Transfer Checklist for Brain Injured Patients (Trauma and Stroke)

NHS
South Yorkshire & Bassetlaw
Adult Critical Care Network

Patient Name: ..... DOB: ..... NHS number: .....

TIME CRITICAL TRANSFERS for **LIFESAVING NEUROSURGICAL** or **NEURORADIOLOGICAL** intervention, **DO NOT DELAY transfer for unnecessary investigations or interventions.**

This form is designed to be used in conjunction with the SYBCCODN transfer form to provide advice on the safe transfer of brain injured patients. If in doubt about any aspect of the transfer, please contact **Neuroananesthetic / Neurosurgical team at Royal Hallamshire Hospital (RHH) 24/7 for advice** *(contact numbers overleaf)*.

1 Airway

Grade of Intubation: ..... Time of Intubation: .....

ETT mark at lips..... cm

Intubation aids used: Bougie ☐
Video-laryngoscope ☐
Other..... ☐

If possible **TAPE** the ETT ☐
(Avoid tight ligature around neck)

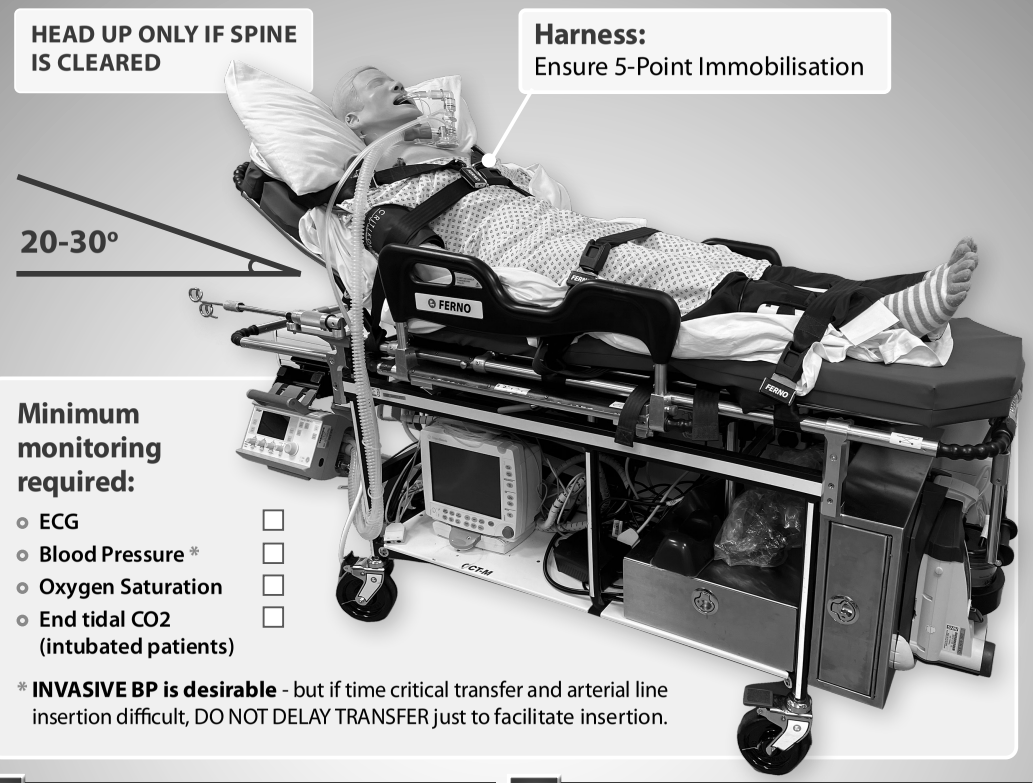
C-SPINE PROTECTION (Trauma) ☐

2 Breathing

CONTROLLED MV (Aim 6-8ml/kg tidal volume) ☐

Targets:

- ABG: PaO2 ≥ 13kPa, PaCO2 4.5 - 5kPa (allow PaCO2 4.0 - 4.5kPa if evidence of herniation) ☐
- SPO2 ≥ 95% ☐
- Validate ETCO2 by estimation of **A-a gradient** ☐
- PEEP ≥ 5cmH2O (Pneumothorax - consider **Chest Drain** prior to transfer if instability during transfer likely) ☐



Minimum monitoring required:

- ECG ☐
- Blood Pressure * ☐
- Oxygen Saturation ☐
- End tidal CO2 (intubated patients) ☐

* **INVASIVE BP is desirable** - but if time critical transfer and arterial line insertion difficult, DO NOT DELAY TRANSFER just to facilitate insertion.

3 Circulation

Arterial line - transducer at the level of TRAGUS (see BP targets overleaf) ☐

2 Reliable IV/IO access ☐

Vasopressor easily available (ideally as infusion, bolus doses as minimum) ☐

Crystalloid available - Balanced isotonic solution / 0.9% Saline ☐

(Bleeding controlled/ cross-matched blood available) ☐

4 Disability

Pre-Intubation GCS E..... V..... M..... ☐

Check Pupils (pre departure, on arrival) ☐

Ensure adequate sedation +/- paralysis: (Avoid patient coughing/ straining on ETT) ☐

Treat seizures:

- **Levetiracetam** 30mg/kg (if seizures continue - CONTACT NEUROSURGEONS)
- **Phenytoin** 20mg/kg Adjusted Body Wt. (max. 2g)

After discussion with Neurosurgical team:
Mannitol 0.6g/Kg: 4ml/kg 15% **Mannitol** based on Actual Body Weight

5 Exposure

Temperature: aim normothermia (36-37°C) ☐

Position: 20-30° HEAD UP (IF Spine cleared), ☐
5-point immobilisation ☐

Blood Glucose: 7-11 mmol/L ☐

Confirm NG tube position (if present)

Management of Raised ICP
(In patients without ICP Monitoring)

TIER 1

- Intubate and Ventilate *(indications below)*
- Maintain MAP ≥ 90 mm Hg
- Optimise patient position (head up if possible, no obstruction to cranial venous outflow)
- Ensure adequate analgesia and sedation
- Ensure PaCO2 4.5 - 5.0 kPa, PaO2 ≥ 13kPa
- Treat seizures

Signs of Neurological Deterioration

- **Spontaneous decrease in the GCS motor score of ≥ 1 points** (unsedated patients only)
- **New decrease in pupillary reactivity**
- **New pupillary asymmetry or bilateral mydriasis**
- **New focal motor deficit**

Contact **Neurosurgical/ Neuroanaesthetic team** for advice.

TIER 2

- Ensure Tier 1 therapies optimised
- Neuromuscular blockade in adequately sedated patients
- Allow PaCO2 4.0 - 4.5kPa (If evidence of herniation)
- Consider Mannitol (after discussion with Neurosurgical team - *see under **4 - Disability***)

Please DO NOT...

- Delay transfer of **TIME CRITICAL** patient for unnecessary investigations or interventions
- Give mannitol by continuous IV infusion
- Give steroids
- Actively cool to ≤35°C
- Hyperventilate (PaCO2 < 4kPa)

Indications for Intubation:

- GCS ≤ 8
- Significantly deteriorating conscious level (e.g. fall in GCS ≥ 2 points, or fall in motor score ≥ 1 point)
- Loss of protective laryngeal reflexes
- PaO_2 < 13 kPa
- $PaCO_2$ ≤ 4kPa OR ≥ 6kPa
- Bilateral fracture mandible
- Copious bleeding into the mouth
- Seizures
- Agitation causing risk to self / staff on transfer

Intubating the Brain Injured Patient:

AIM to avoid episodes of hypotension / hypoxia / severe hypertension / severe hypercapnoea

- Use familiar technique including local intubation checklist if available
- Consider early use of video laryngoscope / adjuncts
- Suggested Induction Agents
  - **Propofol 2mg/kg** OR **Ketamine 2mg/kg**

  PLUS
  - Opioids: **Fentanyl 3-5 mcg/kg**, **Alfentanil 10-20 mcg/kg,**
  - Neuromuscular Blockade: **Rocuronium 1 mg/kg**

Recommended Sedation Doses

Propofol PLUS Opiate ESSENTIAL (Midazolam third line).

Neuromuscular Blockade strongly advised when transferring all acutely brain injured patients.

INFUSION OF PERIPHERAL VASOPRESSOR ALSO RECOMMENDED

- **1% Propofol** 0 - 5mg/kg/hr (0 - 35 ml/hr for 70kg) Or TCI to target a BIS of 40-60
- **Alfentanil** (500mcg/ml) 0.1 - 0.6mcg/kg/hr (0.84 - 5.04ml/hr)
- **Remifentanil** (50mcg/ml) 0.1 - 0.2 mcg/kg/min based on Ideal Body Weight [Height (in cm) - 100(M)/105(F)]
  - Increase in increments of 0.025 mcg/kg/min (OR TCI to target a BIS of 40-60)
- **Rocuronium** or **Atracurium** (0.5mg/kg every 30-40 minutes) boluses repeated as appropriate.
  - Or **Atracurium infusion** 0.3 - 1mg/kg/hr (2 - 7 ml/hr for 70kg) ONLY IF enough pumps available.

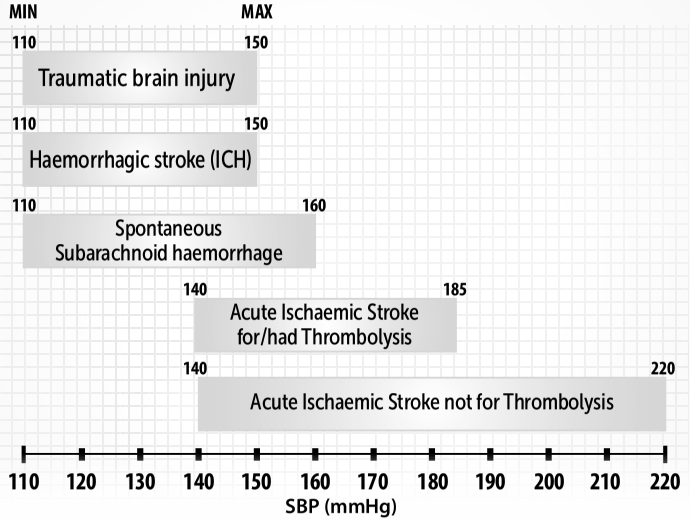
Systolic Blood Pressure Target Range

HYPOTENSION

- Correct Hypovolaemia
- Avoid excess sedation

Vasopressors:

- **METARAMINOL** [20mg in 100 ml 0.9% Saline (0.2mg / ml) OR 10mg in 20ml 0.9% Saline with rate titrated to BP]
- **NORADRENALINE** (0.025 - 1 mcg/kg/min)



HYPERTENSION

- Avoid Fluid Overload
- Ensure adequate sedation / analgesia

Small boluses of **LABETALOL** (20 mg bolus to be given over at least 1 minute, repeated at 10 minute intervals if required; max. 200mg) ONLY IF SEVERE HTN, AFTER NEUROSURGICAL ADVICE.

Communication and Personnel

STH Switchboard	**0114 243 4343**
RHH K floor (Neuro Critical Care)	**0114 271 2326**
RHH Neuroanaesthetic Registrar	**2577**
Neuro Critical Care Nurse in Charge *(Bleep)*	**2018**
Neuroanaesthetic/GITU Consultant	**mobile via switch**
RHH Neurosurgical Registrar / SHO *(Bleep)*	**2883 / 2066**
Emergency Theatre Co-ordinator RHH *(Bleep)*	**2446**
NGH D Floor ICU	**0114 271 4012 / 4122**
NGH E Floor ICU / HDU	**0114 271 5785 / 5786**
NGH GITU Registrar/ Nurse in charge/ Theatre Co-ordinator *(Bleep)*	**2100/ 2815/ 2192**
Emergency Department NGH	**0114 271 4741 / 4743**

Transfer Details

Indication for transfer:

Referring Hospital:

BDGH ☐ BH ☐ CRH ☐ DRI ☐ NGH ☐ RHH ☐ Other: .....

Urgency?	Type of Transfer?	Pre-departure ABG	Arrival ABG
Time Critical (Life/ limb/ sight saving) ☐	**Escalation** (Treatment unavailable) ☐	FiO_2	FiO_2
Urgent (Time sensitive) ☐	**Repatriation** (Return patient closer to home) ☐	$PaCO_2$ $EtCO_2$	$PaCO_2$ $EtCO_2$
Planned (Elective/ ongoing care) ☐	**Non clinical** ☐	PaO_2 SaO_2	PaO_2 SaO_2
		BE	BE

	DATE	TIME	Neurosurgeons/ Anaesthetists Informed?
CT Scan Reported			
Patient Referred to Neurosurgeons - **referapatient.org**			
Patient Accepted by Neurosurgeons			☐ (anaesthetist)
Departure from DGH			☐
Handover at RHH			

Notes (Eg. Critical incidents/ Delays/ Brief History of events / PMHX / communications to receiving team)

Name and Signature: ..... Grade: ..... Transfer trained: Y / N