National guidance for the management of children in hospital with viral respiratory tract infections (2023)

These updated recommendations on the management of children in hospital with viral respiratory tract infections in hospital settings are for clinicians to support planning in partnership with local infection prevention control teams.

While some recommendations describe organisational structures in England, services in the devolved nations are encouraged to adopt them to fit local models.

This guidance is supported by the Infection Prevention Society.

Last modified
24 October 2023

Post date
20 September 2020

Table of contents

Background

This is an update of 2022 National guidance for the management of children in hospital with viral respiratory tract infections.

Sustaining robust infection prevention and control (IPC) processes during periods of high circulation of viral respiratory tract infections is essential to keep patients, parents/carers and staff safe. It is important to learn from our experience during COVID-19 so that we can maintain services and reduce the risk of transmission when faced with surges of RSV, influenza and other respiratory viruses or further waves of new variants of COVID-19. This includes the application of isolation, segregation, mask wearing and testing for respiratory viruses in the urgent and emergency acute unscheduled care pathway to ensure that we reduce the spread of respiratory viruses within inpatient settings.

In the event of a large number of children presenting with viral respiratory tract infections causing bronchiolitis, viral induced wheeze or lower respiratory tract infections, it is important for both IPC and the operational flow of organisations to work collaboratively to ensure the safety of patients and staff, whilst maintaining capacity to provide care.

Updates in this version include:

- Due to measles once again circulating in the UK (Oct 2023), guidance about children presenting with suspected measles has been included.
- The previous RCPCH COVID-19 - guidance for management of children admitted to hospital and for treatment of non-hospitalised children at risk of severe disease has been summarised and amalgamated into this guidance (Appendix 7)
- Amendments have been made to Appendix 5 - Children at highest risk of severe infection

The application of this guidance should always be informed by a situational specific local risk assessment, which organisations will have in place as part of their operational systems of escalation and surge planning.

Download the summary flow chart as an A4 poster below

Principles

- The safety of patients and their families, and staff is paramount.
- Recommendations are to be equitable irrespective of socioeconomic status, ethnicity, or geographic location.
- An evidence-based approach is adopted, recognising that recommendations will evolve with experience.
- The potential respiratory virus status of an infant or child should not affect the initial approach to their assessment and management when they present to a healthcare setting (primary or secondary care). Key features of assessment are oxygenation, hydration and nutrition.
- The hierarchy of controls should be used to identify the most appropriate control measures to help reduce the spread of respiratory pathogens in health and care settings; these are applied in order (See Appendix 1).
- The personal protective equipment (PPE) recommendations within this guidance are based on the principles outlined in the National infection prevention and control manual for England. These principles should be applied in the care of patients with suspected and actual respiratory viruses:
    - Standard Infection Control Precautions (SICP) must be reliably applied by all staff, in all clinical settings, at all times, for all patients. This includes: performing hand hygiene immediately before and after patient contact and before aseptic procedures; selecting the

appropriate PPE for tasks where there is a risk of direct contact with blood or body fluids; removing gloves, aprons/gowns and decontaminating hands between patients and/or between tasks on the same patient; and ensuring equipment is decontaminated or discarded between patients During periods of high prevalence of respiratory viruses, universal masking should also be considered as part of local PPE risk assessment.

- Additional Transmission Based Precautions (TBPs) e.g. use of plastic apron, gown, mask/respirator, eye protection and/or gloves, should be considered based on an assessment of the patient´s symptoms, duration of clinical encounter, proximity to the patient and risk associated with the clinical procedure being performed or if an unacceptable risk of transmission remains following application of the hierarchy of controls.
- Respirator, eye protection, apron (gown if disposable apron provides inadequate cover for the procedure or task being performed) and gloves should be worn during aerosol-generating procedures (AGPs) on children with known or suspected respiratory infection. The respirator must meet the requirements of the individual wearing it i.e. FFP3 fit testing. The definition of AGPs has been amended following a rapid review of AGPs conducted in June 2022. High-flow nasal cannula oxygen (HFNCO) or continuous positive airway pressure (CPAP) are no longer considered AGPs. However, open suctioning beyond the oro-pharynx, such as in children with tracheostomies is still considered an AGP (See Appendix 2). Staff managing children with tracheotomies who are symptomatic for viral respiratory tract infections should wear appropriate PPE (FFP3 and eye/face protection or Respirator/Hood with a visor if the risk assessment suggests a splash is likely) during open suctioning or whilst performing other AGPs.

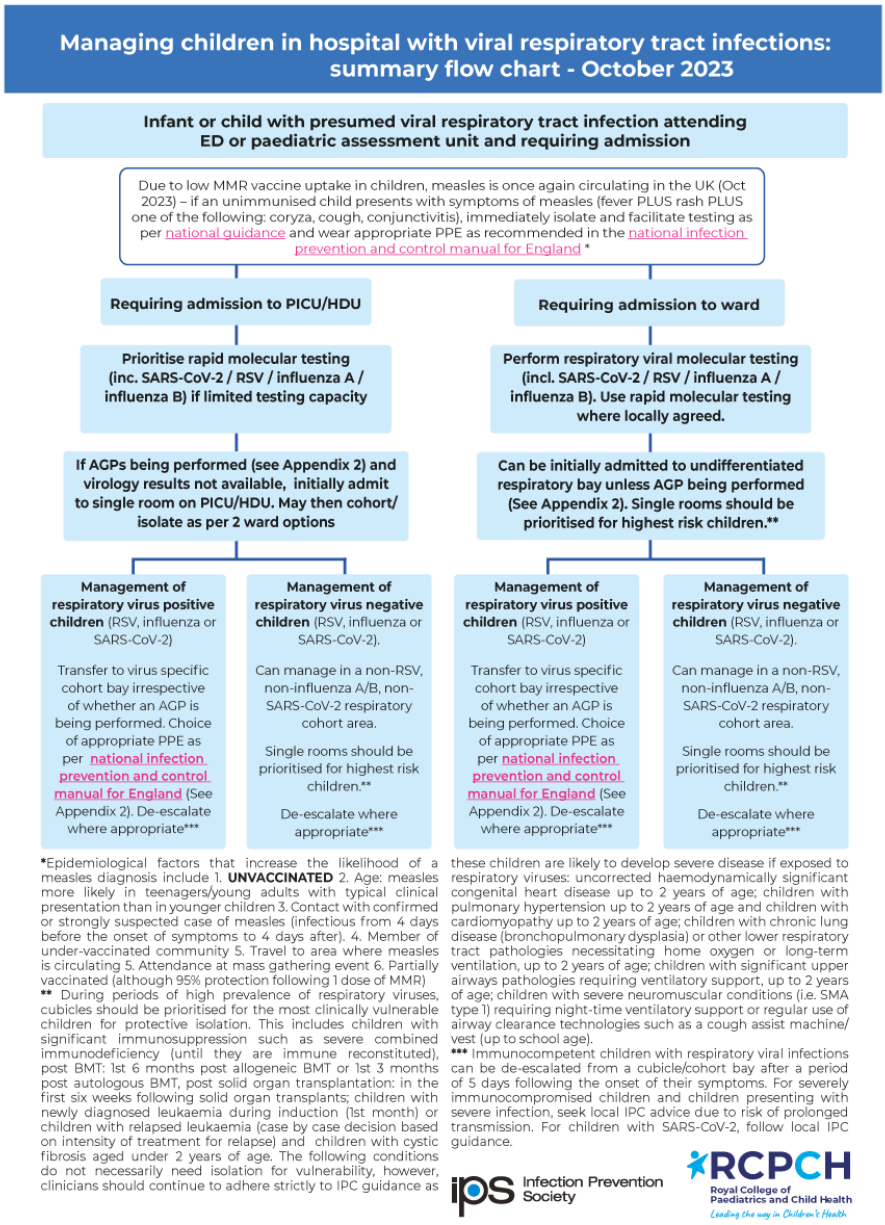
- The environment within which children with viral respiratory tract infections are managed should be compliant with national recommendations. Steps should be taken to reduce the risk of virus transmission in areas that are crowded and/or poorly ventilated. These might include systems for segregating patients who are particularly vulnerable from those who may have infection, reducing the occupancy of the area, enhancing ventilation or adding air cleaners (See Appendix 3). All patient areas, including waiting areas and cohort bays, should have adequate ventilation (minimum 6 air changes per hour) (See Appendix 4).

- Specific measures should be put in place to minimise the risk of exposure to respiratory viruses for children at the highest risk of severe infection from respiratory viruses during periods of high respiratory virus prevalence (See Appendix 5). The aim of such an approach is to reduce the risk of nosocomial infection and subsequent admission to PICU or a prolonged hospital stay:
    - Such patients should be prioritised to a cubicle/single room for protective isolation if possible, although in the event of a cubicle not being the most appropriate place of safety for managing the child, measures should be put in place to minimise the risk of nosocomial transmission (see Appendix 1). In the event of a high risk patient being admitted with a viral respiratory tract infection, a risk assessment should be performed when their test results are available to help decide whether they are subsequently transferred into a virus specific cohort bay or remain in a cubicle.
- Although these recommendations provide guidance on good practice, in the event of single room capacity being exceeded or testing capacity being limited, it may not be possible to adhere to them in their entirety. In this situation, a local risk assessment involving dialogue between paediatricians, IPC staff and microbiology/virology staff needs to be conducted. This local risk assessment needs to be regularly reviewed as cases of viral respiratory tract infections increase significantly. See NHSE criteria for completing a local risk assessment: acute inpatient settings.

Summary flow chart

You can also download this flow chart as an A4 poster below.

Expand to view summary flow chart - updated October 2023



Recommendations - Testing of children with lower respiratory tract infections (including bronchiolitis)

- Routinely, only children requiring admission need to be tested for respiratory viruses in hospital.
- Children being admitted with symptoms consistent with a viral respiratory tract infection should have access to a point of care (POC) molecular test or rapid laboratory based molecular test (SARS-CoV-2 +/- RSV +/- influenza A/B). Children should have parity with adults in terms of access to diagnostic tests. Access to rapid respiratory virus results will facilitate efficient patient flow whilst maintaining robust IPC practices. This requires local negotiation and agreement.

- Very few EDs have sufficient capacity to keep large numbers of children in their department awaiting virology results. Transfer of a child from ED to a short stay or inpatient setting including escalation to critical care units should not be delayed whilst awaiting a test result. However, testing should be performed in ED where possible, and processes should be in place to minimise the turnaround time of results.
- Further respiratory virus testing for a broader range of pathogens should be considered only if it will influence the management of the patient (i.e., facilitate stopping of antibiotics by achieving a definitive diagnosis).

Recommendations - Prior to presentation at hospital

- Integrated care systems spanning the entire urgent care pathway should be in place to ensure children with mild bronchiolitis and lower respiratory tract infections are managed in primary care settings where possible and to reduce the number of infants and children with respiratory symptoms presenting to hospital. Planning should include the implementation of locally appropriate integrated models of care , enabling secondary care clinicians to support primary care colleagues. The expectation should be that children with mild and moderate bronchiolitis or viral induced wheeze are initially reviewed in primary care settings and guidance is provided to parents about when to seek a healthcare consultation. An example of this includes:
    - parent facing resources on difficulty breathing and wheeze.
    - parent facing resources on bronchiolitis
- Examples of clinical pathways supporting the management of children with shortness of breath by clinicians in primary care settings include the following:
    - bronchiolitis pathway (face to face assessment)
    - cough/breathlessness pathway for children aged <2 years (face to face assessment)
    - cough/breathlessness pathway in child <1 year of age (remote assessment)
    - cough/breathlessness pathway in child ≥1 year of age (remote assessment).
- Clinicians should have access to paediatric oxygen saturation monitor probes in primary care settings.

- Uptake with preventive treatment as per national guidance including influenza vaccines and COVID-19 vaccines in children, as well as palivizumab for children aged under 23 months that meet the criteria as specified in the Green Book should be optimised. Children with risk factors for severe influenza outside of the ages of routine immunisation (6 months to 2 years) should be actively identified and influenza vaccination promoted. Due to measles once again circulating in the UK (Oct 2023), immunisation status should be checked on all children presenting to hospital and MMR vaccination promoted for all unimmunised children aged >12 months (including 2nd MMR vaccine in children aged >3 years and 4 months).

Recommendations - Presentation to ED or Paediatric Assessment Area

- There is no evidence to support the practice of separating paediatric emergency departments into hot and cold areas. This is because of the potential of asymptomatic transmission in 'cold' areas; isolation of the most vulnerable children is a far more effective strategy during periods of high prevalence of respiratory viruses.
- Prompt triage of patients and allowing adequate physical distancing, respiratory hygiene and hand hygiene are important for reducing the risk of nosocomial infection. Parents/carers who are symptomatic should be encouraged to wear face coverings. Regular environmental cleaning should be performed according to national standards or if IPC recommendations differ due to new and emerging evidence. A local risk assessment is required.
- During periods of high respiratory virus prevalence, protective isolation should be offered to children at highest risk of severe infection (see Appendix 5) as well as other children routinely requiring protective isolation.
- Due to low MMR vaccine uptake in children, measles is once again circulating in the UK (Oct 2023) – if an unimmunised child presents with symptoms of measles (fever PLUS rash PLUS one of: coryza, cough, conjunctivitis), immediately isolate and facilitate testing as per national guidance and wear appropriate PPE. Epidemiological factors that increase the likelihood of a measles diagnosis include:

1. UNVACCINATED
2. Age: measles more likely in teenagers/young adults with typical clinical presentation than in younger children

3. Contact with confirmed or strongly suspected case of measles (infectious from 4 days before the onset of symptoms to 4 days after).
4. Member of under-vaccinated community
5. Travel to area where measles is circulating
6. Attendance at mass gathering event 6. Partially vaccinated (although 95% protection following 1 dose of MMR)

Recommendations - Admission to paediatric ward / HDU

- Patients with viral respiratory tract infections can be admitted into a respiratory cohort area until their virology results are available. However, children at the highest risk of severe disease (See Appendix 5) should be prioritised to a cubicle (irrespective of symptoms) to reduce the risk of nosocomial infection (these children are also the largest risk for asymptomatic carriage and prolonged viral excretion so isolating them also protects other children from infection). The implementation of a cohort area should be underpinned by a local risk assessment that takes into consideration the hierarchy of controls (see Appendix 1). These include:
    - use of curtains/screens where possible
    - adherence with IPC procedures by parents/carers (use of face covering if symptomatic and daily symptom checks, and complying with hand hygiene)
    - review of ventilation of the bay and mitigation strategies (see Appendix 4). Advice can be sought from the Ventilation Safety Group which is part of the Trust governance structures.
    - environmental cleaning as specified within the National Standards of Healthcare Cleanliness.
- Staff looking after children in this cohort area (or in a cubicle) must apply appropriate transmission based precautions and appropriate Respiratory Protective Equipment (RPE) (surgical face masks unless AGP being performed (see Appendix 2) in which case aerosol PPE is required – as per national IPC manual).
- Once virology results are available, it is best practice to cohort children with the same pathogen to minimise risk of nosocomial infection. If this is not possible, then a documented organisational local risk assessment should be undertaken including the hierarchy of controls to minimise and mitigate the

risk of healthcare associated (nosocomial) infection (see Appendix 1).

- If a child is negative for respiratory viruses (SARS-CoV-2 / RSV/ influenza A and influenza B), they do not need to be managed in a cubicle but ideally be managed in a non-RSV, non-influenza A/B, non-SARS-CoV-2 respiratory cohort area.
- Children at highest risk of severe disease (see Appendix 5), as well as other children routinely requiring protective isolation, should ideally be managed in a cubicle. They should not be admitted to an undifferentiated respiratory bay. If single room capacity is limited, a local risk assessment needs to be conducted. If there are admitted with a viral respiratory tract infection, a risk assessment should be performed when their test results are available to help decide whether they are subsequently transferred into a virus specific cohort bay or remain in a cubicle.
- If high-flow nasal cannula oxygen (HFNCO) is initiated, a clear plan should be in place to promote appropriate weaning (see Appendix 6).
- Children being repatriated to a local hospital from a PICU do not require admission into a cubicle unless AGPs continue to be performed or there are other reasons for source isolation.
- If a child develops new symptoms / signs consistent with a respiratory viral infection during their admission, urgent testing should be undertaken along with review that appropriate transmission-based precautions are in place
- Discharge of children with bronchiolitis from an inpatient setting should be considered when:
    - They are clinically stable
    - They are taking adequate oral fluids
    - They are maintaining oxygen saturation in air at the following levels for 4 hours, including a period of sleep:
        - over 90%, for children aged 6 weeks and over
        - over 92%, for babies under 6 weeks or children of any age with underlying health conditions. (NICE guidance: Bronchiolitis in children (Aug 2021))

Recommendations - Transfer to PICU

- Virology samples should be sent from the referring hospital / ED, where possible. A point of care molecular test or laboratory based rapid molecular test should be performed in the local hospital if routine laboratory results are not available.

- Members of the retrieval team should adhere to appropriate transmission-based precautions / PPE. The decision to wear an FFP3 respirator/hood should be based on clinical risk assessment e.g. task being undertaken, the presenting symptoms, the infectious state of the patient, risk of acquisition and the availability of treatment (see Appendix 3)
- During periods of high viral prevalence and large numbers of children requiring admission to PICU, a child who requires repatriation from PICU to a local hospital should be given priority over an elective admission to facilitate flow of severely unwell children into and out of PICU. Patient placement advice should be provided to the receiving organisation based on the respiratory virus, test results and other pathologies / clinical conditions.

Recommendations - Parents and carers

- Daily symptoms checks should be performed on parents/carers and siblings should not visit if symptomatic.
- Resident carers should not be in the hospital if they have respiratory symptoms. If parents/carers are symptomatic and need to remain in the hospital, they should wear a fluid resistant surgical mask in communal areas including within a cohort bay. Symptomatic parents in cubicles should wear a fluid resistant surgical mask when staff are in the cubicle.
- Education and written information for resident carers should be made available regarding respiratory viruses, local policies, and use of communal facilities, face coverings, hand hygiene, PPE and physical distancing.

De-escalating children with respiratory tract infections admitted to cubicles or cohort bays

Immunocompetent children with respiratory viral infections can be de-escalated from a cubicle/cohort bay after a period of 5 days following the onset of their symptoms.

For severely immunocompromised children and children presenting with severe infection, seek local IPC advice due to risk of prolonged transmission. For children with SARS-CoV-2, follow local IPC guidance.

Guidance on escalating infection control processes

In the event of confirmed outbreaks within paediatric units involving staff, parents or children, escalation of infection control processes may need to be considered including some or all of the following:

- Ensure infection control measures in hospital (e.g., use of face coverings by parents/carers, hand washing) are being actively encouraged.
- Consider limiting visiting to one parent/carer for duration of admission (or swapping weekly) or introducing tighter restrictions on visitors, such as limiting the frequency of changeover of resident parents/carers
- Daily screening of symptoms in resident parents/carers

Additional measures may need to be considered during periods of high local prevalence of respiratory viruses in conjunction with local infection prevention and control teams.

Mitigating risk if these recommendations cannot be met

It is acknowledged that there is considerable variation between hospitals in terms of isolation capacity (single rooms), turnaround times for respiratory virus PCR results and access to respiratory virus panels. This may make it extremely challenging to comply with the recommendations made within this document whilst maintaining flow of patients.

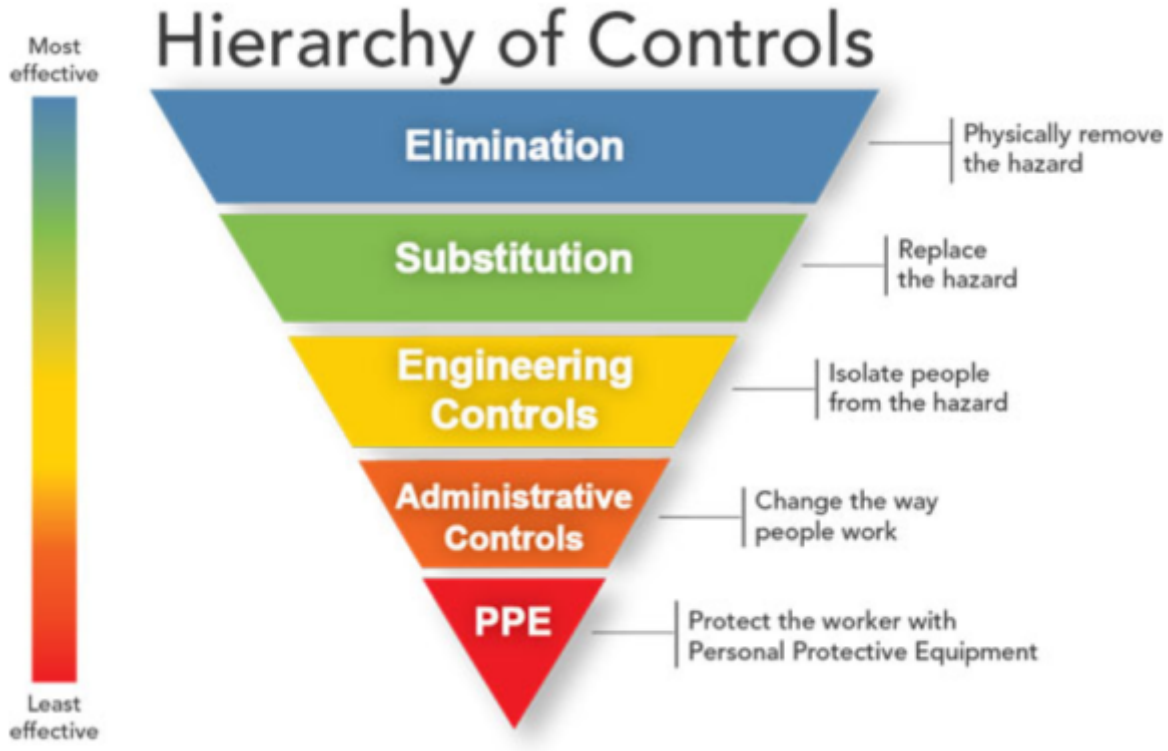
In this situation, a local risk assessment needs to be conducted based on IPC principles, the hierarchy of controls and relative risks (see Appendix 1). Weighing up of various factors including patient factors (extreme vulnerability, continuation of AGPs), staff factors (vulnerability of staff working within cohort areas), geographical factors (ventilation of cohort areas, distance between bed-spaces), respiratory virus prevalence rates and access to testing (turn-around time for respiratory viral PCR testing) is required.

It is recommended that a multidisciplinary approach is adopted (including medical, nursing, operations and IPC teams) in order to collaboratively develop clinical pathways and contingencies based on local risk assessments. This risk assessment needs to be regularly reviewed, especially as the number of respiratory virus admissions increases. In addition, if virology samples are sent to regional virology units, it is recommended that discussions about prioritisation of paediatric samples and access to rapid test results takes place.

Appendix 1: Hierarchy of controls

Expand to view Appendix 1

Controlling exposures is the fundamental method of protecting patients and staff from nosocomial infections. A hierarchy of controls is used as a means of determining how to implement feasible and effective IPC measures:



Appendix 2: Aerosol generating procedures (AGPs)

Expand to view Appendix 2

Aerosol generating procedures (AGPs) are medical procedures that can result in the release of aerosols from the respiratory tract. The criteria for an AGP are a high risk of aerosol generation and increased risk of transmission (from patients with a known or suspected respiratory infection).

The list cited in the National Infection Control Manual includes the following (but local policy may vary):

- awake* bronchoscopy (including awake tracheal intubation)
- manual ventilation via endo-tracheal tube (ETT) or tracheostomy if open circuit- e.g. Ayres T-piece without a filter or NIV via tracheostomy on a

single limb circuit
- awake* ear, nose, and throat (ENT) airway procedures that involve respiratory suctioning
- induction of sputum
- respiratory tract suctioning**
- surgery or post-mortem procedures (like high speed cutting / drilling) likely to produce aerosol from the respiratory tract (upper or lower) or sinuses
- tracheostomy procedures (insertion or removal).

*Awake including 'conscious' sedation (excluding anaesthetised patients with secured airway)

** The available evidence relating to respiratory tract suctioning is associated with ventilation. In line with a precautionary approach, open suctioning of the respiratory tract regardless of association with ventilation has been incorporated into the current (COVID-19) AGP list. It is the consensus view of the UK IPC cell that only open suctioning beyond the oro-pharynx is currently considered an AGP, that is oral/pharyngeal suctioning is not an AGP.

For complete list of AGPs, see NHS England » Aerosol generating procedures & A rapid review of aerosol generating procedures (AGPs). An assessment of the UK AGP list conducted on behalf of the UK IPC Cell. Version 2.0, 7 February 2022

Staff should be fit tested and provided with the appropriate training for the correct use of respiratory protective equipment (RPE). Current guidance is that an FFP3 respirator must be worn by staff when caring for patients with a suspected or confirmed infection spread by the airborne route, when performing AGPs on a patient with a suspected or confirmed infection spread by the droplet or airborne route, and when deemed necessary after risk assessment. It may be necessary to consider the extended use of an FFP3 mask for patient care in specific situations, such as prolonged and close exposures to infectious patients.

Appendix 3: Considerations for minimising transmission of respiratory infections in healthcare settings - standard Infection Control Precautions

(SICPs)

Expand to view Appendix 3

Increasing evidence suggests that many respiratory diseases are spread through the inhalation of particles that carry pathogens that have been released into the air by an infected person. This may be through breathing, coughing, talking or in some cases via an aerosol generating procedure. Particles in the air can be a range of different sizes and can stay in the air from a few seconds to hours depending on their size and the ventilation in a room. Exposure is always riskier at close proximity to an infected person, however there is evidence for transmission when sharing the same room or even between rooms for a number of diseases.

The risk of transmission of airborne respiratory viruses is highest when any of the three C's are present:

- Crowded places
- Close contact
- Confined and enclosed spaces with poor ventilation.

Other factors which affect the risk of transmission are the number of people in the room who are infected, the amount of viruses they are expelling (which may be influenced by the stage of their infection and their behaviour e.g. coughing, talking), the length of time a person is present in the room, and whether the masks are being worn to reduce virus emission and inhalation.

Areas that meet any of the three C's criteria should be identified and steps taken to mitigate the risk of virus transmission especially during periods of high prevalence. These might include establishing systems for segregating patients who are symptomatic or who are known to be infected, reducing the occupancy of spaces to enable people to maintain distance, enhancing ventilation or adding air cleaners, using masks as a source control where possible, and using respiratory protection for all those present in the area who may be susceptible to infection.

Appendix 4: Principles of room ventilation

Expand to view Appendix 4

Ventilation means the process of providing fresh (outdoor) air into a room or building and can be provided by mechanical methods (using fans and ducts) and/or by the passive flow of air through openings (windows, doors, or vents) – known as natural ventilation. Air conditioning is the process of cooling, heating, and humidifying air and although it may be linked to ventilation and provide outdoor air as well as controlling the building environment; in many spaces air conditioners simply recirculate the same air.

The movement of air through indoor spaces helps to reduce the risk of transmission by dispersing and diluting virus particles in the air. Assuming the air in a room is reasonably well mixed, the ventilation rate can be expressed as air changes per hour (ACH) which is equivalent to air flow in m3/hour divided by the room volume (height x width x depth). Ventilation can also be expressed in terms of the amount of air per person, which is normally litres per second per person (l/s/p).

A ventilation rate of at least 6 ACH in general healthcare areas is preferred to minimise the risk of transmission of airborne viruses (NHS England » (HTM 03-01) Specialised ventilation for healthcare buildings). Ventilation rates in source isolation rooms should be 10 ACH under negative pressure. In non-clinical areas such as offices and break rooms at least 10 l/s/p based on normal maximum occupancy is recommended. These can be achieved by either mechanical or passive ventilation in office setting and mechanical ventilation in clinical settings.

- Mechanical ventilation provides more reliable and consistent ACH provided the system is well designed and maintained. Hospital mechanical ventilation systems in UK hospitals should be full fresh air without recirculation; any recirculation should be minimised unless the system is specifically designed with infection control measures (filters or UV disinfection) in place to prevent reintroduction of pathogens via the ventilation system.
- Natural ventilation is less reliable as the airflow rate depends on the weather and it often relies on staff or patients remembering to open windows. It may not be an available option in some rooms, and in cold, windy or wet weather may only be possible for short periods. Opening two or more windows on opposite sides of the room helps to create

cross ventilation and improve dilution and dispersion. Because natural ventilation is determined by the external weather conditions, particularly the wind, it can sometimes create unwanted airflows between rooms. It is not recommended for isolation rooms, ICU or in other settings where patients are known to have an infection that is transmissible via an airborne route or where susceptible patients are very vulnerable.

- Air cleaners (purifiers or scrubbers) are local air circulators which draw air through filters and/or over UVC lamps to remove particles and release clean air. They can be used to enhance ventilation in areas with poor air changes. Devices can be portable plug in units, or semi-permanent devices fixed to walls or ceilings. They should be placed in spaces where ventilation rates are lowest and not close to ducts/grills or opening windows/doors, or where they may be a trip hazard. They should also ideally be at least 1m from the patient. They are most effective when operated using the highest fan speed, but this may generate significant noise. Units should be specified with clean air flow rates, noise, size and maintenance considerations in mind.
- When fans or air conditioners are used, it is critical to ensure that there is also an adequate fresh air ventilation supply, as these devices simply manage comfort and do not provide any ventilation or infection control. Electric fans and recirculating air conditioners to manage thermal comfort can be used during hot periods, but should be used with care. Fans should be easy to clean and not have internal parts which can harbour pathogens. Fans should be positioned so that they don't move air between two rooms or so that they don't move air directly from one person to another. Air conditioning units should also be positioned so they don't create unwanted air paths between people and should be well maintained with regular filter changes.

Useful references/further information for Appendix 4

WHO (2021) Roadmap to improve and ensure good indoor ventilation in the context of COVID-19

Victoria State Government Dept of Health (2022) COVID-19 Ventilation principles and strategies to reduce aerosol transmission in community and workplace settings

NHS Estates Health Technical Memoranda.

NHS England Specialised ventilation for healthcare buildings

EMG and SPI-B: Application of CO2 monitoring as an approach to managing ventilation to mitigate SARS-CoV-2 transmission, 27 May 2021

Estates and Facilities Alert EFA/2019/001 'Portable fans in health care facilities: risk of cross infection' Issued 11 January 2019

Appendix 5: Children at highest risk of severe infection

Expand to view Appendix 5

Children vulnerable to severe disease if infected with respiratory viruses should be prioritised to a cubicle (protective isolation). These include:

- Children with significant immunosuppression such as severe combined immunodeficiency (until they are immune reconstituted), post BMT: 1st 6 months post allogeneic BMT or 1st 3 months post autologous BMT, post solid organ transplantation: in the first six weeks following solid organ transplants; children with newly diagnosed leukaemia during induction (1st month) or children with relapsed leukaemia (case by case decision based on intensity of treatment for relapse).
- Children with cystic fibrosis aged under 2 years of age.

The following conditions do not necessarily need isolation for vulnerability, however, clinicians should continue to adhere strictly to IPC guidance as these children are likely to develop severe disease if exposed to respiratory viruses

- Children with uncorrected haemodynamically significant congenital heart disease up to 2 years of age; children with pulmonary hypertension up to 2 years of age and children with cardiomyopathy up to 2 years of age.
- Children with chronic lung disease (bronchopulmonary dysplasia) or other lower respiratory tract pathologies necessitating home oxygen or long-term ventilation, up to 2 years of age

- Children with significant upper airways pathologies requiring ventilatory support, up to 2 years of age.
- Children with severe neuromuscular conditions (ie SMA type 1) requiring night-time ventilatory support or regular use of airway clearance technologies such as a cough assist machine/vest (up to school age).

Appendix 6: Example guidance on commencing and weaning from HFNCO

Courtesy of North and South Thames Paediatric Networks and retrieval services

Expand to view Appendix 6

Commencing treatment

1. **Select interface and equipment** based on local availability and patient age and weight. Interface size should not exceed 50% of nares. If flow rate according to weight cannot be achieved on the correct interface, then use maximum flow for interface.
2. **On initiation** a competent clinician should observe the patient for comfort and compliance. If necessary the flow can be increased to reach the maximum recommended range according to weight, over a five-minute period.
3. **Titrate FiO2** to maintain SpO2 >92% (or alternative patient range).
4. **Escalate or wean**. To avoid rapid deterioration or unnecessary continuation on HFNCO, review response to HFNCO and follow the escalation or weaning criteria below.

<12 kg	2 l/min/kg
13-15 kg	20-30 l/min
16-30 kg	25-35 l/min
31-50 kg	30-40 l/min
>50 kg	40-50 l/min

Response to treatment

Sustained response to HFNCO Nursing ratio 1:4 or 1L3 <2 years	Response to HFNCO Nursing ratio 1:2 or 1:3 if cohort is ward level	Unresponsive to treatment
Wean FiO2 to 0.3-0.4 (depending on patient)	Moderate respiratory distress continues and/or FiO2>0.4-0.6	In the first hour
THEN Halve the flow rate THEN If no clinical deterioration is seen after 4 hours, HFNCO can be discontinued (or as soon as 1 hour if paediatric consultant confirms) THEN Restart at weaning flow rate if stopping HFNCO is not tolerated	Re-assess essential care considerations** and continue on current HFNCO settings until ready to wean THEN Continue to observe for any deterioration or red flags*	• Re-assess essential care considerations** • Ensure paediatric consultant has reviewed the patient • Discuss with the retrieval service • Discuss/review with the anaesthetic registrar • Closely observe for any red flags* After 2nd hour or with any red flags*: • Consider NIV or invasive mechanical ventilation (IMV) • Prepare patient, team and family for intubation
***Red flags for immediate escalation**		**Immediate reaction**

• Any apnoeic/bradycardic episodes • Increasing respiratory distress after HFNCO commenced • Clinically tiring • The Paediatric Early Warning System (PEWS) indicates immediate escalation to resus team • FiO2 >0.6	• Increase FiO2 to maximum • Call 2222 • Prepare for intubation • Liaise with retrieval team or on-site Level 3 paediatric critical care • Communicate with the family

Monitoring and patient management (with corresponding patient acuity)

- Continuous oxygen saturations (green, amber, red)
- Observation frequency and escalation according to PEWS (green)
- Minimum hourly observations and escalation according to PEWS (amber, red)
- Consider continuous electrocardiogram (ECG) if required (amber, red)
- 2 hourly mouth and nose care including pressure area check (green, amber, red)
- Hourly documentation of FiO2, flow rate, and temperature as well as equipment specific checks (green, amber, red)

** Essential care considerations

- Optimised positioning (e.g. head elevation).
- Consider referral for physiotherapy assessment.
- Secretion clearance if indicated and safe to do so.
- Consider feeding regime alteration according to risk and underlying disease:
    - High risk (red) should be nil by mouth (NBM) with intravenous fluids.
    - Medium risk (amber) should be assessed before feeding and fed with caution.
- Psychosocial support, clear communication, play and distraction.
- Minimal handling / cluster cares.
- Blood gas analysis not essential and acidosis is a late sign of failure.

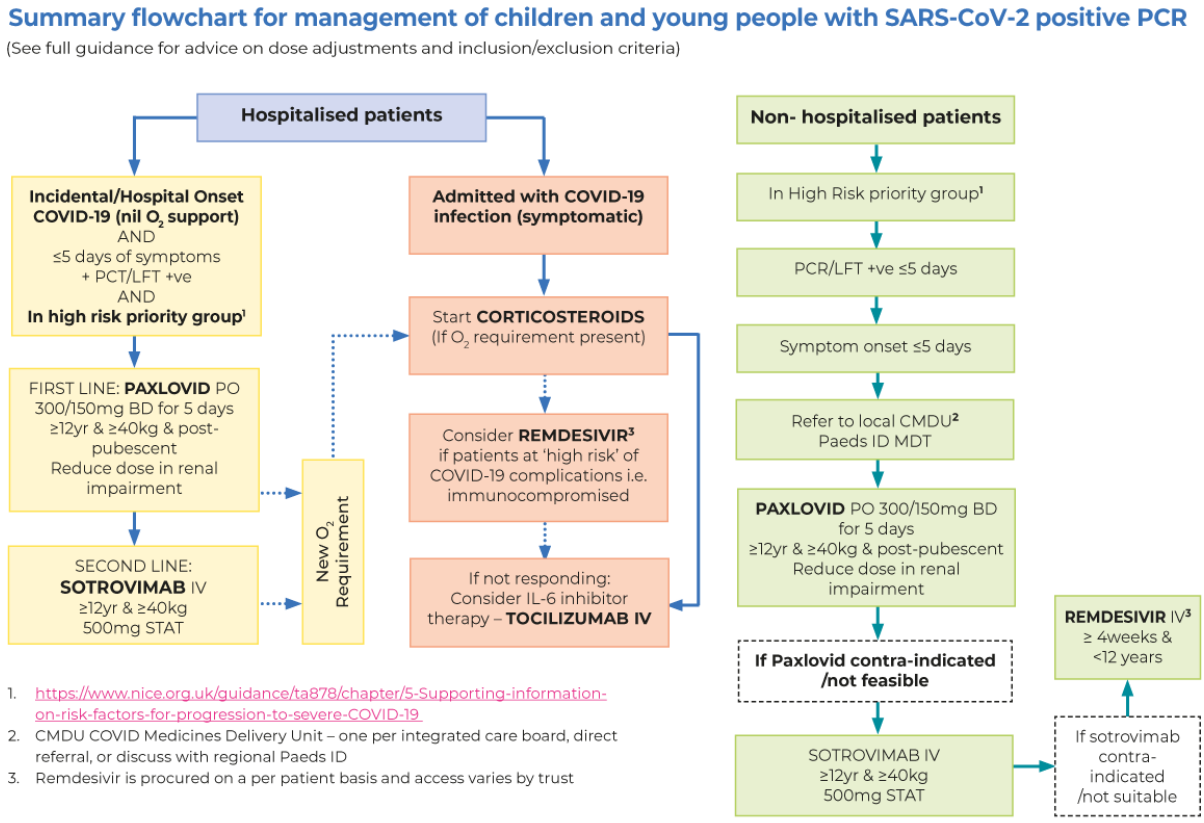
Patient transfer

If patient transfer is required, then a suitable risk assessment tool should be used. Examples include the safe transfer of paediatric patients (STOPP) tool. Where portable HFNCO is not available, a senior clinician should assess the appropriate oxygen delivery based on direct patient assessment.

Appendix 7: SARS-CoV-2 /COVID-19 Treatments

Adapted from the previous RCPCH COVID-19 - guidance for management of children admitted to hospital and for treatment of non-hospitalised children at risk of severe disease

Expand to view Appendix 7 - summary flowchart for management of CYP with SARS-CoV-2 positive PCR



Expand to view Appendix 7 - guidance

Clinical management of patients hospitalised with COVID-19

For children with SARS-CoV-2 infection who present with clinical syndromes that are also associated with other respiratory viruses (e.g. bronchiolitis,

croup, asthma) there is no evidence to suggest that these syndromes should be managed differently when caused by SARS-CoV-2 infection. These treatments are intended for children with pneumonitis secondary to SARS-CoV-2 infection causing significant disease.

Table 1: Treatment criteria and specific therapies for COVID-19. All children should be discussed with the regional paediatric infectious diseases team.
High risk group**

Treatment	Inclusion Criteria	Exclusion Criteria
Corticosteroids Consider dexamethasone IV/PO 150microgram/kg OD for 10 days (or hydrocortisone for neonates)	Requires supplemental oxygen OR sats <94% on room air	
Remdesivir* 5mg/kg loading dose on day 1, followed by 2.5mg/kg once a day for 4 days May be extended to 10 days in immunocompromise	Patients at 'high risk' of complications** in particular immunocompromise >4 weeks of age and at least 3kg Within 10 days of symptoms onset	Not for patients requiring ventilatory support unless high risk** ALT > 5x upper limit of normal < 4 weeks and <3kg
Tocilizumab (IL-6 inhibitor) See dosing table below Only after discussion with paediatric infectious diseases team	Confirmed COVID-19 pneumonitis receiving dexamethasone Within 48 hours of requiring ventilatory support	Likely to have a significant bacterial co-infection ALT >10 times upper limit o normal Neutrophil count <1 x 10^9/L Platelets <50

* Remdesivir is procured on a per patient basis and access varies by trust

** NICE guidance - Supporting information on risk factors for progression to severe COVID-19

Antibiotics

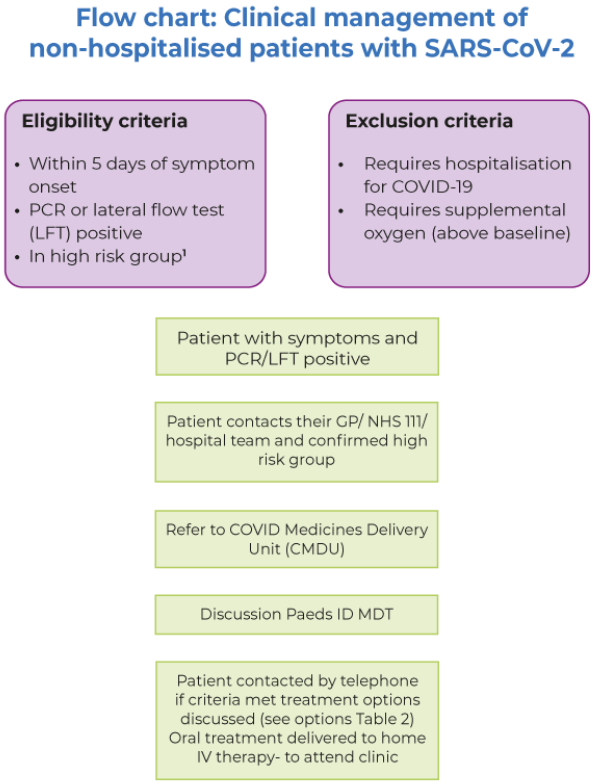
- Follow local guidelines
- Review antibiotics after 48 hours and de-escalate if no focus of bacterial infection.

Clinical management of high risk patients with SARS-CoV-2 infection (incidental/hospital onset and non-hospitalised)

Non-hospitalised patients with SARS-CoV-2

Although high risk patients should have been identified centrally by the NHS and sent information on what to do if they develop symptomatic COVID-19, there may be local definitions in place identifying which children should be considered at high risk of severe COVID-19 infection. NHSE Commissioned therapies are currently limited to patients ≥12 years and ≥40kg. If treatment is being considered, patients may/should be discussed with the regional paediatric ID team on a case-by-case basis.

Patients should be directed to their regional COVID Medicines Delivery Unit (CMDU) for access to the treatments, if eligible. These can be found on their local integrated care board website, eg North West London Integrated Care System.



Prevention of progression of COVID-19 in symptomatic high-risk patients admitted for other reasons and found to be SARS-CoV-2 PCR positive

All patients should be discussed with a regional paediatric infectious diseases team.

Inclusion criteria (must satisfy **all** criteria)

- Hospitalised for indication other than for the management of acute symptoms of COVID-19
- SARS-CoV-2 infection is confirmed by polymerase chain reaction (PCR) test
- **Symptomatic*** with COVID-19 and showing no signs of clinical recovery. NOT on oxygen. *If oxygen required patient moves to ACUTE treatment pathway*
- Patient is high risk **or** COVID-19 infection presents a material risk of destabilising a pre-existing condition or illness or compromising recovery from surgery or other hospital procedure (as determined by MDT assessment)

* fever, sore throat, dry cough, myalgia, GI upset, headache

Treatment options for high risk patients

Table 2: Treatment options to prevent progression in high-risk patients at home or in hospital

Treatment	**Inclusion Criteria**	**Exclusion Criteria**
Paxlovid (Nirmatrelvir +Ritonavir) Prescribe on Bluteq form Nirmatrelvir 300mg plus ritonavir 100mg twice daily for 5 days	• Treatment within 5 days of symptom onset • No history of severe liver or kidney disease • ≥12yrs, ≥40kg, post pubescent	• Symptoms > 5 days • Liver disease (transplant, bilirubin >50) • Significant Drug interactions • <12yrs <40kg pre-pubescent

Remdesivir* 5mg/kg loading dose on day 1, followed by 2.5mg/kg once a day for 2 days	• Treatment within 5 days of symptom onset • No history of liver disease	ALT > 5x upper limit of normal
Sotrovimab 500mg IV once only	• children ≥12 years and ≥40kg • symptom onset within 5 days • treatment with paxlovid or remdesivir contra-indicated or not possible	Age <12yrs or <40kg

*Remdesivir is procured on a per patient basis and access varies by trust

Please see Central Alerting System - coronavirus alerts: 28 November 2022 for further details of policy and commissioning guidance.

Methodology

This guidance was updated in September to October 2023 in consultation with the clinical advisory group.

Clinical advisory group members

- Chair: Dr Sanjay Patel. Paediatric Infectious Diseases Consultant. Southampton Children's Hospital
- Helen Dunn, Consultant Nurse Infection Prevention & Control and Director of Infection Prevention & Control (DIPC), Great Ormond Street Hospital for Children NHS Foundation Trust
- Dr Liz Whittaker, Paediatric Infectious Diseases Consultant, Imperial College Healthcare NHS Trust
- Fiona Hammond, IPC Improvement Lead, National Infection Prevention and Control Team, NHS England
- Carole Fry, Lead for Infection Prevention and Control, UK Health Security Agency

- Dr Beatriz Larru Martinez, Consultant in Paediatric Infectious Diseases and Director of Infection Prevention & Control, Alder Hey Children's NHS Foundation Trust
- Samantha Matthews, National Clinical Lead (Infection Prevention & Control Programme), NHS England
- Sarah Thompson, Consultant microbiologist and Director of Infection Prevention & Control, Sheffield Children's Hospital NHS Foundation Trust
- Professor Jennie Wilson, President, Infection Prevention Society, University of West London
- Dr Conor Doherty, Paediatric Infectious Diseases Consultant, NHS Greater Glasgow & Clyde
- Dr Danielle Eddy, Paediatric Specialty Trainee, Gloucestershire Hospitals NHS Foundation Trust
- Dr Ian Maconochie, Paediatric ED consultant, Imperial College Healthcare NHS Trust
- Dr Ian Sinha, Paediatric Respiratory Consultant, Alder Hey Children’s Hospital
- Dr John Criddle, Paediatric ED Consultant, Evelina London Children's Hospital
- Dr Julian Legg, Lead for Paediatric Respiratory Medicine, Southampton Children’s Hospital
- Dr Matthew Clarke, NHSE National Specialty Advisor for Children and Young People
- Dr Padmanabhan Ramnarayan, PICU Consultant, Imperial College Healthcare NHS Trust
- Dr Paul Randell, Consultant Virologist, Imperial College Healthcare NHS Trust
- Dr Poonamallee Govindaraj, Paediatric Consultant, Cwm Taf Morgannwg University Health Board
- Dr Raymond Nethercott, General Paediatric Consultant and RCPCH Officer for Ireland
- Dr Ruchi Sinha, PICU Consultant, Imperial College Healthcare NHS Trust
- Samantha Matthews, NHSE/I Infection Prevention & Control National Clinical Lead
- Dr Sean O’Riordan, Paediatric Infectious Diseases Consultant, Leeds Children’s Hospital
- Professor Simon Kenny, NHSE National Clinical Director for Children and Young People

Downloads

Managing children in hospital with viral resp tract infections - Flow chart Oct 2023.pdf56.26 KB