Management of coexisting conditions in the context of COVID-19

The right clinical information, right where it's needed
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Introduction

This page summarizes important considerations for the care of people with coexisting medical conditions during the COVID-19 pandemic. Key points from guidance and position statements are summarized 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, etiology, 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 may experience more severe infection and should take extra precautions, especially those above 28 weeks’ gestation.[1] [2] [3]

Some elements of routine perinatal care may be amended during the COVID-19 pandemic.

Prenatal care:

- The number of hospital visits should be limited, with remote consultations by telephone or video call replacing some face-to-face appointments in low-risk pregnancies.[1] [2] [3] Women may be advised to check their blood pressure at home if possible, and given advice on when to seek medical assistance.[3]
- In the UK, the Royal College of Midwives and the Royal College of Obstetricians and Gynaecologists advise that generally there should be a minimum of six face-to-face prenatal contacts in total.[4] Where possible, appointments should be arranged to provide scans and other investigations, such as blood and urine tests, at the same visit.
- If there is concern about the patient or fetus, a face-to-face appointment should be advised.
- 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 prenatal appointment is needed, or if the appointment can be delayed.[3] [4]

Intrapartum care:

- Women and their birth partners should be screened for symptoms of COVID-19 on contact or attendance of the maternity unit.[2] [5]
- Scheduled induction and cesarean 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.[2] [6] COVID-19 status alone is not an indication for cesarean delivery.[7]
- Home birth may still be considered for low-risk pregnancies, where appropriate support can be provided.[6] [8]

Postnatal care:

- As with prenatal 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.[4] [6] The first visit after birth should be prioritized for a face-to-face visit.

Considerations for newborn care

The American Academy of Pediatrics has published guidance on the care of babies born to mothers who have COVID-19. Babies born to women who have COVID-19, or women who have severe acute respiratory disease coronavirus 2 (SARS-CoV-2) test results pending at the time of delivery, should be treated as
"persons under investigation" for infection. Clinicians should attend deliveries according to their normal institutional policies; maternal COVID-19 infection alone is not an indication to do so. Clinicians should not alter indicated newborn care because of maternal COVID-19. If neonatal stabilization is required, clinicians should wear airborne, droplet, and contact precautions-level personal protective equipment. Suctioning, positive pressure ventilation, and intubation may all generate infant virus aerosols.[9]

Temporary separation of mother and newborn is recommended, where facilities allow, to minimize the risk of postnatal infant infection from maternal respiratory secretions. The benefits of separation may be greater in mothers with more serious illness. The likely benefits of temporary maternal and newborn separation at birth for decreasing the risk of newborn infection should be discussed with the mother, ideally before delivery.[3][9]

Newborns should be bathed as soon as reasonably possible after birth to remove virus potentially present on skin surfaces. Mothers may express breast milk (after appropriate breast and hand hygiene) for designated caregivers to feed the baby. If facilities for separate care of the newborn are not available, or the mother declines separation, the newborn should ideally be kept 6 feet (2 meters) from the mother at all times. A mask should be worn, and meticulous breast and hand hygiene performed, for direct skin-to-skin contact between mother and child.[3][9]

Where testing capacity is available, newborns should be tested for SARS-CoV-2 infection using available molecular assays at 24 hours after birth and, if still in the hospital, at 48 hours after birth. Decisions to discharge newborns who test positive for SARS-CoV-2 infection but are asymptomatic should be taken on a case-by-case basis, with close follow-up in the community. Newborns who test negative for SARS-CoV-2 should ideally be discharged into the care of a noninfected caregiver. The mother should maintain a distance of 6 feet (2 meters) until 7 days have elapsed since symptoms began and she has been afebrile for 72 hours without antipyretics, or she has had two negative consecutive tests for SARS-CoV-2 at least 24 hours apart. A mask should be worn, and meticulous breast and hand hygiene performed, for direct contact between mother and child before this.[9]

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, bag-valve-mask ventilation, and intubation of the newborn are considered aerosol-generating procedures, and full personal protective equipment (PPE) is recommended. If it is anticipated that the baby will require respiratory support, appropriately skilled neonatal team members should be present at delivery and wearing PPE.[10]

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.[11] 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.[11] The newborn can be dried as usual while the cord is still intact. Deferred cord clamping is recommended in the absence of other contraindications.[10]

Well babies born to mothers with suspected or confirmed COVID-19 and who do not require medical intervention should remain with their mother in their designated room.[10] 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 visualization of the soft palate, should be completed before discharge. [10] Breastfeeding should be encouraged; the benefits substantially outweigh the risks of transmission.[7] There is currently no evidence that COVID-19 can be transmitted through breast milk.[2][6][12] 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 minimized while maintaining standards of care. All babies requiring respiratory support should be nursed in an incubator:[10]

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.[2]
Considerations for patients with dermatologic conditions receiving drugs that affect the immune response

Nonessential face-to-face consultations with patients with dermatologic conditions should be avoided, with appointments either rescheduled or done using telemedicine.[13] [14]

Patients taking drugs that affect the immune response may have atypical presentations of COVID-19: for example, they may not develop a fever.[14]

UK guidelines recommend that patients with known or suspected COVID-19 infection continue on topical treatments and that new-onset dermatologic conditions are treated with topical treatments if possible, rather than systemic treatments that act on the immune system.[14] If the patient is already taking systemic treatment, they should be advised they can continue hydroxychloroquine, chloroquine, quinacrine, dapsone, and sulfasalazine, and advised that they should not suddenly stop taking oral corticosteroids. All other oral immunosuppressive therapies, biologics, 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 caregiver, including considering the effect that stopping treatment may have on other comorbid conditions.[14] The half-life of some drugs means that immunosuppression will continue for some time after stopping treatment. The International Psoriasis Council recommends discontinuing or postponing the use of immunosuppressive medications in patients diagnosed with COVID-19.[15] 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.[14] 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.[15]

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.[16]

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. Patients taking drugs that affect the immune response may have atypical presentations of COVID-19: for example, they may not develop a fever.[17]

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) advises against making anticipatory adjustments to immunosuppressive drugs in patients without COVID-19.[18] Patients may continue taking aminosalicylates; these drugs do not affect the immune response.[17] 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 minimizing 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, and route of administration, should be considered.[17] 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).[18] 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.[17] 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.[18]

Endoscopy and liver biopsy should only be used to make urgent management decisions.[17]
**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 fecal 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 anemia 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.

If patients have symptoms of weight loss, abdominal pain, changes to bowel habit or iron deficiency anemia, 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 prioritized 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 patients receiving systemic anticancer therapy**

Patients are at risk of severe disease if they develop COVID-19 after receiving systemic anticancer treatment, and the case fatality rate is higher for patients with cancer. Patients may present with atypical symptoms of COVID-19, and other conditions, notably neutropenic sepsis and pneumonitis, can mimic COVID-19. Patients with a fever or other symptoms of infection should have a comprehensive evaluation.

UK guidelines recommend that systemic anticancer treatment should be deferred, if possible, in patients who have COVID-19 until the patient has had at least one negative test. Systemic anticancer treatment may be continued if necessary for urgent control of the cancer.

UK guidelines recommend that the highest priority for systemic anticancer treatments should be:

- 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 radiation therapy alone or treatment given at relapse.

NHS England has made recommendations for treatment change options for systemic anticancer 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.

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 still fit and willing to be treated after explanation of the risks and benefits.

ESMO suggests the following patient prioritization:
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• 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 noncritical 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 nonpriority based on the magnitude of benefit (e.g., no survival gain with no change nor reduced QoL).

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.[26]

Considerations for patients receiving radiation therapy

The National Institute for Health and Care Excellence in the UK has issued guidelines for the delivery of radiation therapy during the COVID-19 pandemic. Patients with known or suspected COVID-19 may still receive radiation therapy, provided 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.[27]

When prioritizing radiation therapy 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:[27]

• Radical radiation therapy or chemoradiation with curative intent, if the patient has a rapidly proliferating tumor and treatment has already started and there is little or no possibility of compensating for treatment gaps
• External beam radiation therapy with subsequent brachytherapy, if the patient has a rapidly proliferating tumor and external beam radiation treatment has already started
• Radiation therapy that has not started yet, if the patient has a rapidly proliferating tumor and they would normally start treatment
• Urgent palliative radiation therapy for patients with malignant spinal cord compression who have salvageable neurologic 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 radiation therapy 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 still fit and willing to be treated after explanation of the risks and benefits.[25]

ESMO suggests the following patient prioritization:
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• 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 noncritical 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 nonpriority based on the magnitude of benefit (e.g., no survival gain with no change nor reduced QoL).

Further oncology resources are available at:

• [NCCN: COVID-19 resources for the cancer care community]
• [ASCO: coronavirus resources]
• [ESMO: COVID-19 and cancer]
• [Summary of international recommendations in 23 languages for patients with cancer during the COVID-19 pandemic]
• [Royal College of Radiologists (UK): Coronavirus (COVID-19) cancer treatment documents]

Considerations for patients with head and neck cancer

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 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.[28]

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.

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.[29]
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Considerations for management of patients in community psychiatry services

Psychiatrists are advised to contact patients remotely, using telemedicine where possible, ideally by live videoconferencing in the patient's home.[30]

The US Center for the Study of Traumatic Stress advises that patients with delusions, obsessive-compulsive thoughts and behaviors, 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 hospitalizations.[31]

Patients should have adequate supplies of prescribed medication to avoid interruptions in treatment. Some treatment programs 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,[32] and in the UK, most services are transferring patients from supervised opioid substitution therapies to take-home doses.[33]

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 tranquilization, lithium, clozapine, and depots/long-acting injectables.[34] 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. Financial insecurity and job loss caused by the pandemic may exacerbate symptoms of depression, anxiety, and distress, and psychosomatic symptoms. People who are unemployed are more likely to experience suicidal thoughts. [35]

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.[36] [37] [38] [39] British, European, and American heart groups have all released statements highlighting the lack of evidence for this association and strongly advising that patients should continue to take ACE inhibitors and angiotensin-II receptor antagonists as prescribed.[40] [41] [42] Any change in medication should be based on individual patient risk assessment.

Routine immunization

The World Health Organization recognizes immunization as a core health service that should be prioritized and safeguarded during the COVID-19 pandemic, where feasible, to prevent morbidity and mortality from vaccine-preventable non-COVID-19 diseases.[43]

The ability to maintain routine immunization 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.[43] [44] [45] Priority may be given to vulnerable people at higher risk of morbidity and mortality.[46] Data from the US show a fall in childhood immunization rates since the declaration of a national emergency in March 2020.[47] Clinicians are encouraged to prioritize in-person newborn care and well visits and immunization of children up to 2 years of age.[48]

Considerations for patients who require anticoagulation

NHS England has published guidelines on the management of patients who require anticoagulation during the COVID-19 pandemic. If a patient requires initiation of anticoagulation, this should only be done by clinicians with experience in initiating anticoagulation, whether in primary or secondary care. Direct oral anticoagulants (DOACs) should be initiated if possible.[49] Patients with mechanical heart valves should be started on warfarin; if monitoring is not available, a low molecular weight heparin should be prescribed and the patient or a family member taught to administer the injection.[49] Self-monitoring of international normalized ratio (INR) using self-test kits may be possible. Whenever possible, consultations should take place remotely. A maximum of 28 days’ medication should be prescribed, to avoid disrupting the supply chain. NHS England and the Anticoagulation Forum advise that stable patients who take warfarin can be offered extended INR testing; an interval of up to 12 weeks is appropriate.[49] [50]
If a patient is taking warfarin already, the indication should be reviewed to establish whether anticoagulation is still necessary. If so, clinicians should consider whether patients can switch to a 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.[50]

Patients who take DOACs require renal function monitoring at least annually, and more frequently if they have renal dysfunction, are age over 75 years, or are frail. Patients with mechanical heart valves should continue on warfarin at all times.[49] Anticoagulation may need to be switched if the patient is hospitalized 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.[51]

Considerations for the mental health of healthcare workers

The Centers for Disease Control and Prevention (CDC) recognizes that first responders may experience burnout or secondary traumatic stress, developing stress reactions and symptoms after exposure to another individual's traumatic experience. Healthcare workers managing novel viral outbreaks are at risk from adverse psychological events.[52] Specific advice for healthcare professionals and first responders from the CDC and World Health Organization includes:[53] [54] [55]

- Recognize 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.

[CDC: emergency responders - tips for taking care of yourself]
[SAMHSA: disaster preparedness, response, and recovery]
[Support the Workers (UK)]
[COVID trauma response working group (UK)]
[NHS Practitioner Health (UK)]
Considerations for immunocompromised children and young people

The UK 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.[56]

The guideline says that patients and their parents and caregivers can be reassured that COVID-19 usually causes a mild, self-limited 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.

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 caregivers, 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 minimize 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 caregivers 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 caregivers become ill with COVID-19 and are unable to provide care.

In the UK, patients who are at risk of severe illness because of primary immunodeficiency or immunodeficiency induced by their disease or its treatment should continue to take shielding precautions. This group of children includes patients with severe vasculitis, patients taking cyclophosphamide or high-dose corticosteroids, patients receiving induction chemotherapy for acute lymphoblastic leukemia or Non-Hodgkin lymphoma, patients receiving chemotherapy for acute myeloid leukemia or relapsed and/or refractory leukemia or lymphoma, patients who have received an allogeneic stem cell transplant in the last 12 months or an autologous stem cell transplant within the last 6 months and patients receiving, or within 6 months of receiving, chimeric antigen receptor (CAR) T-cell therapy.[57]

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 caregivers, 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.[58]

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.[58]

The American Academy of Pediatrics strongly supports the continued provision of child healthcare during the pandemic, unless community circumstances require necessary adjustments. Well child care should
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occur in person if possible. If in-person visits are limited, clinicians are encouraged to prioritize in-person newborn care and well visits and immunization of children up to 2 years of age. Other visits should occur using telehealth, recognizing that children will need to attend in person for certain examinations and tests after the pandemic passes.[48]

The Royal College of Paediatric and Child Health emphasizes that pediatricians should continue to make decisions based on the best interests of the child. The College recognizes that redeployment of staff may reduce pediatricians’ ability to contribute to multiagency safeguarding processes and advises that pediatricians 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 the hospital as a place of safety unless there is no alternative. Contingency plans should be made in case the caregivers of vulnerable children become ill and cannot look after the children in their care or acquire food and medicine.[59]

Schools in the UK remain open to provide care for vulnerable children and young people. This includes children who have a child in need plan or a child protection plan, looked-after children, children with an education, health and care (EHC) plan whose needs cannot be met in the home environment, and children who have otherwise been assessed as vulnerable by education providers or local authorities. These children should attend school unless they, or a member of their household, is clinically vulnerable or following shielding precautions.[60]

Further information is available at:

[Prevent Child Abuse America: coronavirus tips & resources for parents, children, educators & others]
[CDC: child abuse and neglect prevention]
[Healthychildren.org (AAP): 2019 novel coronavirus (COVID-19)]

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 childbearing 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 childbearing 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.[61]

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.[61]

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...
Management of coexisting conditions in the context of COVID-19

Introduction

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.[62]

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.[62]

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.[62]

Guidelines from Australia and New Zealand state that cardiac stress testing and transesophageal echocardiography (TEE) pose significant viral transmission risk. TEE should only be performed if all other investigations have been exhausted, or after exclusion of COVID-19. If TEE is performed, it should be performed in a negative pressure room or with patient intubation and with appropriate personal protective equipment.[63]

Resources

[CDC: Information for healthcare professionals about coronavirus (COVID-19)]

[NICE: COVID-19]

[NHS England: coronavirus specialty guides]
## Conditions

### Coronavirus disease (COVID-19)

» see our comprehensive coverage of Coronavirus disease (COVID-19)

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

### Acute kidney injury

» see our comprehensive coverage of Acute kidney injury

Patients with COVID-19 may develop acute kidney injury (AKI), proteinuria, or hematuria. AKI is a risk factor for in-hospital mortality.[64] The etiology of AKI in COVID-19 is likely multifactorial and is incompletely understood. Patients with elevated body temperature and increased respiratory rate will have greater insensible fluid losses.[65] 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.[66] UK guidelines recommend checking fluid status and biochemistry for all patients admitted to the hospital with suspected or confirmed COVID-19.[67] Intravenous fluids are required in many cases, and choice should be guided by biochemistry. The goal is to maintain a euvoletic state. Hypernatremia is common at presentation and can also develop later.[65] Medications that can cause or worsen AKI should be stopped unless essential. Potassium binders can be used as part of the emergency management of life-threatening hyperkalemia, alongside standard care. These agents may have a role in preventing or delaying the need for renal replacement therapy if resources are limited.[65] [68]

### Acute myelogenous leukemia

» see our comprehensive coverage of Acute myelogenous leukemia

Patients with acute myelogenous leukemia (AML) should be screened for COVID-19 before starting induction or consolidation chemotherapy. 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.[69]

### Addison disease

» see our comprehensive coverage of Addison 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.[70] 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 prednisone as directed. Patients are also advised to take acetaminophen 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 diarrhea, increasing shortness of breath, respiratory rate >24/min, difficulty speaking) the patient or carer should inject hydrocortisone intramuscularly and call for emergency medical assistance.[70] Hospitalized patients should receive intravenous hydrocortisone and continuous intravenous fluid resuscitation with isotonic saline; fludrocortisone should be temporarily stopped.
Management of coexisting conditions in the context of COVID-19

◊ Asthma

» see our comprehensive coverage of Asthma

Patients should continue taking their prescribed asthma medication as usual, including inhaled and oral corticosteroids and biologic therapy.[71] [72] [73] The Global Initiative for Asthma (GINA) advises that all patients should have a written action plan so they know how to recognize worsening asthma, how to increase reliever and controller medications, and when to seek medical help. GINA advises that nebulizers should be avoided for acute attacks due to the risk of transmitting respiratory viral particles, and that a pressurized metered-dose inhaler and spacer with mouthpiece or tightly fitting facemask can be used to deliver a short-acting beta-2 agonist instead.[71] The US Centers for Disease Control and Prevention and Canadian Thoracic Society also consider nebulizer therapy to be a high-risk aerosol-generating procedure.[74] [73] However, UK guidelines advise that nebulizers may continue to be used, as the aerosol comes from the fluid in the nebulizer chamber and will not carry virus particles from the patient.[71] [72]

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.

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.[75]

◊ Attention deficit hyperactivity disorder (ADHD)

» see our comprehensive coverage of Attention deficit hyperactivity disorder (ADHD)

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 behavioral parenting strategies and schools are advised to prioritize 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.[76]
**Breast cancer**

» see our comprehensive coverage of Breast cancer

The American Society of Breast Surgeons has released recommendations for the prioritization, treatment, and triage of patients with breast cancer during the COVID-19 pandemic.[77] The highest-priority conditions for treatment during the pandemic are:

Potentially unstable breast disease (e.g., hematoma, infection): assessment and surgery

New diagnosis of invasive breast cancer (may be suitable for telemedicine)

Surgery: revision of ischemic mastectomy flap; revascularization/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

Radiation therapy for painful, inoperable breast masses; continuation of radiation therapy that has started; treatment for critical metastatic lesions (e.g., brain metastasis, spinal cord compression).

UK guidelines recommend giving highest priority to patients receiving:[22]

Curative systemic anticancer treatment with a high (more than 50%) chance of success

Adjuvant or neoadjuvant systemic anticancer treatment that adds at least 50% chance of cure to surgery or radiation therapy 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. Empiric letrozole treatment may be considered. Follow-up for existing patients should be performed by telephone where possible.[78]

Capacity for surgery is limited in many hospitals. The Association of Breast Surgery suggests prioritising patients in the following order:[78]

1. Estrogen receptor (ER) negative
2. Human epidermal growth factor receptor 2 (HER2) positive
3. Pre-menopausal patients
4. Post-menopausal, ER positive patients with high risk disease (grade 3 or node positive)
5. Large areas of high grade ductal carcinoma in situ (DCIS)
6. Post-menopausal, ER positive patients with lower risk disease
7. 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.[79]

Further oncology resources are available at:

[NCCN: COVID-19 resources for the cancer care community]

[ASCO: coronavirus resources]
Management of coexisting conditions in the context of COVID-19

◊ Cardiopulmonary resuscitation (CPR)

» see our comprehensive coverage of Cardiopulmonary resuscitation (CPR)

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 recognized (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.\[80\] \[81\] \[82\]

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, minimizing aerosolization risk.\[80\] \[81\] \[82\] \[83\]

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. Pediatric 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.\[80\] \[81\] \[82\] \[83\]
Chronic kidney disease

The UK National Institute for Health and Care Excellence has published guidelines for managing patients with chronic kidney disease (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 angiotensin-converting enzyme inhibitors, angiotensin II receptor blockers, immuno-suppressants and diuretics. Patients should be advised to keep a list of their medications, other medical conditions, 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 immuno-suppression, 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 >300mg/mmol; or a new diagnosis of GFR category G5 (GFR <15ml/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 hematuria, 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 an urgent need for renal biopsy. Patients who have a GFR of <30ml/min/1.73m² that has been stable for at least 6 months.

Patients who receive hemodialysis are at increased risk of becoming infected with COVID-19 and are at higher risk of severe illness. 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 >300mg/mmol; or a new diagnosis of GFR category G5 (GFR <15ml/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 hematuria, 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.

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**Chronic obstructive pulmonary disease (COPD)**

Patients with COPD are at higher risk for severe COVID-19 illness and should carefully follow public health advice.

The Global Initiative for Chronic Obstructive Lung Disease (GOLD) advises 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.[89]

UK guidelines also advise that patients established on inhaled corticosteroids should delay any planned withdrawal.[90]

Exacerbations of COPD should be managed by the patient following their individualized 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.[90] [91] 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 prednisone if needed, irrespective of whether the exacerbation is triggered by SARS-2-CoV.[73] Patients already taking prophylactic antibiotics should continue to take them as prescribed (unless there is a new reason to stop, such as side effects).[90] [91]

To reduce the risk of acute exacerbations, and a poorer outcome from COVID-19 infection, strongly encourage patients who are still smoking to stop.[90] [91]

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.[90] Precautions are also advised for those receiving noninvasive ventilation at home, as this is also a potentially infectious aerosol-generating procedure.[90] UK guidelines advise that nebulization is not considered a viral aerosol-generating procedure and may continue to be used, as the aerosol comes from the fluid in the nebulizer chamber and will not carry virus particles from the patient.[90] However, the Global Initiative for Asthma (GINA) does consider nebulization to have aerosol-generating potential - see Asthma, above.[71] The US Centers for Disease Control and Prevention and Canadian Thoracic Society also consider nebulizer therapy to be a high-risk aerosol generating procedure.[74] [73]

The British Thoracic Society has developed online pulmonary rehabilitation resources for patients to use while face-to-face meetings are not possible.[92]

**Cirrhosis**

Patients with chronic liver disease have a higher mortality rate from COVID-19 infection, and mortality is associated with liver disease severity.[18] European guidelines advise that patients who have cirrhosis and COVID-19 should be admitted to the hospital for inpatient care. Patients with cirrhosis and portal hypertension should avoid nonsteroidal anti-inflammatory drugs. Care should be taken to avoid acetaminophen overdosing in patients with cirrhosis.[93] Guidelines to prevent complications should be followed 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.[93] Organ donations and transplants are likely to be reduced in many countries. Listing for transplantation should be restricted to patients with poor short-term prognosis, including those with acute-on-chronic liver failure or a high model for end-stage liver disease (MELD) score.[93]
Clostridium difficile-associated disease

As there is a potential risk of transmission of severe acute respiratory disease coronavirus 2 (SARS-CoV-2) via fecal microbiota transplantation (FMT), the US Food and Drug Administration (FDA) has made the following new recommendations for stool donated after 1 December 2019:[94]

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.
Community-acquired pneumonia

Community-acquired COVID-19 pneumonia can be difficult to distinguish clinically from community-acquired bacterial pneumonia. UK guidelines advise that COVID-19 pneumonia is more likely if the patient has had typical COVID-19 symptoms for about 1 week, has myalgia or anosmia, has dyspnea but no pleuritic pain, and has a history of exposure to known or suspected COVID-19. Patients with bacterial pneumonia tend to become rapidly unwell after a few days of symptoms, have pleuritic pain or purulent sputum, and do not have a history of exposure to known or suspected COVID-19. The CRB65 tool has not been validated in patients with COVID-19.[95]

There are no validated tests for assessing dyspnea by telephone or video consultation.[96] 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; hemoptysis; cyanosis; cold, clammy, pale, or mottled skin; syncope; new confusion or difficult to rouse; and little or no urine output.[95]

Antibiotics should not be offered in the community for likely COVID-19 pneumonia when symptoms are mild. If a patient is suitable for oral treatment in the community and it is unclear whether symptoms are bacterial or viral, or the patient is at high risk of complications, antibiotic monotherapy may be prescribed.[95]

Patients admitted to the hospital with moderate to severe community-acquired pneumonia may require antibiotic treatment. Tests including culture and sensitivity, SARS-CoV polymerase chain reaction, chest imaging, full blood count, and legionella and pneumococcal antigen tests are recommended to help guide decisions about antibiotic use.[97] UK guidelines state that if there is confidence that the clinical features are typical for COVID-19, then it is reasonable not to start antibiotic treatment. However, empiric antibiotics should be started if there is clinical suspicion of bacterial infection, including characteristic symptoms and localized chest findings. [97] 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.[7] Antibiotic treatment should be started within 4 hours of diagnosis and within 1 hour if the patient has suspected sepsis.[97] Choice of antibiotic will depend on local resistance data and availability. If antibiotic treatment was started in the community, this should be reviewed and amended if necessary. 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 when test results are available. Antibiotic treatment may be safely stopped if signs, symptoms, and test results are consistent with COVID-19 pneumonia and there is no evidence of bacterial infection. If antibiotic treatment is continued, the choice should continue to be monitored and reviewed.[97] Patients should be reassessed if they do not improve as expected, or if symptoms become significantly or rapidly worse; specialist advice may be needed.[97] Where possible, clinicians should discuss the benefits, risks, and likely outcomes of any treatment with the patients, their relatives, and caregivers. 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.
◊ Congenital heart disease

» see our comprehensive coverage of Congenital heart disease

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.[98] 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.[99] 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 dyspnea. 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. [98] Clinicians should be aware of the QT prolonging effects of some COVID-19 medications (e.g., chloroquine or hydroxychloroquine, azithromycin, lopinavir/ritonavir).

◊ Contraception - existing users

» see our comprehensive coverage of Contraception - existing users

The American College of Obstetrics and Gynecology recommends giving prescription refills for as long as possible to reduce the need for pharmacy visits.[6] UK guidelines advise that a 6- to 12-month course of combined hormonal contraception can be provided without rechecking body mass index and blood pressure.

A 12-month course of a progestogen-only pill can be issued without a face-to-face review.[100]

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 counseled on contraceptive efficacy past the duration of licensed use.[6] [100]

◊ Contraception - new users

» see our comprehensive coverage of Contraception - new users

Many new patients can be safely screened and offered a prescription for contraception remotely.[6]

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.[100]

Self-administered oral contraception may be offered as a bridge when insertion of long-acting reversible contraception is delayed due to the COVID-19 outbreak.[6]

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.[100]
Management of coexisting conditions in the context of COVID-19

◊ Contraception - emergency

» see our comprehensive coverage of Contraception - emergency

The American College of Obstetricians and Gynecologists recommends that women should be counseled on the use of emergency contraception, including over-the-counter and prescription options. Clinicians may consider providing advanced prescriptions for emergency contraception, particularly ulipristal.[6]

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.[100]

◊ Contraception - termination of pregnancy

» see our comprehensive coverage of Contraception - termination of pregnancy

US and UK guidelines emphasize that timely access to abortion should not be compromised during the COVID-19 outbreak. The American College of Obstetricians and Gynecologists (ACOG) advises that gestational age can be assessed remotely for women who have regular periods, a known last menstrual period, and no risk factors for ectopic pregnancy.[6] Assessment, consent, and follow-up can be performed remotely, and medication for medical abortion can be self-administered at home.[6] ACOG advises that there is a low risk of rhesus isoimmunization during a medical abortion; rhesus testing and administration of Rho(D) immune globulin should not be a barrier to provision.[6]
Crohn disease

» see our comprehensive coverage of Crohn disease

Patients should be advised to continue their current medications. 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. 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 hospitalization. Patients may continue taking aminosalicylates; these drugs do not affect the immune response.

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. Patients taking at least 20 mg/day of prednisone should observe shielding precautions. New courses should be avoided if possible. Urgent specialist advice should be sought before stopping or changing medications that affect the immune response in patients with COVID-19. 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. Testing for COVID-19 is also recommended before initiating biologics, although where possible, initiation should be postponed.

Blood tests to monitor response to therapy should be performed at the minimum safe frequency. International guidelines recommend that patients stop taking methotrexate or tofacitinib if they test positive for severe acute respiratory disease coronavirus 2 (SARS-CoV-2) but do not have COVID-19. Patients should stop taking methotrexate, TNF-alpha inhibitors, ustekinumab, or tofacitinib if they develop COVID-19. 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 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. 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.

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. 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 individualized for each patient with a multidisciplinary team.
**Cushing syndrome**

» see our comprehensive coverage of Cushing syndrome

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.[110] They advise that patients with active Cushing syndrome are immunosuppressed, and should follow public health advice to minimize their risk of infection. Diagnosis of Cushing syndrome is considered to be challenging at all times, and during the pandemic the guidance recommends prioritizing 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 hospitalization 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 optimized.[110] The guidelines recommend avoiding salivary cortisol/cortisone tests due to potential for viral contamination, until it is known how long SARS-CoV-2 remains infectious in salivary samples. The usual approach to investigating the cause of Cushing syndrome is significantly modified: immediate 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 adrenocorticotropic 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 adrenocorticotropic hormone; pituitary imaging by MRI 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.[110] 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 blockers for treatment of hypertension until their influence on susceptibility to SARS-CoV-19 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.[110]

**Cystic fibrosis**

» see our comprehensive coverage of Cystic fibrosis

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 caregivers 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.[111]

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.[111]

UK guidelines advise that nebulizers will not generate infectious aerosols, as the aerosol comes from fluid in the nebulizer chamber, not the patient, so may be used as normal; however, caregivers should use appropriate hand hygiene when helping patients with masks.[111] However, the Global Initiative for Asthma (GINA) does consider nebulization to have aerosol-generating potential - see Asthma, above.[71] The US Centers for Disease Control and Prevention also consider nebulizer therapy to be a high-risk aerosol generating procedure.[74]

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.[111]
Management of coexisting conditions in the context of COVID-19

◊ Dementia

» see our comprehensive coverage of Dementia

The European Academy of Neurology has published advice for healthcare professionals who look after patients with dementia.[112] Infection with COVID-19 may cause worsening confusion and precipitate delirium. A significant change in daily routine during the pandemic may trigger behavioral 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.

Further resources are available at:

[Alzheimer’s Association: coronavirus (COVID-19) - tips for dementia caregivers]
[Alzheimer Europe: COVID-19]
[Alzheimer’s Society (UK): coronavirus - information for people affected by dementia]
[Alzheimer’s Disease International. ADI offers advice and support during COVID-19]
Management of coexisting conditions in the context of COVID-19

◊ Diabetes (type 1)

» see our comprehensive coverage of Diabetes (type 1)

Patients with diabetes are considered to be at higher risk for severe illness. They are more likely to need intensive care if they develop COVID-19, compared with patients who do not have diabetes, and have a higher case fatality rate. Patients with COVID-19 infection appear to have a greater risk of hyperglycemia with ketones, including patients with newly diagnosed diabetes. COVID-19 disease can precipitate atypical presentations of diabetes emergencies (e.g., mixed diabetic ketoacidosis and hyperosmolar states).

UK guidance advises checking blood glucose and ketones in all patients with diabetes who are admitted to the hospital. Out of the 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 hypoglycemia 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 COVID-19. They advise that those with diabetes who have not been infected with 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 glycemic 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.

Further diabetes resources are available at:

[American Diabetes Association: COVID-19 professional resources]

[Association of British Clinical Diabetologists: COVID-19 (coronavirus) information for healthcare professionals]
Management of coexisting conditions in the context of COVID-19

◊ Diabetes (type 2)

» see our comprehensive coverage of Diabetes (type 2)

Patients with diabetes are considered to be at higher risk for severe illness. They are more likely to need intensive care if they develop COVID-19, compared with patients who do not have diabetes, and have a higher case fatality rate. Patients with COVID-19 infection appear to have a greater risk of hyperglycemia 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).

Patients taking sodium-glucose co-transporter-2 (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 stopping SGLT2 inhibitors and metformin in all patients admitted to the hospital. Blood glucose and ketones should be checked in all patients with diabetes who are admitted to the 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 hypoglycemia 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.

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Further diabetes resources are available at:

[American Diabetes Association: COVID-19 professional resources]

[Association of British Clinical Diabetologists: COVID-19 (coronavirus) information for healthcare professionals]
### Eczema

**» see our comprehensive coverage of Eczema**

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).[120]

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

### Epilepsy

**» see our comprehensive coverage of Epilepsy**

The European Academy of Neurology has published advice on the management of epilepsy during the COVID-19 pandemic.[121] 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.[122]

### Epistaxis

**» see our comprehensive coverage of Epistaxis**

ENT UK has published guidance on the management of epistaxis, aiming to reduce the number of patients admitted to the 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 cautery and nonabsorbable packing should be attempted by a specialist before admitting the patient to the hospital.[123]
Management of coexisting conditions in the context of COVID-19

◊ Food allergy

» see our comprehensive coverage of Food allergy

The British Society for Allergy and Clinical Immunology has recommended modifications to pediatric 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, e.g., 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. [124] 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 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.[125]

◊ Hematopoietic stem cell transplantation

» see our comprehensive coverage of Hematopoietic stem cell transplantation

All patients receiving hematopoietic stem cell transplantation (HSCT) should be tested for respiratory viruses, including severe acute respiratory disease coronavirus 2 (SARS-CoV-2), before starting conditioning.[126] [127] Patients should also be tested if they have any symptoms of COVID-19. If COVID-19 is confirmed, HSCT should ideally be deferred for 3 months or, if there is a high risk of disease progression, morbidity, or mortality, until the patient is asymptomatic and has had at least two negative SARS-CoV-2 polymerase chain reaction tests. Recommended testing intervals vary between guidelines.[126] [127] Donors should be tested at the initial assessment, before stem cells or donor lymphocytes are harvested, and 1 to 2 days before starting conditioning if fresh cell donations are needed. Donors who test positive should defer donations of stem cells and other blood products for 3 months after their symptoms resolve.[126]

HSCT should be deferred if possible, particularly for myeloma, low-grade lymphoproliferative conditions, chronic hematologic conditions, and nonmalignant indications.[126] [128]

Following transplantation, patients are at high risk of severe sickness and should follow the national recommendations for protecting themselves.[88] [127] In the UK, HSCT transplant recipients are classed as extremely vulnerable for 1 year after an autologous HSCT, for 2 years after an allogeneic HSCT, if they are receiving ongoing immunosuppressive therapy, and if they have chronic graft-versus-host disease.[126] They are advised to take shielding precautions.[129]

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.[130]

Further hematology resources are available at:

[ASH: COVID-19 resources]
[BSH: COVID-19 updates]
Management of coexisting conditions in the context of COVID-19

◊ Hepatocellular carcinoma

» see our comprehensive coverage of Hepatocellular carcinoma

European guidelines advise that screening for hepatocellular carcinoma (HCC) using ultrasound can 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 prioritized for screening, including patients with: elevated alpha-fetoprotein levels, chronic hepatitis B, advanced cirrhosis, and non-alcoholic steatohepatitis/diabetes. HCC surveillance should be deferred until after recovery in patients who develop COVID-19.[93]

If a patient with hepatocellular carcinoma develops COVID-19, locoregional therapy should be deferred wherever possible and immune checkpoint inhibitor therapy should be withdrawn. Kinase inhibitors may be continued at a reduced dose; this decision should be made on a case by case basis.[93]

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.[93] Guidelines emphasize the importance of vaccination against Streptococcus pneumoniae and influenza.[93]

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.[131] 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.

◊ HIV infection

» see our comprehensive coverage of HIV infection

There is currently no evidence that the infection rate or disease course of COVID-19 is different in people living with HIV compared with those without HIV infection.[132] However, guidance from the US, UK, and Europe advises 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/microliter) or poorly controlled. Influenza and pneumococcal vaccinations should be kept up to date.[133] [134] US guidelines also recommend that patients maintain at least a 30-day supply of antiretroviral therapy, and ideally a 90-day supply.[133] 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 enrollment into clinical trials. Antiretroviral therapy should be continued in the 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 for patients with adherence concerns or patients whose HIV is not fully suppressed should be prioritized.[135] Pre-exposure prophylaxis to prevent HIV infection should be taken as directed; there is no evidence that it is effective against COVID-19.[136]

Further resources are available at:

[WHO: Q&A - HIV, antiretrovirals and COVID-19]

[European AIDS Clinical Society: EACS and BHIVA statement on risk of COVID-19 for people living with HIV (PLWH)]
Management of coexisting conditions in the context of COVID-19

◊ **Hodgkin lymphoma**

» see our comprehensive coverage of Hodgkin lymphoma

A panel of lymphoma experts from the UK has developed interim treatment guidelines for the management of adults patients during the pandemic.[137] Hodgkin 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, relapsed Hodgkin, and nodular lymphocyte-predominant Hodgkin.

◊ **Hospital-acquired pneumonia**

» see our comprehensive coverage of 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 during the COVID-19 pandemic so far, most pneumonia has been viral and that bacterial coinfection occurs in less than 10% of patients with COVID-19, but that bacterial pneumonia may be more likely in patients in critical care wards compared with other hospital settings.[97] Where possible, clinicians should discuss the benefits, risks, and likely outcomes of any treatment with the patients, their relatives, and caregivers. 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.

Tests including culture and sensitivity, SARS-CoV polymerase chain reaction, chest imaging, full blood count, and legionella and pneumococcal antigen tests are recommended to help diagnosis and guide decisions about antibiotic use.[97] UK guidelines state that if there is confidence that the clinical features are typical for COVID-19, then it is reasonable not to start antibiotic treatment. However, empiric antibiotics should be started if there is clinical suspicion of bacterial infection, including symptoms and chest findings.[97] 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.[7] Antibiotic treatment should be started within 4 hours of diagnosis and within 1 hour if the patient has suspected sepsis.[97]

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 when test results are available. Antibiotic treatment may be safely stopped if signs, symptoms, and test results are consistent with COVID-19 pneumonia and there is no evidence of bacterial infection. If antibiotic treatment is continued, the choice should continue to be monitored and reviewed.[97] Patients should be reassessed if they do not improve as expected, or if symptoms become significantly or rapidly worse; specialist advice may be needed.[97]
Management of coexisting conditions in the context of COVID-19

◊ Idiopathic pulmonary fibrosis

The UK National Institute of Health and Care Excellence has published guidelines for the management of patients with interstitial lung disease, including idiopathic pulmonary fibrosis, during the pandemic. Many patients with idiopathic pulmonary fibrosis are at risk of severe illness if they develop COVID-19. Patients may have received government advice for protecting people at very high risk (‘shielding’) and should be advised to follow this advice. 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, 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.[138]

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.[138]

Decisions about stopping, adjusting and restarting treatment in patients who develop COVID-19 should be made in conjunction with the patient’s specialist team. 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). 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. The half-life of some medicines means that the immunosuppressive effect will continue for some time after stopping treatment. Patients who are taking maintenance prednisone 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. If patients with COVID-19 develop acute kidney injury or deranged liver function tests, medicines should be stopped and adjusted as recommended by your local drug formulary or prescribing information.[138]

New outpatient appointments should be telephone or video appointments if suitable. Unless the patient’s condition 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.[138]

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 minimize 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, prednisone 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 the multidisciplinary team confirms the diagnosis, usual eligibility criteria are satisfied and the appropriate blood monitoring can be performed.[138]

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.[138]

Further resources are available at:

[British Thoracic Society. COVID-19: information for the respiratory community.]
Management of coexisting conditions in the context of COVID-19

**Liver dysfunction**

» see our comprehensive coverage of Liver dysfunction

Patients with COVID-19 may have abnormal liver function tests, including elevated aminotransferases and mildly elevated bilirubin. Low serum albumin on admission to the hospital is a marker of COVID-19 severity. The American Association for Study of Liver Diseases (AASLD) and the American Gastroenterological Association (AGA) advise regular monitoring of liver biochemistries in all hospitalized patients with COVID-19, particularly those treated with remdesivir or tocilizumab, regardless of baseline values.[18] [139] 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 may exclude patients from consideration of some investigational agents.[18] Other causes of abnormal liver function tests, including viral hepatitides, should be considered in patients with COVID-19 and abnormal liver biochemistries.[139] 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.[18]

**Migraine**

» see our comprehensive coverage of Migraine

The European Academy of Neurology has published advice on the management of migraine during the COVID-19 pandemic.[140] 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. Nonsteroidal 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. Acetaminophen and triptans may also be used as required for acute attacks. Ongoing care should be delivered using telemedicine where possible.

**Non-Hodgkin lymphoma**

» see our comprehensive coverage of Non-Hodgkin lymphoma

A panel of lymphoma experts from the UK has developed interim treatment guidelines for the management of adults patients during the pandemic.[137] For most patients with aggressive non-Hodgkin 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, CNS lymphoma, peripheral T cell lymphoma, and relapsed/refractory aggressive lymphoma. For patients with low-grade non-Hodgkin lymphoma and not requiring immediate treatment, watchful waiting may be considered. [137]
Management of coexisting conditions in the context of COVID-19

◊ Multiple myeloma

» see our comprehensive coverage of Multiple myeloma

The American Society of Hematology (ASH) advises 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. 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.[128]

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. Hematopoietic stem cell transplantation should be delayed until after the pandemic.[128]

The UK Myeloma Forum has released guidance to assist clinical decision making during the COVID-19 pandemic. Newly diagnosed patients with hypercalcemia, 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 hematopoietic 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 hematopoietic stem cell transplant should be deferred.[141]

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.[142]
◊ Non-ST elevation myocardial infarction (NSTEMI)

» see our comprehensive coverage of Non-ST elevation myocardial infarction (NSTEMI)

The European Society of Cardiology has published guidance on the diagnosis and management of cardiovascular disease during the COVID-19 pandemic.[143]

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, hemodynamic 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 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 noninvasive testing once their SARS-CoV-2 test results are known. Coronary computed tomography angiography (CCTA) is the favored investigation for intermediate-risk patients where equipment and expertise are available. Noninvasive imaging using CCTA may speed up risk stratification, avoid an invasive approach, and allow early discharge.[143]

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, hemodynamic 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.[63]

◊ Olfactory loss

» see our comprehensive coverage of 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.[144]
Management of coexisting conditions in the context of COVID-19

Conditions

◊ Osteoporosis

» see our comprehensive coverage of Osteoporosis

Guidelines from an international group of experts suggest altering the approach to management of osteoporosis during the current pandemic:[145]

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 cholecalciferol (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.

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 health diet.
**Palliative care**

The National Institute for Health and Care Excellence in the UK has published guidelines for managing symptoms at the end of life in the community. Where possible, clinicians should discuss the benefits, risks, and likely outcomes of any treatment with the patients, their relatives, and caregivers. 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.[146] [147]

Cough should initially be managed with nonpharmacologic measures if possible. Patients should be discouraged from lying on their back because this makes coughing ineffective. Persistent, distressing cough can be managed with opioids.[146] [147] [148]

If patients have symptomatic fever, acetaminophen or a nonsteroidal anti-inflammatory drug (NSAID) may be used as antipyretics. If using an NSAID, advise patients to take the lowest effective dose for the shortest period needed to control symptoms. Antipyretics should not be used with the sole aim of reducing body temperature.[146]

Patients with breathlessness should be advised against using a fan, because this could spread infection. Relaxation and breathing techniques, maintaining a cool environment, opening a window or door, and a trial of oxygen (if available) may help ease symptoms of breathlessness. A combination of opioids and benzodiazepines may be considered for patients who have moderate or severe breathlessness, are distressed, and are near the end of life.[146] [148] An antiemetic and regular stimulant laxative should be considered concomitantly.

Benzodiazepines may also be considered to manage symptoms of anxiety and agitation.[148] Oral haloperidol may be considered if a patient has delirium.[146] [147]

Consider whether the sublingual, rectal, or subcutaneous route is appropriate for administration for medication; this may be easier for relatives or caregivers to administer if there are fewer healthcare staff.[146] In the UK, hospices and care homes may run a medicines reuse scheme during the COVID-19 pandemic, following a strict standard operating procedure to ensure safety.[149]

Further resources are available at:

[The World Hospice and Palliative Care Alliance: COVID-19 resources]

**Parkinson disease**

Patients with Parkinson 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.[150] 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 hospitalization with DBS cessation would be considered the highest priority for DBS replacement; patients at lower risk may be able to have replacement postponed.[150]
Management of coexisting conditions in the context of COVID-19

◊ Prostate cancer

» see our comprehensive coverage of 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. Radiation therapy for very low-, low-, and favorable-intermediate-risk disease may be deferred until pandemic restrictions are lifted (assuming the pandemic wanes over the next 12 months).[151]

Remote telehealth visits should continue for patients with unfavorable-intermediate, high-risk, very high-risk, postprostatectomy, clinical node-positive, oligometastatic, and low-volume metastatic disease. Androgen deprivation therapy may allow radiation therapy to be deferred. If androgen deprivation therapy cannot be delivered, the benefits of radiation therapy should be weighed against the risk of COVID-19, taking into account the patient’s age, comorbidities, and immunosuppression.[151]

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 anesthesia staff and personal protective equipment. Brachytherapy performed with use of local anesthesia may be a suitable option for those experienced with this method and if resources are available.[151]
Renal transplant

Renal transplant recipients are clinically extremely vulnerable to COVID-19 and should follow 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 prednisone 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. Guidelines from the British Transplantation Society and Renal Association recommend stopping mycophenolate and azathioprine until the patient has fully recovered. If the patient is admitted to hospital, clinicians should consider stopping or reducing calcineurin inhibitors. If the patient is taking corticosteroids, an increase in dose may be considered.

Transplant specialists should discuss the risks and benefits of transplantation with patients. Clinicians should take a history of social distancing and any contact with people who might have COVID-19, take a nasopharyngeal swab for severe acute respiratory distress syndrome coronavirus 2 (SARS-CoV-2) and conduct a respiratory assessment when patients are admitted to hospital for a transplant. SARS-CoV-2 testing should be interpreted in the context of other assessments; a negative test does not definitely rule out infection. Dialysis in the 14 days preceding the transplant should take place in a COVID-19 secure area.

Transplant recipients should have a negative swab for SARS-CoV-2 before receiving a deceased donor kidney. 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.

Live kidney donors and their household should self-isolate for 14 days before the transplant. Live kidney donors and intended transplant recipients should both have negative swabs for SARS-CoV-2 48 to 72 hours before surgery. Donor surgery should not begin until both donor and recipient are confirmed swab-negative for SARS-CoV-2.

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.
◊ Rheumatoid arthritis

see our comprehensive coverage of Rheumatoid arthritis

Patients should continue their usual medication and observe recommended infection prevention and control precautions.[156] 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.[158] 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.[102] 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.[102] Patients may continue taking hydroxychloroquine and sulfasalazine if they are infected with severe acute respiratory disease coronavirus 2 (SARS-CoV-2), but should stop any other conventional disease-modifying antirheumatic drugs or biologics.[102] The half-life of some drugs means that immunosuppression will continue for some time after stopping treatment.[102] Patients may continue taking nonsteroidal 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.[159] 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.[160]

The 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."[161] 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 epidemiologic studies to provide adequate evidence for any effect of NSAIDs on the disease prognosis of COVID-19.[162]

Some patients may experience difficulty obtaining hydroxychloroquine. If a patient cannot obtain hydroxychloroquine, clinicians should consider whether a dose reduction or temporary cessation of hydroxychloroquine is possible.[163] Rapid rheumatology assessment is advised for patients with suspected inflammatory arthritis.[157] Clinicians should take measures to reduce hospital visits for patients, which may include longer duration of prescriptions, home delivery of medication, utilizing telephone or video appointments, and increasing drug monitoring to the maximum safe interval.[102][157]

Patients are advised to have influenza, whooping cough, and pertussis vaccinations.[164]
◊ Sickle cell disease

» see our comprehensive coverage of Sickle cell disease

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 optimizing therapies known to reduce acute sickle cell pain frequency to reduce the need for hospital attendance.[165]

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.[165]

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.[165]

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 multiorgan 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, empiric antibiotics, oseltamivir until influenza is excluded, incentive spirometry and good pain control. Patients with worsening anemia, 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 anemia and mental status, hemolysis, 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.[165]

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 hydroxyurea, and cardiovascular or respiratory comorbidity. Clinicians should assess whether patients can switch to hydroxyurea or whether transfusion strategy can be temporarily altered.[165]

◊ Smoking cessation

» see our comprehensive coverage of Smoking cessation

In patients with COVID-19, evidence suggests that smoking is associated with an increased risk of more severe disease and death.[166] 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.

Smoking involves repetitive hand-to-mouth movements, which may increase the risk of infection. Vaping/use of e-cigarettes is often used as nicotine-replacement therapy; however the evidence on benefits and harms is still developing. Vaping also involves repetitive hand-to-mouth movements.[167] Smoking cessation is strongly encouraged.[166] [167]
ST-elevation myocardial infarction (STEMI)

The European Society of Cardiology has published guidance on the diagnosis and management of cardiovascular disease during the COVID-19 pandemic.[143]

The guidance emphasizes that the pandemic should not compromise the timely reperfusion of patients with STEMI, therefore in the absence of previous 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 revascularization, if indicated and appropriate, in order to avoid staged procedures and reduce hospital stay.[143]
Management of coexisting conditions in the context of COVID-19

**Conditions**

◊ **Stroke**

» see our comprehensive coverage of 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.[168]

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.[168]

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 hemorrhage, or large ischemic 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.[168]

UK guidance recommends that prehospital telemedicine can be used to reduce unnecessary conveyance to hospital for patients with stroke mimics and transient ischemic attacks. Emergency department assessment of patients who may be suitable for thrombolysis should be performed using telemedicine. Consideration should be given to reducing the need for repeat imaging: clinicians should request an MRI scan as initial imaging if the patient is likely to need one, and if the patient has carotid territory symptoms, clinicians should consider requesting CT angiography at the time of the initial CT scan.[169]

Particular attention should be given to trying to maintain the following aspects of the stroke care pathway: assessment by a senior clinician with one hour, appropriate cerebral imaging within one hour, rapid thrombolysis and referral for thrombectomy, reversal of anticoagulation and blood pressure control in patients with intracerebral hemorrhage within one hour, direct admission to stroke unit, early swallow screen, maintaining stroke unit care for as long as needed and early supported discharge from hospital.[169]

Patients with transient ischemic attack (TIA) should be assessed using telemedicine, with local access to blood pressure and ECG recording. Patients with TIAs should not be admitted to hospital or kept in the emergency department. Most outpatient reviews can be performed using telemedicine.[169]
Management of coexisting conditions in the context of COVID-19

◊ Ulcerative colitis

Patients should be advised to continue their current medications. 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.[102] 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 hospitalization.[103] Patients may continue taking aminosalicylates; these drugs do not affect the immune response.[17]

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.[17] Patients taking at least 20 mg/day of prednisone should observe shielding precautions. New courses should be avoided if possible.[103] Urgent specialist advice should be sought before stopping or changing medications that affect the immune response in patients with COVID-19.[17] 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.[104] Testing for COVID-19 is also recommended before initiating biologics, although where possible, initiation should be postponed.[105]

Blood tests to monitor response to therapy should be performed at the minimum safe frequency.[102] [103]

International guidelines recommend that patients stop taking methotrexate or tofacitinib if they test positive for severe acute respiratory disease coronavirus 2 (SARS-CoV-2) but do not have COVID-19. Patients should stop taking methotrexate, TNF-alpha inhibitors, ustekinumab, or tofacitinib if they develop COVID-19. If a patient has stopped taking their IBD 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, IBD medication can be restarted 10 days after the first test, providing that no symptoms have developed in the interim. 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.[106]

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 ulcerative colitis, 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.[107] [108] 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 individualized for each patient with a multidisciplinary team.[109]
Management of coexisting conditions in the context of COVID-19

◊ Viral gastroenteritis

» see our comprehensive coverage of Viral gastroenteritis

COVID-19 may present with gastrointestinal symptoms that mimic viral gastroenteritis. The estimated pooled prevalence of gastrointestinal symptoms in patients with COVID-19 varies from less than 10% to 15%.[139] [170] Nausea or vomiting, anorexia, and diarrhea are the most common manifestations.[170] Patients with severe COVID-19 had higher rates of gastrointestinal symptoms than those with less severe disease. Most patients with gastrointestinal symptoms and COVID-19 have concomitant respiratory symptoms or fever; 3% of patients reported gastrointestinal symptoms only.[171] Patients may present with nausea or diarrhea 1 to 2 days prior to onset of fever and breathing difficulties.[113] 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).[172]

Guidelines from the American Gastroenterological Association (AGA) recommend that outpatients with new-onset diarrhea are asked about high risk contact exposure, whether they have a history of COVID-19-associated symptoms, and whether they have other gastrointestinal (GI) symptoms (nausea, vomiting, abdominal pain).[139] 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.[139] 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.

◊ Vitamin B12 deficiency

» see our comprehensive coverage of Vitamin B12 deficiency

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

Patients who have B12 deficiency that is not related to diet (e.g., pernicious anemia, gastrectomy, inflammatory bowel disease, achlorhydria) can omit 1 or 2 quarterly injections, since liver stores of B12 last up to 1 year. Injections should be delayed until the surge of the pandemic has passed. Oral B12 can be offered as an alternative if the patient is symptomatic in the weeks preceding B12 injection.[173]

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.[173]

Further hematology resources are available at:

[ASH: COVID-19 resources]
[BSH: COVID-19 updates]
**Online resources**

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