

Guideline

Stabilisation of Neonates in Preparation for Emergency Transfer

1 Scope

This guideline is for use by the PaNDR team for neonatal patients requiring transfer for uplift of care.

2 Purpose

The aim of this document is to support clinicians preparing and stabilising babies in preparation for transfer.

3 Definitions and abbreviations

BP	Blood pressure
EBS	Emergency Bed Service
ECG	Electrocardiogram
ETT	Endotracheal Tube
FiO ₂	Fraction Inspired Oxygen
HIE	Hypoxic-Ischaemic Encephalopathy
HR	Heart Rate
IV	Intravenous
NCP1	Neuroprotective Care Pathway 1
N-PASS	Neonatal Pain Agitation and Sedation Scale
PaNDR	Paediatric and Neonatal Decision Support Retrieval Service
PCO ₂	Partial pressure carbon dioxide
PEEP	Positive End Expiratory Pressure
PO ₂	Partial pressure oxygen
PPHN	Persistent Pulmonary Hypertension of the Newborn
PVL	Peripheral Venous Line
UAC	Umbilical arterial catheter
UVC	Umbilical venous catheter

4 Introduction

Transfer of neonatal patients, particularly those who are critically unwell, is a complex process. It is important to consider the potential for deterioration during transfer, bearing in mind that it is more challenging to care for a baby in the back of an ambulance than in a hospital environment. Appropriate stabilisation reduces the risk of deterioration en route and means babies are more likely to arrive at their destination in good condition.

It should be remembered that the aim is stabilisation not definitive treatment. The aim should be to facilitate safe, timely transfer. The decision to perform any procedure should take into account the risks and benefits, taking into account any time delays involved.

5 Taking a referral

<p>Introduction</p>	<ul style="list-style-type: none"> • Ensure you open the correct encounter on Epic (EMERGENCY VS ELECTIVE REFERRAL) • Introduce yourself to Referring Team with name and role, and confirm the name, location and contact details of the referrer • Inform the Referring Team whether on a conference call and/or other team members listening to the referral • Confirm EBS information is correct
<p>Information Gathering</p>	<ul style="list-style-type: none"> • Use Epic referral form as a prompt for information gathering • Ensure key data (observations, most recent gas, current treatment) is obtained • If referrer has been deputised by other more senior clinicians who are currently stabilising the patient or if patient is very unwell, consider curtailing discussion to facilitate faster dispatch
<p>Discussion and Plan</p>	<ul style="list-style-type: none"> • Define clear stabilisation aims for referring team • Agree the recommended actions to be carried out by the referring team before the arrival of the PaNDR team • Discuss which interventions are most important and what the priorities are • Agree a plan in case of deterioration and anticipate how to manage this • Anticipate any medications/fluids/blood products that may be required by PANDR Team for transfer and ask the referring team to prepare them • Consider agreeing a time for further discussion if it is



	<p>anticipated that there will be a delay before the PaNDR team arrive at the referring unit and ask the referring team to call back if there are any major changes in the patient's condition.</p> <ul style="list-style-type: none"> • Remind the team to prepare the discharge paperwork and photocopies and to obtain a maternal blood sample and day 1 newborn blood spot (+/- day 5 blood spot if appropriate) • Agree with the consultant whether or not the team will travel on blue lights to reach the referring unit
<p>Dispatch</p>	<ul style="list-style-type: none"> • Dispatch as promptly as possible • For time critical transfers, the team should dispatch within 30 minutes when at base • Remind referring team to prepare the necessary paperwork, discharge letter and other relevant documents prior to arrival of PANDR team. • The incubator should have been checked at the start of the shift and a full check is not needed before dispatch • Ensure drugs have been signed out of the drugs cupboard and laptops have been signed out • Print out and bring drug calculator if dispatching from base • The whole team should complete the pre-dispatch section of the transfer checklist together before dispatching • Inform EBS and the referring unit of dispatch and give an estimated arrival time

6 Stabilization of infants at the referring unit

6.1 Stabilization of Infants in Emergencies

ARRIVAL AND INITIAL ASSESSMENT

- Introduce yourself to the referring team and parents (if present)
- Plug in the incubator to the mains power source on the unit
- Plug gases into the wall
- Wash hands and put on appropriate PPE. If baby is being isolated due to infection control issues, this may need to be done before entering the room and plugging in the incubator and gases
- Set up laptop and log into Epic when appropriate (initial priority should be to engage with the referring team and identify any urgent clinical issues which need to be addressed)
- Receive handover from clinical team
- Perform detailed clinical examination of the baby
- Confirm position of lines and ETT is as per handover
- Review blood results and imaging
- Set up additional equipment as needed (e.g. Tecotherm, inhaled Nitric Oxide)

- Doctor/ANNP and nurse to discuss initial assessment and plan then doctor/ANNP to update consultant with initial assessment and to agree a management plan
- Ensure local team are preparing any documentation needed for transfer
- Agree target time for departure (see below). Patient safety remains the priority

Suggested stabilisation target times:

Baby not on respiratory support	45 minutes
Baby on non-invasive support	60 minutes
Stable ventilated baby	90 minutes
Unstable ventilated baby	2 hours

AIRWAY

<p>If intubated:</p> <ul style="list-style-type: none"> • Ensure ETT in good position • Ensure airway is well secure • Ensure gastric tube present • Ensure any leak around the ETT is not significantly compromising ventilation • Review most recent post intubation CXR (ideal ETT tip position T1-T2) • Documentation of ETT size and length • Use Paediacap or end tidal CO₂ to confirm ETT in situ if any doubts 	<p>If not intubated, does the baby require intubation? Discuss with the PaNDR consultant and consider if:</p> <ul style="list-style-type: none"> • <28 weeks • Rising oxygen requirement >40% • Rising PCO₂ • Apnoea • Concerns about ability to maintain airway (e.g. seizures) <p>Discuss with PANDR consultant if an uncertainty</p>
--	---

BREATHING

<p>Ventilated babies</p> <ul style="list-style-type: none"> • Assess chest movement, air entry, saturations • Start transcutaneous CO₂ monitoring • Consider appropriate blood gas targets • Adjust ventilation as required and liaise with PaNDR consultant as required • Consider surfactant administration • Consider adding closed suction to circuit for use in transfer • Consider need for inhaled nitric oxide in babies with suspected PPHN. Request ambulance technician to bring nitric pouch from ambulance and start setting this up early if potential use anticipated • Set up and transfer baby from unit ventilator onto transport ventilator, bearing in mind settings used on unit ventilator

- Potential problems to exclude if ventilation is difficult:
- Displaced ETT – check position
 - Obstructed ETT – consider suction
 - Pneumothorax – consider needle decompression or drain insertion
 - Equipment – check the ventilator circuit for leaks and ensure the ventilator is working correctly
 - Large leak around ETT – consider upsizing tube
 - Ventilator mode – consider using active PEEP if using BabyPac
 - Baby-ventilator interaction – Consider increasing sedation or muscle relaxation

- Babies on non-invasive respiratory support
- Ensure appropriate size and fit for mask/prongs
 - Change to transport circuit
 - Ensure baby stable on current settings. Consider increasing flow/PEEP/FiO₂
 - If not stable, consider need for intubation
 - Consider optimal positioning and whether use of prone positioning aids would be beneficial

- Babies not on respiratory support
- Ensure good respiratory effort
 - If work of breathing is increased, consider need for respiratory support

CIRCULATION

- Cardiovascular monitoring and treatment
- Monitor HR with continuous ECG monitoring
 - Monitor blood pressure. If using non-invasive BP, ensure appropriate cuff size used and check BP at least every 30 minutes throughout stabilisation (at least every 15 minutes during transit)
 - Assess perfusion and lactate
 - Review any fluid boluses and inotropes already given
 - Anticipate cardiovascular instability in a sick neonate. Consider having fluid boluses and inotropes prepared and ready to infuse
 - When starting inotropes, consider asking local team to prepare next-line inotrope
 - Consider cardiac anomaly if concerns about oxygenation or pre-post ductal saturation difference. Consider starting prostin infusion
 - Discuss circulatory support measures with PaNDR consultant

Access

- Ensure 2 secure points of IV access. Flush all PVLs to ensure patency
- Relative indications for central venous access – multiple inotropes, dextrose infusions with concentration 15% or greater, prostin, unstable baby with estimated journey time >1hr

<ul style="list-style-type: none"> • Relative indications for arterial access – Unstable BP, need for multiple inotropes, PPHN • Ideal UVC position is T8-T12 and UAC position is T6-10 but a low/high lying catheter might be acceptable for the purpose of transfer balancing the risks of repositioning and waiting for x-ray with the impact of delaying the transfer • If arterial line in situ, prepare an arterial transducer compatible with the PaNDR monitor • Ensure all catheters are adequately secured and labelled for transfer • Do not delay transfer by inserting lines that are not required for safe transfer • Obtaining x-rays to confirm line position can take some time. Consider the risks and benefits of waiting for repeat imaging if line positions are adjusted on a case by case basis • If the baby is on a Tecotherm, this will compromise the quality of the images obtained. However despite this, the images will be adequate to check line positions and starting active cooling should not be delayed while awaiting x-rays.
DISABILITY (Neurology)
<ul style="list-style-type: none"> • Assess need for active cooling where appropriate and if needed, start this as soon as possible. Ensure NCP1 has been completed by the local team and complete the cooling section of the Epic flowsheet • Consider whether sedation and analgesia are adequate as guided by N-PASS score. Ensure adequate analgesia and sedation before giving muscle relaxants • For suspected seizures, consider anticonvulsant treatment if confirmed on CFM and/or causing cardiorespiratory compromise
EXPOSURE
<ul style="list-style-type: none"> • Consider temperature control, aiming for normothermia (unless therapeutic hypothermia indicated). Adjust transport incubator temperature accordingly • Use of Neohelp suit for infants < 30 weeks or < 1kg, and consider using the Neohelp suit for infants who are 30-32 weeks and <1.5kg • Ensure naso/orogastric tube in situ and test aspirate to confirm correct position
FLUIDS & GLUCOSE
<ul style="list-style-type: none"> • Monitor blood glucose. • Ensure maintenance fluids are running at the correct rate • Consider increasing dextrose infusion rate or dextrose concentration if concerns about hypoglycaemia • Ensure a sufficient volume of maintenance fluid is available, particularly if a long journey time is anticipated or if the fluids are running at a high rate. Consider whether a 2nd syringe of dextrose may be required

- Consider restricting fluids in babies with HIE

HAEMATOLOGY & INFECTION

- Ensure vitamin K given
- Anticipate need for blood products, request these early
- Ensure antibiotics given as appropriate and clarify when next doses are due
- If any infection control concerns are present ensure receiving unit is made aware. This will also guide cleaning level required at end of transfer

EQUIPMENT AND SPECIAL CONSIDERATIONS

Attach monitoring compatible with transport incubator as per table below:

All babies	If required
Saturation probe (pre- and post-ductal if suspected PPHN)	Rectal temperature probe (if active cooling in progress)
ECG leads	Transcutaneous CO ₂ (if ventilated and on a case by case basis for other babies on respiratory support)
BP cuff or arterial blood pressure transducer	
Skin temperature probe	

Other special considerations

- If gut pathology suspected, ensure large bore (8Fr for a term baby) gastric tube in situ on free drainage
- If chest drain in situ, discuss whether to use Heimlich (flutter) valve or atrium drain with PaNDR consultant
- If using the Tecotherm, please switch this off before disconnecting from wall power supply to avoid triggering alarms

Move infusions across onto transport infusion pumps

Ensure adequate supply of gases available before leaving referring unit

Anticipate drugs that might be needed during transfer (e.g. morphine, pancuronium or saline boluses, phenobarbitone or additional inotropes) and ask local team to prepare these to take on journey.

A blood gas must be taken with baby on transport respiratory circuit before departure from referring unit

FAMILY

- Ensure you have introduced yourself to parents and update them before departure. It may be helpful to utilise the local team to communicate with parents while the PaNDR team focus on stabilisation
- Give parents a copy of the PaNDR parent information leaflet
- Ensure parents are aware of the planned destination and have the contact details for the receiving unit
- Obtain contact details for parents

- Document any safeguarding issues that have been identified
- If parents are planning to travel in the ambulance and meet the criteria to do so, they must complete the appropriate “Confirmation of travel” form in the parent leaflet and any relevant questionnaires
- The ambulance technician should set up a V-Create account for the baby where appropriate

“GO” – DEPARTURE FROM REFERRING UNIT

Try to work within the time frame established with the team on arrival. If a delay occurs, review the situation and prioritise as a team. Please see section 9.2

Check blood gas before departure

Reassess the baby as a team in preparation for departure

Update PANDR consultant before departure and agree whether blue lights will be required

Ensure Pre Departure Checklist is completed with all team members present

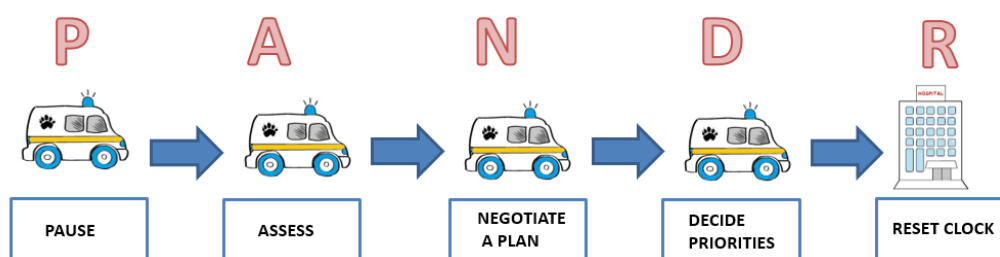
Inform EBS of departure

Inform receiving unit of departure and give a clinical update so all relevant equipment and medications can be prepared

Ensure all actions taken during stabilisation are clearly documented

9.2. Framework for reassessment in the event of unexpected events or delays

In case of unforeseen delay in stabilization for any reason (clinical deterioration, equipment failure, or other) it is useful to review the situation as a team and set up new targets for departure.



PAUSE: What has happened? Is there a sudden deterioration? Alert the whole team and verbalise any concerns.

ASSESS: Assess the patient systematically and review vital signs. What has changed? Is the equipment working properly?

NEGOTIATE A PLAN: Step back as a team and discuss findings and verbalise your thoughts and concerns. Discuss your plan with the PaNDR consultant. Consider who else needs to be informed – EBS, the receiving unit, parents?

DECIDE PRIORITIES: Make a plan of action prioritising what needs to be done first to facilitate transfer and what could be deferred until arrival at receiving unit.

RESET THE CLOCK: Set a new provisional time for departure.

7 Monitoring compliance with and the effectiveness of this document

The PaNDR team will monitor compliance with this document by undertaking regular audits, which will be reported back to the PaNDR consultants and lead nurse.

The effectiveness of the document will be monitored by review of any reported incidents via the lead nurse for risk.

Equality and diversity statement

This document complies with the Cambridge University Hospitals NHS Foundation Trust service equality and diversity statement.

Disclaimer

It is **your** responsibility to check against the electronic library that this printed out copy is the most recent issue of this document.

Document management

Approved by:	PaNDR Consultants 2021		
Approval date:	09/11/2021		
JDTC approval date:			
Owning department:	PaNDR		
Author(s):	Dr Catriona MacDougal, Dr Carolina Costa		
Pharmacist:			
File name:	Stabilisation of Neonates in Preparation for Emergency Transfer Version 1		
Supersedes:			
Version number:	1		
Local reference:		Document ID:	102352



