Decompensated cirrhosis – presentation and initial management

ST 1 and 2 Teaching Day

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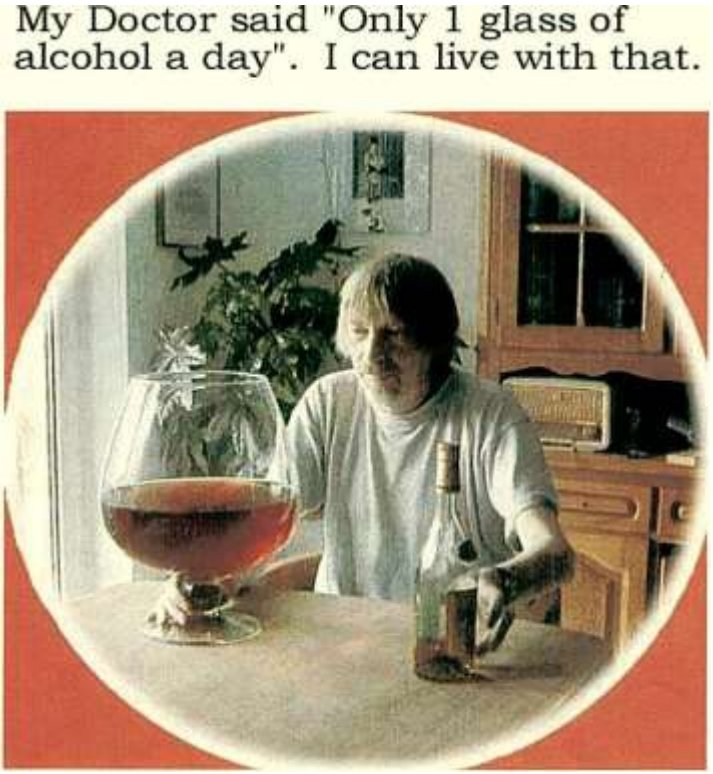
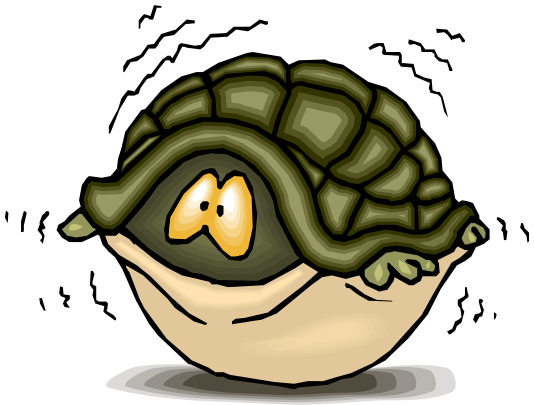


Overview

- Introduction and background
  - NCEPOD and care bundle
- Features of decompensated cirrhosis
  - Ascites
  - SBP
  - Bleeding
  - HE
- Summary, close & questions

The problem

- “Liver patients are so complex”
- “I have no idea what to do and not sure my colleagues have either”
- “so many different problems”
- “where to start”



Interconnections

Malnutrition & frailty

Polypharmacy

Constipation

HE

Hypotension

(Very) unwell liver patient

Sepsis

Bleeding

Ascites

Renal impairment

Withdrawal

nutrition & frailty

Aspects of care / complications of CLD

- Withdrawal (if actively drinking or just stopped)
- Alcoholic hepatitis (if actively drinking or reccently stopped)
- Jaundice and coagulopathy
- GI Bleeding
- Ascites
- Hepatic encephalopathy
- SBP
- Infection
- Renal impairment
- Nutrition
- Prognosis – escalation of care – palliation

Challenging and satisfying

One complication will beget another..

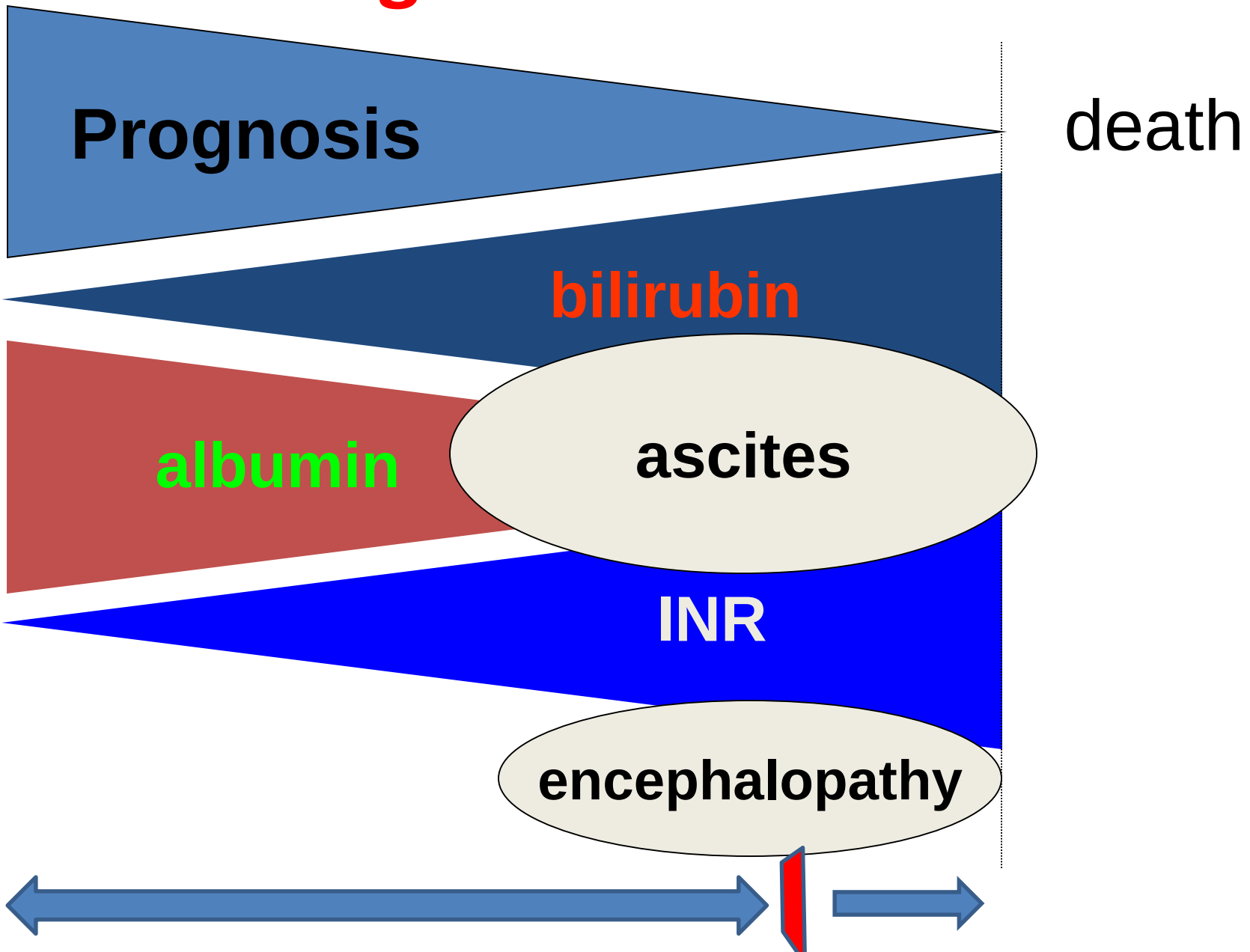
Twin Problems

Hepatic dysfunction ⇔ **Portal hypertension**

- **Hepatic encephalopathy**
- **Hypoalbuminaemia**
- **Reduced clotting factors**
- **Reduced metabolic activity**

- **Ascites**
- **Variceal bleeding**

Prognosis in Cirrhosis



Prognosis in Cirrhosis: Child-Pugh Score

	1 point	2 points	3 points
Bilirubin (µmol/litre) in PBC or PSC	<34 <68	34-51 68-110	>51 >110
Albumin (g/litre)	>35	28-35	<28
Prothrombin time (secs prolonged)	1-3	4-6	>6
Ascites	None	Slight	Moderate
Encephalopathy grade	None	1-2	3-4

A = 5 – 6 points B = 7 – 9 points C = 10 – 15 points

Scoring Systems

- **Child Pugh Score**
- **MELD / PELD / UKELD score**
- **Apache Score/SOFA score**

Cirrhosis severity

- **Fib-4, APRI…**

Disease stage

- **Glasgow Alcoholic Hepatitis Score**
- **Maddrey Score**
- **NFS, BARD**

Disease specific

NECPOD

- **Huge variation in the care of patients with decompensated cirrhosis – resulting in differences in outcome and LOS**
- **Higher mortality and longer stay in smaller volume hospitals**
- **On analysing the data found care in first 24 hours to be critical for further course**

Cirrhosis care bundle

Patient details

Decompensated Cirrhosis Care Bundle - First 24 Hours

:ompensated cirrhosis is a medical emergency with a high mortality. Effective early interventions can e lives and reduce hospital stay. This checklist should be completed for all patients admitted with :ompensated cirrhosis within the first 6 hours of admission.

1. Investigations								
a)	NEWS❑	FBC ❑	U/E ❑	LFT ❑	Coag ❑	Gluc ❑	$Ca/PO_4/Mg$ ❑	Initials: Time:
b)	Blood cultures ❑			Urine Dip/ MSU ❑	CXR ❑	Request USS abdo ❑	CRP ❑	
c)	Perform ascitic tap in **all patients with ascites** using green needle **irrespective of clotting parameters** and send for ascitic PMN/WCC, culture and fluid albumin						Done **Y N**	N/A ❑
d)	**Record recent daily alcohol intake**			..... Units				

2. Alcohol - if the patient has a history of current excess alcohol consumption (>8 units/day Males or >6 units/day Females)		**N/A** ❑	Initials: Time:
a)	Give IV Pabrinex (2 pairs of vials three times daily)	**Y N**	
b)	Commence CIWA score if evidence of alcohol withdrawal	**Y N** **N/A**	Initials: Time:

3. Infections - if sepsis or infection is suspected		**N/A** ❑	
a)	What was the suspected source?.....		Initials: Time:
b)	Treat with antibiotics in accordance with Trust protocol	**Y N**	
c)	If the ascitic neutrophils >0.25 x 10^9/L (>250/mm^3)(i.e. SBP) then give:	**Y N**	
	I) Treat with antibiotics as per trust protocol	**Y N NA**	
	II) IV albumin (20% Human Albumin solution) 1.5g/kg (20g of albumin in 100ml of 20% Human Albumin Solution)	**Y N NA**	

4. Acute kidney injury and/or hyponatraemia (Na <125 mmol/L)		**N/A** ❑	
KI defined by modified RIFLE criteria	1: Increase in serum creatinine ≥ 26µmol/L within 48hrs ***or***		
	2: ≥50% rise in serum creatinine over the last 7 days ***or***		
	3: Urine output (UO) <0.5mls/kg/hr for more than 6 hrs based on dry weight ***or***		
	4: Clinically dehydrated		
a)	Suspend all diuretics and nephrotoxic drugs	**Y N NA**	Initials: Time:
b)	Fluid resuscitate with 5% Human Albumin Solution or 0.9% Sodium Chloride (250ml boluses with regular reassessment: 1-2L will correct most losses)	**Y N**	
c)	Initiate fluid balance chart/daily weights	**Y N**	
d)	Aim for MAP>80mmHg to achieve UO>0.5ml/kg/hr based on dry weight	**Y N**	
e)	At 6 hrs, if target not achieved or EWS worsening then consider escalation to higher level of care	**Y N NA**	

5. GI bleeding – if the patient has evidence of GI bleeding and varices are suspected		**N/A** ❑	
a)	Fluid resuscitate according to BP, pulse and venous pressure (aim MAP >65 mmHg)	**Y N**	
b)	Prescribe IV terlipressin 2mg four times daily (caution if known ischaemic heart disease or peripheral vascular disease; perform ECG in >65yrs)	**Y N NA**	
c)	Prescribe prophylactic antibiotics as per Trust protocol (cefuroxime unless contraindicated)	**Y N**	Initials: Time:
d)	If prothrombin time (PT) prolonged give IV vitamin K 10mg stat	**Y N NA**	
e)	If PT> 20 seconds (or INR >2.0) – give FFP (2-4 units)	**Y N NA**	
f)	If platelets <50 – give IV platelets	**Y N NA**	
g)	Transfuse blood if Hb <7.0g/L or massive bleeding (aim for Hb >8g/L)	**Y N NA**	
h)	Early endoscopy **after** resuscitation (ideally within 12 hours)	**Y N**	

Continues overleaf..→

Please place in medical notes

1. Encephalopathy		**N/A** ❑	
a)	Look for precipitant (GI bleed, constipation, dehydration, sepsis etc.)	**Y N**	Initials: Time:
b)	Encephalopathy – lactulose 20-30ml QDS or phosphate enema (aiming for 2 soft stools/day)	**Y N**	
c)	If in clinical doubt in a confused patient request CT head to exclude subdural haematoma	**Y N** **N/A**	
2. Other			
a)	Venous thromboembolism prophylaxis – prescribe prophylactic LMWH (patients with liver disease are at a high risk of thromboembolism even with a prolonged prothrombin time; withhold if patient is actively bleeding or platelets <50)	**Y N NA**	Initials: Time:
b)	GI/Liver review at earliest opportunity (ideally within 24 hrs)	❑	

Name.....Grade.....Date.....Time.....

Decompensated Cirrhosis Care Bundle - First 24 Hours

The recent NCEPOD report 2013 on alcohol related liver disease highlighted that the management of some patients admitted with decompensated cirrhosis in the UK was suboptimal. Admission with decompensated cirrhosis is a common medical presentation and carries a high mortality (10-20% in hospital mortality). Early intervention with evidence-based treatments for patients with the complications of cirrhosis can save lives. This checklist aims to provide a guide to help ensure that the necessary early investigations are completed in a timely manner and appropriate treatments are given at the earliest opportunity.

- Decompensated cirrhosis is defined as a patient with cirrhosis who presents with an acute deterioration in liver function that can manifest with the following symptoms:
  - Jaundice
  - Increasing ascites
  - Hepatic encephalopathy
  - Renal impairment
  - GI bleeding
  - Signs of sepsis/hypovolaemia
- Frequently there is a precipitant that leads to the decompensation of cirrhosis. Common causes are:
  - GI bleeding (variceal and non-variceal)
  - Infection/sepsis (spontaneous bacterial peritonitis, urine, chest, cholangitis etc)
  - Alcoholic hepatitis
  - Acute portal vein thrombosis
  - Development of hepatocellular carcinoma
  - Drugs (Alcohol, opiates, NSAIDs etc)
  - Ischaemic liver injury (sepsis or hypotension)
  - Dehydration
  - Constipation

When assessing patients who present with decompensated cirrhosis please look for the precipitating causes and treat accordingly. The checklist shown overleaf gives a guide on the necessary investigations and early management of these patients admitted with decompensated cirrhosis and should be completed on all patients who present with this condition. The checklist is designed to optimize a patient's management in the first 24 hours when specialist liver/gastro input might not be available. Please arrange for a review of the patient by the gastro/liver team at the earliest opportunity. Escalation of care to higher level should be considered in patients not responding to treatment when reviewed after 6 hours, particularly in those with first presentation and those with good underlying performance status prior to the recent illness.

Background of case presentation

Mr RW, 60 yr (at time of index presentation)

PMH: Ca larynx 1996

Ca Prostate 2001

Campylobacter enteritis 2004

SHx: re-married, retired

50 Units/week for 30 yrs.

Less last few years (no dependency)

First presentation, Jan 2006

PC: increased SOB and abdominal girth

O/E: gross ascites; BP 120/70 , pulse 80 min

Lab: Hb 13, WCC 6, Plt 190, PT 15

Alb 22, Bili 61, ALT 90, Na 134, Ur 3, Creat 56

Initial Management?

First thoughts

- Cirrhosis ? — most likely
  DD: NCPH , BCS
- Decompensated ?
  - Ascites — yes
  - HE /VB /Infection ….. — Needs checking

Initial approach

1. Investigations								
a)	NEWS ❑	FBC ❑	U/E ❑	LFT ❑	Coag ❑	Gluc ❑	$Ca/PO_4/Mg$ ❑	
b)	Blood cultures ❑			Urine Dip/ MSU ❑	CXR ❑	Request USS abdo ❑	CRP ❑	
c)	Perform ascitic tap in **all patients with ascites** using green needle **irrespective of clotting parameters** and send for ascitic PMN/WCC, culture and fluid albumin						Done **Y N**	N/A ❑
d)	**Record recent daily alcohol intake**			..... Units				

Initials:

Time:

Ascitic tap is safe regardless of PT and with rather low platelet counts (>20)

Investigations

SAAG estimation (> 11 cirrhosis, CCF, Nephrotic Syndrome)

Cell count

Culture on diagnosis & every paracentesis & representation

If turbid/creamy : Amylase, TG

First Admission - Investigations

USS: gross ascites

CT scan: ascites, no obvious mass lesion

Diagn Tap: WCC 100, no growth, Alb 20

Rx diuretics

No significant weight loss

First Admission - Management

Paracentesis with Albumin cover

Discharged home

Clinic review March 2006:

Losing weight, feels well

Oedema resolved

Maintains abstinence

First Admission - Management

Paracentesis with Albumin cover

Discharged home

Clinic review March 2006:

Losing weight, feels well

Oedema resolved

Maintains abstinence

Ascites (in liver cirrhosis)

- Landmark in the natural history of cirrhosis
- Poor prognostic sign
  - 50 % mortality in 2 years
  - 50 % will be refractory in 6 month
- Treatment will improve quality of life but not survival
- In suitable patients consider referral for transplantation once ascites has developed

Refractory ascites

Intractable = unable to resolve due to diuretic induced complications

Resistant = no resolution on max medical therapy

Ascites management (EASL)

Grade	Definition	Treatment & comment
Grade 1	Ultrasound detected only	- No treatment required (but vigilance)
Grade 2	Mod distension of the abdomen	- No added salt diet - Diuretics - Regular weight
Grade 3	Gross abdominal distension	- LVP - Diuretics (unless refractory) - No added salt - Regular weight

- Bed rest & fluid restriction no longer advocated
- Advise to avoid excess fluid
- Spironolactone 100 mg – increased stepwise
- Frusemide 40 mg - increase stepwise (if recurrent ascites, no response to Spiro or SE – hyperkalaemia)

BSG guidelines - Paracentesis

- Safe, despite ↓ platelets and ↑ PT
- STH cut of : Plat 50 + and PT < 20
- Therapeutic paracentesis
  - Resistant ascites
  - Large volume (part if SOB)
  - > 5 litre – HAS 20 % (100 ml/2.5 litre drained)
- Single (total) paracentesis safer than repeated procedures
- Restart diuretics after 24-48 hours
- 20 % recurrence with diuretic therapy (>90 % without)

BSG guidelines - treatment

- Hyponatriaemia

Sodium	Diuretics	Fluid
126 – 135	Continue	No restriction
121 – 125	Controversial	
121 – 125 + Cr Or HE	Stop	Volume expansion
< 121	Stop	Volume expansion

Second Admission - Presentation

May 2006 attended A&E:

Worsening ascites

“Not his usual self”

Diagnostic tap: WCC 550: U&E normal, FBC normal

Cultures: no growth

Imp:

Spontaneous bacterial peritonitis triggering mild HE

1. **Infections** - if sepsis or infection is suspected				N/A ❑
a)	What was the suspected source?…… Ascites / UTI / chest/skin / other			
b)	Treat with antibiotics in accordance with Trust protocol	**Y**	**N**	
c)	If the ascitic neutrophils >0.25 x 10^9/L (>250/mm^3)(i.e. SBP) then give:	**Y**	**N**	
I)	Treat with antibiotics as per trust protocol	**Y**	**N**	**NA**
II)	IV albumin (20% Human Albumin solution) 1.5g/kg (20g of albumin in 100ml of 20% Human Albumin Solution)	**Y**	**N**	**NA**

Initials:

Time:

1. **Encephalopathy**				N/A ❑
a)	Look for precipitant (GI bleed, constipation, dehydration, sepsis etc.)	**Y**	**N**	
b)	Encephalopathy – lactulose 20-30ml QDS or phosphate enema (aiming for 2 soft stools/day)	**Y**	**N**	
c)	If in clinical doubt in a confused patient request CT head to exclude subdural haematoma	**Y**	**N**	**N/A**

Initials:

Time:

1. **Other / VTE prophylaxis**				
a)	Venous thromboembolism prophylaxis – prescribe prophylactic LMWH (patients with liver disease are at a high risk of thromboembolism even with a prolonged prothrombin time; withhold if patient is actively bleeding or platelets <50)	**Y**	**N**	**NA**
b)	GI/Liver review at earliest opportunity (ideally within 24 hrs)	❑		

Initials:

Time:

Second Admission -

Ciprofloxacillin 500 mg BD one week

Lactulose increased

Diuretics increased

Improved

Discharged home – on prophylactic antibiotics and lactulose (but no FU reuqested)

Complications of ascites

- Spontaneous bacterial peritonitis
- Umbilical hernia +/- infection
- Bursting hernia
- Persistent hyponatriaemia
- Renal impairment

Spontaneous Bacterial peritonitis

- Complications of ascites
- Translocation of bacteria

- Once occurred – high risk of recurrence whilst ascites present
- Prophylactic antibiotics longterm
  - Per local protocol
  - If stopped as acute other infection – need to be restarted
  - Only stop if no ascites (or transplanted)

Hepatic encephalopathy (in cirrhosis)

- Can be spontaneous or precipitated
- Has severe impact on QoL
- If subtle is hard to spot
  - Collateral history can be key
- Grade MSHE and HE Grade 1-4
  - MSHE only detected on testing
- Several tests to check for it – all have caveats
- If driving – advise not to drive and that they need to inform DVLA

Hepatic Encephalopathy Diagnosis

- **Dyspraxia** — **5-star drawing**
- **Dyscalculia** — **Subtract – 7**
- **Spell W-O-R-L-D backwards, baby hippopotamus**
- **Standardised tests**
  - **Animal naming** — **animals named in 1min**
    > 15 -17 normal
  - **Number connection test** — **timed normal <30 sec**
    (clinically < 1 min)
    Mainly used to detects MSHE

Causes of Hepatic Encephalopathy

- Infection
- GI-Bleeding
- Constipation
- Drugs – sedating , diuretics
- Electrolyte disturbances
- Progressive liver disease

Hepatic Encephalopathy Management

- Identify and treat cause
- “Keep in calm environment”
- May needs discussion about HDU/ITU
- Keep hydrated
- Monitor close
- Rx Lactulose 30 ml TDS/QDS
- If unsafe to swallow – lactulose enema
- (phosphate enema –if you can’t convince the nurse)

Third admission (2 weeks later)

PC: Drowsy, unwell

O/E: Ascites

Hepatic encephalopathy

Results: Hb 11, Ur 13, Creat 60, Na 125

Impression:

Admitted, iv fluids, antibiotics

Third admission

Overnight – SHO called melena

Crossmatched

Transfused

OGD: varices, with red spots, banded

The bundle…

	1. GI bleeding – if the patient has evidence of GI bleeding and varices are suspected	**N/A** ❑
a)	Fluid resuscitate according to BP, pulse and venous pressure (aim MAP >65 mmHg)	**Y N**
b)	Prescribe IV terlipressin 2mg four times daily (caution if known ischaemic heart disease or peripheral vascular disease; perform ECG in >65yrs)	**Y N NA**
c)	Prescribe prophylactic antibiotics as per Trust protocol (cefuroxime unless contraindicated)	**Y N**
d)	If prothrombin time (PT) prolonged give IV vitamin K 10mg stat	**Y N NA**
e)	If PT> 20 seconds (or INR >2.0) – give FFP (2-4 units)	**Y N NA**
f)	If platelets <50 – give IV platelets	**Y N NA**
g)	Transfuse blood if Hb <7.0g/L or massive bleeding (aim for Hb >8g/L)	**Y N NA**
h)	Early endoscopy **after** resuscitation (ideally within 12 hours)	**Y N**

Initials:

Time:

Acute Variceal Haemorrhage Management

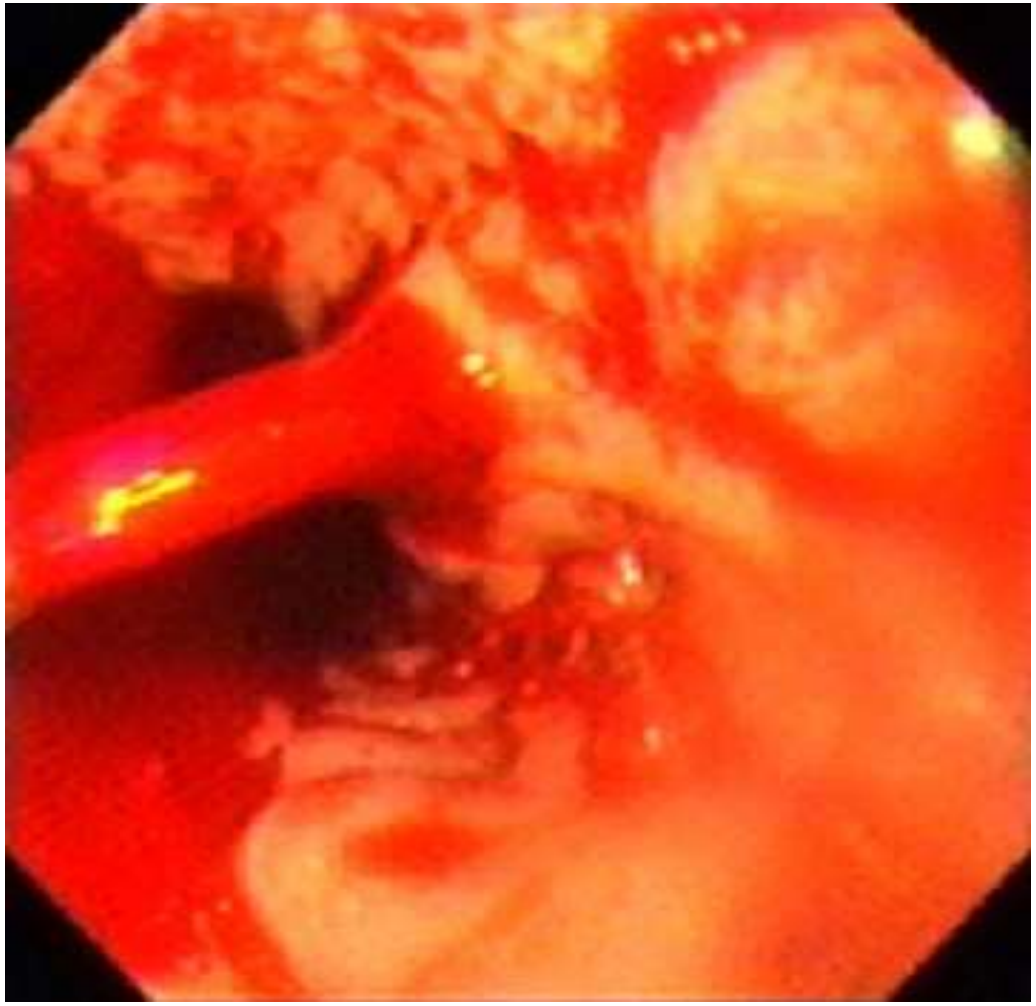
- **Resuscitation, Resuscitation, Resuscitation…….**
  - **–limits secondary liver dysfunction**

Initial Management

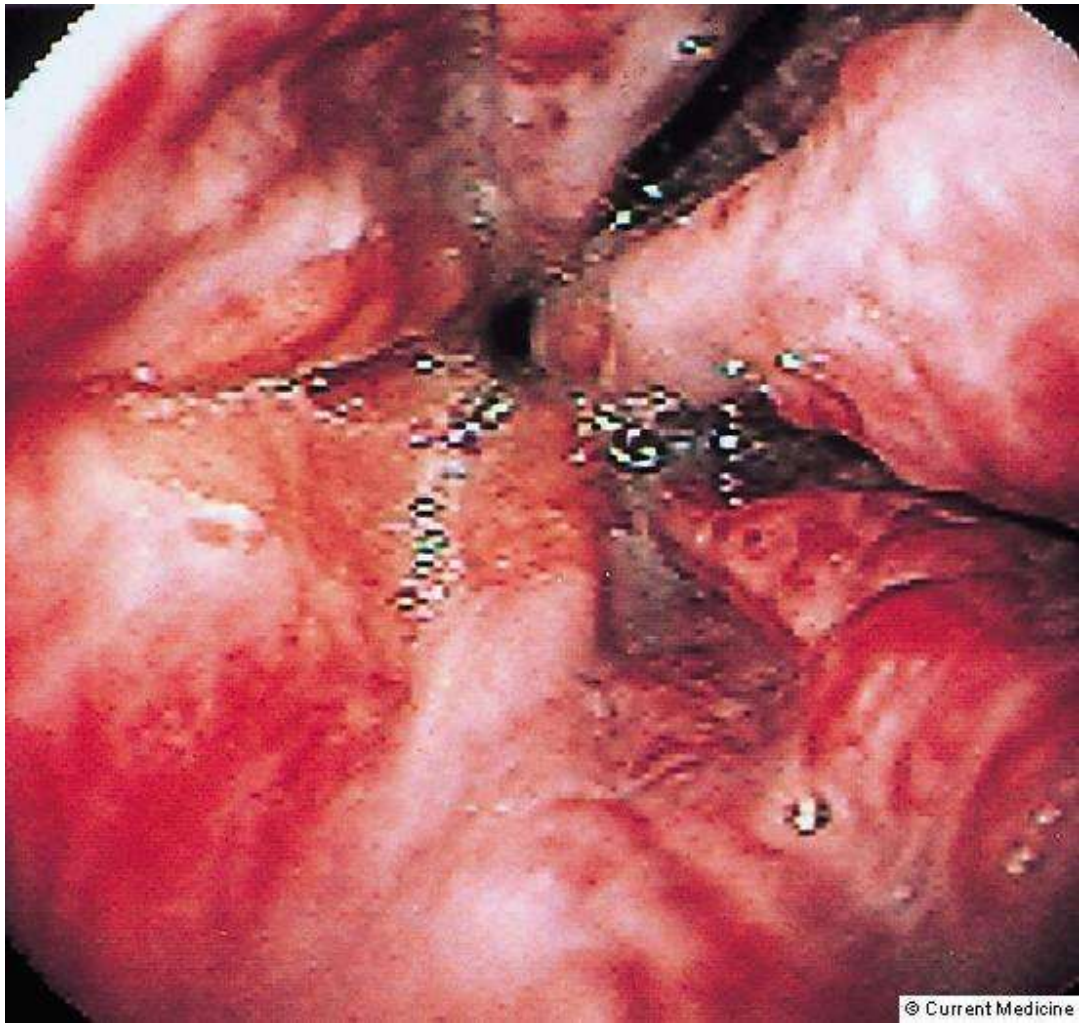
- ABC
  - Airway — risk of aspiration
  - Breathing
  - Circulation — fluid resuscitation

  - Transfusion
  - iv Antibiotics
  - (terlipressin)

Acute oesophageal variceal bleeding

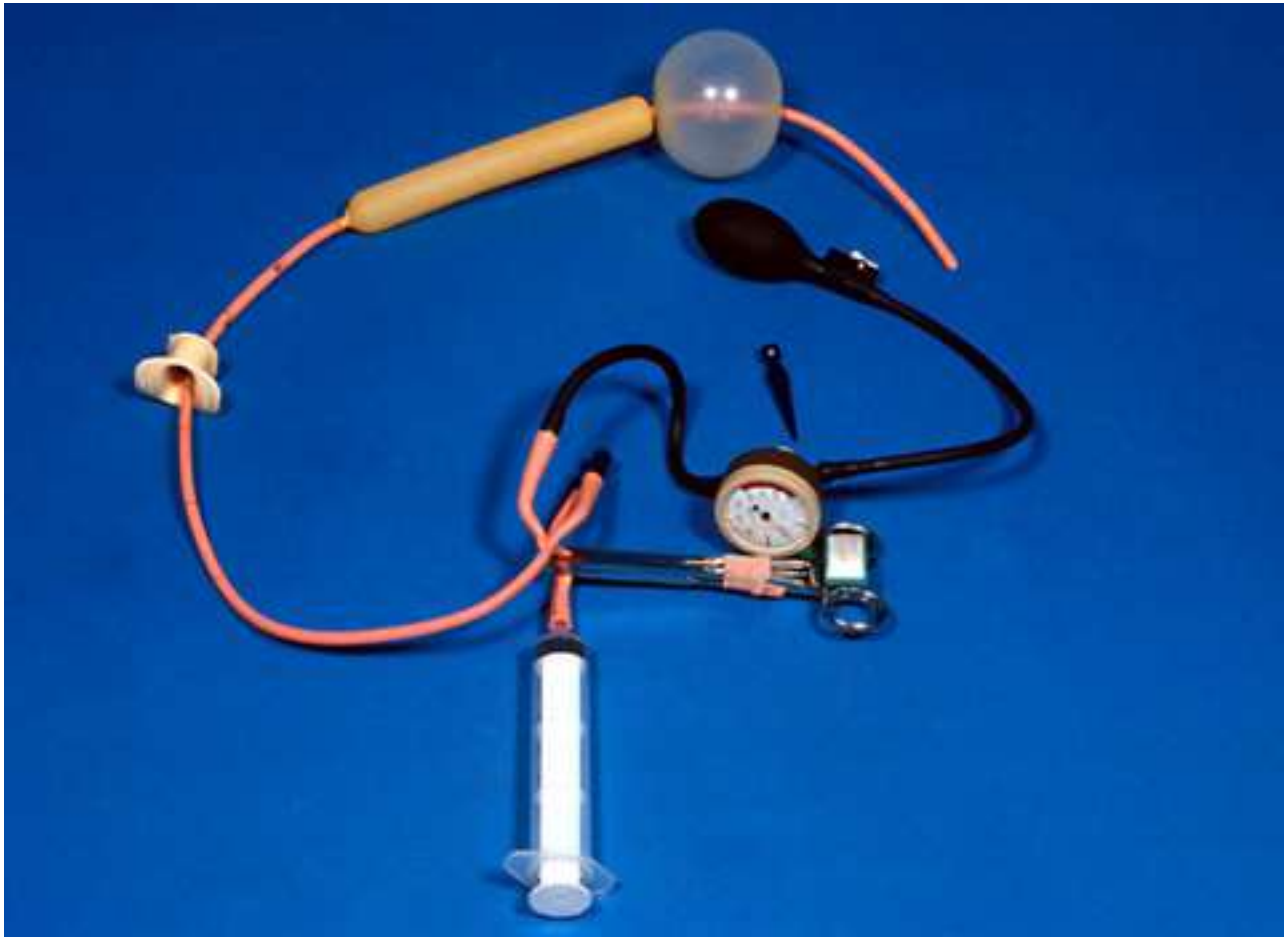


Endoscopic images of varices



Large varices banded

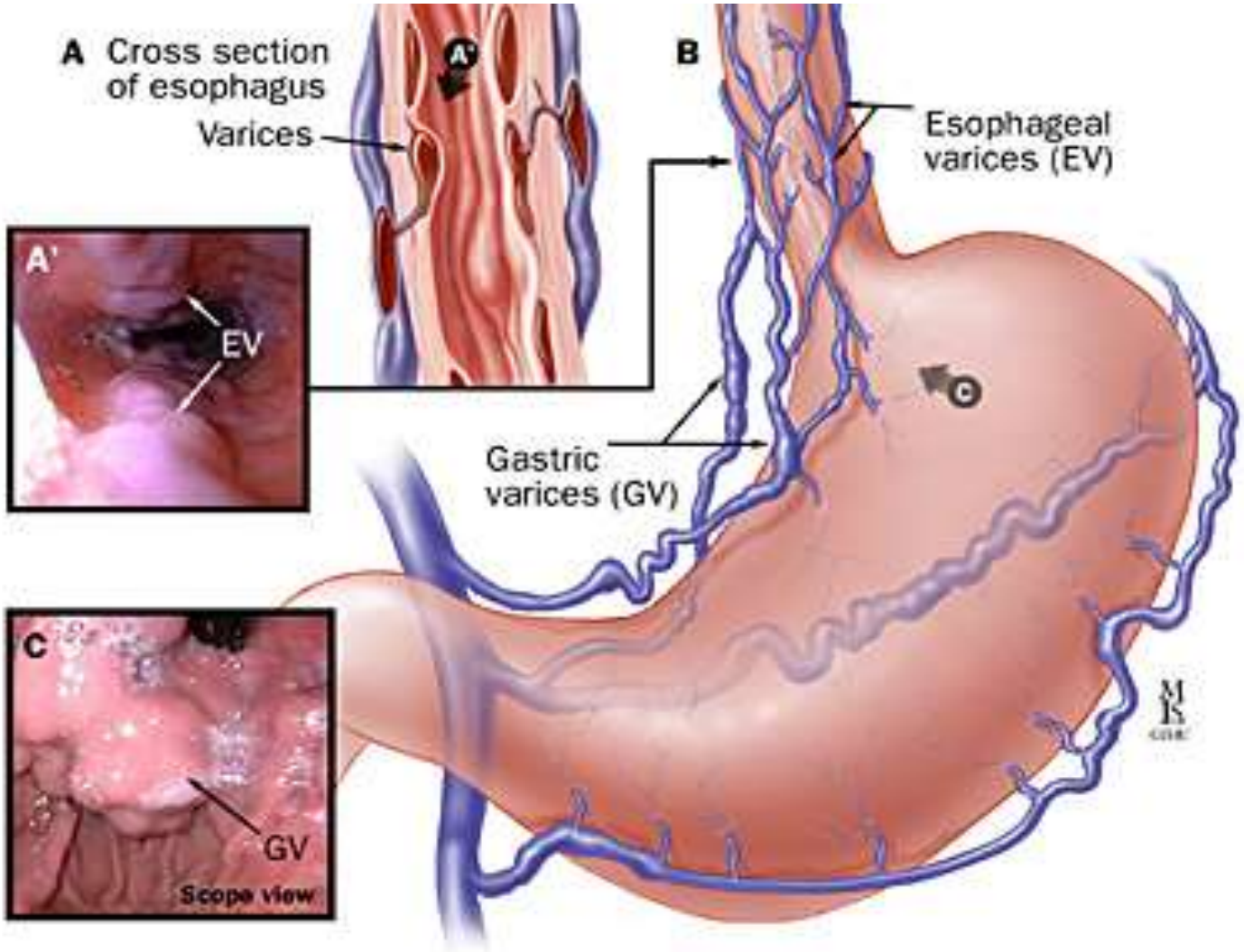
Sengstaken Blakemore tube



Acute Variceal Haemorrhage Important points

- Mortality rate 30 to 50% - relates to CPS
  - exsanguination
  - liver failure
  - Secondary infections
- Increased mortality with re-bleeding
  - stop bleeding: intervention
  - prevent early re-bleeding: terli, second look OGD
  - Later: Non selective Beta-Blocker (Carvedilol , Propranolol)
  - Banding Program
- Poor prognosis associated with
  - advanced liver disease (Child-Pugh class C)
  - shock at time of presentation
  - concomitant disease, sepsis

Anatomy of oesophageal varices



Varices

- When diagnosis of cirrhosis has been made refer patient for gastroscopy
  - As inpatient
  - As outpatient
- If varices present
  - Education
  - Non-selective beta-blocker – titrate dose
  - If intolerant or needing anticoagulation – elective banding
  - Once banded – needs to go on program to eradicated varices

Update on patient…

Referred to palliative Care

Discharged home

GP not happy:

Referred urgently to Gastro

Readmitted with more ascites

Admitted to Gastroenterology

- **What do you think about this patient now?**
- **What are his chances?**
- **What would you do?**
- **What is important?**

Gastroenterology

- **Large volume paracentesis with albumin cover**
- **Optimising diuretic treatment**
- **Optimising nutrition**
- **Re-assessment of varices & treatment to varices**
- **Regular lactulose**
- **Education & information**
- **Close clinic follow-up & direct access**
- **Work-up of liver disease (NILS, biopsy)**

Update

Liver Biopsy: active cirrhosis (10 month of abstinence)

NILS: alpha-1-antitrypsin deficiency

Referred for assessment for OLT

Admitted to Leeds

Accepted on liver transplant waiting list

Further review by dietician

Malnutrition in liver disease

- **Is common and increases with severity and makes liver disease worse**
- **Can be hidden (obese cirrhotics)**
- **Early metabolic shift to “starvation mode”**
- **Needs to be addressed proactively**
- **Dietician referral**
- **Remember micronutrients – check and replace**
- **Regular meals and snacks**
- **Night time snack**

Micronutrient deficiency in (alcoholic) liver disease

Thiamine (B_1)

B Vitamins

Vitamin C

Folate

Zinc

Selenium

Vitamin K

Vitamin E

Vitamin D

Vitamin A

Magnesium

Potassium

January 2007

Ascites appeared resolved

Difficult to improve nutritional status

Increasing nausea

Antibiotics stopped (by patient)

Appetite improved

One week later

Admitted via A&E

Grade IV encephalopathy

Admitted to ITU (as already on OLT- list)

Ventilated

Diagnostic tap: confirmed SPB

iv Antibiotics

NGT – lactulose

Sedation turned off on day 2

Extubated on day 4

RW back on the ward

- **Creatinine 96**
- **On Spiro 200 and Frusemide 80**
- **(but on admission it was 45)**
- **Next day Creatinine 115**

- **Diuretics stopped**
- **HAS 20 % and Terlipressin started**
- **Renal function improved but unable to tolerate diuretics**

The bundle…

1. Acute kidney injury and/or hyponatraemia (Na <125 mmol/L)		**N/A ❑**
AKI defined by modified RIFLE criteria	**1: Increase in serum creatinine ≥ 26µmol/L within 48hrs *or***	
	2: ≥50% rise in serum creatinine over the last 7 days *or*	
	3: Urine output (UO) <0.5mls/kg/hr for more than 6 hrs based on dry weight *or*	
	4: Clinically dehydrated	
a)	Suspend all diuretics and nephrotoxic drugs	**Y N NA**
b)	Fluid resuscitate with 5% Human Albumin Solution or 0.9% Sodium Chloride (250ml boluses with regular reassessment: 1-2L will correct most losses)	**Y N**
c)	Initiate fluid balance chart/daily weights	**Y N**
d)	Aim for MAP>80mmHg to achieve UO>0.5ml/kg/hr based on dry weight	**Y N**
e)	At 6 hrs, if target not achieved or EWS worsening then consider escalation to higher level of care	**Y N NA**

Initials:

Time:

The story goes on

Renal function becoming more brittle

Unable to tolerate diuretics

Recurrence of gross ascites

July 2007 to January 2008

Fortnightly admission for paracentesis with albumin cover

Called for OLT twice – false alarms

- One donor not suitable, one ALF - prioritised

And on

Dec 2007

Possible HCC on USS AFP normal

Jan 2008

During admisison for paracentesis

Call from Leeds

Liver transplant Mid January 2008

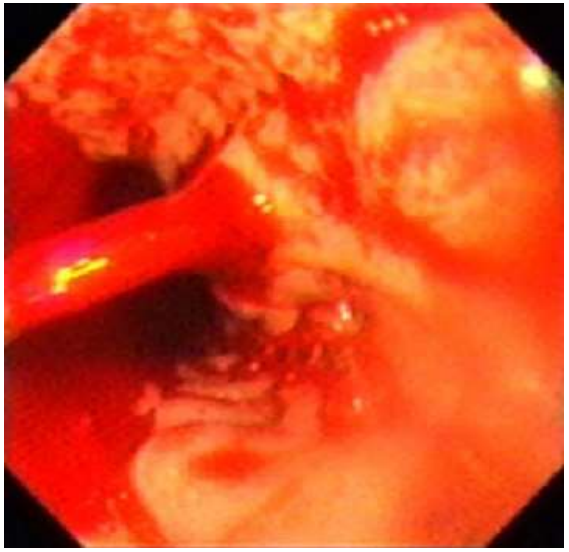
Severe liver disease

- **Patients can recover from very poor states – but often do not**
- **Liver disease can be unpredictable and if in doubt active treatment should be instigated**
- **It can always be scalded down after 48 hour if no improvement**
- **Good communication is paramount**
- **Close observations and early intervention improve prognosis**

Conclusion

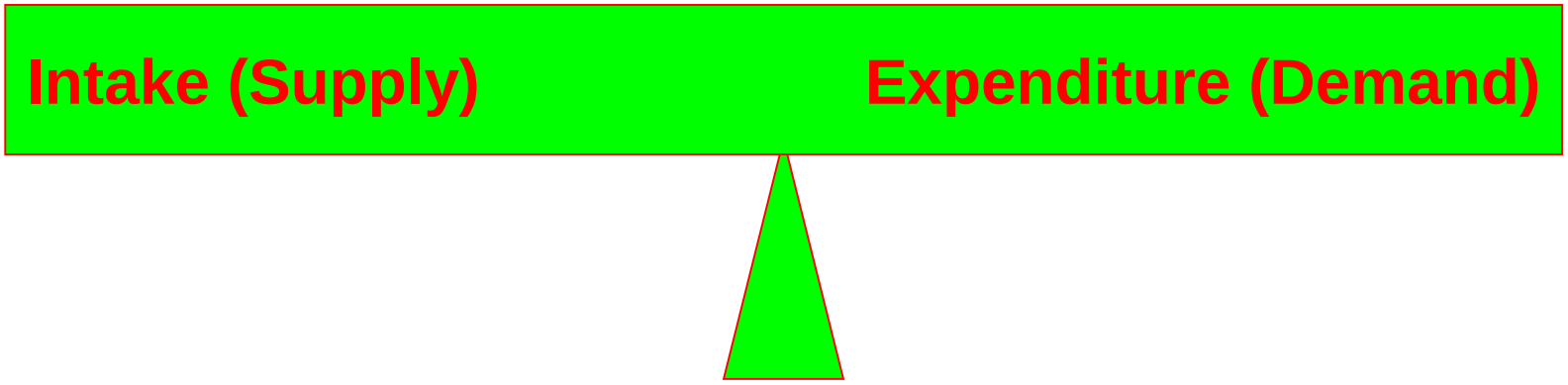
- **High vigilance:** **? Bleeding**
  ? Ascites
  ? He
  ? Infection
  ? AKI
- **Early treatment**
- **The care bundle is helpful and concise and good aide memoir**
- **Involve hepatology early**

Any questions ….

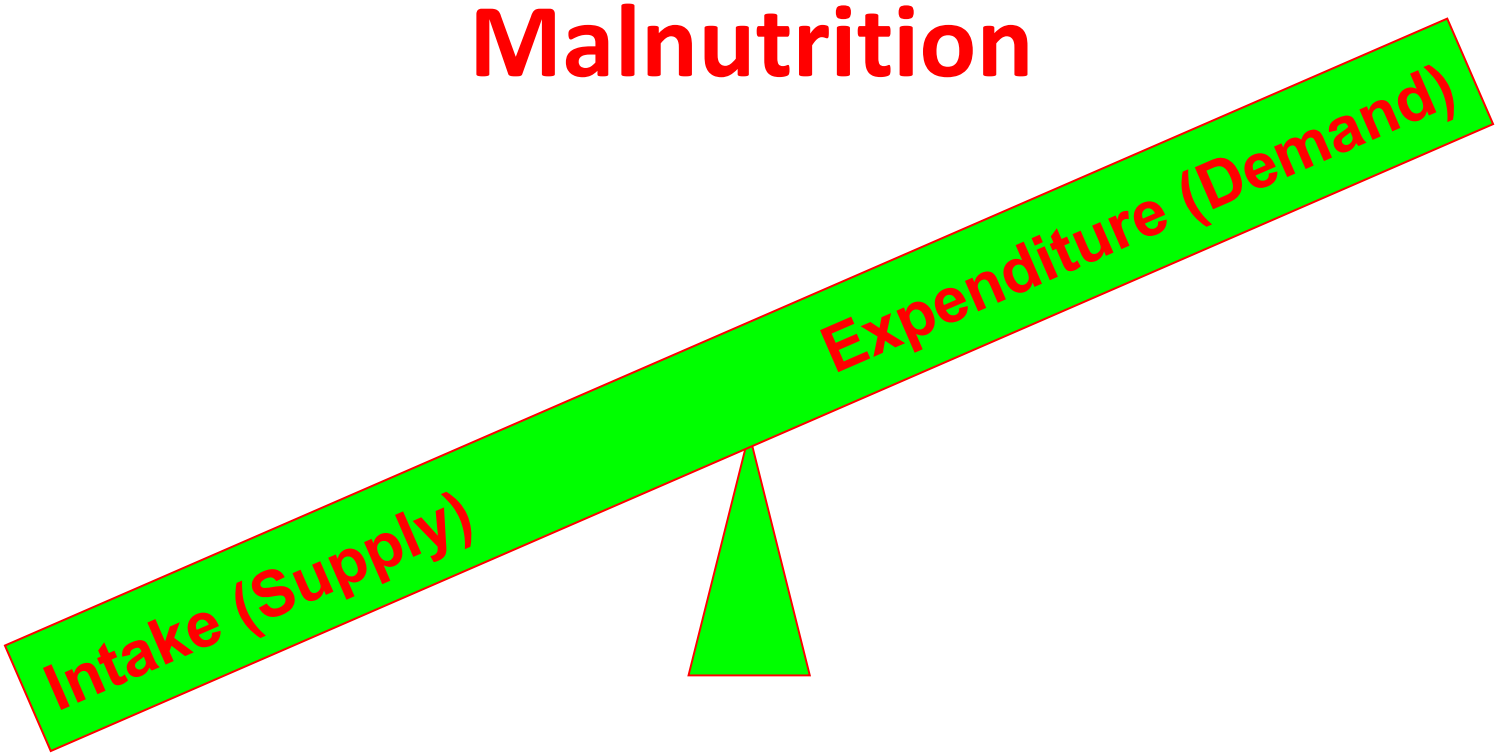


Nutritional Status

Nutritional status can be defined as the degree to which an individual's physiological and metabolic needs for energy and nutrients (the demand) is being met by the food he/she is eating (the supply).



Malnutrition



Anorexia

Lack of taste

Vomiting

Malabsorbtion

Infection

Bleeding

Sepsis

Ascites

Pathophysiology of Malnutrition in Chronic Liver Disease

Fat soluble vitamins

- $\Downarrow$ choleresis $\Rightarrow$ $\Downarrow$ fat emulsification $\Rightarrow$ mild steatorrhoea
- reduced absorption

Water soluble vitamins

- reduced absorption and utilisation
- Additional effect of alcohol

Trace elements & minerals

- reduced / in the wrong space

Cytokines / Cytokine-nutrient interaction

- low grade endotoxiaemia, altered cytokine profile,
- Oxidative stress and low anti-oxidants levels

Ascites management

- Aim resolve ascites and avoid recurrence – once resolved minimum dose required needs to be established
- EASL gives no fixed Creatinine level when to stop diuretics
- Frequent biochemical and clinical monitoring
- Advised stop: HE, Na <120, worsening renal failure (Interpretation: Creat. double or >170)