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1. Detail of Procedural Document

North West (England) & North Wales Paediatric Critical Care Network: Transport Guidelines

2. Equality Impact Assessment

EqIA Registration Number: **64/13**

3. Consultation, Approval and Ratification Process

This guideline was developed with input from:

- North West (England) & North Wales Paediatric Transport Service (NWTs).
- Representatives from the North West (England) and North Wales Paediatric Critical Care Network (PCCN).
- Representatives from both Paediatric Intensive Care Units (Royal Manchester Children's Hospital and Alder Hey Children's Hospital).
- Representatives from the District General Hospitals within the PCCN

These guidelines were circulated amongst the NWTs team and the Paediatric Critical Care Network. All comments received have been reviewed and appropriate amendments incorporated.

Note: The guidelines were initially considered for ratification by CMFT Medicines Management Committee (MMC) in March 2013, who advised that ratification by MMC was not required. It was therefore confirmed that CMFT Divisional Children's Clinical Effectiveness Committee would be the appropriate forum for ratifying the guidelines. The guidelines were forwarded for consideration in preparation for the May Clinical Effectiveness Committee meeting.

For Guidelines Ratification Process please see appendix G.

4. References and Bibliography

See guidelines.

5. Disclaimer

These clinical guidelines represent the views of the North West (England) and North Wales Paediatric Critical Care Network and North West (England) and North Wales Paediatric Transport Service, which were produced after careful consideration of available evidence in conjunction with clinical expertise and experience.

The guidance does not override the individual responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient.

Clinical advice is always available from NWTs on a case by case basis. Please feel free to contact NWTs (01925 853 550) regarding these documents if there are any queries.

North West and North Wales Paediatric Critical Care Network

Transport Document

This guideline sets out the minimum standards relating to paediatric stabilisation and the intra-hospital and inter-hospital transfer of children.

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NB NWTs parent information leaflet is available via NWTs website www.nwts.nhs.uk

1. Introduction

- 1.1. Moving patients from one clinical environment to another is a process that requires careful thought, preparation and attention to detail. Whether that move is from a home environment to hospital, from the scene of an incident to an emergency department, from a hospital ward to a CT or MRI scanner or from one hospital to another, it is essential that the staff involved in moving the patient have given due consideration to the process of the move, considered what equipment and monitoring is required, who should accompany the patient and the best means of transport.
- 1.2. Transfers may be undertaken by a variety of different teams. The options in North West (England) and North Wales region include a paramedic team, a team from the referring hospital, the North West (England) and North Wales paediatric Transport Service (NWTSS), or, rarely, a transport team from the receiving paediatric intensive care unit. Any transfer must be conducted as safely as possible and to current Paediatric Intensive Care Society Standards.

2. Aim

- 2.1. The aim of this guideline is to standardise practice and assist both medical and nursing staff in facilitating the safe transfer of children between hospitals within the North West (England) and North Wales regions or to an appropriate paediatric unit bed when clinical need and/or pressures dictate. By doing so it is hoped that the inherent risks associated with any transfer will be minimised.

3. Scope

- 3.1. This guideline covers a large number of clinical situations and, therefore it is in effect a summary document. It should be read in conjunction with the existing North West (England) and North Wales Paediatric Critical Care Operational Delivery Network or other regional paediatric network guidelines (eg children's major trauma and congenital heart networks) for the management of critically ill and injured children.
- 3.2. The contents relate primarily to the transfer of children from referring centres to another hospital or between hospital buildings (Categories of Transfers – see below).
- 3.3. The most common reasons for transferring a child are for specialist treatment or investigation, usually to a tertiary centre, for example paediatric intensive care (paediatric critical care level 3), paediatric high dependency (paediatric critical care level 1-2), emergency neurosurgery, specialist cardiology services, paediatric surgery, burns care, metabolic or endocrine services, and specialist radiology investigation / intervention.
- 3.4. In certain circumstances, it may be necessary to move a patient for the delivery of a specific level of care and/or in order to create a bed for another patient needing specialist services available in a particular unit. In this case, the transfer will be discussed with the patient's family and all units involved. It will only take place if there is agreement that the transfer is appropriate.
- 3.5. However the principles for the safe movement of ill children are also applicable to transport within a hospital e.g. from A&E to ward, or for an x-ray or CT scan.

4. Roles, Responsibilities and Accountabilities

- 4.1. Any transfer must embody clear, clinical advantages for the child and be balanced against the potential risks inherent during any transfer.
- 4.2. The decision to transfer lies with the consultant or associate specialist in charge of the child's care at the point of transfer, with the knowledge and acceptance of the consultant at the receiving unit.

- 4.3. Simplistically the referring consultant in charge of the patients' care will remain responsible for their care until the transfer team have received handover, assessed the patient and formally accepted the patient into their care. Thereafter the responsibility for clinical care ultimately rests with the consultant in charge of the team undertaking the transfer. However the boundaries are often blurred; the transfer team will usually recommend a management plan to be followed prior to their arrival. This should be considered expert advice. Assuming that the advice is followed the consultant of the transfer team will then take some responsibility for the consequences of their advice being followed. Where advice is not followed and a poor outcome occurs it will be for the local team to explain why they took an alternative course (appropriately or otherwise). The transport team should be able to demonstrate that they give appropriate advice. In the absence of such evidence an expert team might be criticised for not providing appropriate guidance.
- 4.4. There may be a particularly difficult period during stabilisation and preparing for transfer where a trainee doctor from a transport team is working under the direct scrutiny of a local/referring hospital consultant. Clear communication and accurate documentation is key, including keeping the transport consultant up-to-date with clinical situation. It is expected that the local team will be supportive throughout this process, and that the transport team will be able to request help from within the local multi-disciplinary team as required. For example, a trainee doctor from transport team should request the help of a consultant anaesthetist from the referring hospital if an intubation is expected to be difficult.
- 4.5. When the situation requires the local / referring hospital to undertake the inter-hospital transfer, it is not uncommon for the medical or surgical teams to ask the anaesthetic service to manage the transfer. The lines of responsibility will alter between teams in the same way as would occur using an external transfer service for specialist referrals. Therefore the local team, the anaesthetic team and the receiving (specialist) centre will all assume some part of the responsibility of care. NWTS is available for advice on all transfers, including paediatric high dependency, trauma and time critical. NWTS team are able to set up a conference call with relevant specialties in addition to providing advice on patient management. This may reduce any delays associated with multiple phone calls for any potential time critical or trauma transfers undertaken by the referring hospitals' team

5. Organisation of Transfer

- 5.1. For referrals to PIC, NWTS provides a single point of contact for paediatric critical care transfers in the North West (England) and North Wales region.

NWTS Referral Number

08000 84 83 82

- 5.2. NWTS will transfer neonates over 2 kg, infants and children below 16 years of age that are to be transferred into Paediatric Intensive Care (PIC). NWTS will provide advice on stabilisation and management, whilst locating an appropriate paediatric critical care bed to receive the child. It is NWTS responsibility to transfer all non-time critical patients to an appropriate critical care bed (whether this is in or out of region). Young adults (i.e. those above 16 years age) who are currently under the care of paediatric specialists at a tertiary centre and require PIC will only be transferred by NWTS if the patient has been accepted by a specialist consultant via a direct (consultant to consultant) conversation (e.g. via NWTS conference call). NWTS are funded as single transport team 24/7 for Paediatric Critical Care (PCC) level 3 transfers, and therefore does not have capacity for the vast majority paediatric high dependency transfers ie PCC level 1 or 2 (see section 14 for definitions). Any PCC level 1 or 2 transfers will only ever be agreed after a consultant to consultant discussion and as an exception to the rule.
- 5.3. Neonatal referrals (ie in-patients on a neonatal unit) should be discussed with the relevant regional neonatal transfer team (ie CONNECT North West or North Welsh team). If there is uncertainty which transport team is most suitable to undertake the transfer, a conference call between NWTS, the relevant neonatal transport team, referring team and any appropriate regional specialists will clarify which transport team is most appropriate. There may be exceptional circumstances (e.g. peak demand for neonatal teams) when it may be possible for NWTS team to transfer neonates less than 2 kg whose final destination is paediatric critical

care. On such exceptional occasions it may be more appropriate to utilise a hybrid neonatal/NWTS team especially if the destination is a tertiary NICU.

- 5.4. Time critical transfers such as neurosurgical, surgical emergencies should be referred to NWTS, who will facilitate conference calls with the appropriate surgical team and locate an appropriate PIC bed. Advice on stabilisation and transport will be provided, however in these circumstances the referring team will be expected to undertake the transfer unless an alternative plan is agreed with between the accepting consultant surgeon and NWTS consultant.
- 5.5. Standard information will be requested upon referral (Referral Information, Appendix A). To simplify the referral process NWTS recommend that all referring teams complete the form (available at www.nwts.nhs.uk – see guidelines section) before making a referral to enable NWTS to provide appropriate timely advice on patient management.
- 5.6. The ultimate responsibility to ensure all appropriate communication takes place lies with the consultant responsible for the decision to transfer (includes both verbal and written). Similarly, the accepting clinician in the receiving unit has ultimate responsibility to ensure that the handover communication at that end of the transfer chain is both unambiguous and sufficient.

6. Patient Preparation and Packaging

- 6.1. A risk assessment should be undertaken prior to any transfer of a patient. This should be clearly documented and use of the STOPP document and Paediatric Early Warning Score (Appendix B) is recommended.
- 6.2. To reduce complications during transfer, adequate resuscitation and stabilisation should be carried out prior to departure using the ABC approach (STOPP document, Appendix B). If any triggers are identified it is essential that a consultant paediatrician +/- consultant anaesthetist review the patient, and, if indicated, the consultant should contact NWTS who will provide advice on patient management prior to transfer.
- 6.3. Hypovolaemic children tolerate the inertial forces of transportation poorly. This is likely to manifest itself with unstable/labile blood pressure. If this is a possibility always have a fluid bolus available and/or an inotrope infusion drawn up and ready to start if needed.
- 6.4. Time critical transfers require transfer once the airway is secured (if required), ventilation established and adequate peripheral intravenous or intraosseous access achieved. Do not delay transfer to place central or arterial lines. On-going stabilisation will need to continue during the transfer.
- 6.5. For all major trauma patients the overall aim is to arrive at a children's major trauma centre (ChMTC) for on-going care within 3 hours of injury whether or not there is a time critical neurosurgical lesion (4 hours for patients from Bangor, Barrow or Isle of Man). Responsibility to do the transfer rests with the local team, unless otherwise agreed by the Trauma Team Leader at the receiving Children's Major Trauma Centre and NWTS consultant on duty. NWTS will provide advice on patient management and logistics.
- 6.6. Monitoring should be established prior to transfer and consist of a minimum of continuous ECG, pulse oximetry, capnography (on all intubated and ventilated patients) and temperature. Blood pressure readings should be measured at a minimum of 15 minute frequency (preferably invasive, particularly if on inotropes). A record of clinical monitoring before and during transfer should be able to remain with the patients' notes once transfer complete (use of STOPP document recommended).
- 6.7. All drug dosages should be calculated using www.crashcall.net. Ongoing advice is available 24/7 via NWTS referral line from a Consultant Paediatric Intensivist.
- 6.8. All drugs and fluids given must be documented appropriately (including date/time) and copies of prescription/administration sent with the patient. All infusions should be labelled appropriately including drug concentrations.

- 6.9. Radiology images should be sent electronically by PACS to the receiving centre or copied onto a CD (without encryption) and given to the transfer team.
- 6.10. A copy of medical and nursing documentation/summary should be sent with the patient (see below).

7. Transfer personnel (check with STOPP document)

- 7.1. The personnel chosen to accompany the infant or child on transfer should reflect the transfer category (see STOPP document). The transfer personnel should familiarise themselves with the patient's history, present condition and treatment up to the point of departure.
- 7.2. All staff undertaking transfers should have appropriate competencies, training and experience. They should be trained and competent to use the transfer equipment provided. Appendix C: PCC level 1-3 equipment list – this is an example of the type of equipment needed to transfer a critically sick or injured infant or child and may be adapted for local use.
- 7.3. Personnel should wear appropriate clothing for the clinical environment and have fluorescent, high-visibility jackets or vests available in case they need to leave the vehicle.
- 7.4. The team should carry a mobile phone and contact numbers to allow communication with the receiving unit, along with a small amount of money in case of emergencies. They should know the precise destination of the patient and have a named contact and telephone number for the receiving unit
- 7.5. Whilst in transit personnel should remain seated at all times and wear seat belts. NB the ambulance must be stopped before any personnel undertake any emergency interventions that are required.
- 7.6. NHS Trusts must ensure that all their employees sent on transfers have adequate insurance cover.

8. Transfer equipment

- 8.1. All equipment should be robust, durable and lightweight (see Appendix C for examples).
- 8.2. All equipment should be checked and tested prior to transfer and have adequate power reserves for the transfer, including spare batteries in case of power failure.
- 8.3. The availability of electrical supply within the transport vehicle should be ascertained and used if appropriate to continue charging equipment during transfer.
- 8.4. Monitors should have a clear illuminated display and alarms should be both visible and audible in view of background noise levels from vehicle.
- 8.5. Portable ventilators must have disconnection and high-pressure alarms.
- 8.6. All monitors, infusion devices and ventilators must remain visible to the transferring personnel.
- 8.7. Additional equipment for maintaining and securing the airway, assisting ventilation and achieving intravenous or intra-osseous access etc should be carried.
- 8.8. All equipment should be safely secured in the back of the vehicle prior to the journey.
- 8.9. All infants and children being transferred between hospital sites must be secured to an ambulance trolley using a 5-point harness or, in certain circumstances, an age-appropriate car-seat (always ensure a patient's airway can be maintained). A lap-belt or the equivalent on a trolley is inadequate and should not be used.

- 8.10. The vehicle used for patient transfer should be one deemed and assessed as appropriate for the task (see STOPP document).

9. Documentation and Handover

- 9.1. The consultant responsible for the patient's care at the referring unit is ultimately responsible for all communication about their patient to the transport team (NWTs) or the receiving unit (if local team transferring patient). The referring consultant has the responsibility to ensure that messages are timely, clear, concise and consistent. It is important that an accurate written record of all communication is kept.
- 9.2. Children being transferred between trusts must be accompanied by high quality information. Members of the multi-disciplinary teams involved in resuscitation and stabilisation of the patient should be present to give a full handover including history, details of stabilisation and intubation, any safeguarding concerns and any other additional information. These teams will remain involved in the patient's care until the NWTs team leave the host hospital.
- 9.3. Photocopies of notes, observations, prescription charts and all investigations, x-rays etc should be included along with a summary bearing the responsible clinician's name.
- 9.4. Ideally, any imaging should be transferred electronically (e.g. radiology via PACS transfer). If this is not possible then the images should be copied onto a non-encrypted CD (this is particularly important for time critical, PICU and HDU transfers) and taken with the child.
- 9.5. The receiving unit should be contacted just prior to departure to confirm the availability of the bed, provide an update on the child's condition and give an estimated time of arrival (Appendix B: STOPP document - checklist prior to transfer).
- 9.6. A contemporaneous record of all observations and on-going medical therapy must be kept during the transfer. - eg STOPP document plus NWTs referral document – please use both of these documents along with drug/fluid charts. Please record the response to any intervention.
- 9.7. Any untoward problems or incidents should be documented for audit and follow up.
- 9.8. On arrival, there should be a formal verbal and written handover from the transfer personnel to the medical and nursing staff at the receiving unit.

10. Infection Control

- 10.1. Local guidelines for infection control should be followed.
- 10.2. As many diseases may be transmitted between patients and potentially between patients and members of staff, it may be necessary to isolate:
- 10.2.1. Patients with a known infection e.g. Pertussis, Measles, Chicken Pox
 - 10.2.2. Patients who are known or may be colonised with multi-resistant organisms including MRSA, Extended Spectrum Beta-Lactamase (ESBL) producing organisms (usually E. coli or Klebsiella pneumonia), glycopeptide resistant enterococci (GRE), and carbapenemase resistant Enterobacteriaceae (CPE) (coliforms and Acinetobacter species).
 - 10.2.3. Patients who are particularly vulnerable to infection e.g. neonate (especially premature), and neutropenic oncology patients
- 10.3. It is important to inform both the transport team and the receiving unit of any potential need for isolation.
- 10.4. Certain infections must be reported to the Health Protection Agency, this should ideally be done by the referring unit (if uncertain check with HPA via their website www.hpa.org.uk). This should be clearly documented in the patient records, including any documentation sent with the patient to the receiving unit.

- 10.5. Any appropriate antibiotic prophylaxis for immediate family i.e. parents and siblings should ideally be arranged by the referring team and documented in the patient records. It is important to inform the transport team and receiving unit if this has not been done.
- 10.6. Any appropriate antibiotic prophylaxis or vaccination for exposed staff, e.g. those involved in treatment of a patient with probable Meningococcal sepsis or Pertussis, is the responsibility of their employing trust.

11. Communication with relatives

- 11.1. Keep parents/carers/guardians informed of any decisions being made regarding their child's transfer – particularly regarding where, why and what treatment is potentially needed (e.g. operation).
- 11.2. Some children may not survive even with best clinical care. If death is a possible / likely outcome it is important that the referring team inform parents/ carers. It is important to offer clear realistic information to parents/ carers.
- 11.3. Document all communication with parents/carers in patient notes.
- 11.4. Parents should be warned that they may be unable to accompany their child in the ambulance due to restricted space. Decisions whether it is beneficial to the child for the parent to accompany them should be made on an individual patient basis. In many cases, one family member will be able to travel with the patient (NWTS have an extra seat to accommodate a parent) as long as they are fit to travel at the time of transport.
- 11.5. Parents' names and contact details including phone numbers must be included in the handover documentation for the receiving hospital (even if one parent/guardian is travelling with the patient)
- 11.6. Contact details and the precise whereabouts of the clinical area that the child is being transferred to in the receiving hospital should be provided for the immediate family and other family members. This should include the address (including postcode), maps and directions to the receiving unit. NWTS parent information leaflet is available via NWTS website www.nwts.nhs.uk and includes maps and directions to both Alder Hey Children's and Royal Manchester Children's Hospitals.
- 11.7. Ideally, a friend or other family member should drive parents to the receiving hospital. Where a third party is unable to provide transport this must be provided by the referring hospital e.g. taxi.
- 11.8. It may be advisable that parents wait 10-15 minutes after the transfer team have departed before following on at a safe pace or go home to make arrangements for a stay on PICU/HDU (shower, get fresh clothes, see other children etc). Parents should be told not to attempt to lead or follow the ambulance especially if a blue light journey is essential. Under no circumstances should parents be asked to leave the premises before appropriate face – to – face discussion with the transfer team has occurred.

12. Safeguarding

- 12.1. It is important to consider and clearly document any safeguarding concerns for all children transferred between departments or hospitals.
- 12.2. It is important that any probable safeguarding concerns are flagged early to the local safeguarding teams to ensure that timely investigations can take place and to prevent loss of vital information (See appendix E for safeguarding checklist / documents).
- 12.3. Transfer documentation should state clearly whether a referral has been made to children's social care and what has been said to parents. In addition there should be a referring consultant to receiving consultant discussion to ensure that responsibility for management of any child protection concerns is agreed within the receiving trust.

12.4. Patient documentation must include clear documentation of any injuries noted (including colour, shape and size – with accurate dimensions), any interventions performed (including any unsuccessful attempts at insertion of lines or urinary catheters), information given to parents, names of the responsible clinicians conducting the initial assessments, and names (and contact details) of those spoken to in social services and/or police.

13. Categories of Transfer (see STOPP document)

- A.1. Careful assessment must be undertaken jointly by the senior nurse on duty and medical team to determine the appropriate level of transfer required for any individual patient (see Appendix B: STOPP document). If any concerns are identified whilst completing the risk assessment the patient must be reviewed by consultant paediatrician and/or consultant anaesthetist prior to transfer.
- A.2. Stability is best assessed by the presence of two identical STOPP risk assessments plus Paediatric Early Warning Scores (PEWS) or equivalent, completed at least 30 minutes apart. This does not replace but should complement a careful clinical assessment by the consultant in charge of the patient.

Five levels of transfer are identified as (full definitions in section 14):

TRANSFER CATEGORY	ANY TRIGGERS	STAFF REQUIRED (examples only)	DISCUSS WITH NWTS
Level 0 (ward level) Child not on continuous monitoring	Non-anticipated	Parent / carer or Nurse or both Standard ambulance crew / transport	NO
PCC Level 1 (Basic critical care) Children needing continuous monitoring or iv therapy or any PCC Level 1 Care <u>Can be a difficult transfer: Joint decision /agreement between senior nurse & consultant essential before transfer</u>	a. No	Competent nurse OR doctor (essential if on iv infusion fluids / drugs) OR paramedic ambulance crew	NO
	b. YES	Competent Nurse &/or Doctor + Paramedic crew	PROBABLY
	c. YES <u>AND</u> High Flow Oxygen, OR potential for airway or other compromise	Nurse/ODP AND Senior Airway and Paediatric resuscitation competent Doctor AND paramedic ambulance crew OR NWTS transfer only if agreed jointly with referring consultant + NWTS consultant	YES
PCC Level 2 (Intermediate critical care) PCC Level 1—acute intervention for more than 24 hours	YES / NO	Nurse/ODP AND Senior Airway and Paediatric Resuscitation competent Doctor AND paramedic ambulance crew OR NWTS transfer only if agreed jointly with referring consultant + NWTS consultant	YES
Level 3 (Advanced critical care) Intubated and Ventilated	Yes / No	NWTS transfer unless time critical (rare exception may be palliative care)	YES
Time Critical (Level 1-3) Traumatic Brain Injury, Ischaemic gut, Life or Limb threatening diagnosis	Yes / No	Local Team: Nurse/ODP + Senior Airway + Paediatric resuscitation competent Doctor + paramedic crew MAJOR TRAUMA: REFER TO TRAUMA TEAM LEADER	YES

Level 0: Ward level transfer

- A.1. A stable child transferred electively between hospitals for specialist investigation/treatment or an outpatient appointment. This transfer is indicated for patients requiring:
 - A.1.1. Repatriation to a local paediatric ward
 - A.1.2. Specialist review in tertiary centre outpatients department
 - A.1.3. Investigation not available in the referring hospital
 - A.1.4. Bed capacity – when no local bed is available
 - A.1.5. Palliative care in a different location
- A.2. This assumes accurate clinical assessment of the child and the appropriate grading of the severity of the child's illness.
- A.3. The child's observations/Paediatric Early Warning Scores (PEWS) or equivalent, should be within normal limits for that child for the preceding 24 hours.
- A.4. By definition minimal monitoring should be required
- A.5. A child should be moved in an ambulance, accompanied by an appropriately experienced, competent nurse or paramedic. The majority of patients can be transferred by a paramedic crew, as they should not require any drugs, intravenous fluids or interventions during the transfer. A patient should be accompanied by a nurse if they need any equipment unfamiliar to a paramedic during the transfer, for example, a patient with a tracheostomy, and a tracheostomy trained parent or carer will not be accompanying the patient. This assessment should be made by the senior responsible clinician from the referring unit.
- A.6. Observations are to be recorded prior to and on arrival at the receiving hospital (minimum) for the majority of patients. However, they may need to be recorded more frequently for some patients e.g. on journeys more than 1 hour duration.
- A.7. If full monitoring is required or the possibility that drug administration may be required, it should be considered at least PCC level 1 transfer.
- A.8. The majority of transfers are anticipated to be from one paediatric unit to another for on-going paediatric care e.g. from a short stay assessment unit to an in-patient unit or between in-patient units (at periods of peak demand) when bed capacity is a problem. A small number of transfers are anticipated for in-patient tertiary speciality care or opinion.

Level 1: Basic critical care (HDU / PCC level 1)

- A.1. These transfers should only occur for patient specific reasons as every hospital within North West (England) & North Wales should be able to provide Level 1 paediatric critical care (basic) as a minimum. Decision to transfer should be on a case by case basis. The STOPP tool must be used for all cases and discussion with NWTS should be considered depending on patient triggers during risk assessment.
- A.2. These patients are children needing continuous monitoring or continuous IV therapy
- A.3. This transfer is indicated if;
 - A.3.1. Urgent investigations or treatments are needed and not available in the referring Hospital.
 - A.3.2. The patient requires on-going specialist care
 - A.3.3. No local bed is available.

However, routinely, only ward level/ level 0 patients should be moved for this reason. Therefore, any Level 1, or above, patients being moved because of bed capacity issues should be reported as an exception via the local Trust incident reporting system.

- A.4. **NWTS do not undertake PCC level 1 transfers but are able to assist with advice on patient management and transfer after assessment by consultant on duty.** Advice from NWTS may be particularly helpful when there is uncertainty or lack of consensus regarding a patient transfer. Please use the table above from the STOPP document to determine the most appropriate team to accompany the patient during transfer.
- A.5. Monitoring should include (as a minimum) ECG, oxygen saturations, respiratory rate and non-invasive blood pressure readings recorded every 15-30 minutes during transfer.
- A.6. Adequate drugs and equipment should be carried to manage any potential deterioration during transfer

Level 2: Intermediate critical care (HDU / PCC level 2)

- A.1. **The NWTS team is not commissioned for PCC Level 2 transfers but NWTS may undertake these transfers in exceptional cases.** This will be decided by NWTS consultant on a case by case basis, taking into account service demands and the best interests of the patient. The STOPP tool must be used for these cases. Advice should be sought from NWTS prior to moving any PCC level 2 patient.
- A.2. Level 2 patients are at risk of sudden deterioration during transfer. Examples include the immediate post-operative child or a child with unstable epilepsy or patients requiring non-invasive ventilatory support.
- A.3. The child should be moved in an emergency ambulance, accompanied by a senior clinician, ideally a consultant in paediatrics/anaesthesia/emergency medicine or a trained/competent, senior trainee or advanced (paediatric) practitioner, and a PLS/APLS/EPLS (ideally) trained nurse or ODP.
- A.4. Monitoring should include (as a minimum) ECG, oxygen saturations, respiratory rate and non-invasive blood pressure readings recorded every 15-30 minutes during transfer.
- A.5. Adequate drugs and equipment should be carried as per PCC level 3 transfer.

Level 3: advanced paediatric critical care ie paediatric intensive care (PIC) transfer

- A.1. A child requiring on-going intensive care and organ support e.g. ventilated +/- inotrope infusions, which will usually be provided at either of the two tertiary paediatric centres in North West (England) & North Wales.
- A.2. Most PIC transfers will be undertaken by NWTS. If the team is unavailable (eg major incident) NWTS may coordinate a transport team from another regional service or the receiving PIC unit. Rarely, DGH staff may be asked to undertake the transfer of a stable patient.
- A.3. If a DGH team is transferring a critically sick or injured child, they should be transferred in an emergency ambulance, accompanied by a senior clinician who is confident and competent in airway management (including intubation), ideally a consultant in anaesthesia/ paediatric/emergency medicine or a competent senior trainee or advanced (paediatric) practitioner, and a PLS/APLS/EPLS (ideally) trained nurse, or ODP.
- A.4. Monitoring should include (as a minimum) continuous ECG, oxygen saturations, end-tidal carbon dioxide, respiratory rate, invasive and/or non-invasive blood pressure, ventilator observations, and temperature readings recorded every 15 minutes (minimum) during transfer. Non-invasive blood pressure measurement suffers from motion artefact and invasive blood pressure monitoring is preferable if clinically justified.

Children's Major Trauma

- A.5. These patients require a time critical transfer by the referring unit, after discussion and agreement with Trauma Team Leader at the receiving Children's Major Trauma Centre +/- NWTS for advice on stabilisation via conference call (if possible). The child should be moved in a paramedic ambulance, accompanied by a senior clinician who is confident and competent in airway management (including intubation), ideally a

consultant in anaesthesia/paediatrics/emergency medicine or a senior trainee with the appropriate competencies, and a PLS/APLS/EPLS (ideally) trained nurse, advanced practitioner or ODP.

- A.6. When phoning 999 for an **ambulance for a major trauma transfer** state that you need to transfer your patient as a **Category 1 Trauma Transfer** (i.e. as an emergency, not as an urgent case) which should mean the ambulance response time is short (i.e. less than 8 minutes).
- A.7. Monitoring should include (as a minimum) continuous ECG, oxygen saturations, end-tidal carbon dioxide (if intubated and ventilated), non-invasive blood pressure, and ventilator observations recorded every 15 minutes (minimum) during transfer. In addition, the patients' pupil size and reaction must be recorded just before and after the transfer to ChMTC (minimum).
- A.8. **Do not delay the transfer to place arterial or central lines or urinary catheter** unless agreed with Trauma Team Leader +/- NWTS. Ensure that patient has one good peripheral line +/- intraosseous line plus full non-invasive monitoring. Delaying transfer to place lines etc increases risks to a patient that needs emergency potentially life/limb preserving surgery.
- A.9. Transfer when able to maintain good oxygenation and age appropriate blood pressure – with measures to provide on-going stabilisation as needed eg fluid bolus and/or inotrope infusion to maintain BP.
- A.10. **For Major Burns, patients must be transferred within 4 hours (if urban) or 6 hours (if rural) of injury.** Contact NWTS who will arrange a conference call with the burns team and organise transfer. To help with fluid calculations consider using 'Mersey Burns' app.

Time Critical (PCC level 1-3)

- A.1. Any transfer of child who has been assessed to require emergency potentially life/limb -saving surgical, ischaemic gut or other intervention.
- A.2. Every time critical transfer should be discussed with NWTS. NWTS will give advice on patient management, and bring the appropriate specialist team(s) into a conference call at referral, and arrange PIC bed. This should allow the local team more time to concentrate on patient management and preparation for transfer.
- A.3. These may be neurosurgical (e.g. newly diagnosed tumour or intracranial bleed), general paediatric surgical (e.g. acute volvulus, intra-abdominal trauma), burns or cardiac or metabolic (e.g. hyperammonaemia). It is important that the child is transferred without delay, once they have a secure airway, and have secure intravenous or intraosseous access
- A.4. **For acute neurosurgical patients:** on-going stabilisation during transport may be needed. To avoid secondary injury it is essential to maintain good oxygenation and blood pressure, and maintain low normal carbon dioxide (4.5-5 kPa or 35-37 mmHg). NB transfer CT scan head via PACS to neurosurgeon to ensure rapid review of images and advice on appropriate patient management.
- A.5. Do not delay the transfer to place arterial or central lines or urinary catheter unless agreed with NWTS and the receiving surgical team. Ensure that patient has one good peripheral line +/- intraosseous line plus full non-invasive monitoring. Delaying transfer to place lines etc increases risks to a patient that needs emergency potentially lifesaving surgery.
- A.6. When phoning 999 for an ambulance for a time critical transfer state that you need to transfer your patient as a category 1 transfer which should mean the ambulance response time is short (i.e. less than 10 minutes).
- A.7. In rare instances it may be appropriate to perform lifesaving surgery within the District General Hospital under direct or indirect tertiary consultant surgical and anaesthetic guidance. NWTS would mobilise to transfer the patient postoperatively to an appropriate PIC bed. This would be on a case to case basis and would only occur if the patient required imminent surgery.

- A.8. **For all patients:** Monitoring should include (as a minimum) continuous ECG, oxygen saturations, end-tidal carbon dioxide (if intubated and ventilated), non-invasive blood pressure, and ventilator observations recorded every 15 minutes (minimum) during transfer. In addition, the patients' pupil size and reaction must be recorded just before and after the transfer to receiving paediatric unit (minimum).
- A.9. Transfer when able to maintain good oxygenation and blood pressure – with measures to provide on-going stabilisation as needed.
- A.10. **For other potentially time sensitive transfers** e.g. cardiac or metabolic patients, please contact NWTS who will organise a conference call with the appropriate specialist team, provide advice on stabilisation and organise a PIC bed. Most transfers will be undertaken by NWTS if able to do so in a timely fashion.

14. LEVELS OF PAEDIATRIC CRITICAL CARE

Level 1 = Basic Critical Care (HRG XB07Z)

- Oxygen therapy + pulse oximetry (SpO₂) + ECG monitoring
- High flow humidified nasal cannula oxygen e.g. Optiflow or Airvo or Vapotherm
- Severe asthma requiring intravenous bronchodilator therapy / continuous nebulisers
- Upper airway obstruction (eg croup) requiring nebulised adrenaline (+ dexamethasone)
- Apnoea
- Arrhythmia on intravenous anti-arrhythmic
- Diabetic ketoacidosis (DKA) needing continuous insulin infusion
- Reduced conscious level (GCS 12 or below) & hourly (or more frequent) GCS monitoring
- Stable patient on long term ventilation (LTV) – after 90 days established on LTV support

Level 2 = Intermediate Critical Care (HRG XB06Z)

Any child on level 1 intervention that has failed to respond to treatment as expected or the acute intervention is required for more than 24 hours

OR

- CPR in last 24 hours
- Nasopharyngeal airway or care of tracheostomy patient (first 7 days only)
- Acute non-invasive ventilation eg CPAP & BiPAP – to maximum 90 consecutive days
- Invasive ventilation via tracheostomy to maximum of 90 consecutive days
- Stable LTV patient following an acute increase in level of support via patients' usual ventilator
- More than 80 ml/kg fluid volume boluses in 24 hours
- Status epilepticus requiring continuous intravenous infusion eg midazolam
- Status epilepticus who have been extubated within last 4 hours
- Vasoactive infusions eg adrenaline, noradrenaline, milrinone, dopamine, dobutamine, vasopressin, sodium nitroprusside, prostaglandin, esmolol, labetalol
- Invasive arterial or central venous pressure monitoring
- Significant apnoea: more than 3 in 24 hours affecting heart rate or oxygen saturations
- Intracranial pressure (ICP) monitoring; external ventricular drain (EVD)

OR, the following (usually only in a tertiary paediatric centre)

- Acute renal failure (ARF) requiring continuous renal replacement therapy, peritoneal dialysis, acute haemodialysis
- Exchange transfusion, plasmapheresis
- Temporary external pacing
- Intravenous thrombolysis
- Extracorporeal liver support (MARS)
- Epidural infusion

Level 3 = Advanced Critical Care

Advanced 1 (HRG XB05Z)

Non-invasive ventilation plus one or more:

- Unstable LTV patient – despite an acute increase in level of ventilator support
- Vasoactive infusions eg adrenaline, noradrenaline, milrinone, dopamine, dobutamine, vasopressin, sodium nitroprusside, prostaglandin, esmolol, labetalol
- CPR in last 24 hours
- More than 80 ml/kg fluid bolus in 24 hours
- Burns less than 20%
- ARF requiring continuous renal replacement therapy, peritoneal dialysis, acute haemodialysis
- Exchange transfusion, plasmapheresis
- Intracranial pressure (ICP) monitoring; external ventricular drain (EVD)
- Thrombolysis
- Extracorporeal liver support (MARS)

OR

Invasive mechanical ventilation via endotracheal tube or via tracheostomy plus one or more:

- Continuous intravenous infusion of sedative agent
- Invasive arterial or central venous pressure monitoring
- Epidural infusion

Advanced 2 (HRG XB04Z)

Invasive mechanical ventilation via endotracheal tube or via tracheostomy plus one or more:

- Vasoactive infusions eg adrenaline, noradrenaline, milrinone, dopamine, dobutamine, vasopressin, sodium nitroprusside, prostaglandin, esmolol, labetalol
- CPR in last 24 hours
- Intracranial pressure (ICP) monitoring; external ventricular drain (EVD)
- Intravenous thrombolysis
- Burns 20-49% BSA

OR

Advanced respiratory support eg HFOV or JET ventilation

OR

Advanced 1 patient that requires isolation

Advanced 3 (HRG XB03Z)

Invasive mechanical ventilation via endotracheal tube or via tracheostomy OR advanced respiratory support (HFOV or JET ventilation) plus one or more:

- Haemofiltration, haemodialysis, peritoneal dialysis
- Burns 50-79% BSA
- Extracorporeal liver support (MARS)
- Exchange transfusion, plasmafiltration
- Inhaled nitric oxide or surfactant

OR

Advanced 2 patient that requires isolation

Advanced 4 (HRG XB02Z)

Invasive mechanical ventilation via endotracheal tube or via tracheostomy OR advanced respiratory support (HFOV or JET ventilation) plus one or more:

- Burns >79% BSA
- More than 80 ml/kg volume boluses

OR

Advanced 3 patient that requires isolation

Advanced 5 (HRG XB01Z)

Extracorporeal membrane oxygenation (ECMO)

Extracorporeal Life Support (ECLS) including VAD, Aortic balloon pump

15. References

1. Guidelines for the transport of the critically ill adult patient. The Intensive Care Society, London (2011).
2. Standards for the Care of Critically Ill Children. PICS 2015
3. High Dependency Care for Children 'Time to Move On' RCPCH 2014
4. Safety Guideline – Inter-hospital Transfer. The Association of Anaesthetists of Great Britain and Ireland (Feb 2009).
5. Advanced Paediatric Life Support – The Practical Approach, 6th edition. Advanced Life Support Group (2017)
6. Neonatal, Adult and Paediatric Safe Transfer and Retrieval (NAPSTaR) Advanced Life Support Group
7. The North West Children's Major Trauma Network Guidelines 2015
8. STOPP tool + guideline notes + grab bag contents – Thames Valley and Wessex paediatric critical care network operational transfer policy June 2017
9. Guidance for Intra and Inter-Hospital Transfers. Lancashire & South Cumbria Critical Care Network (2010)
10. North Wales Guidelines for Transfer of Children by District General Staff. North East Wales NHS Trust, North West Wales NHS Trust, Conwy & Denbighshire NHS Trust, Welsh Ambulance Services, Royal Air Force (March 2005).
11. Fasten their seatbelts: legal restraint of children in car seats and road ambulances. Wilson P. Paediatric Nurs. 2007, Volume 19; issue 7, pages 14-18
12. NICE guidelines Head Injury: assessment and early management CG176 Jan 2014

APPENDIX A

PAEDIATRIC REFERRAL TO NWTS		
Referral number: 08000 848382		
Date:	Time of arrival	Form completed by (name/grade/speciality/GMC no.)
Referring Hospital:		Ward/department contact number:
Paediatric Consultant		Anaesthetic Consultant
PATIENT DETAILS		
Name:	DOB:	Gestational age: Corrected age (if < 2yrs)
Weight:	Location: A&E / Theatres / Paediatric Ward / Paediatric HDU	
NHS No:	Patient known to RMCH / AHCH / other tertiary services:	
GP Name	Specialist(s) involved?	
REASON FOR REFERRAL TO NWTS		
Advice / Transfer request / Clinical Question / Other		
Working diagnosis:		
Description of problem – including time of injury or ingestion		
Interventions/treatment given?		
Any safeguarding / social concerns?		
PMH including previous PICU admissions	Immunisations / Allergies:	

SYSTEMS EVALUATION : Current observations required for all referrals			
A	Any stridor? Any drooling? Any airway concerns? Is the child able to swallow?		Previous difficult airway?
Intubated?	Anaesthetic used?	Laryngoscopy grade:	ETT size/length Oral / Nasal Cuffed / Uncuffed
Yes / No	Any problems?		
B	Increased work of breathing? Recession /tracheal tug / grunting? Use of accessory muscles? Is child able to speak in sentences?	Chest examination	Resp Rate SpO₂: CXR?
Long term ventilⁿ?	Usual oxygen and ventilation settings: 24 hour support or night only?		Tracheostomy (size / make) When it was last changed?
Ventilated	Non-invasive support High flow humidified O ₂ ? Yes / No Flow: FiO ₂ CPAP / BiPAP: Flow / Pressures	Invasive ventilation: PIP / PEEP TV Ti	Rate FiO₂ iNO
C	Pale / Mottled / Cyanosed? Femoral pulses present?	Palpable liver? Are peripheries warm?	HR CRT BP (incl^g mean)
	Total Fluid Boluses (ml/kg) Crystalloids	Colloids Blood products	
	Inotropes (what/dose?)		
D	Is the child alert / lethargic or encephalopathic? Seizures / Posturing? Anticonvulsants given? Mannitol / Hypertonic saline given?		A V P U / GCS / 15 E V M Pupils (size/reaction) Fontanelle/Meningism?
E	Any history of fever? Any rashes? Temp.?	Dehydrated? Passed urine in last 6-12 hrs? Maintenance fluids (type/mls/kg/day)?	Antimicrobials given? EWS
LABORATORY RESULTS			
Date/Time			
Hb	Na		Art / Ven / Cap?
WCC Neuts/Lymphs	K		pH
Plts	Urea		pCO₂
PT / INR	Creat		pO₂
APTT / Ratio	ALT		BE
Fibrinogen	AST		Bicarb (HCO₃)
D-dimers	CRP		Lactate
Toxicology?	Ammonia		Glucose
Other?			iCa

APPENDIX B

STOPP Tool

Please use Safe Transfer of Paediatric Patient assessment tool for all inter-hospital transfers in North West England & North Wales
Once transfer is complete send a copy of STOPP form to Paediatric Critical Care Network for audit

Family name: _____ First name: _____ Date of Birth: _____ Age: _____ NHS No: _____ Hospital Number: _____ Address: _____ Post code: _____ GP Name: _____ GP Practice: _____	Weight: _____ Kg Actual/Estimate Age: _____ Date of referral: <table border="1" style="display: inline-table; text-align: center; width: 100px; height: 20px;"> <tr> <td>D</td><td>D</td><td>M</td><td>M</td><td>Y</td><td>Y</td><td>Y</td><td>Y</td> </tr> </table> Time of referral: <table border="1" style="display: inline-table; text-align: center; width: 100px; height: 20px;"> <tr> <td>H</td><td>H</td><td>M</td><td>M</td> </tr> </table> Call made by: <table border="1" style="display: inline-table; width: 100%; height: 20px;"> <tr> <td>(Name, signature, grade)</td> </tr> </table>	D	D	M	M	Y	Y	Y	Y	H	H	M	M	(Name, signature, grade)
D	D	M	M	Y	Y	Y	Y							
H	H	M	M											
(Name, signature, grade)														

CONTACT DETAILS			
Referring Consultant		Receiving Consultant	
Referring Hospital		Destination Hospital	
Ward / Area		Ward / Area	
Ward phone number:		Ward phone number:	
Mobile number:		Mobile number:	

Please describe details of case including any discussion with external specialists (SBAR format may be used if wished)

Problem:

INDICATION FOR TRANSFER <small>(PLEASE INDICATE)</small>	Escalation of treatment	Investigations	Repatriation	Bed Capacity	Palliation
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For all bed capacity transfers you must follow your internal escalation policy and prioritise transfer of a level 0 patient wherever possible. Please document any discussion in patients' notes.

Consensus risk assessment	PERFORM RISK ASSESSMENT ON PAGE 2 THEN TICK RESULTS CATEGORY BELOW:			
	TRANSFER CATEGORY		TRANSFER TEAM	
	Transfer no longer required		LOCAL HOSPITAL TEAM	
	Ward level (level 0)		NWAS + Parents +/- nurse only	
	Basic critical care (HDU / PCC level 1)		Paediatric: medic/ANP + nurse	
	Intermediate critical care (PCC level 2)		Anaesthetics: medic + nurse/ODP	
	Advanced critical care (PCC level 3)		Hybrid Paediatric + Anaesthetic team	
	AND/OR Time Critical		OTHER	
	ASSESSMENT COMPLETED BY (date / time)		NWTS	
	Nurse: (Name, Role, Signature)		Other transport team	PIC / Neonatal
Doctor: (Name, Role, Signature)		AMBULANCE CREW REQUESTED		
		Standard crew	Paramedic crew	

North West & North Wales PCCN STOPP Tool adapted from original STOPP Tool (Thames Valley Paediatric Critical Care Network) by K Parkins June '18.; revision June '19

SYSTEM	RISK ASSESSMENT PRIOR TO TRANSFER		ASSESSMENT
A	Stridor / Stertor or anticipated AIRWAY RISK ie foreign body / difficult airway Airway or facial burns, smoke or gas inhalation?		YES / NO
B	Respiratory Rate = <input type="text"/>	Above or Below normal age adjusted range?	YES / NO
	Respiratory distress of concern ie marked recession / ↑WOB or early exhaustion		YES / NO
	Oxygen Need > 2L/min to maintain SpO ₂ > 94% OR High Flow Humid. O ₂ / CPAP / BiPAP		YES / NO
	Intubated & Ventilated		YES / NO
C	Systolic BP = <input type="text"/>	Is it outside normal age adjusted range?	YES / NO
	HR = <input type="text"/>	Is it outside normal range OR Capillary Refill > 2 secs?	YES / NO
	Is Blood Gas Lactate > 2 OR Base Deficit > 2		YES / NO
	Fluid boluses > 40 ml/kg within last 6 hours + / - inotrope infusion		YES / NO
	Risk of cardiovascular collapse: enlarged liver, oliguria, abnormal heart rhythm		YES / NO
D	Level of consciousness USING A V P U = P or U / GCS < 9 or falling / fluctuating level		YES / NO
	Risk of progressive intracranial event or signs of raised ICP ie bradycardia; hypertension; abnormal breathing; unequal, dilated or fixed pupils		YES / NO
	Prolonged hypoglycaemia (not correcting) AND / OR raised ammonia		YES / NO
	Unrecognised injury / trauma eg laceration / punctures OR Major Trauma		YES / NO
E	Inadequate ability to maintain normothermia (despite treatment / intervention)		YES / NO

**ARE ANY

A	B	C	D	E
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 CRITERIA TRIGGERED?**

IF YES, PAEDIATRIC + / - ANAESTHETIC CONSULTANT (S) SHOULD REVIEW PATIENT AND AGREE TRANSFER WITH SENIOR NURSE ON DUTY. USE TABLE BELOW TO DETERMINE APPROPRIATE TEAM REQUIRED TO TRANSFER PATIENT ONLY IF INDICATED FOLLOWING CONSULTANT REVIEW CONTACT NWTS : 08000 84 83 82 FOR ADVICE BEFORE TRANSFER

TRANSFER CATEGORY	ANY TRIGGERS	STAFF REQUIRED (examples only)	D/W NWTS
Level 0 (ward level) Child not on continuous monitoring	Non-anticipated	Parent / carer or Nurse or both Standard ambulance crew / transport	NO
PCC Level 1 (Basic critical care) Children needing continuous monitoring or iv therapy or any PCC Level 1 Care <i>Can be a difficult transfer: Joint decision /agreement between senior nurse & consultant essential before transfer</i>	1. No	Competent nurse OR doctor (essential if on iv infusion fluids / drugs) OR paramedic ambulance crew	NO
	2. YES	Competent Nurse &/or Doctor + Paramedic crew	PROBABLY
	3. YES <u>AND</u> High Flow Oxygen, OR potential for airway or other compromise	Nurse/ODP AND Senior Airway and Paediatric resuscitation competent Doctor AND paramedic ambulance crew OR NWTS transfer only if agreed jointly with referring consultant + NWTS consultant	YES
PCC Level 2 (Intermediate critical care) PCC Level 1—acute intervention for more than 24 hours	YES / NO	Nurse/ODP AND Senior Airway and Paediatric Resuscitation competent Doctor AND paramedic ambulance crew OR NWTS transfer only if agreed jointly with referring consultant + NWTS consultant	YES
Level 3 (Advanced critical care) Intubated and Ventilated	Yes / No	NWTS transfer unless time critical (rare exception may be palliative care)	YES
Time Critical (Level 1-3) Traumatic Brain Injury, Ischaemic gut, Life or Limb threatening diagnosis	Yes / No	Local Team: Nurse/ODP + Senior Airway + Paediatric resuscitation competent Doctor + paramedic crew MAJOR TRAUMA: REFER TO TRAUMA TEAM LEADER	YES

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TRANSFER DOCUMENTATION:

PERSONNEL			
Doctor 1 (name, speciality & grade)			
Doctor 2 (name, speciality & grade)			
Nurse / ODP (name, speciality & grade)			
Parent / guardian details (including mobile no)			In ambulance: Yes / No
EQUIPMENT		DRUGS/FLUIDS:	
Appropriate drugs & equipment available	Yes / No	Analgesia (as required)	Yes / No
Suction unit & batteries fully charged	Yes / No	Intubation drugs + equipment	Yes / No
Sufficient oxygen in portable cylinder available	Yes / No	Emergency / resuscitation drugs	Yes / No
Appropriate harness available eg ACR harness	Yes / No	IV Fluids (including maintenance + bolus)	Yes / No
Charged batteries for monitor and/or infusion pumps	Yes / No	Blood Products	Yes / No
Infusion devices rationalised and safely secured	Yes / No	Other eg anticonvulsants / antibiotics etc	Yes / No
COMMUNICATION			
Bed in destination hospital identified and availability confirmed (with nursing team / bed manager):			Yes / No
Consultant in destination hospital has agreed transfer:			Yes / No
Parents / Carers informed of transfer and any parental concerns discussed:			Yes / No
Parents / Carers given map/postcode & ward contact number if not travelling with the team			Yes / No
Parents / Carers invited to accompany the child or separate transport arranged to receiving unit:			Yes / No
ALERTS eg allergies, safeguarding, CAMHS etc clearly documented AND verbally communicated to receiving team:			Yes / No
TRANSPORT		AMBULANCE reference number:	
Time ambulance called		Patient secured using eg ACR harness	Yes / No
Time ambulance arrived (referring hospital):		All equipment appropriately secured in ambulance	Yes / No
Time transport team + patient left referring hospital:		Transfer / own mobile phone available	Yes / No
Time of arrival at receiving hospital:		Return travel organised / confirmed & team aware:	Yes / No
Time transport team arrived back at base hospital:		Money / cards for emergencies (transfer team):	Yes / No
PATIENT SPECIFIC INSTRUCTIONS FOR TRANSFER			Other:
MINIMUM monitoring: ECG, SpO ₂ , NIV BP: Yes / No			
If intubated & ventilated monitor ET CO ₂ IV access x 2: Yes / No			
Nil by Mouth / consider NG tube for surgical patients : Yes / No			
Blood glucose, temp & pupils checked before +/- after transfer: Yes / No			
Maintenance IV fluids +/- iv anti-emetics (esp. older child): Yes / No			
PAPERWORK FOR TRANSFER (PHOTOCOPY THE FOLLOWING TO TAKE WITH PATIENT):			
Referral letter			Yes / No
Recent clinic letter / summary for all long term patients			Yes / No
Current medical & nursing notes including blood results, blood gases + copies ECG/rhythm strip (as approp.)			Yes / No
Current drugs chart, PEWs/observation chart and fluid charts			Yes / No
Request radiology uploaded onto PACS or CD of radiology to be transferred with patient			Yes / No

North West & North Wales PCCN STOPP Tool adapted from original STOPP Tool (Thames Valley Paediatric Critical Care Network) by K Parkins June.'18,: revision June '19

OBSERVATIONS RECORDED ON TRANSFER:

- Observations completed and recorded just prior to departure
- Continuously monitor all observations during transfer & record (circle choice) every 15min / 30 mins
- Observations completed and recorded on arrival

Pain assessment

Time last analgesia (drug / dose):

Date	Pre Departure	Transfer										Arrival
Time												
Temperature + site °C												
Heart Rate & Blood Pressure	240											240
	230											230
	220											220
	210											210
	200											200
	190											190
	180											180
	170											170
	160											160
	150											150
	140											140
	130											130
	120											120
	110											110
	100											100
90											90	
80											80	
70											70	
Respiratory Rate	60											60
	50											50
	40											40
	30											30
	20											20
	15											15
	10											10
	5											5
0											0	
FiO ₂												
SpO ₂ +/- ET CO ₂												
Type / mode Resp support												
PIP/PEEP												
Rate												
Tidal Volume												
Neurological Assessment	AVPU											
	Pupil R / L											
	Bld Glucose											

Details of any treatment(s) given or incident(s) en-route:

Care handed over to (name / grade):

Time handed over:

Handover delivered by (name / grade):

Signed:

3 Copies STOPP form (for patient notes at both referring and receiving hospitals, & PCCN audit)

Patient documentation handed over: All drugs/fluids/blood products handed over / disposed of:

North West & North Wales PCCN STOPP Tool adapted from original STOPP Tool (Thames Valley Paediatric Critical Care Network) by K Parkins June.'18.; revision June '19

APPENDIX C

KIT CHECKLIST FOR PCC level 1-3 TRANSFERS

Tick & sign in this section to indicate you have checked the kit before transfer

AIRWAY/INTUBATION & VENTILATION

Endotracheal Tubes (ET tube) of appropriate size(s) - in case of accidental extubation or need to intubate en route	
Laryngoscope handle & blades (appropriate size for patient) – check working	
ET Tube Fixing Kit (Tape, scissors, duoderm)	
Face Mask & Guedel Airways – age/size appropriate	
Bougies – appropriate size if any (potential) difficulty with airway	
Pedicap (1-15 kg) or Easicap (>15 kg). Useful as a back-up if End-tidal CO ₂ fails on monitor	
Nebuliser circuit (for use with bagging circuit if ventilated)	
Heat & Moisture Exchange device - appropriate size	
Stethoscope	
Ayres T-piece or Mapleson C (Water's) circuit	
Self-inflating bagging circuit (appropriate size) - essential in case of gas failure	
Portable ventilator (Babypac < 10kg, Oxylog 3000+ for >5kg or Hamilton for >3kg) – firmly secured to trolley	
Suction catheters including Yankeur & portable suction device	
Oxygen cylinders (firmly secured onto trolley) - for transfer to/from ambulance	
Naso/Orogastric tube - check position on CXR plus (purple oral) syringe (to aspirate stomach)	

CIRCULATION

EZ IO Driver + Appropriate sized needles - pink (infant/small child), blue (child) or yellow (adolescent)	
Portable infusion devices with adequate battery life (e.g. B Braun perfusor space) + securing device	
Appropriate giving sets for infusion device	
Drug Line - long IV extension (flushed & attached to IV line)	
Range of syringes for bolus drugs & infusions plus saline flushes	
Bolus fluid ideally balanced crystalloid eg Plasmalyte or Hartman's solution	
Maintenance fluid – check that adequate for journey	
Mini Spike (for iv fluid)	
Inotrope – check that adequate for journey & next drawn up & ready to start (attached & in pump)	
Sedation and muscle relaxants drawn up ready for use	

NEUROLOGY

Torch to check pupils	
Cervical stabilisation eg blocks – for major trauma patients	
Spinal board or vacuum mattress & scoop – for major trauma pts	

ADDITIONAL EQUIPMENT (FOR USE IN AMBULANCE)

Check adequate oxygen for journey (see table below for cylinder size & calculation O ₂ requirement)	
O ₂ cylinder key/spanner	
5-point Harness e.g. Paraid ACR harness or Ferno	
Babypod (2 – 8 kg pt) or Incubator (< 2 kg pt)	
Blankets e.g. Medi Wrap or Transwarmer	
High Visibility vests/jackets	
Seatbelt cutter	
Head Torch	

Oxygen Cylinder Contents and Flow Rates

	OXYGEN CYLINDER CONTENTS						
Cylinder Size	C	D	CD	E	F	G	HX
Litres (when full)	170	340	460	680	1360	3400	2300
Oxygen Flow rate L/min	APPROXIMATE LIFE OF CYLINDER IN HOURS						
2	85 mins	1 ¾	3 ¾	5 ½	11 ½	23	19
4	42 mins	1 ¼	1 ¾	2 ¾	5 ½	14 ½	9 ½
6	28 mins	1	1 ¼	1 ¾	3 ¾	9 ¾	6
8	20 mins	¾	1	1 ½	3	7	4 ¾
10	17 mins	½	¾	1	2 ¼	5 ½	3 ¾
12	14 mins	¼	40 mins	¾	1 ¾	4 ¾	3
14	12 mins	¼	½	½	1 ½	4	2 ¾

- To calculate how long a cylinder will last, divide the total contents of the cylinder by the oxygen flow rate.
NB if the contents gauge reads full, then the cylinder is full. If the cylinder gauge reads half full, divide the maximum contents by 2
- Next divide the known contents of the cylinder by the oxygen flow rate to predict the number of minutes oxygen supply e.g.
contents = 340 L; flow rate 10 L/min – the cylinder will last 34 mins.

Spontaneously breathing patient: Oxygen requirement = flow (L/min) x 60 x journey time (hrs) x 2

Ventilated patient: Oxygen requirement = Minute Ventilation (L/min) x 60 x journey time (hrs) x 2

Always allow twice the predicted requirement for a journey & account for 1 L/min to power the ventilator itself

Gas Consumption in L/min based on ventilator type and mode

Ventilator	PEEP	High/Active PEEP
Babypac	8 L/min	11 L/min
Oxylog 3000P	Approx equal to MV	Approx equal to MV

Journey time	Hospital	Combination of cylinders in ambulance	Combination cylinders on trolley
≤ 1 hour	Most within North West region	1 HX or G cylinder	1 CD or E for transfer to/from ambulance
1-2 hours	Blackpool, Barrow, Lancaster & most Welsh	1 G cylinder	1 CD or E for transfer to/from ambulance

Appendix D – Drug List - relevant to PCC level 1-3 transfers only

Not every transfer will need emergency drugs etc, but check with the responsible/referring consultant which drugs are appropriate to take before each transfer and if uncertain ask NWTS for advice. Those that are fridge drugs should be carried in insulated bags with 'ice packs' to keep drugs at the relevant temperature during transfer. Drug doses are available via on-line drugs calculator at: www.crashcall.net which should ideally be printed out to take with patient on transfer.

EMERGENCY DRUGS	
Adrenaline 1 in 10,000 (min – I – jet) x2	
Atropine 100 microgram/ml Min-I-Jet x2	
Amiodarone 300mg in 10 ml Min-I-Jet x1	
Calcium gluconate 10% in 10 ml x2	
Diazepam Rectal Tubes (2.5mg x2 OR 5mg x2) OR Lorazepam (4mg /1ml) OR appropriate long acting anticonvulsant if patient already received 2 doses of benzodiazepines & at risk of seizures during transfer	
Glucose 10% 500ml x1	
Sodium Bicarbonate 8.4% (1mmol in 1ml) 10ml Min-I-Jet x2 or 500ml polyfuser	
NaCl 0.9% 10ml x5	

FLUIDS	
Maintenance fluids e.g. Plasmalyte 148 + 5% dextrose OR 0.45% saline + 5% dextrose	
Heparinised saline (500 units heparin in 500 ml 0.9% saline) for arterial line	
2.7% Saline (hypertonic saline) and/or 20% Mannitol	
Hartmann's solution or Plasmalyte 148 (500 ml) – to use as fluid bolus	

READY PREPARED BOLUS OR INFUSIONS (before departure as required)

INOTROPE infusions – usual order of use as required (if uncertain discuss with NWTS)	
Dopamine	
Adrenaline (2 nd line if cold shock)	
Noradrenaline (2 nd line if warm shock or 1 st choice for trauma patients)	
Milrinone	
Vasopressin	

NB if already on 1 inotrope NWTS advise drawing up a syringe of the next drug in case needed during transfer

SEDATIVES, ANALGESIA AND MUSCLE RELAXANTS	
Sedatives - midazolam or ketamine (usually used as an infusion for intubated child)	
Analgesia – morphine or fentanyl (usually used as an infusion for intubated child)	
Muscle Relaxants – Rocuronium or Atracurium (all fridge drugs) if intubated. Muscle relaxants are usually used as boluses on transfer – draw up single doses to prevent errors	
Induction agents – if an unintubated patient is at risk of deterioration during transfer eg ketamine + fentanyl + rocuronium	

Generally sedatives and analgesia is only required if a patient is intubated and ventilated and therefore these patients must be accompanied by an anaesthetist or senior doctor with relevant airway skills/training.

NB Check adequate volumes are available (check syringe prior to transfer) to enable team to complete transfer if any infusions (sedation/analgesia, inotropes or maintenance) are started before transfer

Appendix E – Safeguarding checklist		NHS No.	
Child's Name		DOB:	
For any injury or incident.....		If yes – please elaborate overleaf	YES NO
Was the injury or incident un-witnessed?			
Is the history incompatible or inconsistent?			
Is injury or incident in a non-walking child or any age child/young person that is inconsistent with their developmental history?			
Was there an inappropriate delay between injury or incident & seeking medical advice?			
Is the injury one of the following?			
* Facial bruising	* Unexplained mouth injuries		
* Bruising to ears (check behind), neck, abdomen, & thighs			
* Un-witnessed/unexplained burns/scalds	* Bite marks (human or animal)		
* Evidence of Female Genital Mutilation	* Burns or injuries to perineum		
* Skull fractures/boggy swelling to head	* Implant marks		
* Spiral limb fractures	* Unexplained rib fractures		
Has child/young person had an apparent life threatening event? *Check police informed			
Was the child/young person assaulted? * Check that police informed			
Has the child/young person been attacked by a dog? * Check that police informed			
Are there any risk factors for or markers of potential maltreatment?			
Has the child/young person self-harmed? Has their presentation involved drugs / alcohol?			
Has the child/young person attempted suicide?			
Does the child/young person look unkempt?			
Is there a history or domestic violence or violent offending?			
Is there a history of parental or carer drug / alcohol misuse or mental health problems?			
Is there a history of previous child / animal maltreatment in the family?			
Are parents vulnerable / unsupported?			
Is the child ex-premature or have any disability?			
Is the child the subject of a child protection plan			
If yes – detail....			
If no – is the family known to children's social care?			
If any acute safeguarding concerns please inform:			
	Name professional informed	Date/time	Sign/name caller
Referring paediatric consultant			
Admitting unit consultant			
Social Worker/Safeguarding team - include contact number			
Police NB. Include contact no. & password			
AND perform a top to toe examination of the child to check for marks and bruising, fill in a body map and document nature of concerns fully (see over)			

Ensure measures are in place to appropriately safeguard any siblings (& note here)

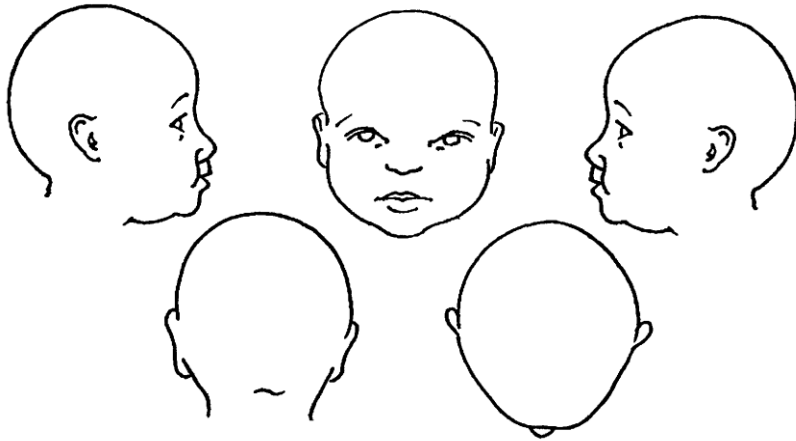
Name/grade/signature		Date / Time	
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Please record reason(s) for current safeguarding concerns? (i.e. inconsistent history, unexplained or unusual bruising or injury, OOHCA or ALTE, delayed presentation, overdose/self-harm, parental drug use etc)

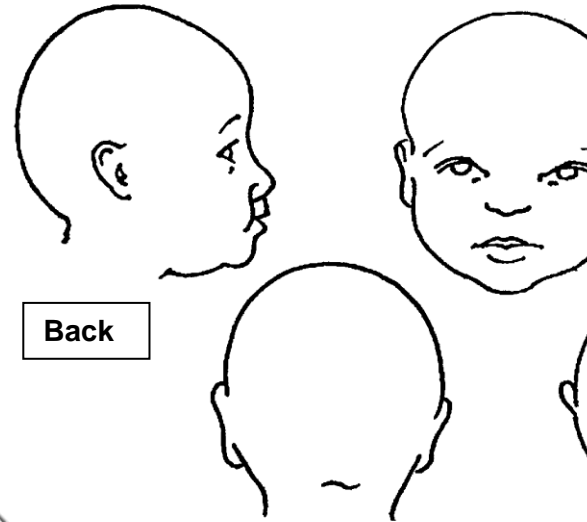
Are parents/guardians aware of safeguarding concerns? Yes No

Document fully any conversations with family NB If not informed of safeguarding concerns please document why.

NB All clothing or bedding should be placed in an appropriate bag & given to police Yes / No

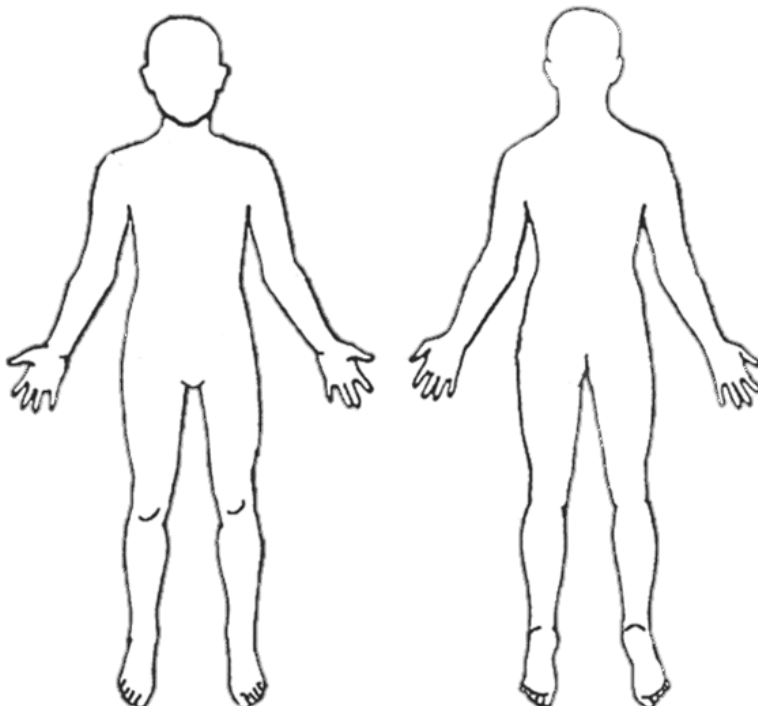


BODY MAP
Record any marks / injuries including size, colour & shape



Back

Front



Name/grade/signature

Date /
Time

Appendix F – North West Children’s Major Trauma Network Algorithm

See North West Children’s Major Trauma website for up to date guidelines <http://nwchildrenstrauma.nhs.uk>

WHO DOES THIS APPLY TO?

All children under 16 years with one of:

- Major trauma – see NWAS pathfinder
- Suspicion of raised intracranial pressure or a space-occupying intracranial lesion
- Acute surgical abdomen/limb injury with suspected ischaemia

MAIN POINTS

4 Do’s.....

Stabilise the patient
Stop major haemorrhage
Organise transfer
Documentation

4 Calls

Children’s Major Trauma Centre
Trauma Team Leader (AHCH or RMCH)
NWTS
NWAS
Safeguarding Team

4 Don’t’s.....

Delay
Undertake CT unless advised
Forget C-spine immobilisation
Do unnecessary procedures

- **SAFE but RAPID transfer**
- **AVOID HYPOXIA , HYPOTENSION or HYPOGLYCAEMIA to prevent secondary injury**
- Do not delay transfer to ChMTC (Alder Hey or Royal Manchester Children’s Hospital) or specialist surgical centre as this increases risk of serious injury or death
- Transfer should be undertaken by local team not NWTS
- Departure to ChMTC or specialist surgical centre should occur within 1 hour of arrival in hospital

Responsibilities of Trauma Team

Stabilise child
Intubate and ventilate child if required
Stop major haemorrhage and treat circulatory instability
Contact ChMTC (for telephone numbers see below)
Contact NWTS (08000 848382) for advice if PICU/PHDU level patient
Discuss need for CT scan with Trauma Team Leader at ChMTC
Identify appropriate transfer team (experienced anaesthetist and appropriate nurse/ODP)
Contact NWAS via 999 and request “**Category 1 Trauma**” transfer
Arrange PACS transfer **or** copies of unencrypted CD of all images to ChMTC
Refer to safeguarding team if appropriate
Undertake transfer

NWTS: 08000 84 83 82

NWTS will....

Liaise with trauma team leader & any specialists required
Advise DGH on stabilisation & transfer
Inform PICU team about incoming transfer
Encourage swift departure from DGH
Inform transferring team which clinical area they should be taking child to (PED, PIC, PHD, theatres)

Alder Hey Major Trauma Team
0151 252 5401

RMCH Major Trauma Team
0161 701 9191

For drug calculations use www.crashcall.net

TOP TIPS FOR A SAFE TRANSFER

For drug calculations use www.crashcall.net

<p>Equipment required - everything must be securely fixed onto trolley (check battery life) Use Critical care transfer trolley if available Appropriate portable ventilator (Hamilton > 3kg to adult; Babypac < 10kg, Ventipac >10kg, Oxylog 3000+ >5kg) Ensure enough oxygen for transfer Portable monitor (ECG, SpO₂, ETCO₂ (if ventilated) and non-invasive BP on 5 minute cycle) Battery powered infusion pumps Vacuum mattress or spinal board and collar/blocks for transfer plus means to fix onto trolley</p>
--

A/B	Need for intubation: GCS < 8/15 or fluctuating LOC
	Saturations > 98%
	Monitor and maintain end-tidal CO ₂ 4.5-5 kPa or 34-37 mmHg
	ETT secured: ORAL , correct size (min leak) & position (CXR). Do NOT cut ET tube
	C spine immobilisation for all major trauma patients regardless of CT spine findings
	Oro-gastric tube on free drainage
C	Maintain Mean BP (& Cerebral Perfusion Pressure): approximate targets for age
	One good, well secured peripheral line plus ability to place intra-osseous or 2 nd line
	Do NOT delay transfer by placing arterial or central lines (or urinary catheter)
	Use fluid bolus and dopamine or noradrenaline via intra-osseous or peripheral line to support BP
	Major bleeding? Trigger local major haemorrhage guidelines (children) including Tranexamic acid

D

Monitor pupil size & response every 15 minutes
Sedate adequately (morphine and midazolam) and paralyse for journey
Nurse 30° head up if possible for Head Injuries
Identify & treat seizures give phenytoin
Treat hyperthermia/avoid hypothermia.
Target temperature 36-37 °C
Maintain normal blood glucose (treat if low i.e. < 3 mmol/L)
Maintenance fluid: Plasmalyte 148 or 0.9% saline (+ dextrose if glucose low)
Aim: sodium > 140 – if Na < 135 consider 2.7% saline
Identify any associated injuries/problems

Age	Mean BP	Aim CPP
< 1 yr	55-65	> 40
1-5 yrs	70-80	> 50
6-11 yrs	80-90	>60
12-14 yrs	85-95	>70

MANAGEMENT OF SUSPECTED INTRACRANIAL PRESSURE SPIKES

WARNING signs: cardiovascular instability +/- urticarial/fleeting rashes

DEFINITE signs: BRADYCARDIA/HYPERTENSION/PUPIL DILATATION

Ensure end-tidal CO₂ 4.5-5 kPa or 34-37 mmHg

Give Hypertonic saline (2.7% NaCl) OR Mannitol

Increase sedation (e.g. morphine/midazolam or fentanyl/propofol)

KEEP MOVING

Doc

umentation

Copy of notes/results/observation and prescription charts

X-ray & CT scans sent via PACS and un-encrypted CD

Parents

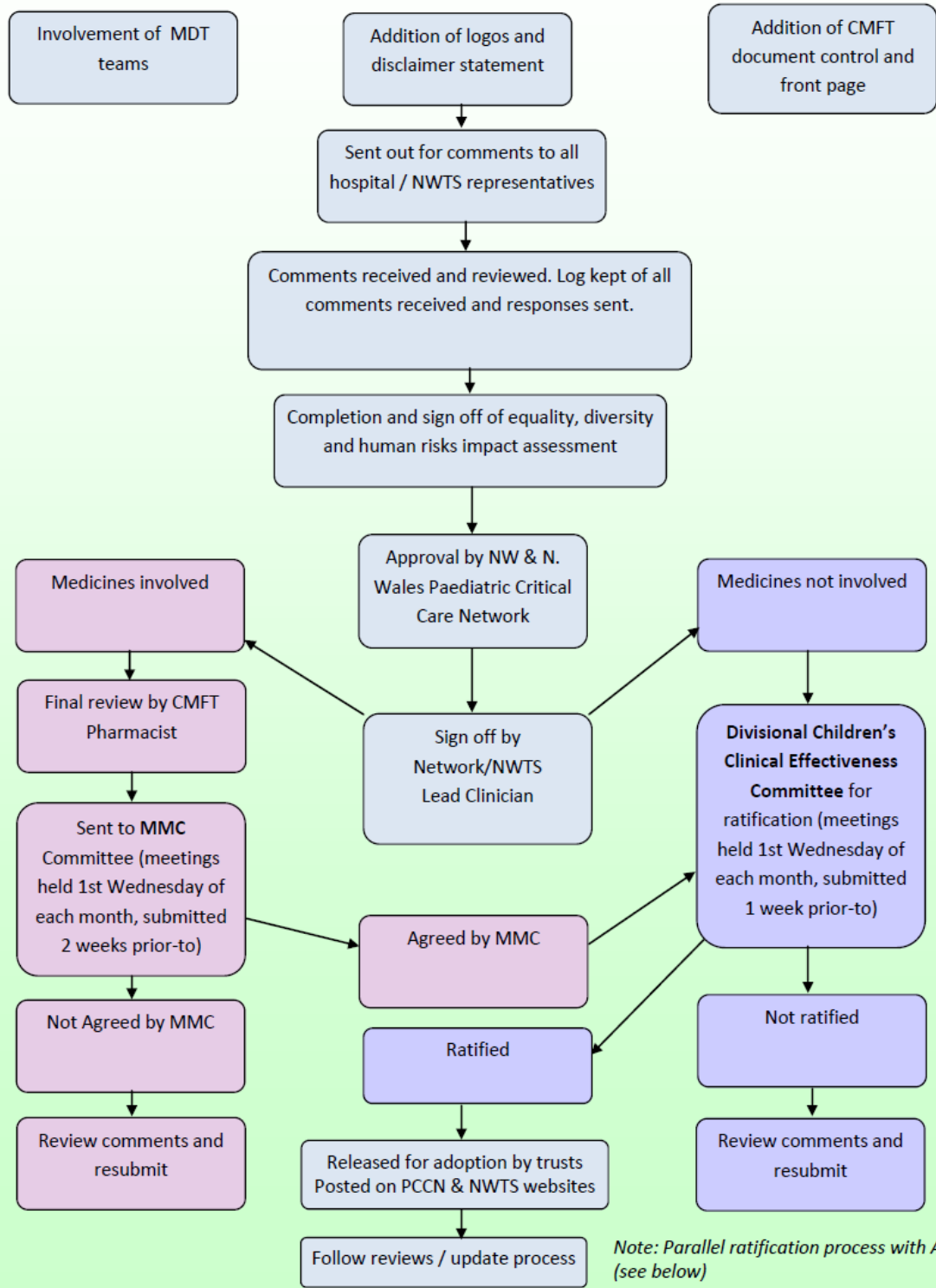
Give them a copy of NWTS parent information leaflet (www.nwts.nhs.uk) which has directions to both regional paediatric neurosurgical/major trauma centres plus the direct phone number of relevant PICU

Make sure transfer team have parents' contact details

Ensure parents are safe to travel in their own vehicle: if not organise taxi

Appendix G

Ratification of Guidelines with Host Organisation (CMFT)



Note: Parallel ratification process with AHFT (see below)

Ratification of Guidelines with Alder Hey

