



British Paediatric Respiratory Society Guidance for management of children with tracheostomies and those on long-term ventilation during the endemic phase of the coronavirus (COVID-19) pandemic

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This BPRS guidance has the support of the Royal College of Paediatrics and Child Health (RCPCH).

Introduction

This clinical and operational guidance is for clinical teams managing children and young people in the following groups:

1. On long-term ventilation (LTV) both at home, some of whom are supported by a home-based care package, and also those awaiting discharge on long term ventilation units.
2. Children with tracheostomies who do not require ventilation some of whom may have care packages.

It supports management decisions for this patient group all of whom should undergo individual risk assessments during periods of health and also when they are unwell and require acute admission.

It provides advice on access to schools, respite and outpatient departments when the child is well without any suspicion of COVID-19.

It does not cover patients requiring ventilation support at home for conditions that do not generally require a package of care, such as otherwise healthy children on CPAP for simple obstructive sleep apnoea syndrome.

This operational guidance aims to:

- Maintain safety of children on home LTV.
- Maintain safety of care staff looking after children on LTV.
- Limit exposure of children, parents and carers to risk of SARS-CoV-2 infection.
- Create solutions to manage children on home LTV if a care package is at risk.
- Create local pathways for escalation of care if a child on home LTV is unwell.
- Ensure children can access outpatient clinical services, education, respite and social activities safely.

Well children not suspected of having COVID-19

PPE requirements and management of aerosol generating procedures (AGPs)

- Well children on LTV units across the UK have been managed using droplet PPE for AGPs without evidence of cross-infection.
- Where prevalence is low (<0.5%) we recommend that asymptomatic children on LTV or with tracheostomies can be cared for safely using droplet PPE following correct risk assessment. This includes care during AGPs if a child is well, including within the school setting. This is similar to the approach outlined by PHE in guidance on AGPs in low risk patients in healthcare settings.¹
- The advice on use of droplet PPE for AGPs in well children not suspected of having COVID-19 is relevant where the regional general population prevalence is low to moderate (either <0.5% or ≥0.5% – <2%).

¹ Public Health England. COVID-19: Guidance for the remobilisation of services within health and care settings: infection prevention and control recommendations. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/910885/COVID-19_infection_prevention_and_control_guidance_FINAL_PDF_20082020.pdf

- In hospitals, when prevalence is $\geq 2\%$ or where there are additional concerns (such as rapid doubling rate or other reasons to consider prevalence is rapidly increasing) use of aerosol PPE for AGPs is recommended.² Other settings would be expected to use aerosol PPE for AGPs when prevalence rates rise above 2%.
- Individual risk assessments should take place on a case by case basis for children at particularly high risk of generating aerosols for example a child who self ventilates with a tracheostomy has numerous secretions and does not tolerate a viral filter or TrachPhone.
- Pragmatic steps to also reduce AGPs where possible should be taken these include
 - Use of viral filters for tracheostomy patients or TrachPhone for children that require regular suctioning as suctioning can be administered through the TrachPhone without disconnection of the filter
 - For non-invasive ventilation use of well-fitting masks
 - Simple tracheostomy bibs.
- Additional reassurance could be obtained by regular individual screening.

Definition of AGPs

- AGPs may increase the risk of environmental viral contamination, and include the following³
 - Intubation
 - Facemask ventilation without a good seal
 - Use of cough assist machine
 - Lower respiratory tract suctioning
 - Circuit disconnection.
- The following are **not** deemed AGPs:

² Further discussion of escalation of infection control processes if regional prevalence rates rise is available in *National guidance for the management of children with bronchiolitis and lower respiratory tract infections during COVID-19*. Available at: <https://www.rcpch.ac.uk/resources/national-guidance-management-children-bronchiolitis-during-covid-19#guidance-on-escalating-infection-control-processes-if-regional-prevalence-rates-rise>

³ Public Health England. COVID-19: Guidance for the remobilisation of services within health and care settings Infection prevention and control recommendations. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/910885/COVID-19_Infection_prevention_and_control_guidance_FINAL_PDF_20082020.pdf and ARHAI Scotland. Assessing the evidence base for medical procedures which create a higher risk of respiratory infection transmission from patient to healthcare worker. https://hpspubsrepo.blob.core.windows.net/hps-website/nss/3055/documents/1_agp-sbar.pdf

- Oral/ nasal suction
- Administration of nebulised saline, medication or drugs
- Chest compressions/ Defibrillation
- Chest physiotherapy
- Administration of oxygen therapy
- The consensus view of the UK IPC cell is that only “open suctioning beyond the oro-pharynx is currently considered an AGP i.e. oral/pharyngeal suctioning is not an AGP.”⁴

Advice for LTV team

- Risk assess current cohort of patients, identifying those most at risk based on clinical condition of the child and stability of the existing care package.
- Some children may be defined as being clinically extremely vulnerable (CEV) by their clinicians in discussion with families but do not need shield whilst it is paused. Guidance on shielding can be accessed via <https://www.brit-thoracic.org.uk/about-us/covid-19-identifying-patients-for-shielding/>
- If patients are newly identified as being CEV they need to be identified as such ready for any circumstance where local or national shielding resumes. Different procedures are in place for updating shielded patient lists in England, Northern Ireland, Scotland and Wales. You should familiarise yourself with the relevant procedures for your organisation.
- An MDT discussion should take place to decide whether it is appropriate for a child to have an escalation plan which includes adjustment of ventilation settings on their existing LTV device. In these cases, ensure families and carers know how to activate them, following discussion with their LTV team. In the absence of pre-arranged circumstances to alter ventilation, settings should not be adjusted at home.
- For children on non-invasive ventilation, assess mask fit and ensure the child has a well-fitting mask to reduce the risk of aerosol generation.
- Facilitate alternative methods of communication using phone calls or video calls, for example, for necessary clinical reviews.

⁴ ARHAI Scotland. Assessing the evidence base for medical procedures which create a higher risk of respiratory infection transmission from patient to healthcare worker.
https://hpspubsrepo.blob.core.windows.net/hps-website/nss/3055/documents/1_agp-sbar.pdf

- Support new or temporary carers in placements and utilise their skills appropriately.
- Ensure children dependent on LTV have fully functioning back-up ventilators at home.
- In accordance with usual care pathways, ensure discussions on what additional respite care or further support local hospices can offer and work with clinical commissioning groups as required for alternative community-based care options.

When a well child's care package is temporarily compromised due to staff shortage:

- Support care providers when it comes to decisions surrounding reallocation and protection of carers (see below).
- If, despite all steps being made to maintain the care package, it becomes limited or absent, alternative arrangements would need to be agreed where the aim is to avoid admissions to paediatric intensive care (PIC) or paediatric high dependency units (PHDU) (critical care level 2). This may include temporarily extending the care that families already provide while sustainable solutions are being sought. Decision making should involve the family, home care provider team, the LTV team and service commissioners. The burden this will place on families should be recognised, with the primary focus being the safety of all those involved.
- Alternative solutions would include hospice settings.

When a child becomes unwell with or without COVID-19 infection:

- In combination with the local LTV team, risk assess the child and decide if they are able to remain in the home setting. This should be the primary aim without compromising care and safety. Establish triggers at which a child will need admission to hospital. See below for further discussion of unwell child.

Advice for Care provider team

- Ensure that high risk children based on their clinical condition or social circumstances remain highlighted as priority patients within the case load.

- Consider reallocation of carers to children who are at the highest risk if carer availability is limited. Involve the local LTV team in these discussions to support decisions over reallocation.
- Where possible minimise the number of carers allocated to individual packages to reduce the number of people in contact with the family.
- In consultation with the MDT risk assess individual patients, considering the procedures involved in their care to identify daily tasks that are designated as AGP and discuss management according to local guidance reducing risk as far as possible. For example, children receiving suction through an HME will generate minimal aerosol with very low risk of SARS-CoV-2 transmission particularly at times of low circulating prevalence in the community.
- Infection prevention and control (IPC) leads in each care provider should ensure PPE programmes of education and training, including a mask fit testing programme, are rapidly rolled out to all staff caring for LTV patients at home. This should cover AGP and non-AGP procedures.
- We advise care providers and LTV teams to work closely with IPC leads to facilitate joint discussion regarding local designations for AGP and appropriate levels of PPE needs for the care of LTV children and those with tracheostomies.
- Hospital based IPC teams will not be expected to provide training to care providers but can be a source of advice.
- Ensure carers have appropriate access to PPE are fully trained in how to use this.
- Ensure care staff are fully aware of what constitutes an AGP and the indications for droplet/aerosol PPE (see above and Appendix 1 below)

Advice for parents

- Family members, who share the same household as the patient, should be regarded as one unit and as such use the same level of protection they would do normally.⁵
- Always insist on strict hand washing within the household.

⁵ Guidance for community management of patients receiving long-term ventilation (LTV) during COVID-19. British Thoracic Society. Available from: <https://brit-thoracic.org.uk/about-us/covid-19-information-for-the-respiratory-community/>

- Consider training additional family members or friends who would be willing to help with care if needed. This will reduce the number of individuals in direct contact with the patient and also provide additional support in the context of carer absence. Parents should contact their care provider or local LTV team for advice on rapid-training options.
- If a child is known to a local hospice which is currently receiving patients, ask parents to contact them and explore respite care options that may be available.
- In case of reduced carer availability, consider when the child's needs are greatest, for example, either during the day or at night, and discuss prioritising care to these times.
- Accept that new or temporary carers may have different skill sets but these should be managed safely within the package, utilising their skills appropriately. Any material changes to the care package must be discussed with the commissioners, and care providers alongside the LTV team.
- Encourage all parents to follow normal communication links and remind them they must not adjust ventilation settings or increase supplemental oxygen unless as part of a pre-established care plan.
- Ensure all ventilators, in use and back-ups, are functioning in conjunction with their care provider.
- Make sure all filters are in place on ventilators and suction machines. Ensure they are in good condition in conjunction with their care provider.
- After suctioning consider soothing techniques that avoid intimate contact with the child for example stroking rather than kissing the child's forehead.
- If practical, take some steps to reduce exposure of carers and help maintain the care package. Therefore, on an individual risk assessment, which takes into account local prevalence rates, parents could be asked to:
 - take the lead on all routine tracheostomy changes and tape changes, asking staff to step outside the room until the procedure has been completed
 - try to take the lead on all routine suction, again asking staff to leave the room while they take place.
- Where possible, try to maintain two metre distance from the patient when interventions are not required.

- For cough assist machines use a well-fitting mask and ensure the mask is cleaned daily
- Avoid opening or disconnecting the circuit as much as possible where it is safe to do so
- Any family member who develops symptoms of fever, cough, increased or discoloured airway secretions, gastrointestinal symptoms, anosmia or myalgia should self isolate and have testing for SARS-CoV-2.

Advice for Carers and Schools/ Respite Facilities/Outpatient attendances

- Procedures should be put in place to allow children with tracheostomies and on LTV to allow access to school, respite and outpatient facilities.
- As noted above, well children on LTV units across the UK have been managed using droplet PPE for AGPs without evidence of cross-infection. Where prevalence is low we recommend that asymptomatic children on LTV or with tracheostomies can be cared for safely using droplet PPE following correct risk assessment. This includes care during AGPs if a child is well, including within the school setting. This is similar to the approach outlined by PHE in guidance on AGPs in low risk patients in healthcare settings.⁶
- Individual risk assessments should take place on a case by case basis. For example if suction of a tracheostomy can take place via an HME, aerosol generation is negligible and droplet PPE is appropriate. However, children at particularly high risk of generating aerosols, for example a child who self ventilates with a tracheostomy has numerous secretions and does not tolerate a viral filter or HME, may require the carer to wear aerosol PPE particularly at times of high circulating prevalence of SARS-CoV-2 in the community (see above). This is in line with guidance from the NTSP and the ARTP.⁷

⁶ Public Health England. COVID-19: Guidance for the remobilisation of services within health and care settings: infection prevention and control recommendations. Available at:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/910885/COVID-19_Infection_prevention_and_control_guidance_FINAL_PDF_20082020.pdf

⁷ National Tracheostomy Safety Project. Supporting children with tracheostomies back to school during the COVID-19 pandemic. Available at:

http://www.tracheostomy.org.uk/storage/files/NTSP%20Paed%20Tracheostomy%20LTV%20during%20COVID_19.pdf

Association for Respiratory Technology & Physiology. COVID-19 – use of CPCP and NIV in community care settings. Available at:

https://www.artp.org.uk/write/MediaUploads/Standards/COVID19/ARTP_Guidance_CPAP_and_NIV_in_the_community_during_COVID19_V1.0.pdf

- There should be stringent adherence to handwashing, cleaning the environment and social distancing where possible. Appropriate steps should be taken to ensure the room is adequately ventilated.
- Avoid opening or disconnecting the circuit as much as possible where it is safe to do so
- Carers who are required to wear sessional PPE should be supported to take breaks with parents providing cover to allow this to take place
- Carers and teachers who are unable to maintain a physical distance of at least 1m from the patient should wear droplet PPE. If a child is well and prevalence rates are low, care including AGP could be administered using droplet PPE. Appropriate steps should be taken to ensure the room is adequately ventilated.
- Children with tracheostomies who self-ventilate during the day and do not require frequent suctioning should where possible use an HME with a viral filter or a TrachPhone, particularly if they require frequent suctioning to avoid regular disconnection of the filter as suctioning can be administered through the TrachPhone. Children should have a tracheostomy bib/surgical mask covering the tracheostomy where practical to do so.
- For children at particularly high risk of generating aerosols, for example a child who self ventilates with a tracheostomy has numerous secretions and does not tolerate a viral filter, facilitation of home schooling may be more appropriate particularly during times when there is a high prevalence of SARS-CoV-2 circulating in the community.
- Where possible tracheostomy changes should be performed in a separate well-ventilated room away from other children. This may not be possible for an emergency tracheostomy change which should not be delayed in order to move the child. The risk to the other children in the classroom is extremely low if an emergency change was to occur there.
- Where possible cough assist procedures should be undertaken at home rather than school. If there is a requirement for use of the cough assist in school this should be undertaken in a well-ventilated room away from other children. In the context of a well child this could be undertaken using droplet PPE.
- Some hospital clinics may be best facilitated via videoconferencing/remote monitoring. Decisions on how best to clinically review patients should be agreed between the family and the MDT.

When a child becomes unwell with or without SARS-CoV-2 infection:

- Children with any of the symptoms of COVID-19 (fever, persistent new cough, increased or discoloured airway secretions, or anosmia) or any symptoms in family members must avoid attending school unless all SARS-CoV-2 tests are negative or the appropriate isolation time has been completed as per PHE guidelines. There should be a low threshold for carers to use of aerosol PPE in these circumstances.
- Aerosol PPE should be used for any AGP in the event of a family member isolating due to suspected SARS-CoV-2 infection even if the child tests negative for SARS-CoV-2 infection for the duration of the isolation period. Children should avoid attending school during the isolation period.

Testing for SARS-CoV-2 infection

- Given the potential for possible aerosol generation with procedures, consideration should be given to regular testing of children for SARS-CoV-2 infection, this reassurance will enable better school attendance. This should be risk assessed locally on a case by case basis and is at the discretion of the lead clinician caring for the child in discussion with the care provider, school and respite facility and is dependent on local availability of testing at any given time, practicality of testing and the understanding of any discomfort to the child from testing.

Equipment (LTV children at home)

- Identify consumable resources and those which may become in short supply with community children's teams and suppliers.
- In extreme situations where there is a lack of equipment availability, and after discussion between the local community teams and the LTV team, use them past the usual recommended shelf life if no supply is available. This change in practice should be escalated to appropriate risk and safety teams within the trust, care provider and CCG.

Team communication and working

- Ensure strong support of the team's physical and mental wellbeing, focusing on emotional support, nutrition, hydration and sleep.
- Follow local guidelines for the testing of staff or staff household members suspected of SARS-CoV-2 infection.

- Support staff who are members of higher risk groups as identified through their employer's risk assessment process. Facilitate redeployment if appropriate.
- Use remote access, for example, telephone or video meetings when possible.
- Maintain social distancing measures at all times.

Oxygen

- Home oxygen suppliers will continue to replace empty cylinders with full cylinders. Do not stockpile oxygen cylinders.

Elective activity

- Consideration should be given as to how elective work can be delivered to limit unnecessary trips to the hospital for example home sleep studies, videoconferencing/telephone clinics.
- This needs to be risk assessed for each patient.

Unwell children admitted to hospital or suspected of having COVID-19

Location (joint responsibility of LTV team and admitting units)

- Discuss with level 1 and 2 units where admissions of LTV patients may be placed:
 - Consider well and unwell LTV patients.
 - Consider SARS-CoV-2 positive or negative patients.
 - Identify clearly when escalation to level 2 or 3 unit is needed.
- Consider how the LTV team will support DGHs admitting LTV patients, for example, regular calls, video conferencing

Transfers of patients from hospitals not using PIC retrieval services

- Referring team to complete risk assessment of COVID-19 virus risk and test early.
- Referring team to complete transfer risk assessment to decide on the level of clinical skills needed on transfer. For example by using the STOPP tool.⁸
- For transfer of patients to regional paediatric intensive care units (PICUs) please see [PCCS pathway](#) advice.

Medical records

- Ensure contemporaneous note taking and recording.
- Work with the hospital IT team or develop a manual system to ensure video calls are recorded or have notes taken including detail of call, those present, etc.

Access to patients

- If an LTV patient is admitted to hospital, visitation rules should follow the local trust policy:
 - All attempts should be made to admit one parent/carer only with the child and this person should stay inside the dedicated isolation area until discharge.
 - If end-of-life care is proposed or there is an imminent risk of death, then every means of allowing both parents by the patient's bedside should be explored. NHS England and NHS Improvement have published [guidance](#)

⁸ <https://www.sort.nhs.uk/Media/Guidelines/Referral-forms/Wessex-PICU-Network-interhospital-transfer-form-Aug2020.pdf>

for children and young people with palliative care needs during the COVID-19 pandemic. NHS Scotland's COVID-19 palliative care guidance is available [here](#).

Clinical guidance for paediatric LTV patients

Context

- The Royal College of Paediatrics and Child Health has detailed the [co-morbidities children may have](#) that put them at an increased risk of the complications associated with SARS-CoV-2 infection. Local LTV teams need to risk assess their patient cohort to determine those who meet the criteria for shielding.

For admitted patients dependent on receiving LTV

- All LTV admitted patients, dependent on either non-invasive or invasive ventilation, must have immediate SARS-CoV-2 testing. Any child with a tracheostomy should have tracheal secretions sent for testing.
- Patients dependent on LTV who are proven SARS-CoV-2 positive will need discussion between local and the regional respiratory team and transfer to regional centres.
- If escalation of care to a level 3 unit is required, follow [PCCS guidelines](#). PIC retrieval services will also be able to provide advice on complex transfers not utilising retrieval services.
- Cough assist devices whilst waiting for confirmation test should be avoided where possible.
- At regional centres specific circuit, tracheostomy tube and mask changes to reduce aerosol production may be explored if clinically appropriate. As these changes require specific skills and have their own risks affecting ventilation, they require specialised centre care and cannot be made in the DGH setting.
- Once stabilised, a well but SARS-CoV-2 positive child can be transferred back to the DGH or home. These patients will continue to need full aerosol PPE appropriate for AGP until the end of an isolation period.
- SARS-CoV-2 negative patients can be locally managed within local network agreements, supported by the tertiary centre. Circuits should not be altered in anyway except where it agrees with the current care plan, for example, changing from dry to wet circuits.

Arrest and peri-arrest

- [The Resuscitation Council's guidance](#) should be followed.

Ethics

- Ensure hospital team aware of any advanced care plans (ACPs) in place.
- Link in with hospice services for their support service.
- Work with palliative care and paediatric networks to ensure that where appropriate and working with families, ACPs are put in place in the community as is usually good practice, including parallel planning.
- Ensure ACPs in place are reviewed and updated.

Appendix 1 PPE

Definition of Aerosol PPE is considered to be:

- Double pair of gloves to allow for changing top pair of gloves between patients or procedures. Bottom gloves should overlap the gown sleeves.
- Long sleeved fluid repellent gown
- FFP3 respirator
- Eye protection (visor which can be disposable or reusable)

Definition of Droplet PPE is as follows:

- Single pair of gloves
- Disposable plastic apron
- Surgical face mask
- Eye protection if you feel there is a risk of patient coughing, or splash or droplet exposure.

Table 1: Proposed use of PPE to manage children when undertaking procedures that have the potential to generate aerosols during times of low to moderate circulating prevalence of Covid-19 (<2%)

	Well Child at home	Well Child at school/respite/outpatients	Well child routinely tested positive for SARS-CoV-2	Household member tested positive for SARS-CoV-2 (follow government guidance on self-isolating)	Unwell child with suspected/confirmed SARS-CoV-2
Parent/Guardian	No PPE	No PPE	Isolate No PPE	Isolate No PPE	No PPE
Carer	Droplet PPE. (consider FFP3 mask following individual risk assessment)	Droplet PPE. (consider FFP3 mask following individual risk assessment)	Aerosol PPE until swab negative	Aerosol PPE until swab negative and family have completed isolation period	Aerosol PPE until swab negative and family have completed isolation period