Purpose

This guideline intends to facilitate the management of patients with Upper GI bleeding referred for specialist input from peripheral hospitals via Embrace Yorkshire & Humber Infant & Children Transport Service. The aim is to have a standard approach across the Yorkshire and Humber region in managing children with Upper GI bleeding and to be aware of which centre is best suited to the patient’s needs.

Intended Audience

Embrace Team (Nurses, ANPs and Doctors)
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ABREVIATIONS

<table>
<thead>
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<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>ABC</td>
<td>Airway, Breathing, Circulation</td>
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<tr>
<td>FBC</td>
<td>Full Blood Count</td>
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<td>HUS</td>
<td>Haemolytic Uraemic Syndrome</td>
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<td>IV</td>
<td>Intra-Venous</td>
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<tr>
<td>LFTs</td>
<td>Liver Function Tests</td>
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<tr>
<td>NSAIDs</td>
<td>Non-Steroidal Inflammatory Drugs</td>
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<td>NBM</td>
<td>Nil By Mouth</td>
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<td>NG</td>
<td>Naso-Gastric</td>
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<td>RBC</td>
<td>Red Blood Cell</td>
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<tr>
<td>GI</td>
<td>Gastro-Intestinal</td>
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<tr>
<td>U&amp;E</td>
<td>Urea and Electrolytes</td>
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1. **OBJECTIVES**

This guideline intends to facilitate the management of patients with Upper GI bleeding referred for specialist input from peripheral hospitals via Embrace Yorkshire & Humber Infant & Children Transport Service. The aim is to have a standard approach across the Yorkshire and Humber region in managing children with Upper GI bleeding and to be aware of which centre is best suited to the patient’s needs.

2. **BACKGROUND INFORMATION**

Upper GI bleeding is defined as haematemesis or any amount of blood from the naso-gastric tube secondary to a bleeding source above the ligament of Trietz (4th part of duodenum). The incidence of Upper GI bleeding in children is not well established. In most cases, the Upper GI bleeding is trivial and unlikely to cause haemodynamic instability. However, it is important to decrease the potential risks that could arise from an Upper GI bleed by acting early.

Children with major Upper GI bleeding will require a multidisciplinary team approach for optimal outcomes. The initial steps include thorough assessment, resuscitation and re-evaluation, identifying the cause of the bleeding and starting treatment early.

3. **GUIDELINE**

Upper GI bleeding, defined as blood loss proximal to the ligament of Treitz in the distal duodenum, is an uncommon but important sign in children. The bleeding can be insidious but can also present as an emergency. Upper GI bleed should always be considered as an emergency.

Consultation with a Paediatric Gastroenterology Consultant +/- Paediatric Surgical Team +/- Liver Team is essential in children with upper GI bleeding and should be considered as an urgent transfer as it needs specific treatment/interventions.

**Common causes of Upper GI bleeding as per age groups:**

**Neonates:**
- Swallowed maternal blood
- Haemorrhagic disease of the newborn
- Coagulopathy
- Oesophagitis
- Stress gastritis
- Gastro-duodenal ulcers

**1 month to 2 years:**
- Oesophagitis
- Gastritis
- Gastro-duodenal ulcer
- NSAID-induced ulcer
- Oesophageal varices
- Gastric varices
- Foreign body ingestion (especially ‘Button batteries’)

**2 years and older:**
- Oesophagitis
- Gastritis
- Gastro-duodenal ulcer
- NSAID-induced ulcer
- Oesophageal varices
- Gastric varices
- Foreign body ingestion (especially ‘Button batteries’)
- Mallory Weiss tears
- Dieulafoy’s lesions
Assessment on First Look Call:

It is essential that you look for the following, as they will have an impact on what you do next.

1. History:
   If neonate/newborn ask if Vitamin K has been given
   Recurrent vomiting
   Regular use of NSAID or steroids or possible ingestion
   Possibility of button battery ingestion
   Family history of Peptic Ulcer Disease (PUD)
   History of liver disease or bleeding tendency or inflammatory bowel diseases or recent illness

2. Physical examination:
   If in shock then proceed to resuscitation as per APLS
   A: Consider securing the airway
   B: There may be tachypnoea secondary to hypovolaemic shock
   C: Tachycardia likely after significant volume los
      Hypotension is a late and worrying sign
      Delayed capillary refill – likely hypovolaemic
      Blood pressure – do not aim to have a high systolic blood pressure
      Newborns to 1 month old: >60mmHg
      1 month old to 1 year old: >70 mmHg
      more than 1 year old: (Age x 2) + 70mmHg
   D: Reduced consciousness secondary to shock
   E: Maintain normothermia
   Jaundice or lemon tinge – think of liver disease or overdose
   F: Consider early blood transfusion.

Other: look for any signs suggesting aetiology
   Abdominal examination – tenderness would suggest surgical cause or gastric/duodenal ulcer;
   signs of liver disease (hepatosplenomegaly; spider naevi, ascites),
   Bruises – think NAI, DIC, Haematological/Oncological pathologies

   Significant pre-existing conditions, reported “large” haematemesis, presence of melaena, heart
   rate at presentation >20 bpm above the mean heart rate for age, prolonged capillary refill time,
   drop of Hb of >20 g/L (compared with a last known Hb for the patient or compared with the
   lower limit of normal range for age), requirement for fluid resuscitation and/or blood transfusion
   and/or other blood products during stabilisation predict higher likelihood of need for endoscopic
   intervention for the upper GI bleed. Complete the Sheffield Score for Paediatric GI Bleeding
   (Appendix 1).

3. Investigations:
   What is the latest FBC and Coagulation result?
      Hb – Initial haemoglobin maybe normal if taken soon after initial blood loss. Aim for a
      Hb of 100 g/l, transfuse slowly or bolus depending on presence of shock
      Is the presenting Hb <80 g/l?
      Has the Hb dropped >20 g/l from a pre-morbid known level, if available?
      Platelets and Coagulation – low platelets and deranged coagulation may warrant
      platelet transfusion, FFP or Cryoprecipitate (if fibrinogen less than 1); in neonates a
      repeat dose of Vitamin K IV may be indicated
      CXR – look for button batteries or other foreign body

Any other recent investigations?
   Endoscopy - History of ulcers or varices?
   Liver US scan or biopsies?
Management:

All cases should be approached in the Airway, Breathing and Circulation manner. If in shock then proceed with immediate resuscitation (follow APLS).

Airway – if in doubt about airway control then ask for HELP early! Opt for early intubation if there is severe uncontrolled bleeding, drowsiness, inability to maintain saturations above 90% or signs of aspiration pneumonia.

Breathing – Aim for saturations above 95%.

Circulation – This is usually the cause of all other problems.
- Aim for ≥ 2 large bore cannulae; Cross match 4 units or request 20 mls/kg if neonates. If severely shocked may require intraosseous access initially
- Correct prothrombin time (after discussion with Hepatology team) and correct platelets count if thrombocytopenic (Pancytopenia may reflect hypersplenism)
- Resuscitate with blood as soon as available, beware of rapid overfilling in variceal bleeds as this can dislodge clots and cause more bleeding
- If in need of inotropes then use the line that you have, do not delay transfer for central lines
- Monitor heart rate, blood pressure, urine output (catheterise)
- Consider activation of the local MASSIVE BLOOD LOSS policy

Drugs –
1. Prophylactic antibiotics are recommended for all cases of variceal bleeding
2. The following drugs are beneficial to decrease the bleed

<table>
<thead>
<tr>
<th>Vital drugs</th>
<th>Octreotide IV infusion (if suspicion of liver disease, portal hypertension, varices)</th>
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<tbody>
<tr>
<td></td>
<td>5 micrograms/kg (max 50 micrograms) loading dose over 15 mins, then 5 micrograms/kg/hr (max 50 micrograms/hr) maintenance infusion</td>
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<td>0 – 10kg - dilute 40 micrograms/kg to 20ml with sodium chloride 0.9%</td>
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<tr>
<td></td>
<td>More than 10kg – dilute 400 micrograms to 20ml with sodium chloride 0.9%</td>
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<tr>
<td></td>
<td>Loading dose = 2.5 ml infused over 15 minutes</td>
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<tr>
<td></td>
<td>Maintenance infusion:</td>
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<tr>
<td></td>
<td>0 – 10kg @ 2.5 ml/hr = 5 micrograms/kg/hour</td>
</tr>
<tr>
<td></td>
<td>More than 10kg @ 2.5 ml/hr = 50 micrograms/hr</td>
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<tr>
<td>Weight*</td>
<td>Vial size to prepare infusion</td>
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<tr>
<td>2.5 kg – 4.9 kg</td>
<td>50 microgram/ml</td>
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<td>5 kg and over</td>
<td>100 microgram/ml</td>
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Vitamin K (phytomenadione)
IV 300micrograms/kg IV; maximum 10mg

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<td>2mg/kg/day; maximum 40mg/day</td>
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<tr>
<td>or</td>
<td>Esomeprazole IV</td>
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<td>1-11 years (body weight up to 20kg): 10mg od</td>
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<tr>
<td>1-11 years (body weight over 20kg): 20mg od</td>
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<tr>
<td>12-17 years: 40mg od</td>
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Exposure
Keep child warm – in intubated patients, consider risk of oesophageal temperature probe, rectal may be more appropriate, otherwise monitor tympanic or axilla temperature
Use warm fluids for resuscitation
A gastric tube is very helpful to assess blood loss, but may lead to trauma in cases of varices
Keep nil by mouth

Failure to control active bleeding
Ask for help from the local surgical team or local adult gastroenterologist if not already done so
If not able to stabilise then discuss need to proceed for endoscopic intervention at referring hospital. Important to discuss with tertiary referral centre endoscopy/GI Consult on call

Glucose – Monitor blood glucose 2-4 hourly and maintain normal blood glucose

Helpful interventions
Urgent endoscopic assessment and treatment, once stabilised for transfer, at tertiary regional referral hospital
A Sengstaken tube is a useful tool in extremis in a child with known varices – but the operator needs to be experienced in its use
Do not use NSAIDs
Referral Pathway

- **Child presents with symptoms/signs of possible upper GI bleeding**
  - Take a focused history
  - Likely upper GI bleed
  - Resuscitate and stabilise child in referring hospital
  - Consider referral via Embrace (0114 305 8200)
  - Patient known to have Varices or Liver problems

**Yes**
- Conference call with Paediatric Hepatology Consultant; Paediatric Surgical Consultant +/- PICU Consultant at **Leeds General Infirmary**
- Continue stabilisation procedures and await Embrace team

**No**
- Refer to Sheffield or Leeds according to normal pathways
  - Conference call with: Paediatric GI Consultant +/- PICU Consultant at Sheffield Children’s Hospital OR Paediatric Surgical Consultant +/- PICU Consultant at Leeds General Infirmary
Management of Upper GI bleeding

- Likely Upper GI Bleed
- Evaluate
- Upper GI Bleeding +/- Circulatory collapse

Resuscitate and stabilise patient in referring hospital
- Secure Airway, supplemental oxygen
- Aim for at least 2 large bore IV access
- Send FBC, U&E, LFTs, Clotting, Cross-match 4 units RBC
- Blood gas
- CXR ?button battery
- Volume expansion with blood products as warranted
- Start Octreotide (bolus then infusion)
- Start IV Omeprazole or Esomeprazole
- Give IV Vitamin K
- Keep NBM and start IV maintenance fluids
- Insert NG tube and keep on free drainage (except if known varices)
- Seek HELP early
- Calculate the Sheffield GI Bleeding Score – to determine need for early endoscopic intervention

Consider referral via Embrace (0114 305 8200)

Re-assess and continue stabilisation whilst awaiting Embrace team

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1 Octreotide IV infusion (if suspicion of liver disease, portal hypertension, varices)
5 micrograms/kg (max 50 micrograms) loading dose over 15 mins, then 5 micrograms/kg/hr (max 50 micrograms/hr) maintenance infusion
0 – 10kg - dilute 40 micrograms/kg to 20ml with sodium chloride 0.9%
More than 10kg – dilute 400 micrograms to 20ml with sodium chloride 0.9%

2 Omeprazole IV (2mg/kg/day; maximum 40mg/day)
3 Esomeprazole IV (1-11 years (body weight up to 20kg): 10mg od; 1-11 years (body weight over 20kg): 20mg od; 12-17 years: 40mg od)
5 Vitamin K (phytomenadione) IV (300micrograms/kg IV; maximum 10mg)
4. **MONITORING ARRANGEMENTS**

This guideline should be reviewed on a yearly basis. Staff will be offered training on how to use the drugs and the logistics of the guideline. Reporting of clinical incidents will help to improve the current guideline.

5. **REFERENCES**

Sheffield Children’s NHS Foundation Trust (2018) Emergency Department Medical Guidelines 5.11 Gastrointestinal bleeding
SC(NHS)FT guideline (CG1191)

Sheffield Children’s NHS Foundation Trust (2019) Guidelines for the management of non-trauma massive blood loss
SC(NHS)FT guideline (CG1451)

Sheffield Children’s NHS Foundation Trust (2020) Embrace Guideline for Suspected Button Battery Ingestion
SC(NHS)FT guideline (CG1808v2)

Sheffield Children’s NHS Foundation Trust (2020) Pharmacy Department Parenteral Drug Administration Guide Octreotide IV Monograph


6. **VERSION CONTROL STATEMENT**

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<th>Author</th>
<th>Status</th>
<th>Comment</th>
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<tr>
<td>1</td>
<td>April 2014</td>
<td>Vickram Singh Jutton</td>
<td>Original</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>June 2015</td>
<td>Aparna Manou</td>
<td>Updated</td>
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<tr>
<td>3</td>
<td>November 2020</td>
<td>Stephen Hancock</td>
<td>Updated</td>
<td>Major revision</td>
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<tr>
<td>4</td>
<td>March 2023</td>
<td>Stephen Hancock</td>
<td>Updated</td>
<td>Major revision</td>
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7. **Appendix 1** Sheffield Score for Paediatric GI Bleeding

| **History taking:** |  
| Significant pre-existing condition | 1 |
| Presence of melaena | 1 |
| History of large amount of haematemesis | 1 |

| **Clinical assessment:** |  
| HR >20 from the mean HR for age | 1 |
| Prolonged capillary refill | 4 |

| **Laboratory findings:** |  
| Hb drop of more than 20g/L | 3 |

| **Management and resuscitation:** |  
| Need for a fluid bolus | 3 |
| Need for a blood transfusion | 6 |
| Need for other type of blood product | 4 |

| **Total score:** |  
| More than 8 indicates need for endoscopy |  

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