These guidelines deal specifically with the management of varices in patients with cirrhosis and are not designed to address: (1) the management of the underlying liver disease; (2) the management of variceal haemorrhage in children; or (3) variceal haemorrhage from other aetiological conditions. They are based on the BSG guidelines for the management of variceal haemorrhage[1] and the Baveno IV consensus workshop on methodology of diagnosis and therapy in portal hypertension[2].

Mortality following variceal bleed

The 3 main reasons why patients die post variceal bleed are:

- Massive uncontrolled bleeding.
- Sepsis (Antibioitic prophlylaxis shown to significantly improve outcome[3]).
- Liver decompensation precipitated by the bleed.

Therefore the principles of treatment are:

- Prompt and optimal fluid resuscitation.
- Prevention and treatment of sepsis.
- Early control of bleeding by terlipressin and endoscopy.

The 1yr mortality following variceal bleed can be predicted by the patient's Child Pugh class[4] (Appendix 1). A 5%; B 25%; C 50%.

Management

If patient presents with significant GI bleeding (haematemesis with either melaena or signs of shock) and has evidence of chronic liver disease it must be assumed that this maybe variceal in origin.

At presentation

a- Resuscitation in a setting where haemodynamic monitoring is possible.

b- Insertion of two large cannulae (at least green).

c- Gelatin-based Colloid (Volplex/Gelofuscine) can be given in the initial volume replacement aiming to bring the systolic BP ideally between 100 to 120 mmHg, and maintaining urine production until blood is available.

d- 6 units of blood should be crossmatched and transfused appropriately to aim for Hb of 8g/dL. The speed of these infusions will be determined by the severity of the shock and whether ongoing bleeding is occurring. In haemodynamically stable patients, transfusion of packed red blood cells (PRBC) should be restrictive with a target haemoglobin (Hb) of 7–8 g/dL and this should be assessed frequently either using a blood-gas analyser or from laboratory samples. A more liberal approach where the Hb is maintained at 9–11 g/dL is associated with a higher mortality 22% vs 11% ($p > 0.05$)5.

e- Major haemorrhage protocol should be activated, to give platelets if the count is below should be 50 x 109/L and to give Fresh Frozen Plasma if the international normalized ratio (INR) is above 1.5 and cryoprecipitate if the fibrinogen in below 1.5[6] (discuss with Haematology)

f- All patients should receive antimicrobial prophylaxis to prevent bacterial transloction[3]:

- 1st line: IV co-amoxiclav 1.2g every 8-hours
- 2nd line (if penicillin allergic): IV ciprofloxacin 400 mg every 12-hours
- Prophylaxis should be continued for 72-hours

- After 24-hours of IV, if patient is clinically well, eating and drinking, and bowel sounds are present: Switch to respective oral agent to complete 72-hours
  - Oral co-amoxiclav 625 mg every 8-hours
  - Oral ciprofloxacin 500 mg every 12-hours

g- All patients should receive Terlipressin 2mg iv stat, then 2 mg 6 hourly for 24-72 hours unless contraindicated (Ischaemic heart disease, previous CVA, PVD)[5].

h- IV Pabrinex in all alcoholics.

i- Urinary catheter placement to monitor hourly urine volumes.

j- Endoscopy should be done at the earliest opportunity after the initial resuscitation and therefore the Gastroenterology SpR / Consultant (if available) should be contacted to discuss.

If the patient presents in a periarrest state or develops this during resuscitation or if the patient's conscious level is impaired to such an extent that they are no longer protecting their airway.

- Cardiac arrest call, if appropriate.
- ITU registrar and a Gastroenterology SpR / Consultant (if available) should be called review the patient immediately to consider:
  - Intubation and ventilation of the patient to allow safe placement of a Linton or Sengstaken tube.
  - Once placed this will allow controlled resuscitation to the point at which endoscopy can safely be performed at the earliest opportunity.
  - Central venous monitoring may be considered to optimise this resuscitation if cardiac history.

Usually this is easier and safer to place after at least some initial fluid resuscitation.

At endoscopy

If there are concerns about the patient's conscious level or haemodynamic instability, then an anaesthetist should be present.

Oesophageal variceal bleeding.

- Band ligation is preferable to injection sclerotherapy[6,7] as less likely to produce significant ulceration post procedure which can give troublesome ongoing bleeding.
- If bleeding is not controlled at endoscopy then a Linton or Sengstaken tube should be placed as temporary control[8] (Appendix 2).
- One further attempt at endoscopic control maybe attempted within the next 24 hours.
- If again unsuccessful then the tube should be replaced and the patient should be considered for a Transjugular Porto-Systemic Shunt (TIPSS) by radiology. TIPSS can control bleeding in 81% of patients long-term[9].
- Prior to a TIPSS a patient should have a Doppler USS of the liver to check for patency of the portal vein.

Gastric fundus variceal bleeding.

- If local expertise available injection with N-butyl-2-cyanoacrylate is the optimal treatment[10].
- If not then placement of Linton or Sengstaken tube followed by TIPSS.

Subsequent management

- If conscious level safe to take oral medication lactulose 20mls orally as prophylaxis for encephalopathy. Aim for 2 soft/loose stools per 24 hours. If oral route unavailable, rectal lactulose enema (pharmacy will make up 500 ml enema) or phosphate enema.

- Full sepsis screen including ascitic tap. Constant monitoring for sepsis.
- Maintenance fluid should be 5% Dextrose rather than Normal saline.
- Avoid large bore NGT if variceal bleed confirmed.
- Oral nutritional support should be given. Consider involving dietetion as most of the patients with liver disease have evidence of sarcopenia and malnutrition.
- Repeat band ligation at endoscopy at 2-3 week intervals until the varices are obliterated.

A summary algorithm is given in Appendix 3.

Appendix 1 Child Score

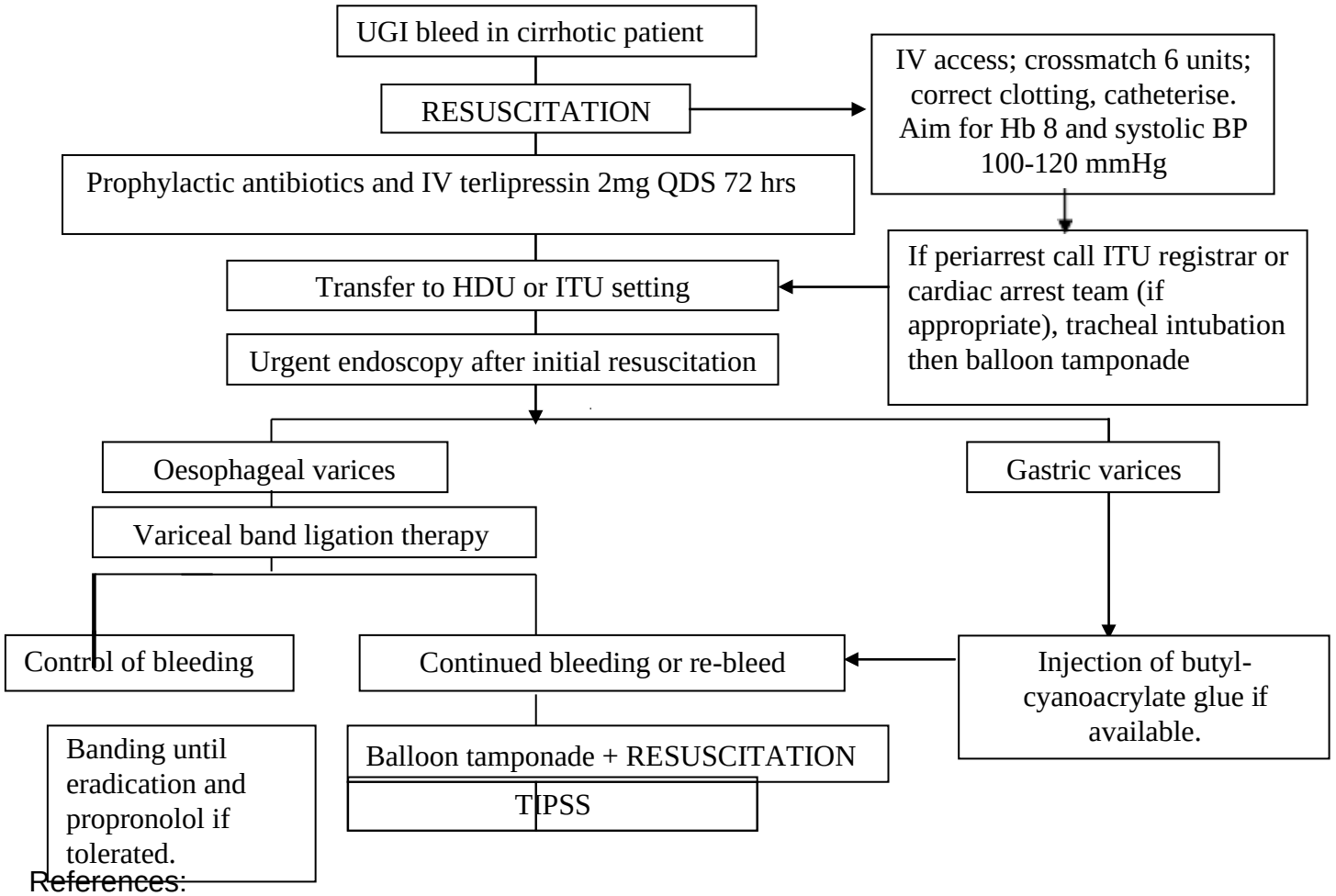
Score	*1*	*2*	*3*
Encephalopathy	0	I/II	III/IV
Ascites	Absent	Mild-moderate	Severe
Bilirubin (µmol/l)	<34	34–51	>51
Albumin (g/l)	>35	28–35	<28
INR	<1.3	1.3–1.5	>1.5

Child-Pugh class A: 6 or <, B: 7–9; C: 10 or >.

Appendix 2 Linton or Sengstaken tube placement

- This is very effective and will stop bleeding in 90% cases[8].
- Aspiration will occur up to 20% if airway unprotected[8] =>ideally intubate prior to placement.
- It should only be passed by a registrar or consultant experienced in its use.
- Technique
    - Check documentation with tube to find out how much air needs to be injected to inflate the gastric balloon. Check for holes by a test insufflation of the gastric balloon.
    - A new lubricated Linton tube, with balloons maximally deflated, should be placed only via the mouth.
    - If circumstances permit, the position should be checked radiologically prior to the inflation of the gastric balloon. Otherwise air should be injected down the gastric port whilst ausculating over the stomach. If bubbling heard, likely to be in correct position. In a ventilated patient oesophageal perforation is a real risk if the balloon remains in the oesophagus when inflated. If inserted at endoscopy then the position may be checked by direct vision.
    - Inflate with appropriate amount of air to fill the gastric balloon.
    - The tube should be withdrawn gently until resistance felt. It should then be pulled a further 5cm out. It should be fixed in position under tension, at the level of the mouth, with two tongue depressors either side of the tube sleeked together, tightly gripping it, with padding to protect the skin at the contact site.
    - A note should be made of the tube's position relative to the angle of the mouth and recorded hourly. Also hourly it should be moved to the opposite side of the mouth to prevent pressure necrosis.
    - Perform CXR to ensure balloon in correct position.
    - The gastric and oesophageal aspirate ports should be aspirated initially, then hourly and left on free drainage.
    - The patient should be nursed at 45^{o}
    - Ideally the tube should be in place for a maximum of 12hrs.
    - It should only be removed at endoscopy or following successful TIPSS.

Apppendix 3 Acute variceal bleeding algorithm



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