

# National guidance for the management of children with bronchiolitis during COVID-19

These recommendations on the management of children with bronchiolitis and respiratory tract infections in hospital settings during COVID-19 are for clinicians to support winter planning in partnership with local infection control prevention teams.

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

## Last modified

18 September 2020

## Post date

18 September 2020

## Table of contents

- [Background](#)
- [Summary flowchart](#)
- [Recommendations - prior to presentation at hospital](#)
- [Recommendations - on presentation to ED or Paediatric Assessment Area](#)
- [Recommendations - on admission to paediatric ward / HDU](#)
- [Recommendations - children being transferred to PICU](#)
- [Recommendations - parents and carers](#)
- [Guidance on escalating infection control processes if regional prevalence rates rise](#)
- [Appendix 1 – Indications and contraindications for HFNCO in children and young people](#)
- [Appendix 2 – Example guidance on commencing and rapid weaning from HFNCO](#)
- [Appendix 3 – PPE requirements based on risk stratification](#)
- [Methodology for developing recommendations](#)
- [Steering group](#)
- [Downloads](#)

## Background

With concerns of a possible second surge of COVID-19 cases this winter, maintaining robust

infection control processes is essential to keep patients, parents/carers and staff safe.

However, it is also necessary to ensure that the flow of patients through the hospital is maintained during the winter period - when it is predicted that demand for paediatric services will increase significantly and the onset of the bronchiolitis/respiratory virus season will place services under considerable pressure.

## 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. No child should be left behind as a consequence of these recommendations.
- The potential COVID-19 status of an infant or child should not affect the initial assessment and management of an infant or child when they present to a healthcare setting. Key features of assessment are oxygenation, hydration and nutrition. If commencement of high flow nasal cannula oxygen (HFNCO) is being considered, a senior decision maker should be involved.
- An evidence-based approach is adopted, recognising recommendations will evolve with experience.
- Recommendations should vary in line with current regional COVID-19 prevalence rates (see [table 1](#) and [table 2](#)).
- The PPE (personal protective equipment) recommendations within this guidance are based on the principles outlined in the [PHE COVID-19 infection prevention and control guidance and care pathways](#) (see [Appendix 3](#)). A testing based approach, including isolation of all high-risk / red patients on admission and repeat testing of low-risk / green children remaining in hospital, enables most children presenting with respiratory tract symptoms to be designated to a low-risk / green pathway.
- Recommendations have been reviewed and accepted by the NHS England/Improvement Infection Prevention & Control cell.

## Aerosol generating procedures (AGP)

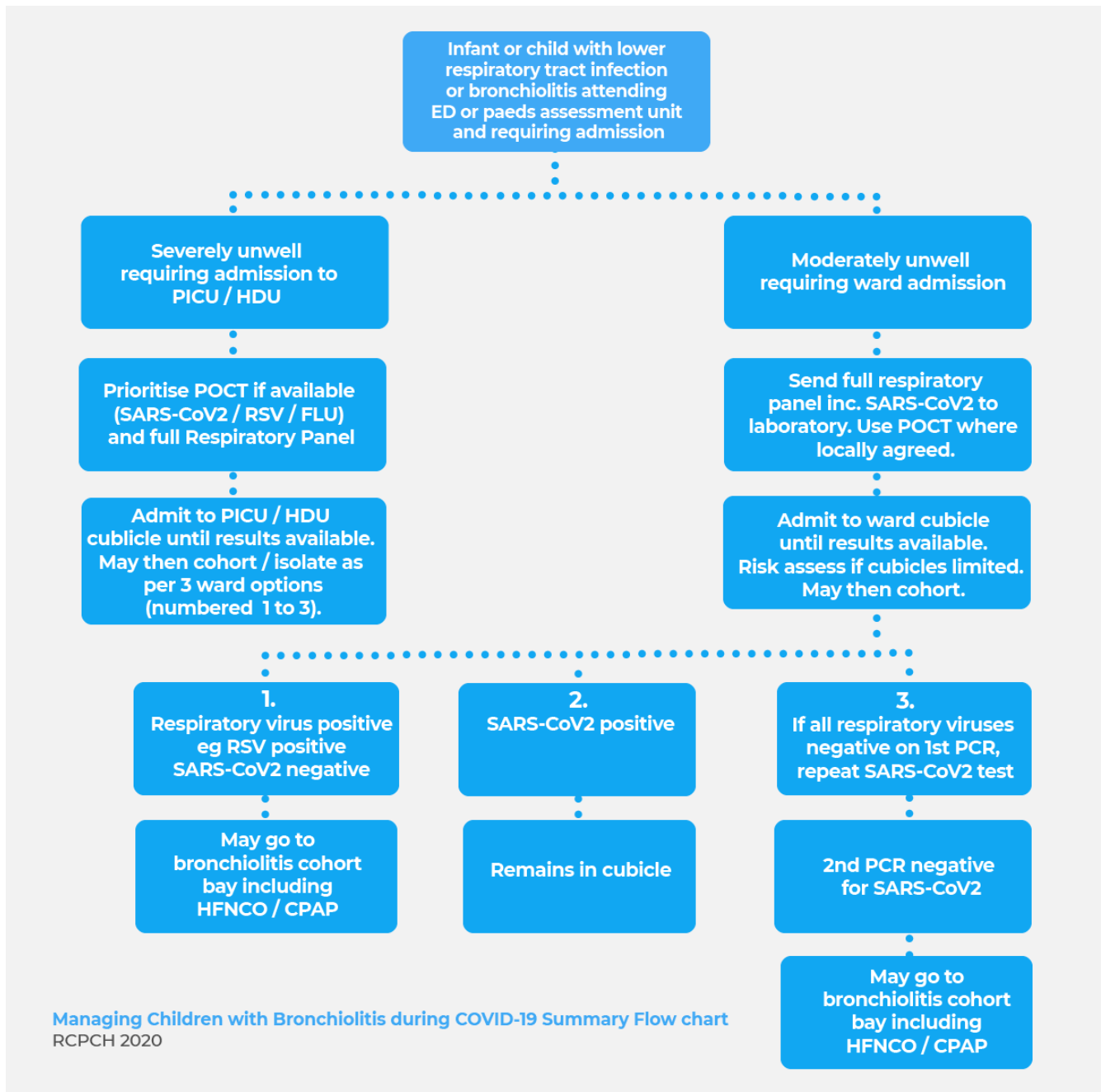
As per [guidance from Public Health England](#), AGPs include:

- tracheal intubation and extubation
- manual ventilation
- tracheotomy or tracheostomy procedures (insertion or removal)
- bronchoscopy
- dental procedures (using high speed devices, for example ultrasonic scalers/high speed drills)
- non-invasive ventilation (NIV), Bi-level Positive Airway Pressure Ventilation (BiPAP) and Continuous Positive Airway Pressure Ventilation (CPAP)
- high flow nasal oxygen (HFNO)
- high frequency oscillatory ventilation (HFOV)
- induction of sputum using nebulised saline
- respiratory tract suctioning
- upper ENT airway procedures that involve respiratory suctioning
- upper gastro-intestinal endoscopy where open suction of the upper respiratory tract occurs

- high speed cutting in surgery/post-mortem procedures if respiratory tract/paranasal sinuses involved.

The delivery of oxygen via HFNCO is an AGP and needs to be carefully overseen to minimise the risk of nosocomial infection.

## Summary flowchart



### Abbreviations

- ED – Emergency Department
- POCT – Point of care testing
- PICU - Paediatric Intensive Care Unit
- HDU - High Dependency Unit

## Notes

- Staff must use appropriate PPE according to level of risk – high-risk / low-risk (See [Appendix 3](#)).
- Transfers to wards / PICU / other hospitals for PICU should be expedited as rapidly as possible to facilitate patient flow.
- Urgent review by a senior clinician is recommended before commencement of HFNCO / CPAP (see [Appendix 1](#)).
- Where children require AGPs (HFNCO / CPAP, etc.), rapid weaning protocols are followed to minimise exposure to aerosols (see [Appendix 2](#)).

You can also [download this flowchart as a poster below](#).

## 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. Winter planning should include the implementation of locally appropriate [models of care](#) enabling secondary care clinicians to support primary care colleagues. The expectation should be that children with mild and moderate bronchiolitis or lower respiratory tract infection are initially reviewed in primary care settings.
- 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 in child <1 year of age \(remote assessment\)](#)
  - [cough/ breathlessness pathway in child ≥1 year of age \(remote assessment\)](#)
- Access to paediatric oxygen saturation monitor probes in primary care should be prioritised.
- Optimise preventive treatment including [influenza vaccines](#) in children and [palivizumab](#) for children aged under 23 months that meet the criteria as specified in the Green Book. Children with risk factors for severe influenza outside of the ages of routine immunisation (2-12 years) should be actively identified and influenza vaccination promoted.

## Recommendations - on presentation to ED or Paediatric Assessment Area

- Environment - although separate red/blue areas are likely to remain in place this winter for both adults and children, these areas can be combined within one paediatric ED footprint if isolation facilities allow. If such a model is adopted, it is important to ensure that protective isolation can also be offered to [RCPCH-defined clinically extremely vulnerable \(CEV\) children](#) as well as other children routinely requiring protective isolation.
- Waiting areas should be organised to minimise the risk of nosocomial infection, by allowing adequate physical distancing, respiratory hygiene and hand hygiene. Adherence with face coverings as appropriate should be monitored and regular

environmental cleaning performed according to national standards. A local risk assessment is required.

## Testing of children with respiratory tract infections (including bronchiolitis)

- Only children requiring admission need to be tested for SARS-CoV2 in hospital.
- Capacity for performing rapid testing is currently extremely limited and this may remain the case over the winter. If a point of care testing platform is available (SARS-CoV2 +/- RSV +/- influenza), local protocols should be followed and use should be prioritised for children who will most benefit from a rapid result (eg for PICU / HDU admission or surgery. Use can be considered in children requiring HFNCO / CPAP and where inpatient cubicle capacity is severely restricted.
- 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 an inpatient setting should not be delayed while awaiting a test result. However, testing should be performed in ED and processes should be in place to minimise the turnaround time of results. This is essential in order to step down patients from inpatient cubicles, enabling flow of children from ED.

## AGPs (such as commencement of HFNCO or CPAP)

- AGPs should only be performed or initiated when clinically indicated (see [Appendix 1](#)). A senior decision maker should be involved if commencement of HFNCO / CPAP is being considered. In addition, the infection control implications of transferring a child on HFNCO need to be considered. If starting HFNCO is unavoidable prior to transfer to an in-patient setting, a point of care test result may be useful.
- The child must be managed in an appropriate isolation area by staff wearing the PPE for level of risk – see [Appendix 3](#). A local risk assessment of these isolation areas is recommended.
- Procedures with no good evidence supporting their use should be minimised. Such procedures include administering nebulisers or hypertonic saline to infants with bronchiolitis.

## Recommendations - on admission to paediatric ward / HDU

- All children with respiratory tract infections need to be admitted into a cubicle until their virology results are available.
- If the patient has a non-SARS-CoV2 pathogen identified which is consistent with their clinical phenotype, they can be moved into a bronchiolitis bay. Care needs to be taken with pathogens such as rhinovirus and bocavirus, which may be identified but may not be responsible for the clinical presentation. In addition, a risk assessment on the whole household needs to be conducted in terms of recent symptoms consistent with COVID-19 in parents/carers such as fever, prolonged cough and loss of smell/taste. If present, consider an urgent second SARS-CoV2 test before moving the child to a bronchiolitis bay.
- [RCPCH-defined clinically extremely vulnerable \(CEV\) children](#), as well as other children routinely requiring protective isolation, should not be managed in a

bronchiolitis bay irrespective of their virology results. If cubicle capacity is limited, a risk assessment needs to be conducted.

- If a child is negative for all viruses (including COVID-19), a second SARS-CoV2 test should be considered before moving the child into a cohort bay. This is especially important if the child is on HFNCO / requiring AGPs. There is no need to delay performing this second test.
- Children who are confirmed to be SARS-CoV2 negative can be managed in a cohort bay unless they require protective isolation. It is best practice to cohort children with the same pathogen if this is not possible due to, for example, bed pressures then an organisational risk assessment should be undertaken and IPC (Infection Prevention and Control) precautions must be maintained to minimise the risk of nosocomial infection. These include adherence with hand hygiene, PPE and environmental cleaning.
- Airborne precautions are **not** required for AGPs on patients/individuals in the low-risk COVID-19 pathway, providing the patient has no other infectious agent transmitted via the droplet or airborne route ([Appendix 3](#)).
- In order to enable a low-risk / green status to be maintained on a child remaining in hospital, weekly SARS-CoV2 testing should be performed or if further symptoms are identified.
- If a child is positive for SARS-CoV2, they should be isolated in a single room applying the correct PPE (droplet / airborne) in accordance with care / procedures being performed as per the high-risk pathway. If AGPs are performed on a SARS-CoV2 positive patient, they should be managed using transmission-based precautions ensuring safe systems of work are in place for donning and doffing PPE.
- If HFNCO is initiated, a clear plan should be in place to promote rapid weaning (see [Appendix 2](#)).
- Discharge of infants with bronchiolitis from an inpatient setting should be considered if oxygen saturations in room air is  $\geq 90\%$  and no other clinical or social indications for continued admission<sup>1</sup>.
- Discharge from hospital should not be delayed if the SARS-CoV2 result is not available. The child and family can continue to isolate at home until the result is available.

## Recommendations - children being transferred to PICU

- Virology samples should be sent from the referring hospital / ED, where possible. Consider point of care test if routine laboratory results not available. If local testing identifies a viral pathogen and negative for SARS-CoV2, it may avoid unnecessary admission into a cubicle on PICU.
- The principles outlined in the [above recommendations on admission to paediatric ward / HDU](#) apply to children moving from cubicles on PICU to cohort areas on PICU.
- Members of the retrieval team should wear PPE as per level of risk (see [Appendix 3](#)).
- Airborne precautions are **not** required for AGPs on patients/individuals in the low-risk COVID-19 pathway, providing the patient has no other infectious agent transmitted via the droplet or airborne route.
- If the patient is positive for SARS-CoV2, they should be managed in a designated COVID (high-risk pathway) area and staff must wear the appropriate PPE (see [Appendix 3](#)).
- 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. If a child has had a negative COVID-19 swab in the preceding 7 days, they do not require placement in a cubicle unless there is a separate indication for source or protective isolation.

## Recommendations - parents and carers

- Resident carers should **not** be in the hospital if they have symptoms of COVID-19. If both parents /carers are symptomatic, SARS-CoV2 testing may be considered and a local risk assessment conducted.
- All resident carers should wear a face covering while in hospital if away from their bed-space. Variations in local policy should be taken into account.
- Resident carers should be minimised as far as possible, with ideally one accompanying each child. When children require an inpatient stay, local policy should be followed. Limiting changeover between named carers from different households should be considered. Ideally, resident carers should not have a co-morbidity which places them in a high-risk category.
- Education and written information for resident carers should be made available regarding local policies to include: use of communal facilities, face coverings, hand hygiene, PPE and social distancing.

## Guidance on escalating infection control processes if regional prevalence rates rise

**Regional prevalence rate data are provided by the Public Health England (PHE) modelling team to the Paediatric Critical Care Operational Delivery Networks (ODNs) on a weekly basis. It is the recommendation of PHE that regional prevalence data are used rather than local rolling period incidence data.**

The dynamics of epidemics are such that it is very unlikely to get a highly discordant local prevalence versus regional prevalence; this is the rationale for basing decision on regional prevalence data. It is expected that low rates of regional prevalence will be maintained throughout the winter. The PHE modelling team will continue to look at local issues and in the event of an unusual localised threat will report it as an exception to the network.

**Table 1**

**Escalation of infection control processes according to regional prevalence rates of COVID-19 during the pandemic**

Low rates	Moderate rates	High rates
Prevalence < 0.5%	Prevalence ≤ 0.5%, but 2%	Prevalence ≥ 22%

Low rates	Moderate rates	High rates
Follow guidance within this document	<p>Watch situation closely, including doubling time / growth rates, to judge whether local situation is worsening</p> <p>Ensure infection control measures in hospital (eg use of face covering by parents, hand washing) are being actively audited</p> <p>Consider limiting visiting to one parent/carer for duration of admission (or swapping weekly)</p>	<p>Consider escalation of infection control processes including some or all of the following:</p> <ul style="list-style-type: none"> <li>• Weekly (or twice weekly) COVID-19 testing of children undergoing AGPs</li> <li>• Mandate aerosol PPE for all staff managing <b>low-risk</b> patients undergoing AGPs</li> <li>• Tighter restrictions on visitors, such as limiting frequency of changeover of parent/resident carer, or limiting carers to one resident parent for the entire stay</li> <li>• Testing of parents / resident carers on admission and regularly during admission</li> <li>• Regular testing of staff</li> </ul>

**Table 2**

**Temporal changes in prevalence of COVID-19 during the pandemic**

The table below shows how prevalence has changed between the initial peak, 23 March 2020, and 1 September 2020.???????

Location	Prevalence (Mean,95% CI)				
	29/03/20	29/04/20	29/05/20	29/06/20	29/07/20
England	3.7% (3.1-4.8)	0.4% (0.3-0.5)	0.2% (0.2-0.3)	0.1% (0.1-0.1)	0.07% (0.05-0.08)
North East & Yorkshire	2.5% (2.0-3.3)	0.6% (0.5-0.8)	0.2% (0.2-0.3)	0.1% (0.1-0.1)	0.07% (0.05-0.10)
North West	3.8% (3.0-4.9)	0.6% (0.4-0.7)	0.3% (0.3-0.4)	0.1% (0.1-0.2)	0.11% (0.08-0.14)



	Prevalence (Mean,95% CI)				
Midlands	3.5% (2.8-3.5)	0.5% (0.4-0.7)	0.2% (0.2-0.3)	0.1% (0.1-0.1)	0.06% (0.05-0.09)
East of England	3.0% (2.4-3.9)	0.4% (0.3-0.6)	0.2% (0.1-0.2)	0.1% (0.1-0.1)	0.05% (0.04-0.07)
London	9.0% (7.3-11.6)	0.3% (0.2-0.4)	0.2% (0.1-0.3)	0.1% (0.1-0.2)	0.07% (0.05-0.010)
South East	2.2% (1.8-2.9)	0.3% (0.3-0.4)	0.2% (0.1-0.2)	0.1% (0.1-0.1)	0.06% (0.04-0.08)
South West	1.1% (0.9-1.5)	0.2% (0.1-0.2)	0.1% (0.1-0.1)	0.03% (0.0-0.0)	0.03% (0.02-0.04)

## Appendix 1 – Indications and contraindications for HFNCO in children and young people

Courtesy of North and South Thames Paediatric Networks and retrieval services

Indications (not exhaustive)	Contraindications	Cautions
<ul style="list-style-type: none"> <li>• High oxygen requirement</li> <li>• Signs of respiratory distress</li> <li>• Post extubation if clinically infected</li> </ul>	<ul style="list-style-type: none"> <li>• Nasal obstruction or craniofacial abnormalities</li> <li>• Trauma/surgery to nasopharynx</li> <li>• Recurrent apnoeas</li> <li>• Respiratory arrest or peri-arrest state</li> <li>• Undrained pneumothorax</li> </ul>	<ul style="list-style-type: none"> <li>• Drained pneumothorax</li> <li>• Upper airway obstruction</li> </ul>

## Appendix 2 – Example guidance on commencing and rapid weaning from HFNCO

## Commencing treatment

1. **Select interface and equipment** based on local availability and patient age and weight.  
 Note: Interface size should not exceed 50% of nares. If flow rate below cannot be achieved on correct interface then use maximum flow for interface.
2. **On initiation** a competent clinician should observe patient for comfort and compliance. If necessary the flow can be increased to reach recommended range below over a five-minute period.
3. **Titrate FiO2** to maintain SpO<sub>2</sub> ≥ 92 (or alternative patient range).
4. **Escalate or wean.** To avoid rapid deterioration or unnecessary continuation on HHHFT, review response to HHHFT and follow 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 HHHFT Nursing ratio 1:4 or 1:3 < 2 years	Response to HHHFT Nursing ratio 1:2 or 1:3 if cohort is ward level	Unresponsive
Wean FiO <sub>2</sub> to 0.3-0.4 (depending on patient)	Moderate respiratory distress continues and/or FiO <sub>2</sub> > 0.40-0.6	In the first hour

Sustained response to HHHFT Nursing ratio 1:4 or 1:3 < 2 years	Response to HHHFT Nursing ratio 1:2 or 1:3 if cohort is ward level	Unresponsive
<p>THEN</p> <p>Halve the flow rate</p> <p>THEN</p> <p>If no clinical deterioration is seen after 4 hours HHHFT (heated humidified high flow therapy) can be discontinued (or as soon as 1 hour if paediatric consultant confirms)</p> <p>THEN</p> <p>Restart at weaning flow rate if stopping HHHFT not tolerated</p>	<p>Re-assess ECC's** and continue on current HHHFT (heated humidified high flow therapy) setting</p> <p>THEN</p> <p>Continue to observe for any deterioration or red flags*</p>	<ul style="list-style-type: none"> <li>• Re-assess</li> <li>• Ensure p reviewed</li> <li>• Discussi</li> <li>• Discussi anaesthe</li> <li>• Closely c</li> <li>• After 2nc</li> <li>• Consider ventilatio mandato</li> <li>• Prepare for intuba</li> </ul>

* Red flags for immediate escalation	Immediate reaction
<ul style="list-style-type: none"> <li>• Any apnoeic/bradycardic episodes</li> <li>• Increasing respiratory distress after HHHFT commenced</li> <li>• Clinically tiring</li> <li>• PEWS indicates immediate escalation to resus team</li> <li>• FiO2 &gt;0.60</li> </ul>	<ul style="list-style-type: none"> <li>• Increase FiO2 to max</li> <li>• Call 222</li> <li>• Prepare for intubation</li> <li>• Liaise with retrieval team or on site Level 3 paediatric critical care</li> <li>• Communicate with the family</li> </ul>

## Monitoring and patient management

(with corresponding patient acuity)

- Continuous oxygen saturations (green, amber, red)
- Observation frequency and escalation according to PEWS (green)
- Min hourly observations and escalation according to PEWS (amber, red)
- Consider continuous 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 (ECCs)**

- Optimised positioning (eg 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 NBM (nil by mouth) with IV 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 a late sign of failure

## **Patient transfer**

If patient transfer is required then a suitable risk assessment tool such as the STOPP tool should be used. Where portable HHHFT is not available a senior clinician should assess the appropriate oxygen delivery based on direct patient assessment.

## **Appendix 3 – PPE requirements based on risk stratification**

Adapted from [guidance issued jointly by the Department of Health and Social Care \(DHSC\), Public Health Wales \(PHW\), Public Health Agency \(PHA\) Northern Ireland, Health Protection Scotland \(HPS\)/National Services Scotland, Public Health England \(PHE\) and NHS England on 20/08/2020](#)

Amber pathways are not included as children presenting with respiratory tract symptoms will either be designated to the high-risk / red pathway at presentation awaiting test results / following a positive SARS-CoV2 test or a low-risk / green pathway if SARS-CoV2 has been excluded.

<b>High=risk</b>	<b>Low-risk</b>
Confirmed SARS-CoV2 (COVID-19) positive individuals OR symptomatic or suspected COVID-19 individuals including those with a history of contact with a COVID-19 case, awaiting test results	SARS-CoV2 excluded following testing

High=risk	Low-risk
<p>Droplet/contact PPE if contact with suspected/confirmed COVID-19 patient/individual:</p> <ul style="list-style-type: none"> <li>• single use disposable gloves</li> <li>• single use disposable apron (gown if risk of spraying / splashing)</li> <li>• FRSM Type IIR face mask for direct patient care</li> <li>• single use or re-usable eye/face protection (visor)</li> </ul> <p>Airborne PPE* when undertaking AGPs on confirmed or suspected COVID-19 patients/individuals:</p> <ul style="list-style-type: none"> <li>• single use disposable gloves</li> <li>• single use disposable gown</li> <li>• FFP3 or Hood for AGPs</li> <li>• single use or re-usable eye/face protection (visor)</li> </ul>	<p>PPE** if contact with blood and/or body fluids is anticipated (all settings/all patients/individuals):</p> <ul style="list-style-type: none"> <li>• single use disposable gloves</li> <li>• single use disposable apron (gown if risk of spraying / splashing)</li> <li>• surgical mask Type II for extended use. FRSM Type IIR for direct patient care</li> <li>• risk assess and use eye/face protection(visor) if required for care procedure / task where anticipated blood / body fluids spraying / splashes</li> </ul>

\* Extended use of facemasks in England/Scotland for HCW when in any healthcare facility

\*\*Airborne precautions are **not** required for AGPs on patients/individuals in the low-risk / green COVID-19 pathway.

## Methodology for developing recommendations

Key stakeholders representing national groups (Royal College of Paediatrics and Child Health, British Paediatric Respiratory Society, Association of Paediatric Emergency Medicine, Paediatric Intensive Care Society, British Paediatric Allergy Immunity & Infection Group, NHSE/I Infection Prevention & Control Cell), and professional groups (paediatric infectious diseases, infection control, virology, general paediatrics, PICU) were identified to support the development of these recommendations.

The group met virtually on 21 August 2020 and again on 3 September 2020. Each step in the patient pathway was discussed systematically by the group, in terms of place of admission / patient flow, virus testing, PPE requirements and use of HFNCO, prior to developing consensus recommendations.

Final consultation included executive committees from all national groups mentioned above. Publication was approved by the RCPCH Winter Pressures Clinical Advisory Group and Senior Officers.

# Steering group

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- Dr Liz Whittaker, Paediatric Infectious Diseases Consultant, Imperial College Healthcare NHS Trust
- [1](#). Cunningham S, Rodriguez A, Adams T, et al. Oxygen saturation targets in infants with bronchiolitis (BIDS): a double-blind, randomised, equivalence trial. *Lancet*. 2015;386(9998):1041-1048. doi:10.1016/S0140-6736(15)00163-4

## Downloads

[Managing children with bronchiolitis during COVID-19 flowchart summary](#) 305.32 KB