Royal Maternity Hospital Neonatal Unit COVID-19 Policy

EDITION 5

29TH APRIL, 2020

Belfast Health and Social Care Trust
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Contents

Introduction

Coronaviruses are a large family of viruses that are common across the world. These viruses can cause mild symptoms ranging from a fever and cough to more serious conditions such as severe pneumonia, shortness of breath and breathing difficulties.

In December 2019, a new strain of coronavirus was first identified in Wuhan City, China. This strain has been classified as 'severe acute respiratory syndrome coronavirus 2' (SARS-CoV-2), with the associated disease termed COVID-19 (Coronavirus Disease 2019). Although we are only beginning to understand SARS-CoV-2, other coronaviruses are mainly transmitted by large respiratory droplets and direct or indirect contact with infected secretions. In addition to respiratory secretions, other coronaviruses have been detected in blood, faeces and urine. COVID-19 has been classified as an air-borne High Consequence Infectious Disease (HCID-A) and there is currently no vaccination or established effective drug therapy against the disease. Treatment for COVID-19 is mainly supportive.

Our understanding of this virus and its consequences is evolving as the body of literature grows. Currently available epidemiological evidence suggests that it has a high case-fatality rate in adults but is a generally mild illness in children, with very few paediatric fatalities reported to date. In a review of 9 publications, 75 infants born to 72 coronavirus positive mothers were identified. There was no evidence of vertical transmission and the 1 case of infantile COVID-19 was identified at 36 hrs of life and felt to be postnatal infection. In a small case series of 6 mothers who were COVID-19 positive at time of birth, all samples from amniotic fluid, cord blood and breast milk samples tested negative for the virus. A more recent case report did describe the finding of IgM at time of birth in an infant born 4 weeks after maternal COVID-19 infection. However, the infant was consistently PCR negative at repeat testing and clinically remained well following delivery. The significance of this remains unclear.

The key considerations for our neonatal unit (NNU) are around the safe management of infants at birth and subsequent transfer and isolation of potentially exposed and/or affected infants.

General COVID-19 Measures within the RMH

During this period of exceptional measures, specific guidance has been issued around infection prevention and control.

Hand hygiene: As is our standard practice, strict hand hygiene must be adhered to. Staff should be bare to the elbows, remove all hand and wrist jewellery (with the exception of a single metal ring band), have clean short fingernails with no artificial nails or nail products and any cuts or abrasions should be covered with waterproof dressings. The Seven Step Technique should always be observed when washing or gelling hands.

Uniform: Staff are asked to travel to and from work in their own clothes and change into scrubs once on site. Scrubs should then be removed at the end of a shift and placed in the appropriate laundry bag. There are facilities available if staff wish to shower before travelling home.

Social Distancing: Where possible staff are asked to maintain a distance of 2 metres between each other while in work. Additional alternative areas for breaks will be made available. Measures such as limiting the number of infants within a room, and limiting 1 parent to the bedside at a time are also being undertaken to facilitate this.

Essential Personnel Only: Only essential personnel should physically attend work. Where possible staff should try and facilitate working from home via remote access, video conferencing etc. Elective and non-urgent work should be reviewed and either cancelled or reallocated as able.

Aerosol Generating Procedures

Below is a list of aerosol generating procedures (AGPs). Additional care should be undertaken when performing any of these on patients with either suspected or confirmed COVID-19. AGPs should only be carried out when absolutely necessary, with only essential staff present.

- Intubation, extubation and related procedures
- Manual ventilation
- Less invasive surfactant administration (LISA)
- Open suctioning
- Non-invasive ventilation (NIV) e.g. Bi-level Positive Airway Pressure (BiPAP) and Continuous Positive Airway Pressure ventilation (CPAP)
- High-frequency oscillating ventilation (HFOV)
- High-flow Nasal Oxygen (HFNO)
- Tracheotomy/tracheostomy procedures

Of note, passing an oral or nasal gastric tube, the use of low flow oxygen, nebulisers and Entonox are not considered to be AGPs.

Personal Protective Equipment

Personal protective equipment is designed for the user's protection and safety. It is not sterile and does not replace equipment used for aseptic techniques. PPE is task and situation dependent and will require different levels depending on both the clinical area and the clinical situation that the person is working in.

On the 4th April Public Health England recommended that, due to sustained background transmission of COVID-19 within the UK, PPE is required in every patient area regardless of infection status. This led the Belfast Trust to categorise all hospital areas with a traffic light 'zoning' system. As this is mostly based around adult care the areas were designated depending on patient contact and whether AGPs were being performed. However, the Trust acknowledge that the NNU is an area of exception due to the unique nature of our patient group. Therefore, in discussion with IPC, we have modified the zoning criteria within the NNU. Definitions of zones within the NNU are as follows:

Green Zone Areas that are considered generally 'clean', with no direct patient contact ie: main corridors, tea room, canteen, offices

Amber Zone These areas will contain infants, who may be undergoing AGPs, but have had no exposure to coronavirus and consist of the main clinical areas within NNU (NICU, 5A, 5B, 5C) and main Delivery Suite areas etc

Red Zone These areas will contain infants of mothers with suspected or confirmed COVID-19, or infants from the PNW who are at risk of horizontal transmission. These areas include the designated cohort areas within NNU (Bay 1, Bay 2, Bay 3, Bay 4) and delivery areas designated for mothers with suspected or confirmed COVID-19

Green Zones

General areas with no direct patient contact eg: main corridors, canteen, tearoom, offices

- No PPE required

Amber Zones – Standard PPE Required

- all general, non-cohort, NNU areas
- attendance at all deliveries of non-suspected or confirmed negative mothers
- working within a COVID-19 cohort area with infants with suspected or confirmed coronavirus, but no exposure to AGPs

Within the Amber areas we advise Standard PPE (see Table below for specific scenarios). Standard PPE consists of:

- Apron
- Non-sterile gloves

- Fluid-resistant surgical face mask
- The use of eye protection should be considered if risks of splashes or droplets

Standard PPE – Front

Standard PPE - Back

Red Zones – Enhanced PPE required

- attendance at all deliveries of suspected or confirmed COVID-19 positive mothers
- working within a COVID-19 cohort area with infants with suspected or confirmed coronavirus, where AGPs are being performed or anticipated
- when resuscitating the acutely collapsed infant in the PNW regardless of maternal status

Within the Red zones we advise Enhanced PPE (see Table below for specific scenarios)

- FFP3 respirator mask
- Long sleeved disposable gown
- Disposable eye protection
- Gloves
- Apron
- Disposable hat

Enhanced PPE – Front

Enhanced PPE - Back

All PPE must be donned and doffed in an established sequence, with specific care and attention taken at each stage. Donning PPE with a 'buddy' ensures satisfactory technique and enhances user safety. Guidance on donning and doffing is listed in Appendix 1

	Working in non-Covid clinical areas of NNU	Working in Covid (suspected or confirmed) cohort areas		Exam of infant regardless of maternal Covid status or location (no AGPs anticipated)	Attending deliveries of non-suspected or Covid negative mothers	Attending deliveries of suspected or confirmed Covid mothers	Attending sudden unexpected collapse of baby in PNW
Location (colour = zone designation)	**ICU Rooms 5A-E**	**Bays 1 - 4 No AGPs**	**Bays 1 - 4 AGPs (PPV, HFO, CPAP & HHFNC)**	**ABC PNW Delivery Suite**	**Delivery Suite Obstet Theatre# Elective Theatre#**	**ABC Obstet Theatre# Elective Theatre#**	**PNW ABC**
PPE Equipment							
Disposable gloves	✓ Single use	✓ Single use	✓ Single use	✓ Single use	✓ Single use	✓ Single use	✓ Single use
Disposable plastic apron	✓ Single use	✓ Single use	✓ Single use	✓ Single use	✓ Single use	✓ Single use	✓ Single use
Long sleeved disposable fluid repellent gown	✗	✗	✓ Sessional use	✗	✗	✓ Single use*	✓ Single use*
Fluid resistant (Type IIR) surgical mask (FRSM)	✓ Sessional use	✓ Sessional use	✗	✓ Sessional use	✓ Sessional use	✗	✗
Fit tested Filtering face piece (class 3) (FFP3) mask	✗	✗	✓ Sessional use	✗	✗	✓ Single use*	✓ Single use*
Disposable eye protection	✗ / ✓ Risk assess - single use	✗ / ✓ Risk assess - sessional use	✓ Sessional use	✗ / ✓ Risk assess - single use	✓ Single use	✓ Single use*	✓ Single use*
Disposable hat	✗	✗	✓ Sessional use	✗	✓ Single use (within theatre areas only)	✓ Single use*	✓ Single use*

#Resuscitaire should NOT be within delivery theatre e.g. in room 12 beside Obstetric theatre or in Theatre 2 (ground floor)

*If planning to remain within NNU cohort area after admitting infant from delivery suite/PNW, the FFP3 mask, long-sleeved gown, eye protection and hat may all be used on sessional basis

Antenatal Admission and Delivery

Entry to the RMH

Everyone visiting or presenting to the RMH will now have to buzz for entry to the building with a strict entry criteria in place due to the restricted visiting policies. If entry is permitted, the person will be allowed access to the reception area before being asked a series of questions including:

- Do you have a cough?
- Do you have a temperature?
- Do you have any shortness of breath?
- Are you / have you recently been, self-isolating?
- Have you been in contact with anyone who is self-isolating or had COVID-19?

If the answer to any of these is 'yes' the person will either be denied entry or treated as a patient with 'suspected COVID-19'. For the purpose of this guideline we are defining a mother with 'suspected COVID-19' as a person who has had a set of swabs taken, but results are not yet available.

Admissions

Any woman presenting to admissions with either suspected or confirmed COVID-19 will be assessed in Rm 6 in admissions. If this room is occupied, Rm 5 will be used, then Rm 4.

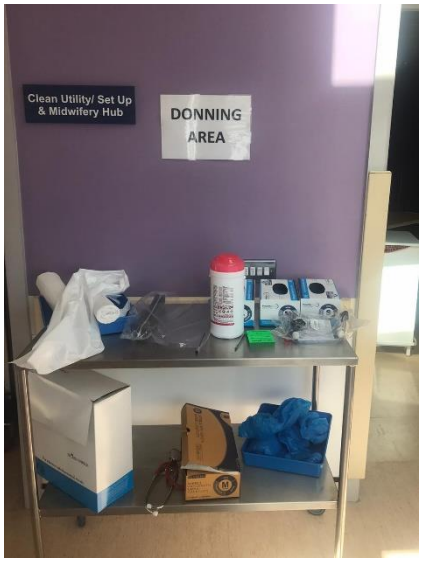
Delivery Suite

If a woman with suspected or confirmed COVID-19 is admitted they will be transferred to Rm 19, 18, 17 or 16. These rooms are normally used as the Active Birthing Centre.

The donning area for these rooms is set up in the lilac corridor just outside these rooms. The doffing areas are in the link corridors between rooms. The link corridor is also the designated exit route out into the hospital main corridor. The entry and exit path of each room should therefore be:

- Don PPE immediately outside room
- Enter room though main door
- Exit room through side door into link corridor
- Doff in link corridor
- Exit out back door of link corridor, into main corridor

Rooms 16 – 19 (Active Birthing Centre)



Donning Areas Outside Each Room

Room 19 is the only room that has a stand-alone, mobile resuscitaire. The other 3 rooms have wall mounted resuscitaires. These resuscitaires are identical to the resuscitaires used elsewhere in the hospital except that the bed must be pulled down and overhead heater moved to the midline position to turn on.

Wall mounted resuscitaire – Closed

Table Pulled Down

Overhead Heater to Midline to Activate

A dedicated COVID-19 resuscitation trolley has been created and is situated in the corridor outside the rooms.

Theatre

If a woman with suspected or confirmed COVID-19 requires delivery within theatre, where possible the ground floor theatre will be used.

There are 2 designated donning areas within the ground floor theatre area. The Primary Donning Area is the scrub room adjacent to Theatre 1 and will be primarily used by obstetric staff. The neonatal staff will use the Secondary Donning Area, a room at the end of the corridor, immediately on the left as you enter from the back stairs.

The neonatal team will use the resuscitaire and equipment in Theatre 2. By being slightly removed from the active operative area we are endeavouring to reduce the potential exposure of both the infant and our staff to the (potentially) infective mother. However, appropriate PPE will still be required.

A member of the theatre team will bring the infant to the neonatal team at birth with handover at the door between Theatre 1 and the anaesthetic room. Discussions around cord clamping, cord gases or retention of placenta should be had with the obstetric team prior to delivery.

Door at back of theatre to doffing area and back corridor

Resuscitaire in Theatre 2

If the infant requires admission, transport should be as per the designated route. If the infant is able to remain with the mother, PPE must be doffed before leaving. The doffing area will be in the theatre back corridor and is accessed through a door at the back of the theatre. PPE should be removed and the team should then exit along this corridor and out of the theatre area.

All areas within the theatre area on the ground floor are clearly signposted.

Doffing Area in Theatre Back Corridor

Hand Washing Area in Theatre Back Corridor

Exit to the Far End of Theatre Back Corridor

Neonatal Management at Delivery

The general principle behind attending deliveries is that the minimum number of people required should be present within the delivery area to try and avoid unnecessary potential exposure of staff. It is therefore expected that more senior staff will attend compared to routine practice.

Specific individuals will be identified to attend deliveries at the MDT handovers at 8am and 8pm each day. In addition to this, when the neonatal unit is made aware of a pending delivery, these roles will again be confirmed in a brief meeting between the Sister-in-charge, the Consultant on-call and the identified clinical team. Where possible, alternative staff to those working within the NICU should be used.

Further guidance around attendance at deliveries is provided in 3 separate charts listed in below. These are grouped into:

- <27 weeks gestation
- 27 – 35 weeks gestation
- ≥35 weeks gestation

Less Than 27 Weeks Gestation

Antenatal admission of woman with suspected or confirmed COVID-19 **<27 weeks gestation**	•Neonatal team to be informed at time of admission •Senior neonatal team to meet and begin preparations including: identification and allocation of staff roles location of mother route for transfer of infant intended admission location for infant
Delivery, resuscitation and stabilisation	•**Designated consultant and senior nurse to attend delivery** •Attend delivery area and don appropriate PPE, in designated donning area •Only when delivery is anticipated, enter delivery area and prepare resuscitaire and essential equipment •Delayed cord clamping should be considered as per unit protocol •Infant should be moved directly to resuscitaire once cord cut •Resuscitate and stabilise as per NLS algorithm •An in-line micro HME filter should be used with all respiratory support
Maternal suspected or confirmed COVID-19: **mother asymptomatic or only mildly symptomatic**	•Infant may be intially shown to parents but social distancing should be observed •Once infant stabilised, if the mother is able to apply a surgical face mask and gel hands, she may have contact with her infant if desired and/or feasible, prior to transfer to NICU
Maternal suspected or confirmed COVID-19, **mother symptomatic and/or acutely unwell**	•Infant may be shown to parents but social distancing should be observed throughout

Transfer to NICU

- Once the infant has been stabilised, NICU should be informed of the pending admission
- Transfer to NICU should be via the agreed route only
- Additional 'clean' helpers should be available to clear corriders, and open doors etc
- Only the 'middle lift' should be used for transport between floors
- Infants <27 weeks gestation should be transferred using a resuscitaire

Admission to NICU

- Admit to designated cohort area within NICU
- Give a clear handover to the receiving team before transferring the infant to the incubator
- The transport resuscitaire should be moved to the designated doffing area to have an initial clean, before moving it to an area outwith the cohort area for further cleaning
- Staff should doff PPE in the designated area before exiting the cohort area

Inform NNNI

- The NNNI should be informed of all admissions of an infant born to a mother with suspected or confirmed COVID-19
- Consideration should be made to whether a Network Call should be scheduled

27 – 35 Weeks Gestation

Antenatal admission of woman with suspected or confirmed COVID-19 **27 - 34+6 wks gestation**	•Neonatal team to be informed at time of admission •Senior neonatal team to meet and begin preparations including: identification and allocation of staff roles location of mother route for transfer of infant intended admission location for infant
Delivery, resuscitation and stabilisation	•**ST4+ and senior nurse to attend delivery unless infant considered 'high risk'** •Attend delivery area and don appropriate PPE, in designated donning area •Only when delivery is anticipated, enter delivery area and prepare resuscitaire and essential equipment •Delayed cord clamping should be consdiered as per unit protocol •Infant should be moved directly to resuscitaire once cord cut •Resuscitate and stabilise as per NLS protocols •An in-line micro HME filter should be used with all respiratory support •All infants of this gestation will require admission
Maternal suspected or confirmed COVID-19: **mother asymptomatic or only mildly symptomatic**	•Infant may be intially shown to parents but social distancing should be observed •Once infant stabilised, if the mother is able to apply a surgical face mask and gel hands, she may have contact with her infant if desired and/or feasible, prior to transfer to NICU
Maternal suspected or confirmed COVID-19, **mother symptomatic and/or acutely unwell**	•Infant should be shown to parents but social distancing should be observed throughout

Transfer to NICU	•Once the infant has been stabilised, inform the NICU of the pending admission •Transfer to NICU should be via the agreed route only •Additional 'clean' helpers should be available to clear corriders, and open doors etc •Only the 'middle lift' should be used for transport between floors •Infants requiring respiratory support should be transported on a resuscitaire. All other infants may be transported in an incubator
Admission to NICU	•Admit to designated cohort area within NICU •Give a clear handover to the receiving team before transferring the infant to the incubator •The transport resuscitaire or incubator should be moved to the designated doffing area to have an initial clean, before moving it to an area outwith the cohort area for further cleaning •Staff should doff PPE in the designated area before exiting the cohort area
Inform NNNI	•The NNNI should be informed of all admissions of an infant born to a mother with suspected or confirmed COVID-19 •Consideration should be made to whether a Network Call should be scheduled

Greater Than or Equal to 35 Weeks Gestation

Antenatal admission of woman with suspected or confirmed COVID-19 ≥ **35 weeks gestation**	•Neonatal team to be informed at time of admission •Senior neonatal team to meet and begin preparations including: identification and allocation of staff roles location of patient route for transfer of infant
Attendance at delivery	•Neonatal attendance at deliveries of infants ≥ 35 weeks should be requested as per current RMH policy •Suspected or confirmed maternal COVID-19 status is NOT an indication in itself for neonatal attendance at birth
Delivery, resuscitation and stabilisation	•**If neonatal attendance is required at delivery but the is infant considered 'low risk' - ST4+ to attend delivery** •**If infant considered 'high risk' - consultant and senior nurse to attend and be present in room prior to delivery** •Attend delivery area and don appropriate PPE in designated donning area •Wait outside delivery area and only enter room if newborn requires resuscitation (unless high risk). It is the responsibility of the midwifery team within the delivery area to have checked and prepared resuscitaire •Delayed cord clamping should be performed as per unit protocol •If required, resuscitate and stabilise as per NLS algorithm •Use an in-line micro HME filter filter for all respiratory support
Maternal suspected or confirmed COVID-19: **mother asymptomatic or only mildy symptomatic**	•If infant well, every effort should be made to keep the infant and mother together postnatally •Depending on maternal infection status and symptoms, there should be consideration of maternal use of a face mask when handling and feeding the infant while in hospital, with distancing measures observed at other times. Infant should be nursed in an incubator •Discharge home should be facilitated as soon as feasible •Family should be educated in hygiene and distancing measures to avoid viral spread

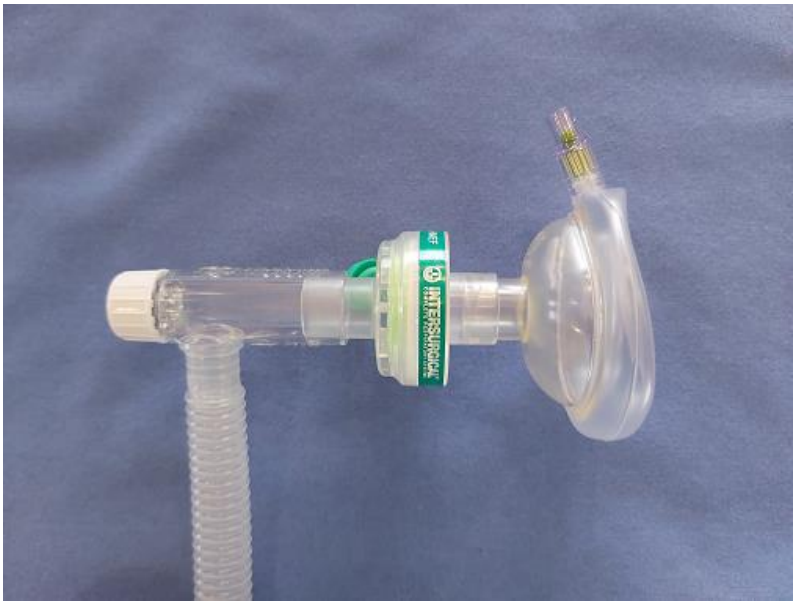
Maternal confirmed COVID-19: **mother acutely unwell**	•Infant to be isolated from mother at birth. If the infant is well it may remain within same room initially, within an incubator, until a suitable carer or care area can be identified (not NNU) •Infant discharge with an alternative carer (clinically well and not self isolating) should be considered
Transfer to NICU	•If the infant requires admission, NICU should be urgently informed of the pending admission •Transfer to NICU via the agreed route only •Additional 'clean' helpers should be available to clear corriders, and open doors etc •Only the 'middle lift' should be used for transport between floors •Infants requiring respiratory support should be transported on a resuscitaire. All other infants may be transported in an incubator
Admission to NICU	•Admit to designated cohort area within NICU •Give a clear handover to the receiving team before transferring the infant to the incubator •The transport resuscitaire or incubator should be moved to the designated doffing area to have an initial clean, before moving it to an area outwith the cohort area for further cleaning •Staff should doff PPE in the designated area before exiting the cohort area
Inform NNNI	•The NNNI should be informed of all admissions of an infant born to a mother with suspected / confirmed COVID-19 •Consideration should be made to whether a Network Call should be scheduled

Resuscitation Equipment

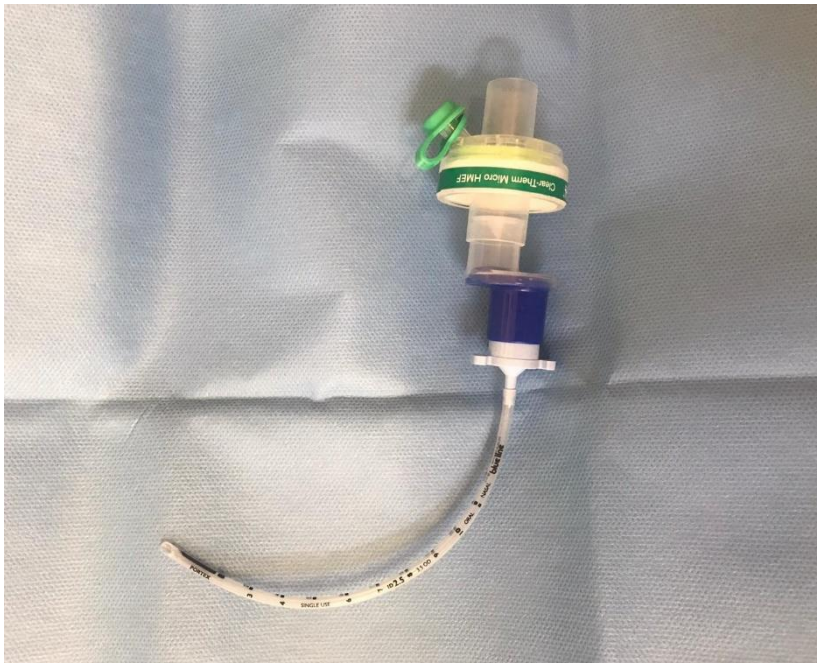
Newborn resuscitation should continue as per the standard NLS algorithm.

Although the vertical transmission of SARS-CoV-2 is considered possible, it remains to be definitively proven. It is assumed that, even if an infant was infected at birth, the viral load would be either very low or undetectable. This, in combination with the fact that infants' lungs are not aerated at time birth and much lower tidal volumes are used compared to adults practice, means that newborn resuscitation, including AGPs, is considered to carry a low risk of infection.

However, we are advising a slight alteration to our standard equipment to further minimise risk of transmission to staff. This is the inclusion of an in-line heat and moisture exchanger (HME) micro filter during respiratory support. These filters should be used for both Neopuff/mask support and when intubated. The photos below demonstrate their position within the equipment. Although some recent work has indicated that tidal volumes and pressures delivered are not affected with the inclusion of a filter, both the weight and the potential dead space of the circuit may be increased and staff should be cognisant of this. Once the ETT position is confirmed with the Neostat and visible chest rise, there is an option to remove the Neostat from your circuit.



Neopuff and Mask with In-Line HME Filter



Neopuff, Neostat and ETT with In-Line HME Filter

Transfer of a Newborn Infant to NNU

If a newborn requires admission to the NNU at birth, the Sister-in-charge should be informed as soon as this decision is made in order to allow time for preparation and staff allocation.

The infant will be admitted to the cohort area within the NNU.

There are specified transfer routes out of both delivery suite and theatres and these should be adhered to. Specifically, the potentially exposed team and infant should NOT use the back lift or enter the NNU through the NICU area.

Additional identified members of staff will travel before and behind the neonatal transfer team to ensure corridors are cleared and doors are open. They will remain at a distance of at least 2 metres from the team and will not assist in the transport itself.

From Delivery Suite (Rooms 19 – 16): Exit out of the back door of the link corridor (doffing area) onto the main hospital corridor. Travel to the middle lift and ascend to the 2nd floor. Enter the NNU cohort area via the side door.

From Theatre (ground floor): Exit out of Theatre 2 onto the main theatre corridor. Travel out through theatre reception into the main corridor and out onto the main hospital ground floor. Travel to the middle lift and ascent to the 2nd floor. Enter the NNU cohort area via the side door.

Walk through videos of each of these routes have been made and shared with the wider group.

Admission to NNU: Suspected Newborns

All preterm or term unwell infants of mothers with either suspected or confirmed COVID-19 will be admitted directly to the cohort area in the NNU (see below). Given the low likelihood that a newborn will be COVID-19 positive at birth, medical treatment and management should be mainly determined based on their pathology and clinical needs rather than being influenced by specific considerations around coronavirus.

All infants should be nursed in a closed incubator for the duration of their stay within the cohort area. This acts as a further layer of isolation.

COVID-19 Screening in Infants of Suspected or Confirmed Mothers

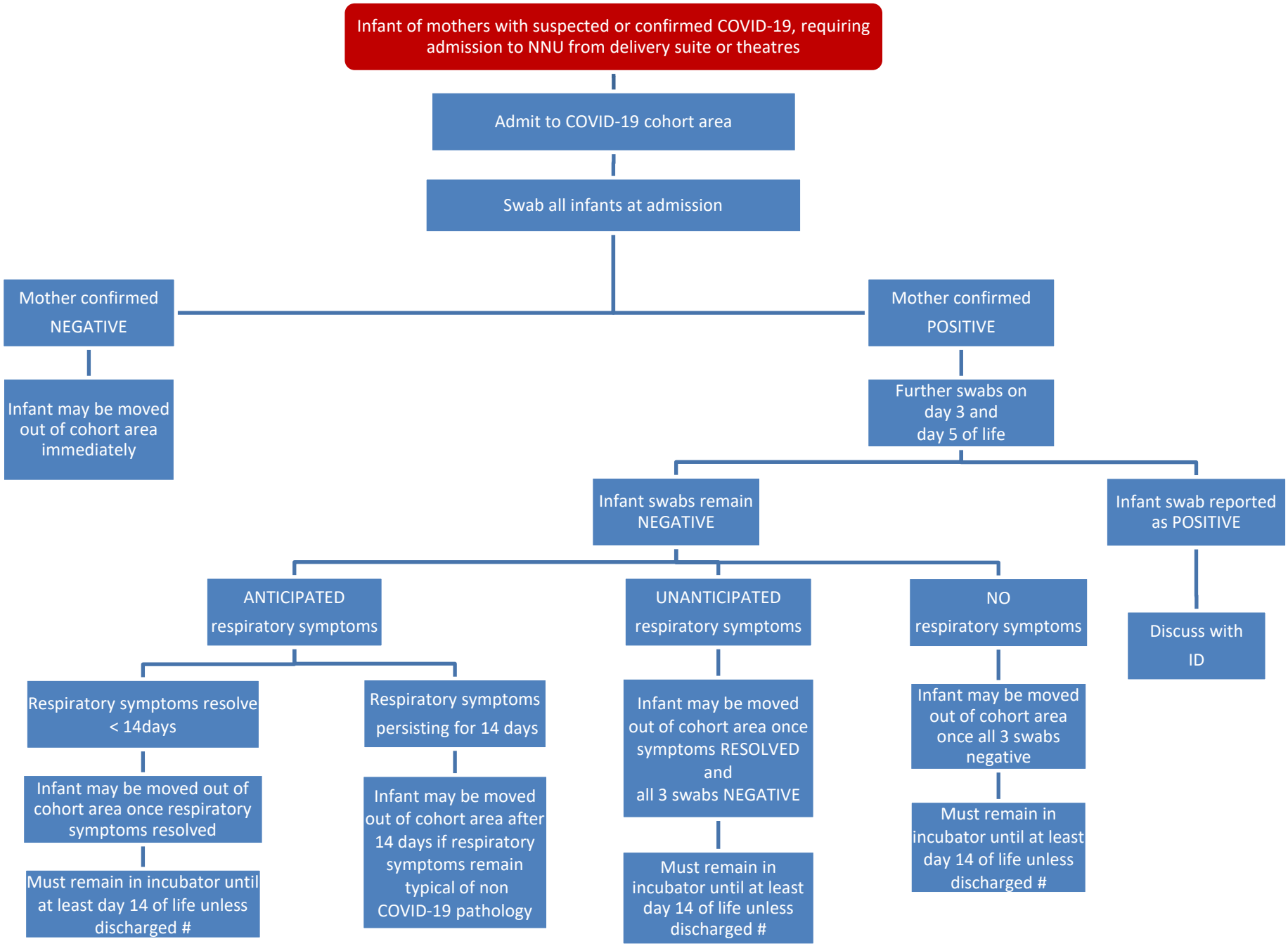
All infants of mothers who have a suspected or confirmed COVID-19 status, admitted to the NNU immediately following birth, require screening. It has been suggested that optimal testing for possible vertical transmission should include IgM / IgG analysis of cord blood at birth. This requires written parental consent but is not being undertaken in RMH until reliable IgM/IgG testing has been developed.

Current screening schedule for infants admitted at birth is:

- First set of swabs at admission
- Second set of swabs at 72hrs (day 3)
- Third set of swabs on day 5

Two dry swabs should be taken at each screen with one swab of the nasopharynx and one deep throat swab. This should make the patient gag to be effective. If the infant is ventilated, then secretions obtained by ET suction should be sent. The process for swabbing is outlined below with further Trust guidance available on the Hub:

- Label the universal container before entering the cohort area. A hazard warning label should be affixed to the container
- Do not take the paper request form into the cohort area. A hazard label should also be added to the form
- Take the nasopharyngeal and throat swabs as above
- Place both swabs into the same universal container
- Wipe outside of sample with Difficil-S or Actichlor Plus (1/1000ppm)
- Place into a leak proof bag and wipe outside with with Difficil-S or Actichlor Plus
- Ideally a buddy should meet you at door and hold open a second bag for you to place leak proof bag into
- Place the form into this bag too and seal
- A ‘COVID-19 biohazard’ label should be attached to the outside of the second bag
- The bag containing the samples must be hand transported to the lab by a porter. The pneumatic tube system **must not be used**



Isolate at home until day 14

Transfer Out of the COVID-19 Cohort Area

The flow chart above also outlines timeframes for when the infant may be considered for transfer out of the cohort area.

If an infant is admitted to the cohort area due to maternal 'suspected' status, and maternal results are subsequently reported as negative, the infant may be moved out of the cohort area immediately. There is no need for a further period of isolation within an incubator, and normal neonatal care should continue.

For infants of mothers with confirmed COVID-19, the duration within the cohort area is mainly based on the presence and nature of their respiratory symptoms.

No Respiratory Symptoms

: If the infant has been admitted for reasons other than respiratory support, and they have no respiratory symptoms, they may be transferred into the general clinical areas once all 3 sets of swabs are reported as negative. Examples would include late preterm infants who are admitted due to gestation and feeding support but require no respiratory support.

Anticipated Respiratory Symptoms

: Anticipated respiratory symptoms are defined as clinical features in keeping with the diagnosed pathology. Examples would include respiratory distress and x-ray changes in keeping with surfactant deficiency in a 25 week preterm infant.

Unanticipated Respiratory Symptoms

: Unanticipated respiratory symptoms are defined as clinical features that are outwith the expected clinical course for an infant of their gestation or pathology. An example would be a 36 week infant with no antenatal concerns who required intubation due to increased work of breathing and climbing oxygen requirements, with no acute pathology to account for this.

If an infant is able to be moved out of the cohort area, into either the general clinical areas within the NNU or the PNW, before 2 weeks of age they should remain within an incubator until day 14 of life regardless of weight etc.

Finally, if an infant is ready for discharge home prior to a full set of swab results being performed, they may be discharged home directly from the cohort area. No further swabs will be required. The family should be advised to self-isolate at home until the infant is 2 weeks of age.

Admission to NNU: PNW Infant

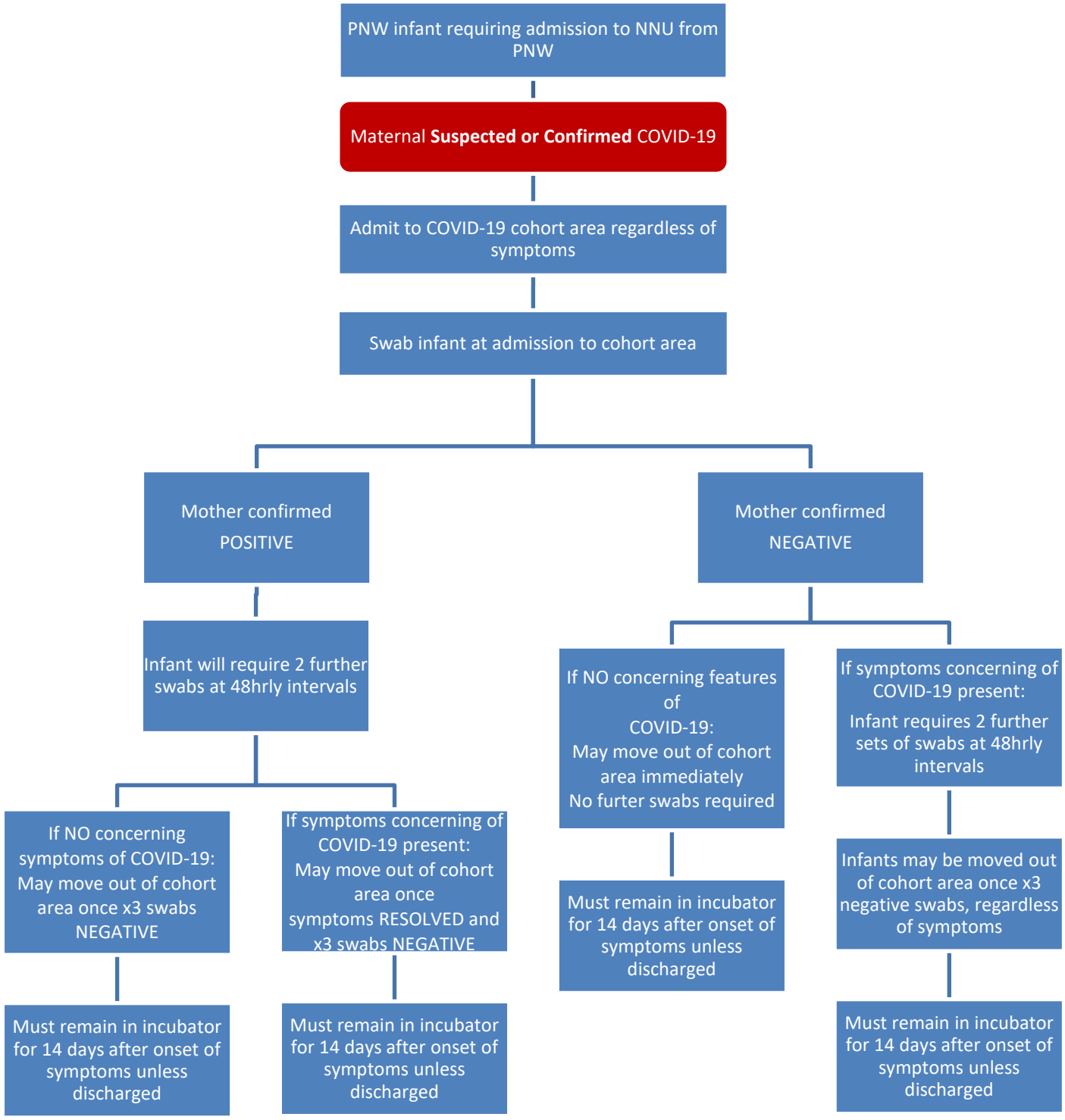
Whilst COVID-19 should be considered as a possible diagnosis in PNW infants who become unwell, it is anticipated that the majority of admissions will be more likely due to common pathologies such as hypoglycaemia or infants requiring lumbar puncture. Accordingly, the vast majority of these infants will be able to be admitted to the NNU as normal, rather than the COVID-19 cohort area.

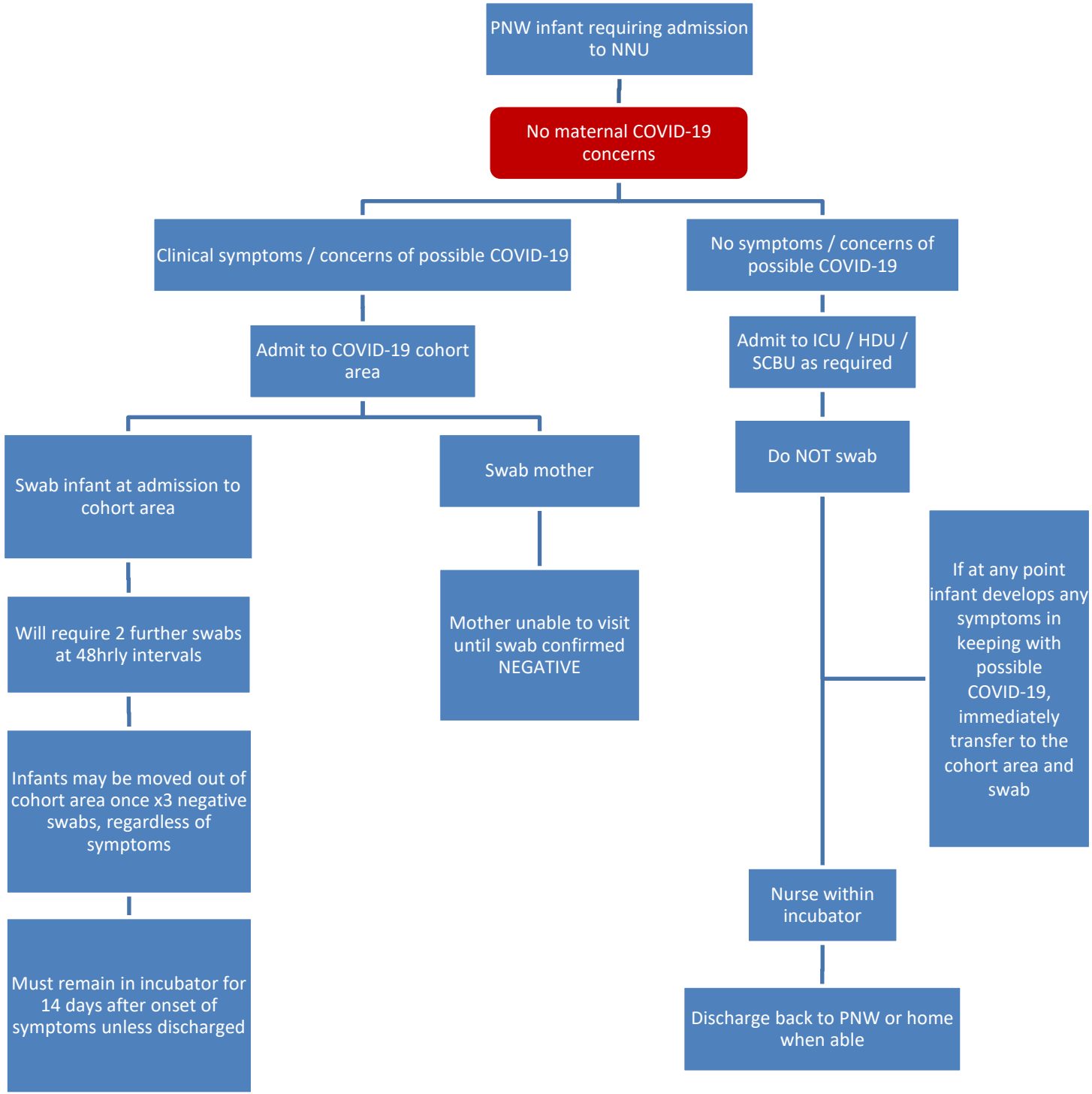
It is expected that all cases will be discussed with the consultant on duty, regardless of symptoms. As shown in the flowchart below, an infant admitted from PNW with unanticipated respiratory symptoms, or whose mother is suspected or confirmed Covid, should be admitted directly to the COVID-19 cohort areas (Bay 3 or 4) initially. These infants should have swabs performed at admission with 2 more sets performed at 48hrly intervals.

In the situation where the mother has no suspicions of COVID-19 but her infant is swabbed, the mother must also be swabbed regardless of symptoms and is unable to visit the NNU until her results are confirmed negative.

If an infant is considered fit for discharge either back to the PNW or home, prior to completing a full set of screening swabs, they should be discharged and no further swabs are required. If an infant has been investigated for coronavirus, the family should self-isolate for 14 days after the onset of symptoms, regardless of swab results.

The flow chart below aims to represent the journey of a PNW admission. We have endeavoured to represent the range of reasons for PNW admissions and try and encompass the various clinical outcomes, but recognise the complexity of the chart as a result.


PNW infant requiring admission to NNU from PNW
Maternal **Suspected or Confirmed** COVID-19
Admit to COVID-19 cohort area regardless of symptoms
Swab infant at admission to cohort area
Mother confirmed POSITIVE
Mother confirmed NEGATIVE
Infant will require 2 further swabs at 48hrly intervals
If NO concerning features of COVID-19: May move out of cohort area immediately No furter swabs required
If symptoms concerning of COVID-19 present: Infant requires 2 further sets of swabs at 48hrly intervals
If NO concerning symptoms of COVID-19: May move out of cohort area once x3 swabs NEGATIVE
If symptoms concerning of COVID-19 present: May move out of cohort area once symptoms RESOLVED and x3 swabs NEGATIVE
Must remain in incubator for 14 days after onset of symptoms unless discharged
Infants may be moved out of cohort area once x3 negative swabs, regardless of symptoms
Must remain in incubator for 14 days after onset of symptoms unless discharged
Must remain in incubator for 14 days after onset of symptoms unless discharged
Must remain in incubator for 14 days after onset of symptoms unless discharged


PNW infant requiring admission to NNU
No maternal COVID-19 concerns
Clinical symptoms / concerns of possible COVID-19
No symptoms / concerns of possible COVID-19
Admit to COVID-19 cohort area
Admit to ICU / HDU / SCBU as required
Swab infant at admission to cohort area
Swab mother
Do NOT swab
Will require 2 further swabs at 48hrly intervals
Mother unable to visit until swab confirmed NEGATIVE
If at any point infant develops any symptoms in keeping with possible COVID-19, immediately transfer to the cohort area and swab
Infants may be moved out of cohort area once x3 negative swabs, regardless of symptoms
Nurse within incubator
Must remain in incubator for 14 days after onset of symptoms unless discharged
Discharge back to PNW or home when able

COVID-19 Concerns in NNU Inpatient

Although strict general IPC protocols remain in place and visiting has been significantly restricted, our vulnerable patients within the NNU remain at theoretical risk of infection with COVID-19 from both parents and staff.

If an infant within the general NNU areas has an unexpected deterioration, COVID-19 should be considered as a differential diagnosis if they fit the 'case definition' as defined by Public Health England:

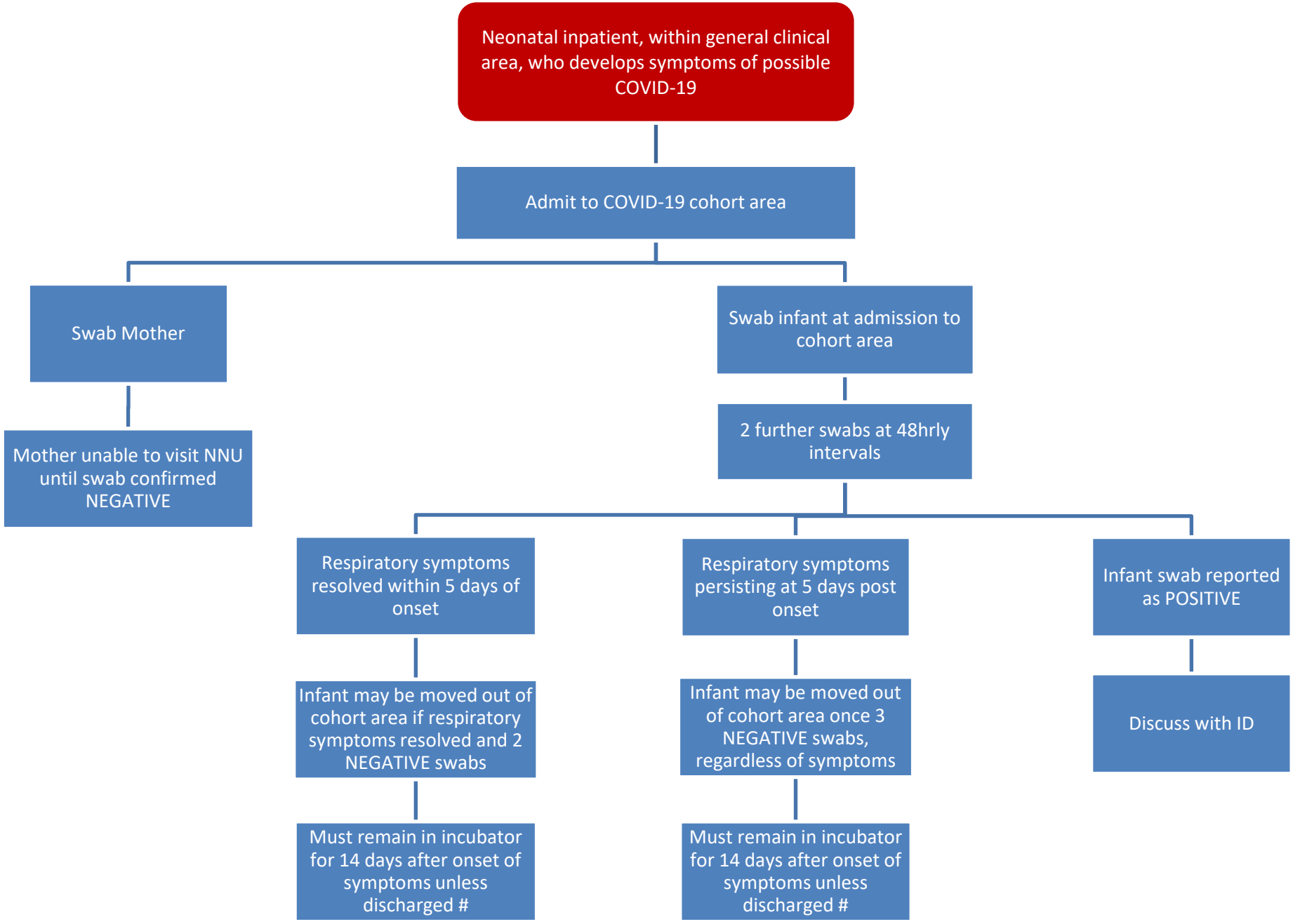
- They are an inpatient
  AND
- have either clinical or radiological evidence of pneumonia
  OR
- acute respiratory distress syndrome
  OR
- influenza like illness (fever ≥37.8°C and at least one of the following respiratory symptoms, which must be of acute onset: persistent cough (with or without sputum), hoarseness, nasal discharge or congestion, shortness of breath, sore throat, wheezing, sneezing

However, the RCPCH have also noted that "newborn infants may not show all the features of an influenza-like illness, particularly a fever, so clinicians should have a high index of suspicion in all infants admitted to NICU and monitor for signs of respiratory illness during the admission".

It remains essential however to consider all other possible pathologies that are encountered within routine neonatal care and there should be a discussion with either the consultant on service or on-call before investigating or cohorting an infant from the general NNU area, for suspected COVID-19.

Below is a flowchart designed to aid with decision making around these infants.

Of note, we again advise that, if an infant is moved to the cohort area and screened for possible COVID-19, the mother should also be swabbed regardless of her symptoms. She will be unable to visit the NNU until her swab is confirmed negative.



Isolate at home until day 14 of symptom onset

Working Within the Cohort Area

COVID-19 NNU Cohort Areas

At present the designated NNU cohort areas are within the HDU area.

- Bay 3 and 4 – The main COVID-19 cohort areas. All newborn infants born to mothers with suspected or confirmed COVID-19, or infants from the NNU or PNW with symptoms concerning of COVID-19 to be isolated here initially, pending screening results
- Bay 2 & 1 – Donning area / overspill isolation area. If this area becomes a clinical cohort area too, the donning area will move to the main hospital corridor outside the side door

With the exception of your facemask (surgical or FFP3), all PPE should be doffed at the door of the bay before exiting. The facemask should then be removed just outside the bay before exiting to a Green Zone.

The length of corridor outside HDU will be screened off for as long as cohort measures are in place. Footfall though this area is actively discouraged during this time but it will remain accessible in the unexpected event of a fire.

Staff will be allocated to work within the cohort area at staff handover. The principle of minimum number of staff entering the room during a shift should be observed and record should be kept of all staff entering the cohort area. Staff who are pregnant or have significant chronic health conditions will not be assigned to the cohort area.

When working within the cohort area:

- All staff must wear the appropriate PPE (see above). Masks, gowns and hats should be used on a sessional basis. The fluid resistant surgical mask has a lifespan of approximately 4 hours, with the FFP3 respirators lasting up to 12hrs unless they become wet. There is no need to change scrubs when out on break
- If an infant within the cohort area is ventilated, closed suctioning should be used
- Due to the risk of contamination, patient notes and observation charts should NOT be kept within the cohort area where possible. If any paper records or charts are used within the cohort area, they must be digitally imaged and archived within the patient record and stored/disposed once the patient leaves the area according to IPC recommendation.
- Electronic versions of nursing care notes and observation records have been made available and BadgerNet should be used for all other notes and records where possible. In preparation for the care of infants in the cohort area, all staff should familiarise themselves with the use of BadgerNet. A sheet of printed patient labels should be made available within the cohort area for each patient
- Where possible the drug Kardex should NOT be used within the room; it should remain outside the cohort room and drugs should be double checked with a clean helper where possible. They can then sign the Kardex as appropriate. If a Kardex is used within the cohort area, it must be digitally imaged and archived within the patient record and stored/disposed

once the patient leaves the area according to IPC recommendation, as per other paper based records.

- Use of re-usable equipment should be avoided if possible. If used it should be decontaminated in the doffing area prior to removal from the cohort area. A dedicated blood gas analyser and ultrasound machine have been made available for use within the cohort area
- Blood investigations should be rationalised to a minimum with Point of Care used where possible. If more than one infant within the cohort area requires bloods, these should be coordinated and performed at the same time if able
- Samples must be handled and transported to the labs with additional precautions. Additional guidance can be found in Appendix 3. In brief:
    - Perform the blood sample as routine
    - Apply a patient identification label and biohazard sticker to both the sample tube and request form
    - Wipe outside of sample tube with Difficil-S or Actichlor Plus (1/1000ppm)
    - Place into the clear leak proof bag attached to the request form and wipe outside of bag with Difficil-S or Actichlor Plus (1/1000ppm)
    - Ideally a buddy should meet you at door and hold open a second bag for you to place sample bag into
    - Attach the 'COVID-19 biohazard' label to the outside of the second bag
    - The bag containing the samples must be hand transported to the lab by a porter. The pneumatic tube system **must not be used**

Parents are permitted to visit their infant whilst they are in the cohort area, as long as they are not COVID-19 suspected or positive but also in adherence to the general restrictions for visiting, as outlined in the visiting policy below.

Postnatal Management of the Term, Well Infant

Term infants who remain well at time of delivery should remain with their mother even if she is COVID-19 positive, as long as the mother is physically able to care for her child. The pair should be cohorted into an individual room on the PNW where possible. There is no indication to test a well term infant for coronavirus, regardless of maternal status, unless they become symptomatic.

For mothers who are confirmed positive or suspected the following measures apply, regardless of symptoms:

- strict hand hygiene measures at all times
- the infant should be nursed in an incubator within the room
- social distancing observed where possible
- use of a surgical face mask when feeding
- early discharge of the pair should be considered, with clear handover to the community team
- staff should wear appropriate PPE when working within the room (Standard PPE)

If the mother is acutely unwell and unable to care for her child, the infant should be isolated from the mother and attempts should be made to identify an alternative non-quarantined carer or relative that could provide care for the infant at home.

Guidance around infant feeding is given below.

Term Infants Requiring Review, Investigation and/or Treatment

Routine procedures such as Newborn Hearing Screening and pre-discharge physical examination (NIPE) should be undertaken by midwives and audiology staff as normal. An infant who is cohorted with the mother in an individual room due to maternal proven or suspected coronavirus, should have these procedures performed beside the mother, within the individual room.

Infants in isolation on the PNW who require additional treatments or investigations (IV antibiotics, blood tests etc) should also have these performed within the patient's room. Only the minimal amount of required equipment should be taken into the room and repeat trips in and out of the room should be avoided. If blood tests have to be performed, these should be handled and sent as per Trust COVID-19 policy (see Appendix 2). If any non-disposable equipment is required within the room (ophthalmoscope), it must be cleaned as per Trust IPC COVID-19 policy after use.

Standard PPE is sufficient for routine examinations and investigations within the cohorted room.

After discharge home, the family should be advised to self isolate with the baby for 14 days from birth.

Management of the Term Infant on PNW with Acute Collapse

If the neonatal team is called urgently to the PNW for an acutely unwell infant, the infant will be deemed as potentially infected with COVID-19 regardless of maternal infection status. Given this, it is imperative that staff don full Enhanced PPE prior to resuscitating the infant, as your own personal safety is paramount. This is essential, even if it results in a short delay in initial treatment. Staff will be issued with their own fit-tested FFP3 mask which should be carried with them while on duty for the PNW areas. This will ensure appropriate protection is available for each individual regardless of location.

Upon full consideration of available equipment and space within the postnatal areas, we are currently recommending that in the event of an acute collapse on either E ward or Johnston House, the infant should be transferred out of their room or bay and onto the resuscitaire within the ward Treatment Room. While this is not ideal from an infection perspective, it will allow full access to a resuscitaire and emergency equipment. Neonatal resuscitation should continue as per standard NLS algorithm.

Once stabilised, inform the NNU and Bed Manager of the pending admission to NNU as additional help will be required to ensure a clear route during transfer. Transfer should be undertaken via designated routes where possible.

Infant Feeding

Breastmilk and breastfeeding has many significant benefits for mothers and babies. This is particularly true for infants born prematurely where breast milk is known to help protect against respiratory infections and necrotising enterocolitis.

There is currently no evidence to date that COVID-19 is transferred to breast milk and the benefits of breastfeeding are thought to outweigh any potential risks of transmission of coronavirus through breastmilk. Therefore, infants born to mothers with suspected, probable, or confirmed COVID-19 should be fed according to standard infant feeding guidelines, while applying necessary IPC precautions. The main risk for infants breastfeeding is the close contact with the mother, and the potential exposure to her infective airborne droplets. It is therefore important that the benefits of breastfeeding and any potential risks associated with COVID-19 transmission are discussed with mothers.

Infants on the Postnatal Ward or Discharged Home

Everyone should be encouraged to:

- Wash their hands before touching the baby, breast pump or bottles
- Try and avoid coughing or sneezing on your baby while feeding at the breast
- Consider wearing a face mask while breastfeeding
- Where mothers are expressing breastmilk in hospital, a dedicated breast pump should be used
- Follow recommendations for pump cleaning after each use
- Consider asking someone who is well to feed expressed milk to the baby
- For women bottle feeding with formula or expressed milk, strict adherence to sterilisation guidelines is recommended (https://www.nhs.uk/conditions/pregnancy-and-baby/sterilising-bottles/)

Infants Within the Neonatal Unit

For infants admitted to the neonatal unit whose mother is suspected or confirmed as having COVID-19:

- Breastfeeding should be encouraged through supporting mothers who have been separated from their baby to express milk (MEBM)
- Mothers should have a designated breast pump for exclusive use
- Specific Trust IPC COVID-19 cleaning procedures for should be used when cleansing the breast pumps
- Breast milk should be expressed, labelled, stored and transported to the neonatal unit in line with local infection / COVID-19 control procedures

Delivery of EBM to NNU From Mothers with Suspected or Confirmed COVID-19

Unfortunately, parents will not be permitted to visit the unit during the period that their infant is in isolation. However, it is important that maternal milk continues to be used for these infants where possible. Mothers will be given advice as follows:

- Milk should be labelled and stored at home in the home fridge/freezer until transported
- Parents should arrange for milk to be transported to the NNU. This needs to be someone who is not requiring isolation for any reason and not from the same household. The milk should be transferred in a cool bag
- Staff will meet the person with the MEBM in the RMH reception area. The staff member will wear an apron and gloves to receive the milk. The milk bottles should be transferred from the cool bag into a plastic bag. NICU staff will bring the milk to the storage area and clean with a detergent before placing in the identified area
- Extra expressing bottles, labels, pump attachments etc, should be ordered for collection by phone and picked up at RMH reception when delivering milk
- MEBM will be stored in a dedicated COVID-19 fridge and freezer within the NNU

Of note, when handling this milk at the bedside staff should continue to comply with current hand hygiene and PPE policy. As an extra precaution, we advise that staff wipe the outside of bottles/ syringes containing MEBM with a Clinell wipe, before and after any handling.

Visiting Policy

During these challenging circumstances of the coronavirus pandemic, visiting across all hospitals sites has been prohibited expect for exceptional circumstances. Although having a child within neonatal intensive care is a special circumstance, restrictions will still apply. Currently within the NNU:

- Visiting is limited to parents or named guardians only
- Only one parent is allowed at the bedside at a time
- Siblings are not allowed to visit the unit
- Parents will not be present on ward rounds
- Parents or guardians with confirmed or suspected COVID-19 are not permitted to visit the hospital until they are fully recovered and have completed the period of self-isolation.
- Parents or guardians in self isolation are not permitted to visit the hospital.
- The RCPCH advice as of 21 April 2020 is that COVID-19 suspected or confirmed mothers should not visit the NNU until symptom free and at least 7 days after the onset of their illness
- In cases where visiting has been restricted, alternatives such as video call may be considered

Discharge Home and Follow-up

For COVID-19 suspected or confirmed mothers with a term, well infant, the aim is to facilitate early discharge home as soon as is appropriate and safe. These families must self-isolate at home for 14 days following discharge. Several NHS parental information sheets are available on illness in newborns and coronavirus.

For infants who have been admitted to the NNU, whose mother is confirmed COVID-19, the need for the family to self-isolate at discharge will depend on timing of maternal illness relative to the infant's admission.

All infants with confirmed COVID-19 infection will require outpatient follow-up, although timing and duration of this is currently unclear. These infants should be discussed with ID regarding appropriate follow-up arrangements prior to discharge home.

Role of Neonatal Network

The Neonatal Network (NNNI) should be informed of all admissions of an infant who has been cohorted due to a mother with suspected or confirmed COVID-19. If the admission has direct impact on the unit capacity, consideration should be made as to whether a Network Call should be scheduled.

During this period of exceptional measures, regular network calls will also take place to gather information of how the pandemic is impacting on the neonatal intensive care capacity across the region, and also to support each other during this difficult time.

NISTAR Transport of Infant with Confirmed or Suspected COVID-19

If an infant with suspected or confirmed COVID-19 requires transfer between units or hospital sites, NISTAR should be contacted as early as possible in the process to consider and arrange the relevant logistics. The neonatal team should be aware that the transfer of a patient with suspected or confirmed COVID-19 between hospital sites requires significantly more organisation, and thus time, compared to routine transfers. It is likely that if either maternal or infant swab results are awaited, transport will be delayed, where possible, pending swab results.

Further details of NISTAR arrangements for patients with confirmed COVID-19 are available at www.nistar.hscni.net

Staff Wellbeing

We appreciate that working as a healthcare worker during this difficult time is potentially stressful. Workload and intensity will likely increase and many new challenges will emerge. It is therefore important that we look after both ourselves and each other.

Designated areas have been made available throughout the hospital for breaks or rest if required. These are referred to as 'Wobble Rooms' and are located in:

- Counselling Room, Antenatal Education Corridor, Ground Floor
- RFC Waiting Room,(after 4pm Mon- Fri and at weekends)
- "PROMPT" Store, Obstetric Theatre, Ground Floor
- Visitors Room, Delivery Suite, 1st Floor
- Conference Room 2, MacAfee Lecture Complex
- Side Room 2, E Ward
- Counselling Room 2nd Floor, beside Clinical Psychology Service
- "Green Room", DOU
- "Expressing Room, Neonatal Unit
- Side Room A, Johnstone House

The acronym HALT (Hungry, Angry, Late or Tired) is useful to gauge whether you feel you need to take a break.

There is also a wealth on on-line resources available which can be accessed either on the BHSCT Hub or within the 'RMH Neonatal Unit' MS Teams page.

Additional Resources

The amount of information available regarding SARS-CoV-2, both local and international, is significant and continues to grow daily. It is not possible to include all relevant information and guidance this within this document but we are endeavouring to maintain accurate, up-to-date information within the 'RMH Neonatal Unit' MS Team. A variety of resources can be found within the 'COVID19' folder under the 'files' tab.

If anyone requires access to this team, please contact alisonc.walker@belfasttrust.hscni.net

The Belfast H&SC Trust has made a number of COVID-19 resources available for all staff on the Hub, at:- http://intranet.belfasttrust.local/COVID-19/Pages/Home.aspx

The RCPCH and the British Association of Perinatal Medicine have dedicated COVID-19 resources at:-

https://www.bapm.org/pages/182-perinatal-covid-19-resources

https://www.rcpch.ac.uk/key-topics/covid-19

Appendices

Appendix 1	PPE Guidance
	Standard PPE Donning and Doffing Poster
	Enhanced PPE Donning and Doffing Poster
	Wearing Fluid Resistant Surgical Face Mask Safely
Appendix 2	How to Package and Transport Samples of a Suspected or Confirmed COVID-19 patient
Appendix 3	Neonatal Unit Surge Plan

Appendix 1 – PPE Guidance

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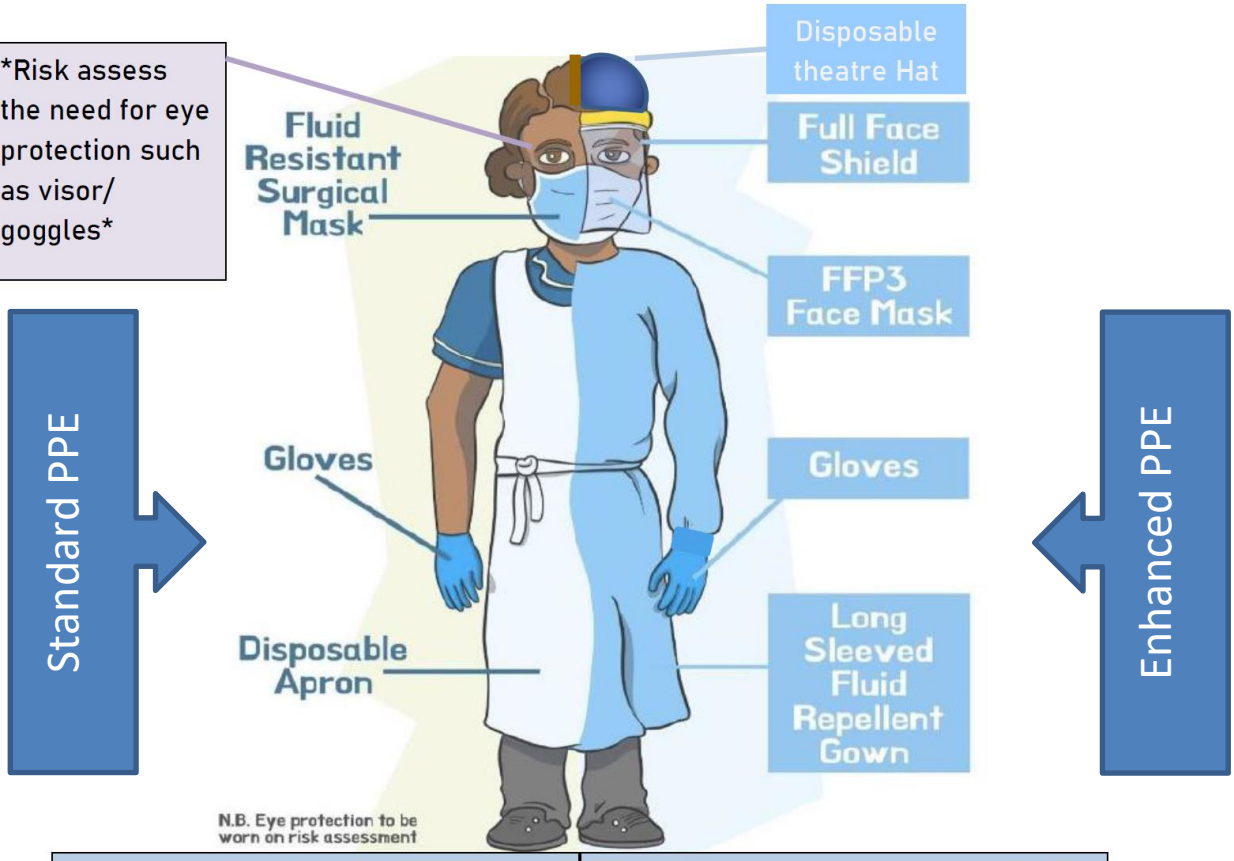
COVID-19 - Choosing the right Personal Protective Equipment (PPE)

Risk assess the need for eye protection such as visor/ goggles



For general contact with suspected/ confirmed cases of COVID-19	For aerosol generating procedures (AGPS) or when working in an 'AGP hotspot' cohort bay e.g. in ICU/HDU. A list of AGPs are found below:
• When having close patient contact (within one metre), for example, providing patient care, physiotherapy • Carrying out other tasks in a patient's room or cohort bay, for example cleaning the room, cleaning equipment, carrying out urgent repairs	• Intubation, extubation and related procedures; • Tracheotomy/tracheostomy • Manual ventilation, Open suctioning, Bronchoscopy, Induction of sputum • Non-invasive ventilation (NIV) e.g. BiPAP & CPAP • Surgery and post-mortem procedures in which high-speed devices are used; • High-frequency oscillating ventilation (HFOV) • High-flow Nasal Oxygen (HFNO) e.g. AIRVO • Some dental procedures (e.g. high speed drilling). N.B. nebulisation is not included

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Standard PPE (Amber Zones) : **Donning** of PPE

1 Preparation
Ensure hair is tied back securely and off the neck and collar. Remove jewellery, ID badges, pens etc.

2 Hand Hygiene

Hand hygiene can be performed with soap and water or alcohol gel, If hands are visibly clean a 7 step technique should always be used.

3 Apply fluid repellent face mask, mould the nose band over the ridge of the nose.

4 Apply disposable apron.

5 **Note:** Risk assess the need for further PPE such as a visor/ goggles if risk of splash. A long sleeve fluid repellent gown should be worn when an apron does not adequately cover your uniform/clothing e.g. extensive splashing.

Standard PPE (Amber Zones) : **Doffing** of PPE

1 Remove Gloves
Carefully grasp the outside of the glove with the opposite gloved hand and peel off; slide the fingers of the ungloved hand under the remaining glove at the wrist and peel the remaining glove off and discard.

2 Hand Hygiene

Hand hygiene can be performed with soap and water or alcohol gel, If hands are visibly clean a 7 step technique should always be used.

3 Remove Apron
Carefully tear the straps and roll away from the body.

4 Hand Hygiene

Hand hygiene can be performed with soap and water or alcohol gel, If hands are visibly clean a 7 step technique should always be used.

5 Remove Mask
Carefully untie the mask and remove away from the face.

6 Hand Hygiene

Hand hygiene can be performed with soap and water or alcohol gel, If hands are visibly clean a 7 step technique should always be used.

*24/03/20 *Please note this advice is based on current PHE guidance and may be subject to change. Please refer to the BHSCT Hub for continuing updates.*

Enhanced PPE (Red Zones) – Donning of PPE

Check you have everything you require for the tasks you are going to undertake. Never bring your hands up to your face or adjust the PPE while in the patients room.

1 Preparation
- Ensure hair is tied back securely and off the neck and collar
- Remove jewellery, ID badges, pens
- Wear appropriate shoes
- Ensure hair is tied back securely and off the neck and collar

2 Hand hygiene
- Hand hygiene can be performed with soap and water or alcohol gel
- A 7 step technique should always be used

3 FFP3 Mask
- Apply a securely fitted FFP3 mask.
- Use the mask for which you have been fit tested.
- Remember to fit check mask

4 Paper disposable hat is advised particularly where staff have long hair; Ensure all hair is covered and straps of the FFP3 mask are tucked in.

5 Apply a full face visor over the paper disposable hat

6 Then begin to apply:
- Waterproof long sleeved gown - securely tied at back and waist
- Long cuffed tight fitting gloves with cuffs of gown tucked in under gloves
- A plastic apron should be worn over the gown when in direct patient contact

Enhanced PPE (Red Zones) – Doffing of PPE

1
- Break apron strap at neck and waist and carefully roll apron away from body

2
- Remove gown by crossing arms and grasping gown at the front pulling it down from the shoulders
- Continue to remove gown by rolling inside out
- If gloves don't come off with the gown then grasp the outside of the glove with the opposite gloved hand and peel off, slide the fingers of the ungloved hand under the remaining glove at the wrist and peel the remaining glove off and discard

3 Hand hygiene
- Hand hygiene can be performed with soap and water or alcohol gel
- A 7 step technique should always be used

4 Carefully remove the visor by taking the strap forward over the head

5 Repeat hand hygiene

6 Remove the hat by pushing two fingers under the front of the hat and push backwards off the head

7 Repeat hand hygiene

8 When outside the patients room. Remove the mask - reaching to the back of the head and lift the bottom strap up to meet top strap bringing both straps over the head. Carefully remove mask and place in clinical waste bin

9 Repeat hand hygiene

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Using fluid shield masks safely

Perform hand hygiene directly prior to putting on the mask and directly after removal ✓

Place mask carefully to cover mouth and nose. Tie securely to minimise any gaps between the face and the mask. Mould the flexible nose band over the bridge of your nose to ensure a good fit ✓

Carefully remove mask by untying the straps.
Dispose of immediately as clinical waste & perform hand hygiene ✓

Once the mask is on do not touch/ handle the mask

Masks should be changed after each session or earlier if:

- damaged
- visibly soiled
- wet
- uncomfortable

Masks should not be partially removed and allowed to dangle around the neck, or removed from the face and reapplied

Where possible, avoid using telephones when wearing masks. If this is unavoidable, telephones should be decontaminated following each use

Appendix 2 – How to Package and Transport Samples of a Suspected of Confirmed COVID-19 Patient

Safe packaging of laboratory specimen from patients with known or suspected COVID-19

OUTSIDE PATIENT ROOM

1. All query/confirmed COVID-19 samples (blood, urine, swabs, sputa etc.) are packaged as follows.

Before entering the patient's room ensure patient information on sample tube label with a ball point pen/sample label. Ensure sample is fully labelled with MAC (minimum acceptance criteria)

Place biohazard label on the sample

INSIDE PATIENT ROOM

2. When sample has been taken decontaminate outside of the sample with Actichlor (Dilution rate is 1/1000 ppm)

INSIDE PATIENT ROOM

3. Place wrapped specimen in the clear plastic Pathoseal ® 95 bag (or double bag in usual biohazard specimen bags if Pathoseal ® 95 bag unavailable) and seal

Decontaminate the outside of the Pathoseal ® 95 bag or second biohazard bag with Acticlor

OUTSIDE PATIENT ROOM

4. A colleague will hold a large orange bag UN3373 transport ("flu") bag open at the door of the patient area room and sample bag is dropped into this.

All samples going to 1 lab (Microbiology, Virology or Biochem/Haem) from 1 patient can go into a single orange bag

Example: Patient A needs biochem, haematology and microbiology samples; patient B needs virology and biochem samples.
Bags required:
Patient A – 2 bags (haem/biochem & micro)
Patient B – 2 bags (haem/biochem & virology)
4 bags total

OUTSIDE PATIENT ROOM

5. The colleague outside the patient area will complete the following steps.

Place a biohazard sticker and write COVID-19 on the request form.

OUTSIDE PATIENT ROOM

6. Place the request form(s) in the large orange bag UN3373 transport bag.

Ensure appropriate forms in correct bag – i.e microbiology forms in bag for microbiology lab, biochemistry forms in bag for biochemistry etc.
Peel away the tape liner, and fold down adhesive to cover the opening to seal UN3373 transport bag.

OUTSIDE PATIENT ROOM

7. Attach the COVID-19 biohazard label to the outside of the UN3373 bag.

Clearly mark on the outside of UN3373 transport bag if specimens are for Haematology, Biochemistry , Microbiology or Virology Lab

8. For Internal, transport place in clean protective carrier bag.
DO NOT USE POD
All specimens transported by road should be transported in UN3373 transport box provided by drivers.
Under no circumstances should specimens be transported to laboratories via the pneumatic tube.

Order details (non-stock) *(Influenza Bulk Transport Bags (ie **Orange UN3373 bags**) , supplier Jones and Brooks, cat.no 106887) / (PathoSeal 95 A5 with 50ml Absorbent, DGP (Intelsius), cat no. BZ008)*
Order details for green biohazard labels (stock item) *WPH000071 can also be found as: Label Biohazard Warning Green 25 X 38mm*

To bring into patient room:
Phlebotomy equipment including pre-labelled bottles/sample containers
Clear biohazard bags
Presoaked acticlor (1:1000) wipes

To remain outside patient room throughout:
Orange UN3373 transport bag
Sample request forms – to be deposited loose into orange bag

Surge Plan - Neonatology

PHASE 1

COVID-19 SURGE PLAN Neonatology

It is anticipated that caring for COVID-19 positive patients who are clinically unwell will be nursing and medical resource intense. The requirement for the wearing of PPE limits interactions with patients for an individual staff member to a maximum 12 hours at a time. The donning and doffing of PPE will require a buddy system, hence requiring a higher number of staff to care for an individual patient.
A neonate of a COVID-19 positive mother who is well will remain with its mother isolated within the Maternity building.
Breastfeeding will be encouraged and supported. For infants who may need admission to the neonatal unit, see Neonatal Appendices and Action Cards.

Nursing Workforce Requirements for the care of COVID-19 patients

NICU Surge Plan

Phase	Placement Plan	Total Capacity COVID-19 patients NICU	Cumulative Nursing Staff requirement COVID patients per week	Total NICU capacity remaining (without additional resources)	Remaining available staff in post
0	Pre Surge (normal activity) with 18 beds operational in NICU (9 ICU & 9 HDU)	0	0	18	
1A	Example- 1 clinically well suspected/ positive neonate, and 2 clinically unwell suspected/positive cases.	1	8RN	16	72RN
1B		3	24RN	12	56RN

During Phase 1, infants of suspected or proven COVID-19 positive mothers will be cohorted in Bay 4 of the HDU zone, with Bay 3 kept as a PPE doffing area. This area can contain a maximum of 4

patients depending on the individual acuity and equipment requirements for each infant. Bays 4 & 3 are currently only negative pressure areas.
During Phase 1 it will be necessary to identify patients who are medically fit for repatriation to other Neonatal units. The Neonatal network would be asked to arrange an urgent conference call with Network partners to facilitate movement of patients unaffected by COVID-19. In addition, there will be weekly Neonatal Network conference calls. The Regional NICU in RJMS would liaise with RBHSC about appropriate neonatal transfers. In this phase it is anticipated that NISTAR will be operating as normal and ongoing close liaison with NISTAR should continue to ensure timely transfer of patients between units.
All training and education would be cancelled to maximise staff availability. Study leave will be suspended.
Trainee rotas will be revised to have two Level 1 doctors and two Level 2 doctors on at night and three at each Level on during the day – 12 hour shifts each supplemented by SASG doctors where possible. At the beginning of each shift, during safety briefs, there will be a MDT "COVID" and "Non-COVID team" identified.
Neonatal outpatient consultations will be scaled back to the bare minimum by using telephone consultations and deferred appointments where possible. Outpatient ROP screening will no longer take place in the NICU treatment room but will take place in the Baby Clinic rooms, taking one RN away from NICU clinical duties for 3 hours. Face to face consultations with antenatal patients in the Fetal Medicine Clinics will no longer take place. Counselling will take place just prior to delivery and/or by telephone judged on a case by case basis. During this phase, active resuscitation will not be undertaken in infants of less than 23 weeks gestation and there should be case specific discussions around resuscitation of infants of 23 weeks gestation.

However, it should be noted that staff absence during this time will also directly affect cot capacity. For example: If there is a 20% staff absence through sickness or self-isolation, the cot capacity will be reduced accordingly e.g.

- For 1 COVID-19 infant: 8RN for cohort area: 58 RN remaining Cot capacity reduced to 13
- For 3 COVID-19 infants: 24RN for cohort area: 45 RN remaining Cot capacity reduced to 10

PHASE 2

COVID-19 SURGE PLAN FOR Neonatology

In order to protect the Regional NICU, daily conference calls would take place with the Neonatal Network. Referrals of in-utero or ex-utero patients at <27 weeks gestation, infants with congenital abnormalities or neonatal surgical conditions would be discussed on a case by case basis by the consultants in RJMS and the referring unit. Pregnant women needing delivered at 27 weeks and above could be prioritised for transfer to other obstetric units. Serious ethical consideration would

have to be given to withholding active resuscitation to extremely preterm infants less than 26 weeks gestation and therapeutic interventions in infants with severe congenital malformations.
Additional COVID-19 capacity will be provided by opening Bay 2 & 1 in HDU, once there is a need for more than 3 isolated infants.
During phase 2, close liaison will take place with PICU based in RBHSC discussing the optimal location of patients on both sites, recognising that surgical neonatal patients may need to be moved out of PICU to NICU because of their surge requirements. There should also be increased consideration of referral to the Children's Hospice for patients requiring palliative care. Close liaison will also be required with NISTAR to ensure timely transfer of patients between units.
During phase 2, other non-neonatal staff (e.g. AHP, HCA, research nurses, QUB nursing students) will be upskilled to undertake level 2 and 3 neonatal care (e.g. tube feeds, personal cares, routine observations, PPE buddy, clean runners). Mothers will also be upskilled to undertake observations, tube feeds and personal cares for their infants, within the COVID-19 precautions at the time.
During phase 2, the consultant neonatologist's rota patterns will change to a "week on"/ "week off" pattern with a "1 in 3 on-call" during the week on. Additional staff (consultants, trainees and nursing) will be requested via the Neonatal Network if required to maintain bed capacity.

Phase	**Placement Plan**	**Total Capacity COVID-19 patients NICU**	**Cumulative Nursing Staff requirement COVID patients per week**	**Total NICU capacity remaining (without additional resources)**	**Remaining available staff in post**
2	More than 3 COVID-19 positive babies requiring isolation cohorted in bays 4, 2 and 1 in HDU	4	24RN	10	56RN
		6	36RN	6	44RN

The estimated cot capacity in the table above, is dependent on full nursing staff availability. During phase 2, there is likely to be at least 30% staff absence due to illness and/or self-isolation. In addition, it is possible that a proportion of junior medical staff may be redeployed by the Trust to frontline COVID care wards. There will be an inevitable reduction in cot capacity, as a consequence. The exact cot availability will be reviewed on a shift by shift basis, by the senior nurse and consultant in charge at the time of handover and safety briefings and the Network will be kept informed via the daily conference calls and the on-line cot locator.

Phase 3 Surge Extreme

In Phase 3 Surge (Extreme), the principle of doing the best for the most will be observed.
It is unclear what the implications of this phase will truly be for the NNU within the RJMS. However, it is likely to be characterised by significant nursing and medical staff absence due to sickness or self-isolation and loss of junior medical staff due to re-deployment. This would lead to significantly reduced cot capacity. At this point it is anticipated that regional neonatal services will be concentrated into a reduced number of sites with shared staff and resources. This would be coordinated through the Neonatal Network.
Due to the downturn of neonatal cots within the region at this time, serious ethical consideration would have to be given to withholding active resuscitation to any extremely preterm infants less than 28 weeks gestation and therapeutic interventions in infants with any congenital malformations.