BMJ Best practice

Coronavirus disease 2019 (COVID-19)

Recommendations

Key Recommendations

Management predominantly depends on disease severity, and focuses on the following principles: isolation at a suitable location; infection prevention and control measures; symptom management; optimised supportive care; and organ support in severe or critical illness.

Consider whether the patient can be managed at home. Generally, patients with asymptomatic or mild disease can be managed at home or in a community facility.[2]

Admit patients with moderate or severe disease to an appropriate healthcare facility. Assess adults for frailty on admission. Patients with critical disease require intensive care; involve the critical care team in discussions about admission to critical care when necessary. Monitor patients closely for signs of disease progression.[2][509]

Provide symptom relief as necessary. This may include treatments for fever, cough, breathlessness, anxiety, delirium, or agitation.[2][510]

Start supportive care according to the clinical presentation. This might include oxygen therapy, intravenous fluids, venous thromboembolism prophylaxis, high-flow nasal oxygen, non-invasive or invasive mechanical ventilation, or extracorporeal membrane oxygenation. Sepsis and septic shock should be managed according to local protocols.[2]

Consider empirical antibiotics if there is clinical suspicion of bacterial infection. Antibiotics may be required in patients with moderate, severe, or critical disease. Give within 1 hour of initial assessment for patients with suspected sepsis or if the patient meets high-risk criteria. Base the regimen on the clinical diagnosis, local epidemiology and susceptibility data, and local treatment guidelines.[2][482]

Consider systemic corticosteroid therapy for 7 to 10 days in adults with severe or critical disease. Moderate-quality evidence suggests that systemic corticosteroids probably reduce 28-day mortality in patients with severe and critical disease, and probably reduce the need for invasive ventilation.[3][509][511]

Consider remdesivir in select hospitalised patients. Remdesivir may reduce mortality and time to symptom resolution compared with standard of care.[3][512][513][514]

Assess whether the patient requires any rehabilitation or follow-up after discharge. Discontinue transmission-based precautions (including isolation) and release patients from the care pathway 10 days after symptom onset plus at least 3 days without fever and respiratory symptoms.[2]

Full recommendations

Location of care

The decision about location of care depends on various factors including clinical presentation, disease severity, need for supportive care, presence of risk factors for severe disease, and conditions at home (including the presence of vulnerable people). Make the decision on a case-by-case basis using the following general principles.[2]

- **Mild disease:** manage in a healthcare facility, in a community facility, or at home. Home isolation can be considered in most patients, including asymptomatic patients.
- **Moderate disease:** manage in a healthcare facility, in a community facility, or at home. Home isolation can be considered in low-risk patients (i.e., patients who are not at high risk of deterioration).
- **Severe disease:** manage in an appropriate healthcare facility.
- **Critical disease:** manage in an intensive/critical care unit.

The location of care will also depend on guidance from local health authorities and available resources. Forced quarantine orders are being used in some countries.

The strongest risk factors for hospital admission are older age (odds ratio of >2 for all age groups older than 44 years, and odds ratio of 37.9 for people aged 75 years and over), heart failure, male sex, chronic kidney disease, and increased body mass index (BMI).[515] The median time from onset of symptoms to hospital admission is around 7 days.[31][449]

Approximately 8.6% of patients with COVID-19 who were discharged from an accident and emergency department returned within 72 hours. Nearly 5% of patients were admitted to hospital within 72 hours of the initial visit, and 8.2% were admitted within 7 days. Risk factors associated with an increased rate of return admission included older age, abnormal chest x-ray, fever, and hypoxia on presentation.[516]

Children are less likely to require hospitalisation, but if admitted, generally only require supportive care.[17][189] Risk factors for intensive care admission in children include age <1 month, male sex, pre-existing medical conditions, and presence of lower respiratory tract infection signs or symptoms at presentation.[517] The majority of children who require ventilation have underlying comorbidities, most commonly cardiac disease.[383] Children with COVID-19 are reported to have similar hospitalisation rates, intensive care admission rates, and mechanical ventilator use compared with those with seasonal influenza.[494]

Overall, 19% of hospitalised patients require non-invasive ventilation, 17% require intensive care, 9% require invasive ventilation, and 2% require extracorporeal membrane oxygenation.[450] The rate of intensive care admission varies between studies; however, a meta-analysis of nearly 25,000 patients found that the admission rate was 32%, and the pooled prevalence of mortality in patients in the intensive care unit was 39%.[518] The most common reasons for intensive care unit admission are hypoxaemic respiratory failure leading to mechanical ventilation and hypotension.[519] Patients admitted to intensive care units were older, were predominantly male, and had a median length of stay of 23 days (range 12 to 32 days).[520] The strongest risk factors for critical

illness are oxygen saturation <88%; elevated serum troponin, C-reactive protein, and D-dimer; and, to a lesser extent, older age, BMI >40, heart failure, and male sex.[515]

Management of mild COVID-19

Patients with suspected or confirmed mild disease (i.e., symptomatic patients meeting the case definition for COVID-19 without evidence of hypoxia or pneumonia) and asymptomatic patients should be isolated to contain virus transmission.[2]

Location of care

- Manage patients in a healthcare facility, in a community facility, or at home. Home isolation can be considered in most patients, with telemedicine or remote visits as appropriate.[2][3] This decision requires careful clinical judgement and should be informed by an assessment of the patient's home environment to ensure that: infection prevention and control measures and other requirements can be met (e.g., basic hygiene, adequate ventilation); the carer is able to provide care and recognise when the patient may be deteriorating; the carer has adequate support (e.g., food, supplies, psychological support); the support of a trained health worker is available in the community.[501]

Isolation period

- Discontinue transmission-based precautions (including isolation) and release patients from the care pathway: 10 days after positive test (asymptomatic patients); 10 days after symptom onset plus at least 3 days without fever and respiratory symptoms (symptomatic patients).[2]
- The US Centers for Disease Control and Prevention (CDC) recommends discontinuing home isolation once at least 10 days have passed since symptoms first appeared, and at least 24 hours have passed since last fever without the use of antipyretics, and symptoms have improved, if a symptom-based strategy is used. In asymptomatic people, the CDC recommends discontinuing home isolation once at least 10 days have passed since the date of a positive test. Alternatively, it recommends at least two negative reverse-transcription polymerase chain reaction (RT-PCR) tests on respiratory specimens collected 24 hours apart before ending isolation if a test-based strategy is used.[521] If the patient is hospitalised, the CDC guidance for discontinuing isolation is the same as for moderate disease (see below).
- Guidance on when to stop isolation depends on local recommendations and may differ between countries. For example, in the UK the self-isolation period is 10 days in patients with milder disease who are managed in the community.[522]

Infection prevention and control

- For patients in home isolation, advise patients and household members to follow appropriate infection prevention and control measures:
    - WHO: home care for patients with suspected or confirmed COVID-19 and management of their contacts external link opens in a new window
    - CDC: interim guidance for implementing home care of people not requiring hospitalization for coronavirus disease 2019 (COVID-19) external link opens in a new window

Symptom management

- Fever and pain: paracetamol or ibuprofen are recommended.[2][510] There is no evidence at present of severe adverse events in COVID-19 patients taking non-steroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen, or of effects as a result of the use of NSAIDs on acute healthcare utilisation, long-term survival, or quality of life in patients with COVID-19.[2][510][523][524][525][526][527][528] Ibuprofen should only be taken at the lowest effective dose for the shortest period needed to control symptoms.
- Cough: advise patients to avoid lying on their back as this makes coughing ineffective. Use simple measures (e.g., a teaspoon of honey in patients aged 1 year and older) to help cough.[510] A meta-analysis found that honey is superior to usual care (e.g., antitussives) for the improvement of upper respiratory tract infection symptoms, particularly cough frequency and severity.[529]
- Olfactory dysfunction: consider treatment (e.g., olfactory training) if olfactory dysfunction persists beyond 2 weeks. Often it improves spontaneously and does not require specific treatment. There is no evidence to support the use of treatments in patients with COVID-19.[530]

Supportive care

- Advise patients about adequate nutrition and appropriate rehydration. Too much fluid can worsen oxygenation.[2]
- Advise patients to improve air circulation by opening a window or door (fans can spread infection and should not be used).[2][510]
- Provide basic mental health and psychosocial support for all patients, and manage any symptoms of insomnia, depression, or anxiety as appropriate.[2]

Monitor

- Closely monitor patients with risk factors for severe illness, and counsel patients about signs and symptoms of deterioration or complications that require prompt urgent care (e.g., difficulty breathing, chest pain).[2][3]

Management of moderate COVID-19

Patients with suspected or confirmed moderate disease (i.e., clinical signs of pneumonia but no signs of severe pneumonia) should be isolated to contain virus transmission.[2]

Location of care

- Manage patients in a healthcare facility, in a community facility, or at home. Home isolation, with telemedicine or remote visits as appropriate, can be considered in low-risk patients. Manage patients at high risk of deterioration in a healthcare facility.[2][3]

Isolation period

- Discontinue transmission-based precautions (including isolation) and release patients from the care pathway 10 days after symptom onset plus at least 3 days without fever and respiratory symptoms.[2]

- The CDC recommends discontinuing isolation once at least 10 days (not severely immunocompromised) or 20 days (severely immunocompromised) have passed since symptoms first appeared, and at least 24 hours have passed since last fever without the use of antipyretics, and symptoms have improved, if a symptom-based strategy is used. In asymptomatic people, the CDC recommends discontinuing home isolation once at least 10 days (not severely immunocompromised) or 20 days (severely immunocompromised) have passed since the date of a positive test. Alternatively, it recommends at least two negative RT-PCR tests on respiratory specimens collected 24 hours apart before ending isolation if a test-based strategy is used. A symptom-based strategy is preferred in these patients.[531] If the patient is isolated at home, the CDC guidance for discontinuing isolation is the same as for mild disease (see above).
- Guidance on when to stop isolation depends on local recommendations and may differ between countries. For example, in the UK the isolation period is 14 days from a positive test in hospitalised patients, and 10 days in patients with milder disease who are managed in the community.[522]

Infection prevention and control

- Implement local infection prevention and control procedures when managing patients with COVID-19. For patients in home isolation, advise patients and household members to follow appropriate infection prevention and control measures (see above).

Symptom management and supportive care

- Manage symptoms and provide supportive care as appropriate (see above).

Antibiotics

- Consider empirical antibiotics if there is clinical suspicion of bacterial infection.[2][3] Antibiotics may also be considered in older people (particularly those in long-term care facilities) and children <5 years of age to provide empirical antibiotic treatment for possible pneumonia.[2]

Monitor

- Closely monitor patients for signs or symptoms of disease progression.
- If the patient is being managed at home, counsel them about signs and symptoms of deterioration or complications that require prompt urgent care (e.g., difficulty breathing, chest pain). There is no evidence to support the use of pulse oximeters in the home setting.[2]
- If the patient is being managed in hospital, monitor patients closely for signs of clinical deterioration using medical early warning scores (e.g., National Early Warning Score 2 [NEWS2]), and respond immediately with appropriate supportive care interventions.[2]

Remdesivir

- Consider remdesivir, a broad-spectrum investigational antiviral agent, in hospitalised patients with moderate disease.[514] The American College of Physicians bases this recommendation on low-certainty evidence that suggests remdesivir may slightly reduce mortality and serious adverse events, reduce time to clinical improvement and recovery, and

reduce the need for invasive mechanical ventilation or extracorporeal membrane oxygenation (ECMO) in hospitalised patients with moderate disease, compared with standard of care.[532]

- In the US, the National Institutes of Health guidelines panel does not recommend either for or against remdesivir for the treatment of patients with moderate or mild disease as there are insufficient data. However, the panel recognises that there may be situations in which a clinician judges that remdesivir is an appropriate treatment for a hospitalised patient with moderate disease (e.g., a person who is at a particularly high risk for clinical deterioration).[3] The Infectious Diseases Society of America does not routinely recommend remdesivir in patients with moderate disease due to a lack of evidence.[513]
- The emergency-use authorisation of remdesivir in the US covers the treatment of suspected or confirmed COVID-19 in hospitalised children and adults, regardless of disease severity.[533] However, in the UK and Europe remdesivir is conditionally approved only in adolescents ≥12 years of age and adults with pneumonia who require supplemental oxygen (usually classified as severe disease).[534]
- Remdesivir may reduce mortality and time to symptom resolution in hospitalised patients compared with standard of care or placebo; however, there is no convincing evidence that remdesivir reduces the need for mechanical ventilation.[512][535]
- The European Medicines Agency has started a review of a safety signal to assess reports of acute kidney injury in some patients. At this stage, it has not been determined whether there is a causal relationship between remdesivir and acute kidney injury.[536]

Management of severe COVID-19

Patients with suspected or confirmed severe disease are at risk of rapid clinical deterioration.[2]

- Severe disease **in adults** is defined as having clinical signs of pneumonia plus at least one of the following:
    - Respiratory rate >30 breaths/minute
    - Severe respiratory distress
    - SpO_2 <90% on room air
- Severe disease **in children** is defined as having clinical signs of pneumonia plus at least one of the following:
    - Central cyanosis or SpO_2 <90%
    - Severe respiratory distress
    - General danger signs: inability to breastfeed or drink, lethargy or unconsciousness, or convulsions
    - Fast breathing (<2 months: ≥60 breaths per minute; 2-11 months: ≥50 breaths per minute; 1-5 years: ≥40 breaths per minute).

Location of care

- Manage patients in an appropriate healthcare facility under the guidance of a specialist team.[2]
- Assess all adults for frailty on admission to hospital, irrespective of age and COVID-19 status, using the Clinical Frailty Scale (CFS). Clinical frailty scale external link opens in a new window A large observational study found that disease outcomes were better predicted by frailty than either age or comorbidity; frailty (CFS score 5-8) was associated with earlier death and longer duration of hospital stay, and these outcomes worsened with increasing frailty after adjustment for age and comorbidity.[537]
- Involve critical care teams in discussions about admission to critical care for patients where:
    - The CFS score suggests the person is less frail (e.g., CFS <5), they are likely to benefit from critical care organ support, and the patient wants critical care treatment; or
    - The CFS score suggests the person is more frail (e.g., CFS ≥5), there is uncertainty regarding the benefit of critical care organ support, and critical care advice is needed to help the decision about treatment.
- Take into account the impact of underlying pathologies, comorbidities, and severity of acute illness.[509]

Isolation period

- Discontinue transmission-based precautions (including isolation) and release patients from the care pathway 10 days after symptom onset plus at least 3 days without fever and respiratory symptoms.[2]
- The CDC recommends discontinuing isolation once at least 20 days have passed since symptoms first appeared, and at least 24 hours have passed since last fever without the use of antipyretics, and symptoms have improved, if a symptom-based strategy is used. In asymptomatic people, the CDC recommends discontinuing isolation once at least 20 days have passed since the date of a positive test. Alternatively, it recommends at least two negative RT-PCR tests on respiratory specimens collected 24 hours apart before ending isolation if a test-based strategy is used. A symptom-based strategy is preferred in these patients.[531]
- Guidance on when to stop isolation depends on local recommendations and may differ between countries. For example, in the UK the isolation period is 14 days from a positive test in hospitalised patients.[522]

Infection prevention and control

- Implement local infection prevention and control procedures when managing patients with COVID-19.

Oxygen

- Start supplemental oxygen therapy immediately in any patient with emergency signs (i.e., obstructed or absent breathing, severe respiratory distress, central cyanosis, shock, coma and/or convulsions), or any patient without emergency signs and SpO_2 <90%.[2][3] There is

no evidence of benefit for oxygen therapy in patients with COVID-19 in the absence of hypoxaemia.[538]

- Target SpO_2 to ≥94% during resuscitation in adults and children with emergency signs who require emergency airway management and oxygen therapy. Once the patient is stable, a target SpO_2 >90% in children and non-pregnant adults, and ≥92% to 95% in pregnant women, is recommended. Nasal prongs or a nasal cannula are preferred in young children.[2] Some guidelines recommend that SpO_2 should be maintained no higher than 96%.[539]
- Some centres may recommend different SpO_2 targets in order to support prioritisation of oxygen flow for the most severely ill patients in hospital. NHS England recommends a target of 92% to 95% (or 90% to 94% if clinically appropriate), for example.[540]
- Consider positioning techniques (e.g., high supported sitting, prone position) and airway clearance management to assist with secretion clearance in adults.[2] Oxygen delivery can be increased by using a non-rebreathing mask and prone positioning.[541] Consider a trial of awake prone positioning to improve oxygenation in patients with persistent hypoxaemia despite increasing supplemental oxygen requirements in whom endotracheal intubation is not otherwise indicated.[3] Early self-proning of awake, non-intubated patients has been shown to improve oxygen saturation and may delay or reduce the need for intensive care.[542][543][544][545][546]
- Monitor patients closely for signs of progressive acute hypoxaemic respiratory failure. Patients who continue to deteriorate despite standard oxygen therapy require advanced oxygen/ventilatory support.[2][3]

Symptom management and supportive care

- Fluids and electrolytes: use cautious fluid management in adults and children without tissue hypoperfusion and fluid responsiveness as aggressive fluid resuscitation may worsen oxygenation.[2] Correct any electrolyte or metabolic abnormalities, such as hyperglycaemia or metabolic acidosis, according to local protocols.[547]
- Fever and pain: paracetamol or ibuprofen are recommended.[2][510] There is no evidence at present of severe adverse events in COVID-19 patients taking non-steroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen, or of effects as a result of the use of NSAIDs on acute healthcare utilisation, long-term survival, or quality of life in patients with COVID-19.[523][524][525][526][527][528] Ibuprofen should only be taken at the lowest effective dose for the shortest period needed to control symptoms.
- Cough: advise patients to avoid lying on their back as this makes coughing ineffective. Use simple measures (e.g., a teaspoon of honey in patients aged 1 year and older) to help cough. Short-term use of a cough suppressant may be considered in select patients (e.g., if the cough is distressing to the patient) provided there are no contraindications.[510] A meta-analysis found that honey is superior to usual care (e.g., antitussives) for the improvement of upper respiratory tract infection symptoms, particularly cough frequency and severity.[529]
- Breathlessness: keep the room cool, and encourage relaxation, breathing techniques, and changing body positions. Identify and treat any reversible causes of breathlessness (e.g., pulmonary oedema). Consider a trial of oxygen, if available. Consider an opioid and

benzodiazepine combination in patients with moderate to severe breathlessness or patients who are distressed.[510]

- Anxiety, delirium, and agitation: identify and treat any underlying or reversible causes (e.g., offer reassurance, treat hypoxia, correct metabolic or endocrine abnormalities, address co-infections, minimise use of drugs that may cause or worsen delirium, treat substance withdrawal, maintain normal sleep cycles, treat pain or breathlessness).[2][510] Consider a benzodiazepine for the management of anxiety or agitation that does not respond to other measures. Consider haloperidol or a phenothiazine for the management of delirium.[510] Low doses of haloperidol (or another suitable antipsychotic) can also be considered for agitation.[2] Non-pharmacological interventions are the mainstay for the management of delirium when possible, and prevention is key.[548]
- Mouth care: an important part of overall patient care in hospitalised patients who are ventilated or non-ventilated and those undergoing step-down or end-of-life care.[549]
- Provide basic mental health and psychosocial support for all patients, and manage any symptoms of insomnia or depression as appropriate.[2]

Venous thromboembolism prophylaxis

- Start venous thromboembolism (VTE) prophylaxis in acutely ill hospitalised adults and adolescents with COVID-19 as per the standard of care for other hospitalised patients without COVID-19, provided there are no contraindications. A COVID-19 diagnosis should not influence a paediatrician's recommendations about VTE prophylaxis in hospitalised children. Pregnant women should be managed by a specialist.[2][3][550][551]
- Low molecular weight heparin or fondaparinux are preferred over unfractionated heparin in order to reduce patient contact. Unfractionated heparin is contraindicated in patients with severe thrombocytopenia. Fondaparinux is recommended in patients with a history of heparin-induced thrombocytopenia. Direct oral anticoagulants are not recommended. Mechanical thromboprophylaxis (e.g., intermittent pneumatic compression devices) is recommended if anticoagulation is contraindicated or not available.[2][551][552]
- The optimal dose is unknown. Standard prophylaxis doses are recommended over intermediate- or full treatment-dose regimens.[551] Some clinicians are using intermediate- or full treatment-dose regimens rather than prophylactic doses as they are worried about undetected thrombi; however, this may lead to major bleeding events.[553] There are insufficient data to recommend increased anticoagulant doses for VTE prophylaxis in COVID-19 patients outside the setting of a clinical trial.[3] However, some guidelines recommend that escalated doses can be considered in critically ill patients.[550]
- Monitor patients for signs and symptoms suggestive of thromboembolism and proceed with appropriate diagnostic and management pathways if clinically suspected.[2]
- Routine post-discharge VTE prophylaxis is not generally recommended, except in certain high-risk patients.[3][550][551]
- A retrospective analysis of over 4000 patients found that anticoagulation was associated with lower mortality and intubation among hospitalised COVID-19 patients. Therapeutic anticoagulation was associated with lower mortality compared with prophylactic

anticoagulation, but the difference was not statistically significant.[554] However, there is little high-quality evidence for VTE prophylaxis in COVID-19 patients; therefore, clinicians should rely on pre-COVID-19 evidence-based principles of anticoagulation management combined with rational approaches to address clinical challenges.[550]

Antimicrobials

- Consider empirical antibiotics if there is clinical suspicion of bacterial infection. Give within 1 hour of initial assessment for patients with suspected sepsis or if the patient meets high-risk criteria (or within 4 hours of establishing a diagnosis of pneumonia); do not wait for microbiology results. Base the regimen on the clinical diagnosis (e.g., community-acquired pneumonia, hospital-acquired pneumonia, sepsis), local epidemiology and susceptibility data, and local treatment guidelines.[2][3][482]
- Some guidelines recommend empirical antibiotics for bacterial pathogens in all patients with community-acquired pneumonia without confirmed COVID-19. It is likely that the bacterial pathogens in patients with COVID-19 and pneumonia are the same as in previous patients with community-acquired pneumonia, and therefore empirical antimicrobial recommendations should be the same.[483] However, the National Institute for Health and Care Excellence in the UK recommends that it is reasonable not to start empirical antimicrobials if you are confident that the clinical features are typical for COVID-19.[482] There is insufficient evidence to recommend empirical broad-spectrum antimicrobials in the absence of another indication.[3]
- Some patients may require continued antibiotic therapy once COVID-19 has been confirmed depending on the clinical circumstances (e.g., clinical or microbiological evidence of bacterial infection regardless of severe acute respiratory syndrome coronavirus 2 [SARS-CoV-2] test results, SARS-CoV-2 test result is positive but clinical features are not typical for COVID-19). In these circumstances, review antibiotic choice based on microbiology results and switch to a narrower-spectrum antibiotic if appropriate, review intravenous antibiotic use within 48 hours and consider switching to oral therapy, and give for a total of 5 days unless there is a clear indication to continue.[482]
- Reassess antibiotic use daily. De-escalate empirical therapy on the basis of microbiology results and clinical judgement. Regularly review the possibility of switching from intravenous to oral therapy. Duration of treatment should be as short as possible (e.g., 5 to 7 days). Antibiotic stewardship programmes should be in place.[2]
- Treat laboratory-confirmed co-infections (e.g., malaria, tuberculosis, influenza) as appropriate according to local protocols.[2]

Corticosteroids

- The World Health Organization (WHO) strongly recommends systemic corticosteroid therapy (low-dose intravenous or oral dexamethasone or hydrocortisone) for 7 to 10 days in adults with severe or critical disease. This recommendation is based on two meta-analyses that pooled data from eight randomised trials (over 7000 patients), including the UK RECOVERY trial. Moderate-quality evidence suggests that systemic corticosteroids probably reduce 28-day mortality in patients with severe and critical disease. They also probably reduce the need for invasive ventilation. There is no evidence directly comparing

dexamethasone and hydrocortisone. The harms of treatment in this context are considered to be minor. It is unclear whether these recommendations can be applied to children or those who are immunocompromised. The WHO does not recommend corticosteroids in patients with milder disease as they may increase the risk of mortality in these patients.[511][512] [555][556]

- In the UK, the National Institute for Health and Care Excellence recommends dexamethasone or hydrocortisone in patients with severe or critical COVID-19 (in line with WHO guidance). The marketing authorisations cover this indication in the UK.[509] NICE: COVID-19 prescribing brief – corticosteroids external link opens in a new window
- In Europe, the European Medicines Agency has endorsed the use of dexamethasone for patients with severe disease who require oxygen therapy or mechanical ventilation.[557]
- In the US, the National Institutes of Health guidelines panel recommends dexamethasone, either alone or in combination with remdesivir, in hospitalised patients who require supplemental oxygen. The panel recommends against using dexamethasone in patients who do not require supplemental oxygen. Alternative corticosteroids may be used in situations where dexamethasone is not available.[3] The Infectious Diseases Society of America supports the use of dexamethasone in hospitalised patients with severe disease.[513]
- Monitor patients for adverse effects (e.g., hyperglycaemia, secondary infections, psychiatric effects, reactivation of latent infections) and assess for drug-drug interactions.[3] Follow local policies on gastroprotection during corticosteroid treatment. Clinically significant interactions between remdesivir and corticosteroids are unlikely; however, lopinavir/ritonavir may increase hydrocortisone concentrations.[509]

Remdesivir

- Consider remdesivir in patients with pneumonia who require supplemental oxygen.[3][513] Remdesivir is conditionally approved in the UK and Europe for this indication in adolescents ≥12 years of age and adults.[534] The emergency-use authorisation in the US covers the treatment of suspected or confirmed COVID-19 in hospitalised children and adults, regardless of disease severity.[533]
- In the US, the National Institutes of Health guidelines panel recommends remdesivir, either alone or in combination with dexamethasone, in hospitalised patients who require supplemental oxygen. If a patient progresses to requiring high-flow oxygen, ventilation, or ECMO while on remdesivir, the panel recommends that the course of remdesivir be completed.[3] The Infectious Diseases Society of America recommends remdesivir in hospitalised patients with severe disease who are on oxygen, mechanical ventilation, or ECMO; however, it also recommends prioritising treatment in patients who are on oxygen therapy only when supply is limited.[513]
- Remdesivir may reduce mortality and time to symptom resolution in hospitalised patients compared with standard of care or placebo; however, there is no convincing evidence that remdesivir reduces the need for mechanical ventilation.[512][535] An expert guideline panel makes a weak recommendation for the use of remdesivir in severe disease, and supports more randomised trials as the quality of the evidence is low.[558]

- A UK National Institute for Health and Care Excellence review suggests there is some benefit with remdesivir compared with placebo for reducing supportive measures including mechanical ventilation and reducing time to recovery in patients who are on oxygen therapy. However, no statistically significant differences were found for mortality and serious adverse events.[559]
- The European Medicines Agency has started a review of a safety signal to assess reports of acute kidney injury in some patients. At this stage, it has not been determined whether there is a causal relationship between remdesivir and acute kidney injury.[536]

Experimental therapies

- Consider experimental therapies (e.g., convalescent plasma, lopinavir/ritonavir) only in the context of a clinical trial or according to local protocols.[2] See the Emerging external link opens in a new windowsection for more information.

Evidence for COVID-19 drug treatments

- BMJ interactive tool: drug treatments for covid-19 – living systematic review and network meta-analysis external link opens in a new window
- BMJ rapid recommendations: a living WHO guideline on drugs for COVID-19 external link opens in a new window
- BMJ rapid recommendations: remdesivir for severe covid-19 – a clinical practice guideline external link opens in a new window

Monitor

- Monitor patients closely for signs of clinical deterioration, and respond immediately with appropriate supportive care interventions.[2]

Discharge and rehabilitation

- Routinely assess older patients for mobility, functional swallow, cognitive impairment, and mental health concerns, and based on that assessment determine whether the patient is ready for discharge and whether the patient has any rehabilitation and follow-up requirements.[2]

Palliative care

- Palliative care interventions should be made accessible at each institution that provides care for patients with COVID-19. Identify whether the patient has an advance care plan and respect the patient's priorities and preferences when formulating the patient's care plan.[2] Follow local palliative care guidelines.

Management of critical COVID-19

Patients with critical disease (i.e., presence of acute respiratory distress syndrome, sepsis, or septic shock) should be admitted or transferred to an intensive/critical care unit.[2]

Location of care

- Manage patients in an intensive/critical care unit under the guidance of a specialist team.[2]

- Discuss the risks, benefits, and potential outcomes of treatment options with patients and their families, and allow them to express preferences about their management. Take their wishes and expectations into account when considering the ceiling of treatment. Use decision support tools if available. Put treatment escalation plans in place, and discuss any existing advance care plans or advance decisions to refuse treatment with patients who have pre-existing advanced comorbidities.[510]

Isolation period

- Discontinue transmission-based precautions (including isolation) and release patients from the care pathway 10 days after symptom onset plus at least 3 days without fever and respiratory symptoms.[2]
- The CDC recommends discontinuing isolation once at least 20 days have passed since symptoms first appeared, and at least 24 hours have passed since last fever without the use of antipyretics, and symptoms have improved, if a symptom-based strategy is used. In asymptomatic people, the CDC recommends discontinuing isolation once at least 20 days have passed since the date of a positive test. Alternatively, it recommends at least two negative RT-PCR tests on respiratory specimens collected 24 hours apart before ending isolation if a test-based strategy is used. A symptom-based strategy is preferred in these patients.[531]
- Guidance on when to stop isolation depends on local recommendations and may differ between countries. For example, in the UK the isolation period is 14 days from a positive test in hospitalised patients.[522]

Infection prevention and control

- Implement local infection prevention and control procedures when managing patients with COVID-19.

High-flow nasal oxygen or non-invasive ventilation

- Consider a trial of high-flow nasal oxygen (HFNO) or non-invasive ventilation (e.g., continuous positive airway pressure [CPAP] or bilevel positive airway pressure [BiPAP]) in selected patients with mild acute respiratory distress syndrome (ARDS).[2]
- Airborne precautions are recommended for these interventions (including bubble CPAP) due to uncertainty about the potential for aerosolisation.[2] Novel methods to protect clinicians without access to standard personal protective equipment during aerosol-generating procedures have been suggested.[560][561][562][563]
- Patients with hypercapnia, haemodynamic instability, multi-organ failure, or abnormal mental status should generally not receive HFNO, although emerging data suggests that it may be safe in patients with mild to moderate and non-worsening hypercapnia. Patients with hypoxaemic respiratory failure and haemodynamic instability, multi-organ failure, or abnormal mental status should not receive these treatments in place of other options such as invasive ventilation.[2]
- There is ongoing debate about the optimal mode of respiratory support before mechanical ventilation.[564] NHS England recommends CPAP as the preferred form of non-invasive ventilation in patients with hypoxaemic (type 1) respiratory failure. It doesn't advocate the

use of HFNO based on a lack of efficacy, oxygen use (HFNO can place a strain on oxygen supplies with the risk of site supply failure), and infection spread.[565] Other guidelines recommend HFNO over non-invasive ventilation, unless HFNO is not available.[3][539] Despite the trend to avoid HFNO, it has been shown to have a similar risk of aerosol generation to standard oxygen masks.[566]

- Early CPAP may provide a bridge to invasive mechanical ventilation. Reserve the use of BiPAP for patients with hypercapnic acute on chronic ventilatory failure (type 2 respiratory failure).[565]
- Indirect and low-certainty evidence suggests that non-invasive ventilation probably reduces mortality in patients with COVID-19, similar to mechanical ventilation, but may increase the risk of viral transmission.[567][568]
- Monitor patients closely for acute deterioration. If patients do not improve after a short trial of these interventions, they require urgent endotracheal intubation.[2][539]
- More detailed guidance on the management of ARDS in COVID-19 is beyond the scope of this topic; consult a specialist for further guidance.

Mechanical ventilation

- Consider endotracheal intubation and invasive mechanical ventilation in patients who are acutely deteriorating despite advanced oxygen/non-invasive ventilatory support measures.[2] [3]
- Two-thirds of patients who required critical care in the UK had mechanical ventilation within 24 hours of admission.[569] In New York, 33% of hospitalised patients developed respiratory failure leading to mechanical ventilation. These patients were more likely to be male, have obesity, and have elevated inflammatory markers and liver function tests.[365] Patients spent an average of 18 days on a ventilator (range 9-28 days).[570] Patients who required invasive mechanical ventilation had an 36% to 88% mortality rate in studies.[571] [572][573]
- Endotracheal intubation should be performed by an experienced provider using airborne precautions.[2] Intubation by video laryngoscopy is recommended if possible.[3] Young children, or adults who are obese or pregnant, may desaturate quickly during intubation and therefore require pre-oxygenation with 100% FiO_2 for 5 minutes.[2]
- Mechanically ventilated patients with ARDS should receive a lung-protective, low tidal volume/low inspiratory pressure ventilation strategy (lower targets are recommended in children). A higher positive end-expiratory pressure (PEEP) strategy is preferred over a lower PEEP strategy in moderate to severe ARDS. However, individualisation of PEEP, where the patient is monitored for beneficial or harmful effects and driving pressure during titration with consideration of the risks and benefits of PEEP titration, is recommended.[2] [3][539] NHS England recommends a low PEEP strategy in patients with normal compliance where recruitment may not be required.[574]
- Although some patients with COVID-19 pneumonia meet the criteria for ARDS, there is some discussion about whether COVID-19 pneumonia is its own specific disease with atypical phenotypes. Anecdotal evidence suggests that the main characteristic of the atypical

presentation is the dissociation between well-preserved lung mechanics and the severity of hypoxaemia.[575][576][577][578][579][580] However, this approach has been criticised. [581][582] It has been argued that an evidence-based approach extrapolating data from ARDS not related to COVID-19 is the most reasonable approach for intensive care of COVID-19 patients.[583] As a consequence of this, some clinicians have warned that protocol-driven ventilator use may be causing lung injury in some patients, and that ventilator settings should be based on physiological findings rather than using standard protocols. High PEEP may have a detrimental effect on patients with normal compliance. [575] PEEP should always be carefully titrated.[541]

- Consider prone ventilation in patients with severe ARDS for 12 to 16 hours per day. Pregnant women in the third trimester may benefit from being placed in the lateral decubitus position. Caution is required in children.[2][3][539] Longer durations may be feasible in some patients.[584] A small cohort study of 12 patients in Wuhan City, China, with COVID-19-related ARDS suggests that spending periods of time in the prone position may improve lung recruitability.[585] Two small case series found that many people tolerate the prone position while awake, breathing spontaneously, or receiving non-invasive ventilation. In the patients who tolerated it, improvement in oxygenation and a decrease in respiratory rate occurred.[586][587]
- Lung recruitment manoeuvres are suggested, but staircase recruitment manoeuvres are not recommended.[3][539]
- More detailed guidance on the management of ARDS in COVID-19, including sedation and the use of neuromuscular blockade during ventilation, is beyond the scope of this topic; consult a specialist for further guidance.

Inhaled pulmonary vasodilator

- Consider a trial of an inhaled pulmonary vasodilator in adults who have severe ARDS and hypoxaemia despite optimising ventilation. Taper off if there is no rapid improvement in oxygenation.[3][539]

Extracorporeal membrane oxygenation

- Consider extracorporeal membrane oxygenation (ECMO) according to availability and expertise if the above methods fail.[2][539][588][589] ECMO is not suitable for all patients, and only those who meet certain inclusion criteria may be considered for ECMO.[590]
- There is insufficient evidence to recommend either for or against the routine use of ECMO. [3]
- The estimated 60-day survival rate of ECMO-rescued patients with COVID-19 (31%) was similar to that of previous studies of ECMO for severe ARDS.[591] An international cohort study of 1035 patients found that both the estimated mortality 90 days after ECMO initiation and mortality in those who achieved a final outcome of death or discharge were <40%, consistent with previously reported survival rates in acute hypoxaemic respiratory failure. [592]
- Single-access, dual-stage venovenous ECMO with early extubation appears to be safe and effective in patients with COVID-19 respiratory failure.[593]

Management of septic shock/sepsis

- The management of sepsis and septic shock in patients with COVID-19 is beyond the scope of this topic. See the Complications external link opens in a new windowsection.

Symptom management and supportive care

- Consider fluid and electrolyte management, antimicrobial treatment, and symptom management as appropriate (see above).
- VTE prophylaxis is recommended in critically ill patients. Low molecular weight heparin is the preferred option, with unfractionated heparin considered a suitable alternative and preferred over fondaparinux.[551]

Corticosteroids

- Consider systemic corticosteroids for the management of critically ill patients (see above). In the US, the National Institutes of Health recommends dexamethasone, either alone or in combination with remdesivir, in hospitalised patients who require high-flow oxygen, non-invasive ventilation, mechanical ventilation, or ECMO.[3]

Remdesivir

- Consider remdesivir in select patients with pneumonia who require supplemental oxygen (see above). In the US, the National Institutes of Health recommends remdesivir, in combination with dexamethasone, in hospitalised patients who require high-flow oxygen, non-invasive ventilation, mechanical ventilation, or ECMO.[3]

Experimental therapies

- Consider experimental therapies (see the Emerging external link opens in a new windowsection).

Discharge and rehabilitation

- Routinely assess intensive care patients for mobility, functional swallow, cognitive impairment, and mental health concerns, and based on that assessment determine whether the patient is ready for discharge, and whether the patient has any rehabilitation and follow-up requirements.[2]

Palliative care

- Palliative care interventions should be made accessible at each institution that provides care for patients with COVID-19. Identify whether the patient has an advance care plan and respect the patient's priorities and preferences when formulating the patient's care plan.[2] Follow local palliative care guidelines.

Management of pregnant women

Pregnant women should be managed by a multidisciplinary team, including obstetric, perinatal, neonatal, and intensive care specialists, as well as midwifery and mental health and psychosocial support. A woman-centred, respectful, skilled approach to care is recommended.[2] In women with severe or critical disease, the multidisciplinary team should be organised as soon as possible after

maternal hypoxaemia occurs in order to assess fetal maturity, disease progression, and the best options for delivery.[594]

There are limited data available on the management of pregnant women with COVID-19; however, pregnant women can generally be treated with the same supportive therapies detailed above, taking into account the physiological changes that occur with pregnancy.[2]

The prevalence of asymptomatic SARS-CoV-2-positive pregnant women admitted for delivery appears to be low (<3% in a cohort in Connecticut, and 0.43% in a cohort in California).[595][596] Screening women and their delivery partners before admission may not be helpful. More than 15% of asymptomatic maternity patients tested positive for SARS-CoV-2 infection despite having been screened negative using a telephone screening tool in one small observational study in New York. In addition to this, 58% of their asymptomatic support persons tested positive despite being screened negative.[597] Another study in a New York obstetric population found that 88% of women who tested positive for SARS-CoV-2 at admission were asymptomatic at presentation.[598]

Location of care

- Manage pregnant women in a healthcare facility, in a community facility, or at home. Women with suspected or confirmed mild disease may not require acute care in a hospital unless there is concern for rapid deterioration or an inability to return to hospital promptly.[2] Follow local infection prevention and control procedures as for non-pregnant people.
- Consider home care in women with asymptomatic or mild illness, provided the patient has no signs of potentially severe illness (e.g., breathlessness, haemoptysis, new chest pain/pressure, anorexia, dehydration, confusion), no comorbidities, and no obstetric issues; the patient is able to care for herself; and monitoring and follow-up is possible. Otherwise, manage pregnant women in a hospital setting with appropriate maternal and fetal monitoring whenever possible.[428][599][600]
- Postpone routine antenatal or postnatal health visits for women who are in home isolation and reschedule them after the isolation period is completed. Delivery of counselling and care should be conducted via telemedicine whenever possible. Counsel women about healthy diet, mobility and exercise, intake of micronutrients, smoking, and alcohol and substance use. Advise women to seek urgent care if they develop any worsening of illness or danger signs, or danger signs of pregnancy.[2]
- The American College of Obstetricians and Gynecologists has published an algorithm to help decide whether hospital admission or home care is more appropriate. ACOG: outpatient assessment and management for pregnant women with suspected or confirmed novel coronavirus (COVID-19) external link opens in a new window

Antenatal corticosteroids

- Consider antenatal corticosteroids for fetal lung maturation in women who are at risk of preterm birth (24 to 37 weeks' gestation). Caution is advised because corticosteroids could potentially worsen the maternal clinical condition, and the decision should be made in conjunction with the multidisciplinary team.[428][600][601] The WHO recommends antenatal corticosteroids only when there is no clinical evidence of maternal infection and adequate childbirth and newborn care is available, and in women with mild COVID-19 after

assessing the risks and benefits.[2] Corticosteroids for fetal lung maturation have not been shown to cause more harm in patients with COVID-19.[602]

Treatments

- Most clinical trials to date have excluded pregnant women. However, potentially effective treatments should not be withheld from pregnant women due to theoretical concerns about the safety of these therapeutic agents in pregnancy. Decisions should be made with a shared decision-making process between the patient and the clinical team.[3]
- There is no convincing evidence that systemic corticosteroids increase the incidence of congenital abnormalities. The benefits of corticosteroids in pregnant or breastfeeding women with severe or critical disease are thought to outweigh the risks.[509]

Labour and delivery

- Implement local infection prevention and control measures during labour and delivery. A negative pressure isolation room is recommended if available. Screen birth partners for COVID-19 infection using the standard case definition.[2]
- Individualise mode of birth based on obstetric indications and the woman's preferences. Vaginal delivery is preferred in women with confirmed infection to avoid unnecessary surgical complications. Induction of labour, interventions to accelerate labour and delivery, and caesarean delivery are generally only recommended when medically justified based on maternal and fetal condition. COVID-19 positive status alone is not an indication for caesarean section.[2][428][600] Avoid using birthing pools in patients with suspected or confirmed infection.[602]
- Delayed umbilical cord clamping (not earlier than 1 minute after birth) is recommended for improved maternal and infant health and nutrition outcomes. The risk of transmission via blood is thought to be minimal, and there is no evidence that delayed cord clamping increases the risk of viral transmission from the mother to the newborn.[2]
- Consider babies born to mothers with suspected or confirmed infection to be a person under investigation and isolate them from healthy newborns. Test them for infection 24 hours after birth, and, if negative, again 48 hours after birth.[603]

Newborn care

- Experts are divided on separating mother and baby after delivery; make decisions on a case-by-base basis using shared-decision making.
- A retrospective cohort analysis, the largest series to date, found no clinical evidence of vertical transmission in 101 newborns born to mothers with suspected or confirmed SARS-CoV-2 infection, despite most newborns rooming-in and direct breastfeeding practices. This suggests that separation may not be warranted and breastfeeding appears to be safe.[604]
- The WHO recommends that mothers and infants should remain together unless the mother is too sick to care for her baby. Breastfeeding should be encouraged while applying appropriate infection prevention and control measures (e.g., performing hand hygiene before and after contact with the baby, wearing a mask while breastfeeding).[2] The WHO advises that the benefits of breastfeeding outweigh the potential risks for transmission.[605]

- The CDC recommends that temporary separation of a newborn from a mother with confirmed or suspected COVID-19 may be considered after weighing the risks and benefits as current evidence suggests the risk of a neonate acquiring infection from its mother is low; healthcare providers should respect maternal autonomy in the medical decision-making process. If separation is not undertaken, measures to minimise the risk of transmission should be implemented.[606] A mother with confirmed infection should be counselled to take all possible precautions to avoid transmission to the infant during breastfeeding (e.g., hand hygiene, wearing a cloth face covering). Expressed milk should be fed to the newborn by a healthy carer.[607]
- The Royal College of Obstetricians and Gynaecologists (RCOG) recommends that mothers with confirmed infection and healthy babies are kept together in the immediate postnatal period. It is recommended that the risks and benefits are discussed with neonatologists and families in order to individualise care in babies who may be more susceptible to infection. The RCOG advises that the benefits of breastfeeding outweigh any potential risks of transmission of the virus through breast milk, and recommends appropriate preventive precautions to limit transmission to the baby.[602]
- The American Academy of Pediatrics (AAP) recommends that temporary separation is the safest option, but acknowledges there are situations where this is not possible or the mother chooses to room-in. The AAP supports breastfeeding as the best choice for feeding. Breast milk can be expressed after appropriate hygiene measures and fed by an uninfected carer. If the mother chooses to breastfeed the infant themselves, appropriate prevention measures are recommended. After discharge, advise mothers with COVID-19 to practice prevention measures (e.g., distance, hand hygiene, respiratory hygiene/mask) for newborn care until either: they are afebrile for 72 hours without use of antipyretics and at least 10 days have passed since symptoms first appeared; or they have at least two consecutive negative SARS-CoV-2 tests from specimens collected ≥24 hours apart. This may require the support of an uninfected carer. A newborn with documented infection requires close outpatient follow-up after discharge for 14 days after birth.[603]

Management of people living with HIV

Recommendations for the triage, management, and treatment of COVID-19 in people with HIV are the same as those for the general population. Continue antiretroviral therapy and prophylaxis for opportunistic infections whenever possible, including patients who require hospitalisation. Consult with a HIV specialist before adjusting or switching antiretroviral medications, and pay attention to potential drug-drug interactions and overlapping toxicities with COVID-19 treatments.[3]

Management of co-existing conditions

Introduction

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

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

Considerations for perinatal care

There is no evidence to suggest that pregnant women are more likely to contract COVID-19 compared with the general population; however, they may experience more severe infection and should take extra precautions, especially those above 28 weeks' gestation.[1][2][3][4] Pregnancy increases the risk of hospitalisation, intensive care admission and receipt of mechanical ventilation. A report from MBRRACE-UK (Mothers and Babies: Reducing Risk through Audits and Confidential Enquiries across the UK) advises that all pregnant or post-partum women who have COVID-19 receive multidisciplinary team care and obstetric leadership with daily review and are given advice about when to seek urgent medical attention.[5] In the UK, a study of pregnant women admitted to hospital with confirmed severe acute respiratory distress coronavirus 2 (SARS-CoV-2) infection found that a high proportion were from black or other ethnic minority groups.[6] Maternity units in the UK have been encouraged to take measures to minimise the additional risk to pregnant black, Asian, and minority ethnic (BAME) women by increasing support, tailoring communications, discussing vitamins, supplements, and nutrition, and ensuring records are up to date, to identify those most at risk of poor outcomes.[7] In the US, Hispanic and non-Hispanic black women seem to be disproportionately affected by SARS-CoV-2 infection during pregnancy.[8] Pre-existing comorbidities, high maternal age, pre-pregnancy obesity, and gestational diabetes are associated with more severe COVID-19 disease during pregnancy.[3][9] Disease severity is associated with higher rates of preterm birth and caesarean delivery.[3][10]A case control study compared pregnancy outcomes in women who had a positive SARS-CoV-2 test during labour with women who tested negative for SARS-CoV-2 during labour. A positive SARS-CoV-2 test during labour was associated with a higher prevalence of preeclampsia and a lower prevalence of induction of labour. Mode of delivery, postnatal haemorrhage, preterm birth, infant 5-minute APGAR score, and birth weight for gestational age did not differ between the groups.[11] A prospective cohort study in the US also reported that maternal SARS-CoV-2 status was not associated with birth weight, neonatal respiratory distress or apnoea, or neonatal respiratory infection.[12] Infants born to mothers who tested positive for SARS-CoV-2 up to 14 days prior to delivery were more likely to be admitted to a neonatal intensive care unit and were born earlier (37.5 weeks' gestation versus 39 weeks) than infants born to mothers who tested positive for SARS-CoV-2 more than 14 days prior to delivery.[12] Pregnant women should be advised to take up the influenza vaccine.[13]

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

Antenatal care:

- Women are advised to continue routine antenatal care, and the nationally recommended schedule of antenatal care should be offered in full wherever possible.[1][13] Ideally, antenatal appointments should be offered in-person, particularly to women from BAME communities, with communication difficulties, or whose medical, social, or psychological conditions put them at higher risk of complications or adverse outcomes during pregnancy.[13]

- If there is concern about the patient or fetus, a face-to-face appointment should be advised. Women should be encouraged to attend pregnancy assessment services if they have any concerns for their or their baby's well being.[13]
- Before face-to-face consultations, patients should be contacted to screen for symptoms of COVID-19. Patients who report symptoms of COVID-19 should be assessed to determine if an urgent antenatal appointment is needed, or if the appointment can be delayed.[2][14]
- Investigations such as blood tests and ultrasound scans should be arranged with other in-person maternity appointments to limit repeat clinic attendance.[13]
- Anaemia should be monitored and managed proactively so that women are not anaemic at the beginning of labour.[15]
- Remote consultations by telephone or video call may replace some face-to-face appointments in low-risk pregnancies.[2] Women may be advised to check their blood pressure at home if possible, and given advice on when to seek medical assistance.[2]

Intrapartum care:

- Women and their birth partners should be screened for symptoms of COVID-19 on contact or attendance of the maternity unit.[13][16]
- Scheduled induction and caesarean delivery may continue if indicated, but if the patient screens positive for suspected COVID-19 infection, individual assessment should be made to determine if it is safe to reschedule.[13][17] COVID-19 status alone is not an indication for caesarean delivery.[18]
- Continuous fetal monitoring using cardiotocography during labour is not indicated for asymptomatic women who test positive for SARS-CoV-2, unless there is another indication for monitoring (e.g. previous caesarean delivery). Women with confirmed or suspected symptomatic COVID-19 should be offered continuous fetal monitoring during labour and vaginal birth.[13]
- Home birth may still be considered for low-risk pregnancies, where appropriate support can be provided.[17][19]
- Active management of the third stage of labour is recommended for all deliveries.[15]

Postnatal care:

- As with antenatal care, the number of postnatal visits may be limited, and some may be done remotely rather than face-to-face, depending on the needs of mother and baby.[14][17] The first visit after birth should be prioritised for a face-to-face visit.
- Long-acting contraception should be offered.
- Liberal use of intravenous iron is recommended, with the aim of reducing intensive care admissions for obstetric haemorrhage.[15]

Considerations for newborn care

The American Academy of Pediatrics has published guidance on the care of babies born to mothers who have COVID-19. Clinicians should wear airborne, droplet, and contact precautions-level

personal protective equipment to attend deliveries from mothers with COVID-19. Suctioning, positive pressure ventilation, and intubation may all generate infant virus aerosols.[20]

The risk of the newborn acquiring SARS-CoV-2 infection is low (2-5%) when precautions are taken to protect the newborn from maternal respiratory secretions. A mask should be worn, and meticulous breast and hand hygiene performed, for direct skin-to-skin contact between mother and child.[2][20] The mother should maintain a reasonable distance from the infant where possible; an isolette may be used to facilitate distancing and provide additional protection from respiratory droplets. Breastfeeding is encouraged. Mothers may also express breast milk after appropriate hand hygiene for uninfected caregivers to feed the infant. [20]

Observational cohort studies in the US have followed neonates born to mothers with perinatal SARS-CoV-2 infection. The mothers wore surgical face masks and observed hand and breast hygiene before skin-to-skin contact, breastfeeding, and routine care. There was no clinical evidence of SARS-CoV-2 infection in the neonates.[21][22]

Infants requiring neonatal intensive care and respiratory support optimally should be admitted to a single patient room with the potential for negative room pressure.[20]

Where testing capacity is available, newborns should be tested for SARS-CoV-2 infection at 24 hours and 48 hours after birth. Infants should be bathed after birth to remove virus particles potentially present on the skin surface.[20]

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.[23]

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. [24] 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.[24] The newborn can be dried as usual while the cord is still intact. Deferred cord clamping is recommended in the absence of other contraindications.[20]

Well babies born to mothers with suspected or confirmed COVID-19 and who do not require medical intervention may remain with their mother in their designated room.[20] Babies should only be tested for SARS-CoV-2 if unwell. Early discharge should be facilitated where possible, in conjunction with community midwifery services. Neonatal and infant physical examination screening (NIPE), including visualisation of the soft palate, should be completed before discharge. [23] Breastfeeding should be encouraged; the benefits substantially outweigh the risks of transmission.[18] There is currently no evidence that COVID-19 can be transmitted through breast milk.[13][17][25][26] A mask should be worn, and meticulous hand hygiene performed, for breast or formula feeding. For babies born to mothers with suspected or confirmed COVID-19 who require to be admitted to a neonatal unit, clinical investigations should be minimised while

maintaining standards of care. All babies requiring respiratory support should be nursed in an incubator.[23]

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.[13]

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

Non-essential face-to-face consultations with patients with dermatological conditions should be avoided, with appointments either rescheduled or done using telemedicine.[27][28]

Patients taking drugs that affect the immune response may have atypical presentations of COVID-19: for example, they may not develop a fever.[28]

UK guidelines recommend that patients with known or suspected COVID-19 infection continue on topical treatments and that new-onset dermatological conditions are treated with topical treatments if possible, rather than systemic treatments that act on the immune system.[28] If the patient is already taking systemic treatment, they should be advised they can continue hydroxychloroquine, chloroquine, mepacrine, dapsone, and sulfasalazine, and advised that they should not suddenly stop taking oral corticosteroids. All other oral immunosuppressive therapies, biologicals, and monoclonal antibodies could be temporarily stopped during COVID-19 infection; the risks and benefits of stopping should be carefully considered with the patient or their carer, including considering the effect that stopping treatment may have on other comorbid conditions.[28] 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.[29] 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.[28] 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.[29] The US National Psoriasis Foundation COVID-19 Task Force does not recommend that patients stop their biological or oral therapies for psoriasis and/or psoriatic arthritis; any decision to start or stop a biological or oral systemic therapy should be individualised and involve a healthcare provider.[30]

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.[31]

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.[32]

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.[33] Patients may continue taking aminosalicylates; these drugs do not affect the immune response.[32] Dosage, route of administration, and mode of delivery should be considered for patients who take drugs that affect the immune response, with the aim of minimising face-to-face contact. The risks and benefits of starting a new drug, including need to start treatment during the COVID-19 pandemic, risk profile, feasibility of monitoring and review, and route of administration, should be considered.[32] 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).[33] 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.[32] 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.[33]

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:[34][35]

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

Quantitative FIT should be offered to adults without rectal bleeding who are aged 50 and over with either unexplained changes in bowel habit or iron-deficiency anaemia, or are aged 60 and over and have anaemia even in the absence of iron-deficiency.[35]

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

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

Considerations for endoscopy

Upper gastrointestinal (GI) endoscopy is a high-risk procedure for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) transmission. Lower GI endoscopy also carries a risk of SARS-CoV-2 infection. European and Asia-Pacific guidelines make recommendations for upper and lower GI endoscopy during the COVID-19 pandemic.[36][37][38]

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

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

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

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

GI endoscopy should always be performed for:

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

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

The American Gastroenterological Association (AGA) Institute have published a rapid review and recommendations on the role of SARS-CoV-2 testing prior to endoscopy.[39] The AGA Institute suggests pre-procedure testing where there is an intermediate prevalence of asymptomatic SARS-CoV-2 infection (0.5%-2%). They recommend against testing where the prevalence of

asymptomatic infection is low (<0.5%) due to the high number of false positives and suggest that availability of personal protective equipment (PPE) may drive decision-making. In areas of high prevalence, pre-procedure testing is not recommended due to the number of false negatives, and again, availability of PPE may drive decision-making. In areas with a surge in COVID-19 patients, endoscopy may be reserved for emergency or time-sensitive procedures.[39]

The North American Society for Pediatric Gastroenterology, Hepatology, and Nutrition (NASPGHAN) recommend that all paediatric endoscopic procedures are done in a negative pressure room with all staff using airborne, contact, and droplet precautions regardless of patient risk stratification. To optimise healthcare delivery and minimise risk, NASPGHAN have proposed stratifying procedures as emergent, urgent (assess benefits and risks before proceeding), or elective.[40]

Transient elastography may reduce the need for endoscopic screening for varices in some patients with cirrhosis. Non-invasive assessments including the Baveno VI criteria, platelet-to-liver stiffness measurement ratio, liver stiffness measurement and spleen stiffness measurement have good predictive value for clinically significant varices and to identify patients at risk of bleeding. Screening for varices should balance the risks of SARS-CoV-2 transmission from endoscopy against the risk of bleeding. Elective upper GI endoscopy to screen for varices in patients with no history of bleeding can be deferred until the COVID-19 outbreak is controlled. Endoscopic eradication of oesophageal varices should be performed following a variceal bleed.[41]

Considerations for patients receiving systemic anti-cancer therapy

Patients with cancer are at higher risk of severe disease and death than patients with no comorbid conditions.[42] An observational study of patients referred to oncology services in Europe reported that mortality from COVID-19 was 33.6% and was associated with male sex, age ≥65 years, ≥2 comorbidities and active malignancy. Nearly 60% of patients developed acute respiratory failure. Delivery of cancer therapy (chemotherapy, immunotherapy and targeted therapy) was not associated with case severity or mortality.[43] An observational study from the US also found that administration of cytotoxic chemotherapy was not associated with severe or critical COVID-19. Patients with active lung or haematological malignancies, baseline neutropenia, or lymphopenia at COVID-19 diagnosis had worse outcomes.[44] Data from the UK Coronavirus Cancer Monitoring Project (UKCCMP) found that patients with haematological malignancies had increased susceptibility to severe acute respiratory syndrome coronavirus 2 and also had more severe COVID-19 disease compared with patients with solid organ tumours; recent chemotherapy conferred an additional risk.[45]

The most common presenting symptoms of COVID-19 in patients with cancer are fever, cough and acute dyspnoea.[43] However, patients may present with atypical symptoms of COVID-19, and other conditions, notably neutropenic sepsis and pneumonitis, can mimic COVID-19.[46][47] Patients with a fever or other symptoms of infection should have a comprehensive evaluation.[48]

UK guidelines recommend that systemic anti-cancer treatment should be deferred, if possible, in patients who have COVID-19 until the patient has had at least one negative test. Systemic anti-cancer treatment may be continued if necessary for urgent control of the cancer.[46]

UK guidelines recommend that the highest priority for systemic anti-cancer treatments should be:[46]

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

NHS England has made recommendations for treatment change options for systemic anti-cancer therapy. These take into account the degree of immunosuppression caused by the treatment, the ability to administer treatment in a setting that reduces exposure to COVID-19, resource availability, feasibility, and capacity.[49]

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.[50] Cancer care prioritisation and intensity should be adapted to the pandemic scenario.[51]

ESMO suggests the following patient prioritisation:[50]

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

ESMO advise that where feasible, all cancer patients admitted to hospital for cancer treatment should be tested for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), irrespective of chest radiographic findings or symptoms, if considered at high risk of mortality from SARS-CoV-2 infection. Clinicians should rapidly review the patient’s clinical presentation, their clinical, travel and epidemiological history and planned procedures to ascertain their risk of infectiousness. Healthcare professionals should use personal protective equipment meticulously. Clinicians should consider giving granulocyte colony stimulating factor to elderly patients with comorbidities and patients with an intermediate or high risk of febrile neutropenia, to reduce the risk of febrile neutropenia. Prophylaxis against venous thromboembolism is recommended for patients with cancer and COVID-19. Immune checkpoint inhibitors should not be delayed or withheld in the adjuvant/neoadjuvant setting where there is a significant survival benefit. If a patient receiving immune checkpoint inhibitor therapy for an approved indication tests positive for SARS-CoV-2, the immune checkpoint inhibitor therapy should be withheld until recovery. Tyrosine kinase inhibitors may be withheld until recovery in patients who develop COVID-19 and have oncologically stable disease.[51]

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.[52]

The US National Institutes of Health Coronavirus Disease (COVID-19) Treatment Guidelines provide recommendations for treatment of COVID-19 in adults and children with cancer.[53] The recommendations for treating COVID-19 in patients with cancer are the same as for the general population; however, clinicians should be aware of potential drug interactions and overlapping toxicities. A haematologist or oncologist should be consulted before adjusting cancer-directed medications. Molecular diagnostic testing for SARS-CoV-2 is recommended in patients who develop signs and symptoms of COVID-19 and in asymptomatic patients prior to procedures that require anaesthesia and before initiating cytotoxic chemotherapy and long-acting biologic therapy.

The American College of Cardiology has made recommendations for alterations to routine cardiac surveillance for patients with breast cancer receiving systemic anticancer therapy who are at low risk for cardiotoxicity. Patients at higher risk should receive usual care.[54]

Considerations for patients receiving radiotherapy

The National Institute for Health and Care Excellence in the UK has issued guidelines for the delivery of radiotherapy during the COVID-19 pandemic. Patients with known or suspected COVID-19 may still receive radiotherapy, provided that national guidance on infection prevention and control can be followed. Patients who are immunosuppressed and develop a fever, with or without respiratory symptoms, should be assessed in secondary or tertiary care for neutropenic sepsis.[55]

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

The highest-priority treatments are:[55]

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

The European Society for Medical Oncology (ESMO) has published guidance on management of cancer patients during the COVID-19 pandemic and recommends that the benefit/risk ratio may need to be reconsidered in some patients. ESMO considers patients receiving extensive radiotherapy to be at risk. ESMO suggests that decisions for starting or continuing cancer therapy are discussed for both patients who do not have COVID-19 infection and those who do have COVID-19 infection but are still fit and willing to be treated after explanation of the risks and benefits.[50][51]

ESMO suggests the following patient prioritisation:[50]

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

The International Lymphoma Radiation Oncology Group has published emergency guidelines for radiotherapy in haematological malignancies, should radiotherapy be necessary. Alternative dose fractionations may be given.[56]

The European Society for Radiotherapy and Oncology (ESTRO) and the American Society for Radiation Oncology (ASTRO) have published guidance on radiotherapy for lung cancer in the current COVID-19 pandemic.[57] They highlight that the prognosis of lung cancer patients should not be compromised by departing from guideline-recommended radiotherapy practice; however, delaying or interrupting treatment is generally recommended for patients with COVID-19.

Further oncology resources are available at:

- ESMO: COVID-19 and cancer external link opens in a new window
- ASCO: coronavirus resources external link opens in a new window
- NCCN: COVID-19 resources for the cancer care community external link opens in a new window
- Summary of international recommendations in 23 languages for patients with cancer during the COVID-19 pandemic external link opens in a new window
- Royal College of Radiologists (UK): Coronavirus (COVID-19) cancer treatment documents external link opens in a new window
- Australia: Managing haematology and oncology patients during the COVID-19 pandemic: interim consensus guidance external link opens in a new window

Considerations for patients with head and neck cancer

A European observational study reported an unadjusted mortality rate of 44.8% for patients with head and neck cancer and COVID-19. Overall mortality was higher in male patients, patients ≥ 65 years and patients with ≥2 comorbidities.[43]

An international consensus has made recommendations for head and neck surgical oncology practice in the context of the COVID-19 pandemic. Flexible nasendoscopy should be performed for patients with symptoms or signs suggestive of new cancer or recurrence, or patients with concern for critical airway obstruction, only if adequate personal protective equipment (PPE) is available. Suspicious findings on imaging are not sufficient to confirm a diagnosis of cancer; a core biopsy or fine needle aspiration of a suspicious lymph node is also required. Panendoscopy is not required if a biopsy can be performed under local anaesthesia. Non-emergent surgery should be deferred in patients with confirmed or strongly suspected COVID-19. Tracheostomies should be avoided in patients with oral cancer undergoing transoral surgery; tracheostomies should not be avoided in patients with advanced T2 or T3 oral cancer requiring a free flap. Treatment protocols are given for oral, laryngeal and differentiated thyroid cancer.[58]

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.[59]

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.[59]

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.[60][61][62][63][64][65] A large prospective cohort study in the United Kingdom reported that ACE inhibitor or angiotensin-II receptor antagonist use was associated with a significantly reduced risk of COVID-19 and no increased risk of intensive care admission.[66] 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.[67][68][69] Any change in medication should be based on individual patient risk assessment.

Routine immunisation

The World Health Organization recognises immunisation as a core health service that should be prioritised and safeguarded during the COVID-19 pandemic, where feasible, to prevent morbidity and mortality from vaccine-preventable non-COVID-19 diseases.[70]

The ability to maintain routine immunisation will differ between countries and locations, depending on factors such as health system capacity and the need for physical distancing; local guidelines should be consulted.[70][71] Priority may be given to vulnerable people at higher risk of morbidity and mortality.[72] Data from the US show a fall in childhood immunisation rates since the declaration of a national emergency in March 2020.[73] Clinicians are encouraged to prioritise in-person newborn care and well visits and immunisation of children up to 2 years of age.[74]

The US Centers for Disease Control and Prevention recommend influenza vaccination of persons aged ≥6 months for the 2020-2021 influenza season. The 2020-2021 influenza season is expected to coincide with continued or recurrent circulation of severe acute respiratory syndrome coronavirus 2. Vaccination is expected to reduce prevalence of influenza, thus reducing symptoms which might be confused with those of COVID-19 and reducing the burden on the healthcare system.[75]

In the UK, clinical guidance is available, providing practical advice for maintaining the routine immunisation programme and information that can be given to parents, carers, and patients who have concerns.[76] Clinicians are encouraged to achieve maximum uptake of influenza vaccination in existing eligible groups, particularly during the pandemic. The UK 2020-2021 influenza immunisation programme has been expanded to include household contacts of shielding patients, children in school year 7, and health and social care workers who deliver domiciliary care.[77] Depending on availability following immunisation of currently eligible groups, the influenza vaccine will also then be offered to all 50-64 year olds in the UK.[77] The priority for the human papillomavirus vaccine programme is delivering the first dose to all eligible children, including those who missed their scheduled first dose due to school closures. The interval between the first and second dose can be extended without compromising protection or the effectiveness of the second dose.[78]

Vaccination guidance during a pandemic (Centers for Disease Control and Prevention). external link opens in a new window

Considerations for patients who require anticoagulation

The Anticoagulation Forum advises that if a patient is taking warfarin, the indication should be reviewed to establish whether anticoagulation is still necessary. If so, clinicians should consider whether patients can switch to a direct oral anticoagulant (DOAC) or whether the patient could self-monitor their INR. Patients may be switched from warfarin to a DOAC if they are suitable candidates and consent to switching.[79] Warfarin treatment should be stopped before DOACs are started.[80] Stable patients who take warfarin can be offered extended INR testing; an interval of up to 12 weeks is appropriate.[79]

Anticoagulation may need to be switched if the patient is hospitalised for any reason, including a diagnosis of COVID-19. US guidelines recommend that patients who are receiving anticoagulant or antiplatelet therapies for underlying conditions should continue these medications if they receive a diagnosis of COVID-19.[81] Continued INR monitoring is important in patients taking warfarin or other vitamin K antagonists if they have suspected or confirmed COVID-19 infection.[80]

Adjustments to usual anticoagulation may be indicated, especially if the patient receives antibiotics or antivirals.[82][80] An online tool to check potential COVID-19 drug interactions has been developed:

Liverpool Drug Interaction Group: COVID-19 drug interactions external link opens in a new window

An anticoagulation service in the UK reported a six-fold increase in the odds of having a supratherapeutic INR (>8.0) during the initial period of lockdown in March and April 2020, compared with the same dates in 2019. COVID-19 infection, antibiotic therapy, other interacting drugs, inpatient hospital admission, recent hospital discharge, entering an end-of-life care pathway, and prolonged testing interval were all identified as risk factors for elevated INR.[83]

Considerations for management of patients in community psychiatry services

Psychiatrists are advised to contact patients remotely, using telemedicine where possible, ideally by live video-conferencing in the patient's home.[84] Psychosocial support can be offered via video-conferencing.

The US Center for the Study of Traumatic Stress advises that patients with delusions, obsessive-compulsive thoughts and behaviours, a predominance of somatic symptoms, other active or uncontrolled symptoms, or those previously exposed to severe trauma may be particularly vulnerable in the current pandemic, and that frequent clinical contact may help avoid exacerbations and hospitalisations.[85]

Patients should have adequate supplies of prescribed medication to avoid interruptions in treatment. Some treatment programmes have been amended in response to this: for example, the Substance Abuse and Mental Health Services Administration in the US has introduced flexibility in the Opioid Treatment Program, depending on stability of the patient,[86] and in the UK, most services transferred patients from supervised opioid substitution therapies to take-home doses. As the number of COVID-19 cases falls, UK clinicians are advised to consider whether supervised opioid substitution therapy can resume.[87]

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 tranquillisation, lithium, clozapine, and depots/long-acting injectables.[88] Longer intervals between drug monitoring may be appropriate for some patients who have been stable on treatment.[89] Individual patient needs should be carefully reviewed, but it is likely that many patients should remain on their regular medication until face-to-face consultation is possible. Patients taking psychotropic drugs may be at risk of significant drug-drug interactions with experimental treatments for COVID-19.[90] Financial insecurity and job loss caused by the pandemic may exacerbate symptoms of depression, anxiety, and distress, and psychosomatic symptoms.[91] Proactive screening for suicidality is recommended.[89]

A study of patients hospitalised with COVID-19 in the US found that those with a prior psychiatric diagnosis had a higher mortality rate compared with those with no psychiatric diagnosis. The reasons for this are unclear.[92] A retrospective cohort study of patients with dementia or aged ≥65 reported that patients receiving inpatient psychiatric care in London had a higher risk of infection and a higher risk of death compared with people living in the community. Mental health

complications of COVID-19 were observed in 60% of patients; the most common complication was delirium or acute cognitive decline.[93]

Considerations for mental health of adults

A survey carried out among adults across the US during June 24-30 2020 assessed mental health, substance use, and suicidal ideation during the pandemic.[94] Overall, 40.9% of respondents reported at least one mental health or behavioural health condition related to the pandemic, including symptoms of anxiety or depression (30.9%), symptoms of trauma- and stressor-related disorder (26.3%), starting or increasing substance use to cope (13.3%), and seriously considering suicide (10.7%). Adults aged 18-24 years, minority racial and ethnic groups, unpaid carers for adults, and essential workers reported experiencing disproportionately worse mental health outcomes, increased substance use, and higher suicidal ideation. Another US study reported a 3-fold increase in prevalence of depression symptoms during the COVID-19 pandemic, compared with before the pandemic. Lower income, having less than $5000 in savings and exposure to more stressors were associated with a higher risk of depression symptoms.[95] A study of older adults (aged 60 years or older) in Hong Kong found significant increases in loneliness, anxiety, and insomnia during the pandemic. Women, individuals who live alone, and those with more than four chronic conditions were more likely to experience increased loneliness, and women were also more likely to have increased anxiety and insomnia.[96]

Data from the UK COVID-19 Social Study found that reported frequency of abuse, self-harm and thoughts of suicide/self-harm between March and April 2020 was higher among women, Black, Asian and minority ethnic (BAME) groups and people experiencing socioeconomic disadvantage, unemployment, disability, chronic physical illnesses, mental disorders and COVID-19 diagnosis.[97] In the UK, levels of anxiety, depression and stress were higher than expected during March and early April 2020. Self-reported anxiety decreased during April and May 2020 but has not returned to pre-pandemic levels. Young adults and women were more likely to report worse mental health and wellbeing outcomes than older adults and men. Students and unemployed adults were more likely to report loneliness.[98]

Mental health of children and adolescents

Most children with pre-existing mental health needs have reported that their mental health has worsened during the pandemic, citing concerns about their family's health, school closures, loss of routine, loss of social connection and anxiety about the future. Transition to telemedicine for mental health support presents challenges for children and young people, including lack of access to technology, lack of privacy at home and long wait times.[99] Lockdown restrictions and social isolation may cause loneliness and affect the mental health of previously healthy children. Children and adolescents are probably more likely to experience depression and anxiety during and after enforced isolation. Preventative support and early intervention should be offered where possible.[100]

NHS: Every Mind Matters external link opens in a new window

Considerations for the mental health of healthcare workers

Healthcare workers managing novel viral outbreaks are at risk from adverse psychological events.[101] Frontline healthcare workers are at highest risk for developing anxiety, depression, acute

stress and insomnia.[102] They may experience burnout or secondary traumatic stress, developing stress reactions and symptoms after exposure to another individual's traumatic experience. One study reported that 45% of frontline clinical staff in Italy experienced physical symptoms of burnout during the peak of the COVID-19 outbreak. Increased irritability, altered food habits, difficulty falling asleep and increased muscle tension were the most common symptoms.[103]

Specific advice for healthcare professionals and first responders from the CDC and World Health Organization includes:[104][105][106]

- Recognise that it is normal to feel under pressure in this situation, and that caring for their mental health and psychosocial wellbeing is as important as caring for their physical health
- Learn the symptoms of secondary traumatic stress, including: excessive worry and fear about something bad happening; being easily startled or feeling 'on guard' all of the time; physical signs of stress - for example, heart racing; nightmares or recurrent thoughts about the traumatic situation; and the feeling that other people’s trauma is theirs
- Learn the symptoms of burnout, including: sadness, depression, or apathy; feeling easily frustrated, irritable, or blaming others; feeling indifferent, isolated, or disconnected from others; poor hygiene; feeling tired, exhausted, or overwhelmed; feeling like a failure, that nothing they can do will help, or that they are not doing their job well; or feeling they need alcohol or drugs to cope
- Follow general measures to reduce stress, including: taking breaks from reading, watching, or listening to news stories; taking care of mental and physical health: for example, through meditating, eating well-balanced meals, taking regular exercise, getting plenty of sleep; avoiding alcohol and drugs; ensuring sufficient rest between shifts; spending time doing activities they enjoy; and connecting with family and friends
- Keep a journal
- Work in teams and limit the amount of time working alone
- Develop a 'buddy system', where two partners support each other and monitor each other’s stress, workload, and safety
- Allow time for themselves and their family to recover from helping with the pandemic
- Ask for help if they feel unable to care for family and patients as they did before the pandemic.

Clinicians can help colleagues by being alert to symptoms of burnout or secondary traumatic stress, offering the opportunity to talk (but not forcing them to do so), signposting them to useful resources, being kind and reassuring, encouraging them to maintain good self-care, and escalating concerns if necessary. Healthcare organisations are encouraged to provide proactive, comprehensive mental health support.[102]

- Support the Workers external link opens in a new window
- COVID trauma response working group external link opens in a new window
- NHS Practitioner Health external link opens in a new window

- CDC: emergency responders - tips for taking care of yourself external link opens in a new window
- SAMHSA (US): disaster preparedness, response, and recovery external link opens in a new window
- Physician support line external link opens in a new window

Considerations for immunocompromised children and young people

The National Institute for Health and Care Excellence (NICE) has published guidelines on the general management of children and young people who are immunocompromised, including those with primary immunodeficiencies, those with secondary or acquired immunodeficiencies from a condition or treatment, and those with chronic disease associated with immune dysfunction.[107]

The guideline says that patients and their parents and carers can be reassured that COVID-19 usually causes a mild, self-limiting illness in children and young people, even in those who are immunocompromised. Patients should not avoid their usual appointments unless they have been told to, as this may be harmful. However, face-to-face contact should be reduced where safely possible and replaced with telephone, video, or email consultations.

Patients can continue with their usual treatment and monitoring at home. When deciding whether to start treatments that affect the immune system, risks and benefits should be discussed with the patient and their carers, considering whether it is safe to delay, if the required monitoring and review can be done, and if there are options that may make hospital attendance less likely. Watchful waiting is recommended if it is deemed safe to delay treatment. Patients already taking treatments that affect the immune response should continue to take them, to minimise risk of graft rejection, a relapse, or flare-up, and should continue to be monitored and reviewed.

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

Safeguarding children and young people

The COVID-19 pandemic presents challenges for the safeguarding of children and young people. There is an increased risk of child abuse, owing to increased stress affecting parents and carers, loss of social contact with friends, teachers, and extended family, loss of financial or caring support from community resources or schools, increased exposure of children to parents or carers with substance misuse disorders, and decreased access to mental health services.[108] One hospital in London, UK, reported a 1493% increase in cases of suspected abusive head trauma among young children in March to April 2020, compared with the same period over the prior 3 years (10 vs. 0.67 cases per month).[109]

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.[108]

The American Academy of Pediatrics (AAP) strongly supports the continued provision of child healthcare during the pandemic, unless community circumstances require necessary adjustments. Well child care should occur in person if possible. If in-person visits are limited, clinicians are encouraged to prioritise in-person newborn care and well visits and immunisation of children up to 2 years of age. Other visits should occur using telehealth, recognising that children will need to attend in person for certain examinations and tests after the pandemic passes.[74] The AAP has also published specific guidance for the care of children and youth with special health care needs during the pandemic, as they are more likely to experience disruption to health care, education, and community life, and some are more likely to experience more severe COVID-19 infection.[110] The International Paediatric Association has also published a position statement providing recommendations on children's healthcare during the pandemic, with guidance on routine care and immunisation, prevention of acquiring and transmitting infection, addressing social isolation and disruption of education, and provision of remote care.[111]

The Royal College of Paediatric and Child Health emphasises that paediatricians should continue to make decisions based on the best interests of the child. The College recognises that redeployment of staff may reduce paediatricians' ability to contribute to multi-agency safeguarding processes and advises that paediatricians should liaise with colleagues in the police and social care to discuss the different levels of support available for vulnerable children, depending on local health resources. Well children and young people should not be admitted to hospital as a place of safety unless there is no alternative. Contingency plans should be made in case the carers of vulnerable children become ill and cannot look after the children in their care or acquire food and medicine.[112]

Further information is available at:

- Prevent Child Abuse America: coronavirus tips & resources for parents, children, educators & others external link opens in a new window
- CDC: child abuse and neglect prevention external link opens in a new window
- Healthychildren.org (AAP): 2019 novel coronavirus (COVID-19) external link opens in a new window
- The Health Foundation: Generation COVID-19: Building the case to protect young people's future health external link opens in a new window

Use of valproate

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

conditions. A remote consultation can be considered based on individual risk assessment if the patient is shielding.[113]

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.[113]

Considerations for cardiac investigations

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

Non-urgent or elective procedures should be postponed. This requires an individual risk assessment and discussion with the patient. In general, electrophysiological procedures that are unlikely to directly impact clinical care or outcomes over the next several months may be considered for deferral. Emergent, urgent, and semi-urgent procedures include those where there is a risk to the patient's life, risk of permanent dysfunction of an extremity or organ system, or risk of severe or rapidly worsening symptoms if the procedure is not performed. Specific examples from each category are discussed in the guidance.[114]

Wherever feasible, clinic visits should be performed using telehealth, and in-person cardiac implantable electronic device checks should be performed remotely. Measures should be taken to protect patients and staff from infection, including social distancing and use of personal protective equipment (PPE).[114]

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.[114]

Guidelines from Australia and New Zealand state that cardiac stress testing and trans-oesophageal echocardiography (TOE) pose significant viral transmission risk. TOE should only be performed if all other investigations have been exhausted, or after exclusion of COVID-19. If TOE is performed, it should be performed in a negative pressure room or with patient intubation and with appropriate PPE.[115] Ambulatory Holter monitoring should be deferred for 1 to 3 months or until the pandemic passes, unless it is expected to detect an arrhythmia that would change management or prevent an emergency department presentation. Requests for Holter monitoring should be triaged. When clinically essential, use of ambulatory monitors that can be mailed to patients should be considered.[116]

Considerations for patients with cardiac implantable electronic devices (CIEDs)

Australian guidelines recommend that remote monitoring is used wherever possible for patients with CIEDs. Routine in-hospital and in-person device interrogations should be deferred where

possible, if the patient has a chronic indication for the device and there is at least 9 months' remaining battery life. Video or telephone consultations should be used where possible. If an in-person visit is essential, the patient should be screened for symptoms of or exposure to COVID-19 prior to the procedure and clinicians should don appropriate PPE. Wireless technology should be used where possible for in-person checks of CIEDs to allow staff to maintain a distance of >1.5 metres from the patient. Implantable cardiac defibrillators (ICDs) cannot be deactivated remotely. If a patient with an ICD is receiving end of life care, the treating clinical team should secure a magnet to the skin over the ICD where possible, rather than using the programmer. Advice is given for device management during magnetic resonance imaging and surgery. Indications for urgent and semi-urgent elective procedures are listed.[116]

Considerations for laparoscopy

Elective laparoscopic surgery is re-starting in the UK for urgent procedures. Initially, surgery should be performed on younger (<70 years) patients with fewer comorbidities, aiming for day or short overnight hospital visits. Steps should be taken to minimise the risk of COVID-19 infection, including: routine testing and self-isolation of patients; use of personal protective equipment; a designated 'clean' area for elective surgery; performance of surgery by senior, trained surgeons; use of a closed circuit smoke evacuation system or ultra-low particulate air filtration system; minimising aerosolisation from port sites (e.g., by selecting the correct port size, careful insertion techniques, and minimising instrument exchanges); contained extraction systems; use of the lowest abdominal insufflation pressure for safe progress; minimal use of energy devices during procedures; and routine closed evacuation of all gas at the end of the procedure, before specimen and port removal.[117]

Considerations for gastrointestinal motility tests

The Asian Neurogastroenterology and Motility Association has produced a position statement based on current available evidence and consensus opinion providing guidance for safe practice of gastrointestinal motility tests during the pandemic.[118] Oesophageal manometry, pH-impedance monitoring, urea breath test and hydrogen/methane breath tests are considered to be high-risk procedures for transmission of COVID-19; anorectal physiology tests and treatment are potentially high-risk procedures. Patients should be triaged; procedures for high-risk patients should be decided by a multi-disciplinary team or postponed. Urgent or time-sensitive procedures may be considered for low-risk patients if there are no alternatives. All elective non-urgent procedures should be postponed.

Considerations for elective surgery

As more elective surgical procedures resume, guidelines are being published advising on how procedures may go ahead while minimising the risk of severe acute respiratory disease coronavirus 2 (SARS-CoV-2) transmission.[119] Considerations include local SARS-CoV-2 prevalence, staffing capabilities, supply of personal protective equipment, and potential impact of delaying surgery. Patients should be screened for SARS-CoV-2 before elective surgery, and surgery should be postponed for any patient with confirmed or suspected infection. Risk of contracting COVID-19 while in hospital, possible scarcity of intensive care or ventilator resources and the importance of advance directives should be discussed as part of the consent process. [120][121][122][123][119][124]

Considerations for patients with eating disorders

Patients with eating disorders may have atypical responses to infections, for example, malnourished patients may not develop fever. Clinicians should discuss the best way to reduce risk of COVID-19 infection and other physical health complications with patients, taking into account the potential impact of the approach on their mental health and eating disorder. Factors to consider when advising patients about shielding include: [125]

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

New symptoms of fatigue or lack of energy should be evaluated, even if temperature and cough are absent. Clinicians should be aware that lockdown measures might exacerbate patients' eating disorder symptoms for many reasons, including anxiety about the pandemic, changes in food availability, exercise restrictions, loss of social support, financial stresses and worry about job and accommodation security and increased alcohol consumption.[125]

Assessment, psychological services and medication reviews should be provided using video consultations wherever possible. Physical examination is an important part of assessment, especially for malnourished patients; clinicians should wear appropriate personal protective equipment. Blood tests and ECGs may be performed in primary or secondary care depending on local arrangements and level of risk. An individual care plan for weighing should be developed depending on whether the patient is cooperative or is likely to falsify their weight.[125]

Measures should be taken to reduce the risk of COVID-19 transmission between patients, including cohort wards for patients with and without confirmed COVID-19, providing single rooms with ensuite facilities for patients who have been advised to take shielding precautions and following national recommendations for infection control precautions.[125]

Further online resources:

- Families Empowered and Supporting Treatment for Eating Disorders (FEAST) Community Pandemic Support. external link opens in a new window
- BEAT (UK Eating Disorder Charity) external link opens in a new window
- National Eating Disorders Association (NEDA) external link opens in a new window

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

Concerns have been raised that diagnosis and treatment of other medical conditions may be delayed during the COVID-19 pandemic. Emergency department attendance in 5 US states decreased by

between 41.5% and 63.5% in early March 2020.[126] One study reported a 42% reduction in hospital admissions, including significant reductions in the number of admissions for stroke, myocardial infarction, heart failure, COPD, and appendicitis.[127] In a primary care study in the UK, diagnosis of physical and mental health conditions between March and May 2020 decreased substantially compared with previous years.[128] Another study reported a 47% decrease in new cases of atrial fibrillation during the first 3 weeks of lockdown in Denmark, compared with the number of cases diagnosed in 2019. The adjusted odds ratio of ischaemic stroke or all-cause mortality during lockdown, compared with the corresponding weeks in 2019, was 1.41 (95% CI 0.93 to 2.12).[129] An analysis of hospital admissions in England found a 40% reduction in weekly acute coronary syndrome admissions between mid-February 2020 and the end of March 2020, compared with 2019 rates; by the end of May 2020, admission rates for acute coronary syndrome were 16% lower than the baseline average.[130] Percutaneous coronary intervention procedures for ST-elevation myocardial infarction in England decreased by 43% in April 2020, compared with average monthly procedures in 2017 to 2019. Overall symptom-to-hospital time and door-to-balloon time increased after the lockdown, but no significant differences in major adverse cardiac events or in-hospital mortality were observed between the pre- and post-lockdown patient groups.[131] A study of acute cardiovascular deaths in England and Wales found an increase in cardiovascular deaths during the pandemic, with most unrelated to COVID-19 infection, and nearly half occuring in the community.[132] In France, admissions for acute myocardial infarction (MI) decreased following the nationwide lockdown.[133] In Sweden, there was a significant decrease in the number of patients with MI who were referred for coronary angiography, but there was no change in mortality.[134] One US study reported a 3 fold increase in symptoms of depression during the COVID-19 pandemic, compared with before the pandemic.[95] In Germany, there was a significant increase in the proportion of children and adolescents with newly diagnosed type 1 diabetes who had diabetic ketoacidosis (DKA) during the COVID-19 pandemic compared with the same months in 2018 and 2019.[135] In Italy, there were 23% fewer new diagnoses of type 1 diabetes between 20 February and 14 April 2020, compared with the same period in 2019, and children presenting with DKA had more severe DKA.[136] A region of the UK reported an increase in the number of new cases of type 1 diabetes in children diagnosed during April and May 2020, compared with the previous 5 years, and over half of the children presented with severe DKA.[137] In the US, incidence of croup, bronchiolitis, and influenza in children decreased significantly after the introduction of social distancing measures, and influenza activity overall in the US is reported to be historically low.[138][139] Weekly incidence of newly identified cancers in the US fell by 46.4% during the pandemic.[140]

In the UK, the Royal College of Paediatrics and Child Health has produced guidance for parents and carers to help them know when and where to access help when their child is unwell or injured, to minimise delays in accessing care during the pandemic.[141]

A study of the potential impact of disruptions in health services for major infectious diseases in low-income and middle-income countries suggested that there could be a substantial increase in HIV, tuberculosis, and malaria deaths in settings with high burdens of those diseases.[142]Maintaining core treatment and prevention services are suggested as a priority to minimise the impact of the pandemic.

Resources

- NICE: COVID-19 external link opens in a new window
- NHS England: coronavirus specialty guides external link opens in a new window
- CDC: Information for healthcare professionals about coronavirus (COVID-19) external link opens in a new window