment. Patients who take immunosuppressive treatment may present with atypical symptoms and signs of COVID-19; for example, patients taking prednisolone may not develop a fever. Other infectious and non-infectious causes should also be considered in patients who present with respiratory symptoms or fever. If a patient develops COVID-19, clinicians should consider modifying their immunosuppressive treatment.[441] Guidelines from the British Transplantation Society and Renal Association recommend stopping mycophenolate and azathioprine until the patient has fully recovered. If the patient has severe or progressive disease, clinicians should consider stopping or reducing calcineurin inhibitors.[442]

People who have been exposed to suspected or confirmed COVID-19 in the past 14 days, who have died from unexplained respiratory failure, or who test positive on a polymerase chain reaction test for COVID-19 are not suitable deceased donors.[443]

Live kidney donors and their household should follow comprehensive social distancing and hand-hygiene measures for 14 days before the transplant; clinicians should discuss with donors whether they should self-isolate for 14 days before the transplant, taking into account their individual risk of contracting COVID-19, the current local prevalence of COVID-19, and the delay to transplant if they contract COVID-19. Intended transplant recipients should self-isolate for 14 days before the transplant if possible, and dialysis should take place in a COVID-secure area.[441] Donors and recipients should have a nasopharyngeal swab for SARS-CoV-2 no more than three days before admission and should both self-isolate from the day of the test until admission. SARS-CoV-2 testing should be interpreted in the context of other assessments; a negative test does not definitely rule out infection. Donors should be assessed for symptoms and risk of COVID-19 when scheduling the transplant, on the day before the transplant, and on admission; recipients should be assessed the day before a scheduled live donor transplant and on admission for transplant. Assessment should include symptoms of COVID-19, history of social distancing, any contact with people who might have COVID-19, a respiratory assessment, review of SARS-CoV-2 test results, and completion of a rapid turnaround test if needed.[441] Donor surgery should not begin until both donor and recipient are confirmed swab-negative for SARS-CoV-2.[444]

If patients on the kidney transplant waiting list develop COVID-19, they should be suspended from the waiting list until they have recovered, been symptom-free for 28 days, and have a negative swab for SARS-CoV-2.[441]

In prospective cohort studies, 33% to 54% of kidney transplant recipients developed antibodies against SARS-CoV-2 after two doses of mRNA vaccine.[445] Antibody titres were lower amongst patients who did develop antibodies compared with immunocompetent people.[445]

The British Transplant Society and the Centre of Evidence in Transplantation have provided an open-access repository of guidance for solid organ donation and transplantation in the context of COVID-19. [British Transplantation Society: COVID-19 information] (https://bts.org.uk/information-resources/covid-19-information)
A cohort study conducted in the US found that systemic autoimmune rheumatic disease was associated with increased risk of hospitalisation, intensive care admission, acute kidney injury, and venous thromboembolism. The risk was largely due to comorbidities, except for the risk of venous thromboembolism. Risk of mechanical ventilation and death was not increased in the patients with systemic autoimmune rheumatic disease. Patients should continue their usual medication and observe recommended infection prevention and control precautions. If it is possible and clinically safe, corticosteroid dose may be tapered. Clinicians should consider alternatives to corticosteroids where possible, and if corticosteroids are needed, prescribe the lowest effective dose for the shortest possible time. Corticosteroid injections should only be given when a patient has significant disease activity and/or intrusive and persistent symptoms, and there are no suitable alternatives. UK guidelines recommend assessing whether patients receiving intravenous treatment can be switched to the same treatment in subcutaneous form, or, if this is not possible, to consider an alternative subcutaneous treatment option.

Conventional synthetic disease-modifying antirheumatic drugs (DMARDs) may be started or switched in patients with newly diagnosed or active inflammatory arthritis.

Patients receiving immunosuppressive medication may develop atypical symptoms of COVID-19 (e.g., patients who take an oral corticosteroid may not develop fever). Patients who take an oral corticosteroid should not stop suddenly if they develop COVID-19. Patients who are taking long-term corticosteroids may be at risk of adrenal crisis and may require a higher dose if they are diagnosed with COVID-19. American College of Rheumatology guidance recommends that patients should stop hydroxychloroquine and chloroquine if they become infected with severe acute respiratory disease coronavirus 2 (SARS-CoV-2) because of the potential for cardiotoxicity, which could be heightened by COVID-19 infection and receipt of other drugs in hospital. UK guidelines advise that patients may continue hydroxychloroquine and sulfasalazine if they are infected with SARS-CoV-2. Interleukin-6 receptor inhibitors may be continued in select circumstances as part of a shared decision-making process. The half-life of some drugs that immunosuppression will continue for some time after stopping treatment.

Patients may continue taking non-steroidal anti-inflammatory drugs (NSAIDs). The Commission of Human Medicines in the UK reviewed the safety of ibuprofen in patients with COVID-19 and concluded that there is currently insufficient evidence to establish a link between use of ibuprofen, or other NSAIDs, and contracting or worsening of COVID-19. The UK National Institute for Health and Care Excellence has also reviewed the evidence to determine if long-term use of NSAIDs is associated with an increased risk of developing COVID-19, or an increased risk of developing more severe COVID-19, and found no evidence to recommend that people taking NSAIDs for a long-term condition should stop, and that stopping or switching NSAID treatment could have a negative impact in some people. The American College of Rheumatology advises stopping NSAIDs in patients who develop severe manifestations of COVID-19, such as kidney, cardiac or gastrointestinal injury.

The US Food and Drug Administration (FDA) is investigating and states: "At this time, FDA is not aware of scientific evidence connecting the use of NSAIDs, like ibuprofen, with worsening COVID-19 symptoms." The European Medicines Agency advises that patients and clinicians can continue using NSAIDs as per the approved product indication, and has highlighted the need for timely epidemiological studies to provide adequate evidence for any effect of NSAIDs on the disease prognosis of COVID-19. One prospective multicentre study in the UK in patients hospitalised with COVID-19 found that those taking NSAIDs before admission had the same outcomes as those who did not.

A prospective study of patients with inflammatory arthritis who had confirmed or highly suspected COVID-19 infection found that older age, comorbid hypertension, comorbid COPD, and glucocorticoid use were associated with an increased risk of hospitalisation. Maintenance anti-cytokine biological therapies were not associated with an increased risk of hospitalisation.

Following recovery from COVID-19, US guidelines recommend that rheumatic disease treatments can be restarted within 7-14 days of symptom resolution in patients with mild or no pneumonia who were treated in the ambulatory setting or with self quarantine. Decisions regarding restarting rheumatic disease therapies in patients who had more severe COVID-19 should be taken on an individual basis. If a patient had a positive polymerase chain reaction test for SARS-CoV-2 but has remained asymptomatic, rheumatic disease treatments may be restarted 10-17 days after the positive test result.

Clinicians should take measures to reduce hospital visits for patients, which may include longer duration of prescriptions, home delivery of medication, utilising telephone or video appointments, and increasing drug monitoring to the maximum safe interval.
Management of coexisting conditions in the context of COVID-19

◊ Sickle cell disease

» see our comprehensive coverage of Sickle cell disease (https://bestpractice.bmj.com/topics/en-gb/100)

Patients with sickle cell disease are at higher risk of severe disease and death if they become infected with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). A registry of patients with sickle cell disease and COVID-19 in the US reported that the rate of hospitalisation amongst adults with sickle cell disease was 69%, the intensive care admission rate was 11% and mortality was 7%. The Sickle Cell Disease Association of America has published advice on reducing sickle cell disease morbidity during the COVID-19 pandemic. Routine consultations should take place via telephone or video wherever possible and should not be cancelled. Patients should be advised to adhere carefully to their usual medication, to use a thermometer at home, and to seek prompt medical advice if they develop fever. Clinicians should ensure that patients have an adequate supply of medication to manage acute and chronic pain, and consider starting or optimising therapies known to reduce acute sickle cell pain frequency to reduce the need for hospital attendance.

Patients who have acute sickle cell pain without fever or signs of infection should be encouraged to manage pain with oral medication at home. Patients should be closely monitored, with a low threshold for arranging a face-to-face evaluation and severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) testing.

Patients with fever, cough, or shortness of breath require immediate evaluation for COVID-19. Care should include an assessment for other sources of infection with culture of blood (and other specimens as indicated), testing for typical viral infections, administering broad-spectrum antibiotics to cover encapsulated organisms, and assessing for acute chest syndrome. If the patient tests negative for SARS-CoV-2, home treatment with oral antibiotics and close monitoring may be appropriate. If possible, patients should be given an incentive spirometer to use at home.

Patients with confirmed COVID-19 should be monitored closely for signs of rapidly progressive acute chest syndrome (thrombocytopenia, acute kidney injury, hepatic dysfunction, altered mental status, and multi-organ failure). The symptoms of acute chest syndrome may overlap significantly with symptoms of COVID-19. Standard care for acute chest syndrome should be given, including supplemental oxygen, empirical antibiotics, oseltamivir until influenza is excluded, incentive spirometry, and good pain control. Patients with worsening anaemia, evidence of hypoxia, and chest x-ray changes should receive a transfusion of red blood cells. Clinicians should consider the possibility of undiagnosed pulmonary hypertension in acutely ill patients and be alert for signs of fat emboli syndrome. Signs of fat emboli syndrome include worsening anaemia and mental status, haemolysis, thrombocytopenia, hypoalbuminemia, respiratory distress, and petechial rash; it may progress quickly and carries a high mortality. Patients who have COVID-19 and are discharged from hospital remain at high risk of secondary bacterial infection and acute chest syndrome; they should be monitored daily.

If availability of blood products is limited, the highest priority indications for chronic transfusion are: stroke prevention, progressive or critical neurovascular disease, recurrent acute chest syndrome unresponsive to hydroxyethylamide, and cardiovascular or respiratory comorbidity. Clinicians should assess whether patients can switch to hydroxyethylamide or whether transfusion strategy can be temporarily altered.

◊ Smoking cessation

» see our comprehensive coverage of Smoking cessation (https://bestpractice.bmj.com/topics/en-gb/411)

In patients with COVID-19, evidence suggests that smoking is associated with an increased risk of symptomatic COVID-19 infection, more severe disease, and death. People who smoke tobacco may also have an increased risk of contracting COVID-19. It is well-established that smoking damages the lungs and airways, and weakens the immune response; people exposed to second-hand smoke are also at increased risk.

Vaping/use of e-cigarettes is often used as nicotine-replacement therapy; however, the evidence on benefits and harms is still developing. People should not share vaping devices or cigarettes. Smoking cessation is strongly encouraged.
Management of coexisting conditions in the context of COVID-19

Related conditions

◊ ST-elevation myocardial infarction (STEMI)

» see our comprehensive coverage of ST-elevation myocardial infarction (STEMI) (https://bestpractice.bmj.com/topics/en-gb/150)

The European Society of Cardiology has published guidance on the diagnosis and management of cardiovascular disease during the COVID-19 pandemic, and the European Association of Percutaneous Cardiovascular Interventions (EAPCI) has issued a position statement on invasive management of acute coronary syndromes.[278] [417]

The guidance emphasises that the pandemic should not compromise the timely reperfusion of patients with STEMI, therefore in the absence of previous severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) testing all patients should be managed as if they are COVID-19 positive. Primary percutaneous coronary intervention (PCI) is the reperfusion treatment of choice if it can be performed within 120 minutes in appropriate facilities while ensuring the safety of healthcare professionals and other patients. Experience suggests that a delay of up to 60 minutes may occur due to implementing protective measures, and clinicians should take this into account when assessing whether timely primary PCI is possible. If primary PCI cannot be performed within the target time, fibrinolysis is the intervention of choice provided there are no contraindications. All patients should undergo testing for SARS-CoV-2 as soon as possible following first medical contact irrespective of reperfusion strategy, at the latest upon admission to the intensive care unit after primary PCI. Clinicians should consider immediate complete revascularisation, if indicated and appropriate, in order to avoid staged procedures and reduce hospital stay.[278] [417]

UK guidance advises using ECG and measuring high-sensitivity troponin and N-terminal pro B-type natriuretic peptide in patients hospitalised with COVID-19 who have signs or symptoms of acute myocardial injury. The same ECG diagnostic criteria for cardiac conditions apply in patients with COVID-19 and the general population.[278] Patients with ST-elevation should be referred immediately to a cardiologist for consideration of percutaneous coronary intervention. In patients with severe COVID-19, elevated troponin levels may result from cardiac inflammatory response rather than acute coronary syndrome. Patients with suspected or confirmed acute myocardial injury should receive continuous ECG monitoring, as well as blood pressure, heart rate, and fluid monitoring, in a setting where deterioration can be quickly identified. Where diagnosis is not clear, ECG should be monitored daily and high-sensitivity troponin measurements should be repeated.[125]

A cohort study from the UK reported that black and minority ethnic (BAME) patients had higher rates of hospitalisation for acute myocardial infarction and longer time to reperfusion therapy for STEMI than white patients during the pandemic, compared with the same pre-pandemic period. BAME patients were more likely than white patients to present with STEMI, out-of-hospital cardiac arrest, and cardiogenic shock during the COVID-19 pandemic compared with the period before the pandemic. In-hospital and 7-day mortality was higher in BAME patients (relative to white patients) during the COVID-19 pandemic compared with the pre-pandemic period.[465]
Management of coexisting conditions in the context of COVID-19

◊ Stroke

Guidance from the American Heart Association/American Stroke Association advises that patients with COVID-19 may present with neurological symptoms (such as dizziness, headache, or encephalopathy) at the same time as, or even preceding, the development of respiratory symptoms and fever. Patients affected by stroke may be unable to give a history of COVID-19 symptoms or exposure owing to confusion or aphasia. Patients with stroke frequently develop a fever from stroke complications, including aspiration pneumonia and urinary tract infection; these patients require rapid evaluation for COVID-19.[466]

Evaluation using telemedicine can allow a timely assessment, reduce inter-provider transfers, and protect healthcare professionals. Ideally, full personal protective equipment should be worn by the assessing healthcare professional, but this may not be possible where there are shortages.[466]

All stroke teams should endeavour to adhere to guidelines for patient selection for therapy, treatment timeframes, and post-recanalisation monitoring. Teams should use their judgement, guided by local circumstances, to treat as many patients with acute stroke as possible. Patients with large intracerebral bleeds, subarachnoid haemorrhage, or large ischaemic strokes at risk of herniation should be monitored in an intensive care setting, with appropriately trained personnel, where possible. Stable patients may be moved out of intensive care to step-down facilities during the 24-hour post-thrombolysis or thrombectomy follow-up period, if an intensive care bed is needed. Stroke physicians should provide guidance to staff if patients with acute stroke have suspected or confirmed COVID-19 and require admission to a COVID-19 unit.[466]

Cerebrovascular disease is associated with increased mortality from COVID-19.[282]

◊ Strongyloides infection

Experts have made recommendations to reduce the risk of Strongyloides hyperinfection or dissemination in people at moderate to high risk of Strongyloides infection. There is a risk of hyperinfection following exposure to immunosuppressive drugs. Chronic strongyloidiasis is often asymptomatic; suspicion should be based on risk factors including residence in an endemic area, rural residence, and exposure to soil during labour. A screen-and-treat strategy is recommended for patients at moderate to high risk of Strongyloides infection without confirmed COVID-19, asymptomatic patients with a positive polymerase chain reaction test, and patients with mild COVID-19 who are not candidates for dexamethasone. Serologic testing is preferred. Patients in the hospital setting who are at moderate to high risk of Strongyloides infection, are SARS-CoV-2 positive, and are initiating or are likely candidates for dexamethasone should be treated presumptively with ivermectin. Patients at moderate to high risk of Strongyloides infection who have unexplained gram-negative rod infections after receiving dexamethasone or other immunosuppressive agents should have diagnostic testing for Strongyloides infection. Ivermectin should be given while awaiting results.[467]
Management of coexisting conditions in the context of COVID-19

Related conditions

◊ Substance use disorders

» see our comprehensive coverage of Substance use disorders (https://bestpractice.bmj.com/topics/en-gb/986)

Positive urine drug tests for cocaine, fentanyl, heroin, and methamphetamine in patients diagnosed with, or at risk of, substance abuse disorders increased significantly during the COVID-19 pandemic, compared with the preceding 4 months.[468] A survey comparing self-reported alcohol consumption in 2019 and 2020 found that frequency of alcohol consumption increased overall, and particularly in women, adults age 30 to 59 years, and non-Hispanic white individuals.[469] An urban emergency department in the US has reported a large increase in visits for non-fatal, unintentional opioid overdoses in March to June 2020, compared with the same period in 2019.[470] Fatal opioid overdoses also reportedly increased in some areas during lockdown periods.[471]

A retrospective analysis of US emergency medical services registry data observed a sharp rise in overdose-related cardiac arrests during April 2020, with peak rates in May 2020, more than double than in the same period in 2018 and 2019. [472] The increase in overdose-related deaths in the US during the pandemic was primarily driven by synthetic opioids.[473] The Substance Abuse and Mental Health Services Administration in the US has introduced flexibility in the Opioid Treatment Program, depending on stability of the patient,[129] and in the UK, most services transferred patients from supervised opioid substitution therapies to take-home doses. As the number of COVID-19 cases falls, UK clinicians are advised to consider whether supervised opioid substitution therapy can resume.[130]
**Systemic lupus erythematosus (SLE)**

> see our comprehensive coverage of Systemic lupus erythematosus (SLE) (https://bestpractice.bmj.com/topics/en-gb/103)

Chloroquine and hydroxychloroquine should be started at full dose (when available) for patients with newly diagnosed SLE. Chloroquine and hydroxychloroquine should be continued at the same dose during pregnancy.[433]

Belimumab, ACE inhibitors, angiotensin-II receptor antagonists, and glucocorticoids may be initiated if indicated. High-dose glucocorticoids or immunosuppressants may be initiated for patients with lupus nephritis. Glucocorticoids should not be stopped abruptly and should be used at the lowest possible dose to control disease.[433]

Non-steroidal anti-inflammatory drugs (NSAIDs) may be continued following severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) exposure, but should be stopped if the patient develops severe COVID-19.[433] Chloroquine and hydroxychloroquine should be stopped temporarily if the patient develops COVID-19.[433]

Following recovery from COVID-19, US guidelines recommend that rheumatic disease treatments can be restarted within 7-14 days of symptom resolution in patients with mild or no pneumonia who were treated in the ambulatory setting or with self quarantine. Decisions regarding restarting rheumatic disease therapies in patients who had more severe COVID-19 should be taken on an individual basis. If a patient had a positive polymerase chain reaction test for SARS-CoV-2 but has remained asymptomatic, rheumatic disease treatments may be restarted 10-17 days after the positive test result.[433]

Race, presence of at least one comorbidity, and body mass index have been identified as predictors of hospitalisation in patients with SLE and COVID-19.[474] One study in the US found that, similar to findings in the general US population, black, Asian, and Latin American patients with rheumatic disease and COVID-19 had an increased risk of hospitalisation and ventilatory support compared with white patients, even after adjustment for demographic, rheumatic disease activity, and comorbidities.[458] Another cohort study conducted in the US found that systemic autoimmune rheumatic disease was associated with increased risk of hospitalisation, intensive care admission, acute kidney injury, and venous thromboembolism. The risk was largely due to comorbidities, except for the risk of venous thromboembolism. Risk of mechanical ventilation and death was not increased in the patients with systemic autoimmune rheumatic disease.[447]

Clinicians are advised to engage patients with rheumatic disease in a shared decision-making process to discuss receiving a SARS-CoV-2 vaccine. The response to vaccination is likely to be blunted in patients receiving systemic immunomodulatory therapies compared with the general population. The American College of Rheumatology advises that, beyond known allergies to vaccine components, there are no additional contraindications to SARS-CoV-2 vaccination for patients with autoimmune and inflammatory rheumatic diseases. Vaccination should ideally occur when rheumatological disease is well controlled.[369]
Management of coexisting conditions in the context of COVID-19

Related conditions

◊ Thalassaemia

» see our comprehensive coverage of Thalassaemia (https://bestpractice.bmj.com/topics/en-gb/251)

The American Society of Hematology has published recommendations for the treatment of thalassaemia during the pandemic.[475] They advise that blood transfusion and luspatercept should be continued as usual. Iron chelation should be continued in well patients. If a patient develops COVID-19 then interruption of iron chelation is usually advisable; the case should be discussed with the patient’s haematologist. Febrile, splenectomised patients should be investigated for bacterial infection and receive empirical antibiotics to cover secondary bacterial infections.[475]

The Thalassaemia International Federation (TIF) has published a position statement suggesting management strategies during the pandemic covering patients’ risk level, adaptation of haemoglobinopathy care, safety of blood transfusions, blood supply challenges, and lifestyle and nutritional considerations.[476]

◊ Thrombotic thrombocytopenic purpura

» see our comprehensive coverage of Thrombotic thrombocytopenic purpura (https://bestpractice.bmj.com/topics/en-gb/715)

Plasma exchange remains the recommended initial treatment for immune-mediated thrombotic thrombocytopenic purpura (iTTP). Corticosteroids and rituximab should still be used in treatment of acute iTTP. Patients with severely deficient ADAMTS13 activity may still receive rituximab to prevent relapse; the potential increased risk of COVID-19 complications should be balanced against the benefit of delaying or preventing relapses of iTTP. If access to plasma exchange is limited, the patient should ideally be transferred to a facility that can offer plasma exchange; otherwise, caplacizumab and immunosuppressive therapy alone may be considered.[477]

If a patient develops COVID-19, plasma exchange should be used in the same way as for other patients; the risks and benefits of corticosteroids and rituximab should be carefully considered. Caplacizumab may be used in conjunction with plasma exchange as a temporising measure to protect from exacerbations and relapses until recovery from COVID-19; after recovery, corticosteroids and/or rituximab may be used to increase ADAMTS13 activity.[477]

Trials of severe acute respiratory syndrome coronavirus 2 vaccination in patients with haematological conditions are lacking. Such patients are likely to have an attenuated response to vaccination. Additional measures, such as early vaccination of household contacts, may be considered.[237]

◊ Tonsillitis

» see our comprehensive coverage of Tonsillitis (https://bestpractice.bmj.com/topics/en-gb/598)

UK guidelines have been published for the management of adult patients with tonsillitis and quinsy during the pandemic. Personal protective equipment, including respirator mask, is recommended for all ear, nose, and throat examinations and aerosol-generating procedures. Patients without signs of airway compromise or sepsis may be suitable for treatment based on history alone. Intravenous antibiotics and dexamethasone are recommended to help expedite discharge. If signs of airway compromise or sepsis are present, follow sepsis guidelines and seek urgent expert help. Adrenaline should be administered via nebuliser and dexamethasone given intravenously.[478]
Management of coexisting conditions in the context of COVID-19

◊ Tuberculosis

» see our comprehensive coverage of Tuberculosis (https://bestpractice.bmj.com/topics/en-gb/165)

The Centers for Disease Control and Prevention advise that administration of mRNA COVID-19 vaccines should not be delayed because of testing for tuberculosis (TB) infection. Immune-based testing (tuberculin skin testing or interferon-release assay) may be done before or at the same time as COVID-19 vaccination. If this is not possible, immune-based testing should be delayed for at least 4 weeks after completion of COVID-19 vaccination, but generally should not be cancelled. Patients who have active TB, or an illness that is being evaluated as active TB, may receive COVID-19 vaccination. Severe or acute illness is a precaution to administration of all vaccines. Patients who have symptoms or other diagnostic findings consistent with active TB should receive further evaluation, regardless of immune based testing results.[479]

The UK National Health Service advises that an interferon-release assay blood test may be used instead of tuberculin skin testing for contact tracing to reduce person-to-person contact during the pandemic. Testing for latent tuberculosis and neonatal Bacillus Calmette-Guérin vaccination should continue.[480]

Evidence on COVID-19 infection in patients with TB is limited, but the World Health Organization (WHO) anticipates that people with co-infection may have poorer treatment outcomes, especially if TB treatment is interrupted.[481] WHO had advised that TB diagnosis and treatment services are maintained during the pandemic; however, in March 2021, WHO estimated that 1.4 million fewer people received care for TB in 2020 than in 2019, with low- and middle-income countries most affected.[482]
Ulcerative colitis

» see our comprehensive coverage of Ulcerative colitis (https://bestpractice.bmj.com/topics/en-gb/43)

A cohort study of 500,000 people in the UK found that autoimmune disease and history of oral corticosteroid were associated with increased risk of fatal COVID-19.[44] Patients with ulcerative colitis (UC) should be advised to continue their current medications. Medication should only be stopped, reduced, or changed in discussion with a specialist.[58] Preventing disease flares is a priority to reduce the risk of corticosteroid use and hospitalisation.[316] UK guidelines recommend assessing whether the dose, route of administration, or mode of treatment can be altered to reduce face-to-face contact during the pandemic.[58] Patients may continue taking aminosalicylates; these drugs do not affect the immune response.[58]

Patients receiving immunosuppressive medication may develop atypical symptoms of COVID-19 (e.g., patients who take an oral corticosteroid may not develop fever). Patients who take an oral or rectal corticosteroid should not stop suddenly if they develop COVID-19, due to the risk of adrenal crisis.[58] Patients taking at least 20 mg/day of prednisolone should observe shielding precautions.[316]

A case-control study conducted in the UK found that more patients with acute, severe ulcerative colitis received rescue therapy or surgery during the pandemic period in 2020 compared with historical controls from 2019. More patients received ambulatory intravenous corticosteroids, biologicals, ciclosporin, and tofacitinib during the pandemic; fewer patients received thiopurines and aminosalicylates. Incidence of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection was low during hospitalisation and during the 3-month follow-up period, and treatment for UC was not associated with adverse COVID-19 outcomes.[483]

Testing for COVID-19 is recommended before starting medication for a presumptive UC flare, because COVID-19 can present with gastrointestinal symptoms and administration of higher-dose corticosteroids to these patients could be detrimental.[317] Testing for COVID-19 is also recommended before initiating biologicals, although where possible, initiation should be postponed.[318]

Blood tests to monitor response to therapy should be performed at the minimum safe frequency.[58] [316]

International guidelines recommend that patients stop taking methotrexate, thiopurines, or tofacitinib if they develop COVID-19. Detailed recommendations are given depending on the level of inflammatory bowel disease activity and severity of COVID-19 infection.[319] If a patient has stopped taking their UC medication because they have COVID-19, medication can be re-started when at least 10 days have elapsed since symptom onset and at least 3 days have elapsed since recovery. Recovery is defined as the resolution of fever, without use of antipyretics, and an improvement in respiratory symptoms. In patients with severe or critical COVID-19, restarting medication 7-14 days after recovery may be appropriate, depending on the severity of their IBD. If a patient has laboratory-confirmed SARS-CoV-2 infection but has not had symptoms, medication can be restarted 10 days after the first test, provided that no symptoms have developed in the interim.[320] Viral shedding may persist after recovery, particularly in immunocompromised patients, therefore experts recommend making decisions to restart medication based on symptoms rather than repeat testing.[320]

Infliximab use is associated with impaired serological response to SARS-CoV-2 infection in patients with inflammatory bowel disease. Concomitant use of methotrexate or a thiopurine further attenuated the serological response.[321]

Elective endoscopic procedures should be deferred, but urgent or emergent endoscopy should continue. This includes cases of IBD where endoscopy would urgently change management; for example, establishing the diagnosis in a patient with signs of moderate to severe inflammation, diagnosing a severe acute flare of UC, investigating sub-acute obstruction if imaging suggests a fibrotic or neoplastic stricture, and therapeutic endoscopic retrograde cholangiopancreatography in patients with primary sclerosing cholangitis who have worsening cholangitis and jaundice.[322] [323] International guidelines recommend that surgical management of UC should be considered in some patients, as delay may result in significant downstream morbidity and mortality; decisions on surgery should be individualised for each patient with a multidisciplinary team.[324]

The British Society of Gastroenterology has published a position statement strongly supporting SARS-CoV-2 vaccination for patients with UC.[484]
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Related conditions

◊ **Uveitis**

» see our comprehensive coverage of Uveitis (https://bestpractice.bmj.com/topics/en-gb/407)

The International Uveitis Study Group has published consensus recommendations on the management of patients with uveitis during the COVID-19 pandemic. Patients without symptoms of COVID-19 should continue on their usual immunosuppressive treatment. If a face-to-face review for ophthalmic symptoms is necessary, patients with risk factors for severe COVID-19 should be seen separately from lower risk patients and ideally at the beginning of the day. Patients with symptoms or signs of COVID-19 should be tested as soon as possible to confirm the diagnosis. Immunosuppressive treatment, except tocilizumab or interferon, should be stopped. Slow reduction of systemic corticosteroids should be discussed with the treating medical team. Patients who are asymptomatic and test positive for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) should continue immunosuppressive therapy. The dose should be reduced if their white blood cell count falls below 4000 cells/microlitre.[485]

Patients who are due to start immunosuppressive treatment should be tested for SARS-CoV-2 in addition to the usual screen for infectious diseases. Consideration may be given to using local or regional corticosteroids as bridging therapy to delay the start of systemic immunosuppression. Patients with Behcet’s disease may require first-line systemic therapy; if so, self-administered injections to reduce hospital outpatient visits could be considered.[486]

◊ **Viral gastroenteritis**

» see our comprehensive coverage of Viral gastroenteritis (https://bestpractice.bmj.com/topics/en-gb/202)

COVID-19 may present with gastrointestinal (GI) symptoms that mimic viral gastroenteritis. The estimated pooled prevalence of GI symptoms in patients with COVID-19 varies from less than 10% to 15%. [405] Nausea or vomiting, anorexia, and diarrhoea are the most common manifestations.[487] Patients with severe COVID-19 had higher rates of GI symptoms than those with less severe disease. Most patients with GI symptoms and COVID-19 have concomitant respiratory symptoms or fever; 3% of patients reported GI symptoms only.[488] Patients may present with nausea or diarrhoea 1 to 2 days prior to onset of fever and breathing difficulties.[334] A retrospective cohort study found that median duration of viral shedding in stool samples was 22 days, compared with 18 days in respiratory samples and 16 days in serum samples. The median duration of shedding was lower in mild illness (14 days) compared to severe illness (21 days).[489]

Guidelines from the American Gastroenterological Association (AGA) recommend that outpatients with new-onset diarrhoea are asked about high risk contact exposure, whether they have a history of COVID-19-associated symptoms, and whether they have other GI symptoms (nausea, vomiting, abdominal pain).[405] Patients with new-onset GI symptoms should be monitored for symptoms of COVID-19, as GI symptoms may precede other COVID-related symptoms by a few days. Currently, there is not enough evidence to support stool testing for diagnosis or monitoring of COVID-19 as part of routine clinical practice.[405] In hospitalised patients with known or suspected COVID-19, the AGA recommends obtaining a thorough history of GI symptoms, including onset, characteristics, duration, and severity.
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◊ Vitamin B12 deficiency

» see our comprehensive coverage of Vitamin B12 deficiency (https://bestpractice.bmj.com/topics/en-gb/822)

The British Society for Haematology has published guidance on vitamin B12 (cyanocobalamin) supplementation during the COVID-19 pandemic.

Patients who have B12 deficiency that is not related to diet (e.g., pernicious anaemia, gastrectomy, inflammatory bowel disease, achlorhydria) should be screened for symptoms of COVID-19 before injections. The ongoing need for B12 injections should be assessed for each patient; oral vitamin B12 may be offered until intramuscular injections can be resumed, aiming to have the shortest possible break between injections.[490]

Patients who have B12 deficiency related to diet should be offered advice on dietary sources of B12. Patients may suspend B12 supplementation during the pandemic because they are B12 replete; patients may also be offered oral B12 supplementation.[490]

Further haematology resources are available at:


◊ Vitamin D deficiency

» see our comprehensive coverage of Vitamin D deficiency (https://bestpractice.bmj.com/topics/en-gb/641)

In the UK, people are advised to consider taking a daily vitamin D supplement to maintain bone and muscle health during the COVID-19 pandemic as people may have been indoors more than usual and not making enough vitamin D from sunlight.[491] There is little evidence that use of vitamin D supplements are effective in preventing or treating COVID-19, and they should not be offered solely for this purpose. The guidance advises:[491]

- Adults (including women who are pregnant or breastfeeding), young people, and children over 4 years should consider taking a daily supplement of vitamin D between October and early March
- Adults, young people, and children over 4 years should consider taking a daily supplement of vitamin D throughout the year if they have little or no sunshine exposure, or if they have dark skin
- Babies from birth to 1 year should have a daily supplement of vitamin D throughout the year if they are breastfed or formula-fed and are having less than 500 ml of infant formula a day
- Children aged 1-4 years should have a daily supplement of vitamin D throughout the year.
## Online resources

1. **ESMO: COVID-19 and cancer** ([external link](https://www.esmo.org/covid-19-and-cancer))
2. **ASCO: coronavirus resources** ([external link](https://www.asco.org/asco-coronavirus-information))
3. **NCCN: COVID-19 resources for the cancer care community** ([external link](https://www.nccn.org/covid-19))
4. **Summary of international recommendations in 23 languages for patients with cancer during the COVID-19 pandemic** ([external link](https://www.thelancet.com/journals/lanonc/article/PIIS1470-2045(20)30278-3/fulltext))
7. **Vaccination guidance during a pandemic (Centers for Disease Control and Prevention)**. ([external link](https://www.cdc.gov/vaccines/pandemic-guidance/index.html))
9. **NHS: Every Mind Matters** ([external link](https://www.nhs.uk/oneyou/every-mind-matters))
10. **Support the Workers** ([external link](https://www.supporttheworkers.org))
11. **COVID trauma response working group** ([external link](https://www.traumagroup.org))
12. **NHS Practitioner Health** ([external link](https://www.practitionerhealth.nhs.uk))
13. **CDC: emergency responders - tips for taking care of yourself** ([external link](https://emergency.cdc.gov/coping/responders.asp))
14. **SAMHSA (US): disaster preparedness, response, and recovery** ([external link](https://www.samhsa.gov/disaster-preparedness))
15. **NHS Supporting our people (UK)** ([external link](https://people.nhs.uk))
16. **Physician support line** ([external link](https://www.physiciansupportline.com))
17. **Prevent Child Abuse America: coronavirus tips & resources for parents, children, educators & others** ([external link](https://preventchildabuse.org/resources/coronavirus-tips-resources-for-parents-children-educators-others))
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<td>CDC: child abuse and neglect prevention (<a href="https://www.cdc.gov/violenceprevention/childabuseandneglect/index.html">external link</a>)</td>
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<td>22.</td>
<td>BEAT (UK Eating Disorder Charity) (<a href="https://www.beateatingdisorders.org.uk">external link</a>)</td>
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<td>23.</td>
<td>National Eating Disorders Association (NEDA) (<a href="https://www.nationaleatingdisorders.org">external link</a>)</td>
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<td>European Resuscitation Council: COVID-19 and resuscitation. (<a href="https://www.erc.edu/covid">external link</a>)</td>
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<td>38.</td>
<td>ASH: COVID-19 resources  (external link) (<a href="https://www.hematology.org/covid-19">https://www.hematology.org/covid-19</a>)</td>
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<tr>
<td>42.</td>
<td>The World Hospice and Palliative Care Alliance: COVID-19 resources  (external link) (<a href="https://www.thewhpca.org/covid-19">https://www.thewhpca.org/covid-19</a>)</td>
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Key articles

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245. European Society for Blood and Marrow Transplantation. COVID-19 - Bone Marrow Failure and PNH Recommendations On behalf of the Severe Aplastic Anemia Working Party, European Group


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Regardless of the language in which the content is displayed, numerals are displayed according to the original English-language numerical separator standard. For example 4 digit numbers shall not include a comma nor a decimal point; numbers of 5 or more digits shall include commas; and numbers stated to be less than 1 shall be depicted using decimal points. See Figure 1 below for an explanatory table.

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This approach is in line with the guidance of the International Bureau of Weights and Measures Service. https://www.bipm.org/en/about-us/
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Figure 1 – BMJ Best Practice Numeral Style

5-digit numerals: 10,000
4-digit numerals: 1000
numerals < 1: 0.25

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