Resource Management Principles

1. Know your environment
2. Anticipate and plan
3. Call for help appropriately
4. Prioritise
5. Allocate attention wisely and use all available information
6. Distribute workload and use all available resources
7. Communicate effectively

What does a good team look like?

Ensure you project the following to demonstrate your teamwork abilities:

How should a team leader behave?

The highly functioning **TEAM** requires good leadership and followership to move forward effectively and efficiently towards shared common goals.

As the **team leader** it is important to continuously allow for feedback, share your thought processes and summarise at regular intervals. It is likewise important for the team to feedback and prompt summaries where the direction of the case is not clear…

We suggest using "**LIPS**" to summarise every 4 minutes (this will project strong directive leadership):

LABEL
ISSUES
PRIORTIES
SUMMARY / SEND FOR HELP (?)

This mnemonic is useful as it includes 'buzz words' to complete your case summary:

In your mind a case might look like this:

CASE - 32 YEAR OLD, AMBULANCE, 34/40, SEIZURES

* **Label** – 32 year old, 34/40, coming by ambulance in 5-mins with continuous seizures for 10 minutes
* **Issues** – Eclampsia, Actively Seizing, 2 patients, Minimal info
* **Priorities** – IV, 02, monitor, Stop Seizure, Check BSL, Magnesium
* **Send for Help** – O and G, Theatre for C-section, Blood Bank

What a team leader says might look like this:

"Hi team, my name is Justin, the Emergency Senior on call today... I have to tell you about a patient who is coming in 3 minutes. Before I tell you about the patient can I firstly check in with you guys about roles and experience? (Pause and wait). Great. So Jamie you'll be managing the airway and breathing, Anne you'll be the resus nurse and Atticus you'll be scribing and keeping time. (Roles).

Let's use close loop communication so we're all on the same page.

So I might just summarise the case. Atticus, can you write down what we need to get ready… (PAUSE)

We have a 32-year-old pregnant lady in her 3rd trimester who is actively seizing. I am concerned she may have eclampsia but it is also important to consider other causes of seizure and remember we have two patients to look after (LABEL and ISSUES)

So our priorities are to do the following (PAUSE):

- *We need to stop the seizure so I'd like 5mg of midazolam in 5mls of saline ready now please Anne. (wait for closed loop)*
- *So Jamie you have airway experience so I cam going to ask you to access the airway and feedback to me what you find when the patient arrives, in the meantime Jamie can you do the following:*

  Jamie, can you please call anaesthetics and obstetrics to come to the emergency department as soon as possible because we have a young lady with probably eclampsia who is actively seizing. Then, can you let me know when you have called so I can task you to some further priorities?

- *Anne, the other priorities from a nursing point of view will be to stop the seizure. We'll need that midazolam as I mentioned as well as a Magnesium infusion. We'll follow any local protocols that are available but otherwise we'll need 20mmol of Magnesium Sulphate in a 100ml bag of saline given over 15 minutes. It's important that is started as soon as they arrive so intravenous access and a blood sugar will be priorities. I know that's a lot of information but I can see Atticus is writing down what we need so we can cross-check against what he has written.*

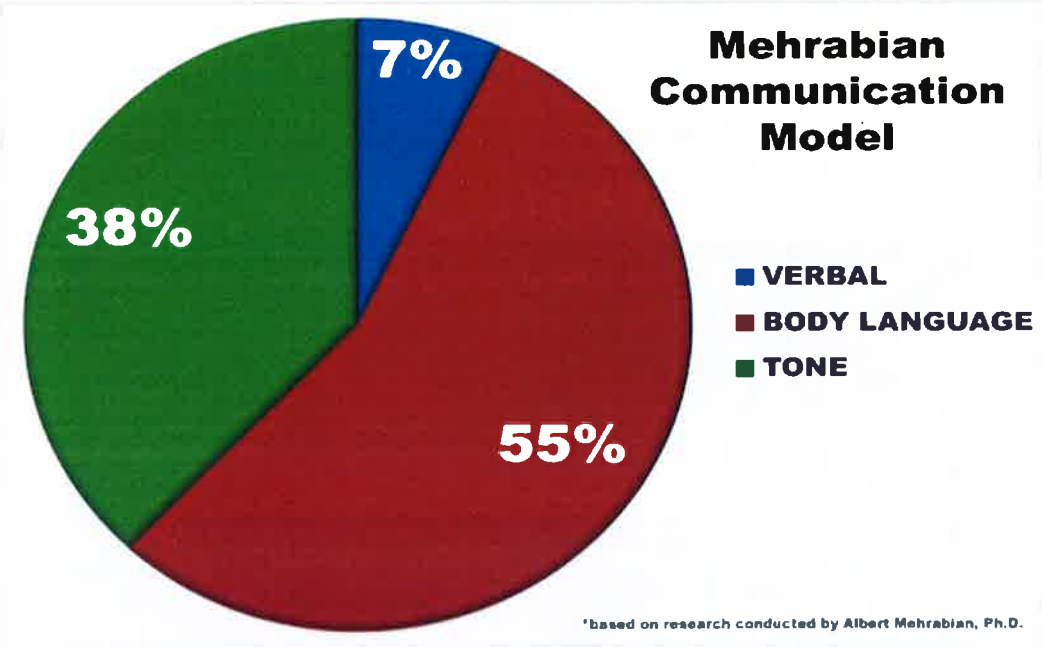
- *Atticus, thanks for writing that down – can you also keep time and remind me to summarise the case every 5 minutes or so we are all on the same page*

- *Jamie thanks for making those calls – when the patient arrives can we ensure we have IV, o2 and full monitoring at an early stage in the first instance. Secondly it is pertinent to start set up for intubation as much as we can before the patient arrives.*

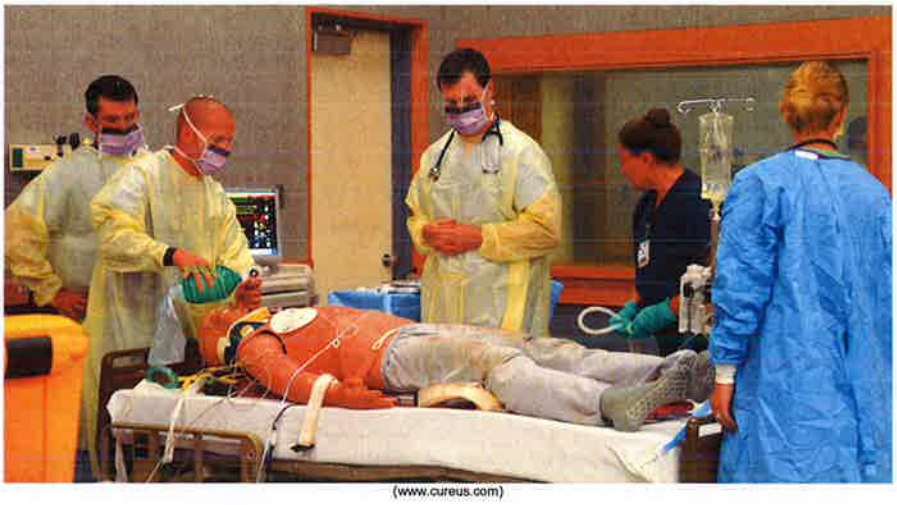
How should you say it?

Suggested Reading - http://resus.me/learning-to-speak-resuscitese

Don't underestimate non-verbal factors including hand position, body language, stance, and eye contact:



What should a team look like?



(www.cureus.com)

(www.resus.me)

Control

Think about managing **YOURSELF, OTHERS, THE PATIENT** and the **ENVIRONMENT** to remain in control when managing an emergency case or a sick patient:

(Picture by Dr Cliff Reid – NSW Ambulance Consultant)

Handover

Use **The I S B A R Framework** when communicating handovers in the exam:

How do I deal with a Difficult Patient/Staff Member?

- Let them vent?
- **Use Negotiation Skills** (see bold text below)
  - *"Credibility, authority, and being LIKED are powerful persuasion tools"* Cliff Reid (2013)
- Show a genuine respect for the patient/colleague's opinion – show respect for their point of view even if you don't agree with them… Attempt to negotiate (see below)
- Seek to compromise, Seek to help - Make it about the patient care and not your disagreement(s)
- Close the loop – repeat back what has been discussed – cross-check what will happen now

Negotiation Skills

• **Authority**	
	Individuals are more likely to comply with experts/authority – you may not have this as an intern but you may be able to call on the help of someone who has…
• **Reciprocity**	("Do us a favour")
	If you give something to people, they feel compelled to return the favour. - e.g. I'll make sure that gets done right now and make a cup of tea for you! You wouldn't mind seeing the patient in the next 20 mins or so please?
• **Liking**	
	We are more inclined to follow the lead of someone who we like or are similar to us rather than someone who is dissimilar or that we dislike. Your reputation is important
• **Social Proof**	
	We view behaviours as correct if others are performing in a similar manner. Unhelpful and disruptive team members are best management by ensuring the whole team follows and acts like the team leader – they are more than likely to fall into like (and follow the crowd) - https://www.youtube.com/watch?v=hO8MwBZl-Vc

Post Hoc Notes for Simulations

References

Westmead Medical Officers Handbook

Edinburgh Emergencies Handbook
https://emergencypedia.files.wordpress.com/2013/04/adult-emergencies-handbook.pdf

www.EMRAP.org

https://www.waops.org/Portals/0/CME/Presentations/Spring/2015/Simplified-Approach-to-Cardiac-Tachydysrthmias_Hampton.pdf

1. GASTROINTESTINAL BLEEDING

- Patients presenting with acute GI bleeding require admission to hospital.
- Although bleeding is often obvious, GI blood loss to the point of syncope can occur without a history of haematemesis or melaena (rectal examination may help).
- The usual cause of death is failure to maintain adequate intravascular volume.
- Frequent reassessment is mandatory **and high dependency for at least 24 hours is appropriate for patients with haemodynamic instability.**
- **The mortality rate for UGI bleeding is still around 10%. If the patient has variceal bleeding then the mortality is around 30-40% (these patients should be treated with extreme urgency).**

MANAGEMENT:

Immediate Therapy:

- Set up IV infusion with plasma expander (normal saline or colloid). **Two** large bore cannulas required.
- Take blood for urgent FBC, coags, cross-match and electrolytes.

History:

- Circumstances of bleeding;
- volume of blood loss (not always accurate);
- associated symptoms;
- associated problems **especially chronic liver disease**, bleeding disorders, COAD, IHD, diabetes;
- current medications especially anti-coagulants and NSAID's. Alcohol intake important.

Examination symptoms and signs of shock include:

- Restlessness, apprehension, syncope.
- Pallor (peripheral vasoconstriction)
  - **this is a very good indicator of general perfusion);**
- sweating; tachycardia; hypotension (postural).
- If pulse > 100/min. and systolic BP < 100 mmHg
  - there is at least 20% volume depletion.
- **Postural change:**
  - Fall of 20mmHg BP or
  - Rise of 20 (supine to erect) in pulse rate are the most reliable sign of significant blood loss.

General examination should include signs of chronic liver disease esp. splenomegaly. This finding strongly supports a variceal source of bleeding and alters management (as the mortality is higher).

- **P.R. examination** is mandatory **(FOBT has no role in this setting).**

Further therapy:

- Frequent examination of pulse, BP, perfusion, fluid balance and stool is essential.

Liver disease: If the patient has suspected CLD then start Octreotide infusion ASAP (see below). At the very least this will help control bleeding for an early endoscopy.

Blood transfusion:

- To correct existing and continuing losses (frequent monitoring for signs of shock and serial Hb estimations).

NB. Hb takes:

- 2-3 hours to start falling and
- 12-24 hours to equilibrate after blood loss.
- 500 mls of blood raises Hb by approximately 10 g/l;

Transfuse 1 unit of **fresh frozen** plasma with each 4 bottles of blood especially if over 10 units of blood are used.

Coagulopathy: if a patient has a coagulopathy all efforts should be made to correct this (discuss with the consultant the extent of reversal suitable for each patient) as this may be sufficient to control the bleeding and allow for upper endoscopy with the patient clinically stable.

C.V.P. Measurements:

- Unstable patients with continuing GIT blood loss.
- Patients with pre-existing conditions especially cardiac.

Upper GIT endoscopy:

- Should be performed after appropriate resuscitation; preferably within 24 hours of Admission.

- Semi-urgent, but not before adequate resuscitation, (if reasonably possible) in patients with:
  - haemodynamic compromise at presentation
  - continuing bleeding OR
  - suspicion of variceal bleeding.

Surgical Consultation:

- Early liaison with the Surgeons facilitates subsequent management (see below)

BLEEDING PEPTIC ULCER

- **Omeprazole infusion (80mg stat IVI followed by 8mg/hour)**
  - reduces the re-scope rate and the need for surgery (Chung et al. NEJM Aug 2000:343(5);310-6).
  - start pre-endoscopy for all significant bleeders (discuss this with the on call Gastroenterologist).
- **Endoscopic haemostasis**
  - Adrenaline injection **Plus**
  - heater probe thermo-coagulation.
    - arrests active bleeding in > 90% of cases
    - dramatically reduces rates of rebleeding, surgery and hospital days.

Surgery is reserved for endoscopic failures: i.e.

- continuing bleeding despite above **(after two failed endoscopies unless otherwise stated**

by the Gastro team) and particularly

- those of advanced age and >8 units of blood transfused
  - old data supports this concept.
  - may not be true anymore with our advanced endoscopic intervention and high dependency support).

BLEEDING OESOPHAGEAL VARICES

- Resuscitate as above;
- correct any coagulation disturbances with FFP.
- Watch for hepatic encephalopathy.

Endoscopic variceal ligation:
Has replaced sclerotherapy

- Has less side-effects and is at least as effective.
- It will arrest bleeding in 90% of cases.
- May be repeated if bleeding has not stopped, or if re-bleeding occurs (in between other specific measures).

Endoscopic Histoacryl glue injection:

- new and very effective in controlling gastric varices (>90%).
- Embolic episodes after large volume injections.

Intravenous Octreotide (Somatostatin):

- prior to, and following, endoscopic therapy to control variceal bleeding.
  - 50 µgm stat, then 50 µgm/hr infusion over 24 hours
    - Safer and cheaper than vasopressin.

TIPS *Trans Jugular intrahepatic portosystemic shunting.*
Shunt is created Radiologically between the hepatic and portal veins using a self expanding metal stent.

- Currently reserved for endoscopic failures
- Very effective at arresting acute bleeding.
- But suffers from long term problems such as hepatic encephalopathy and shunt occlusion.

Balloon tamponade (eg Sengtsaken Blakemeore tube)

- Reserved for failed endoscopic control, particularly cardio-fundal bleeding

Emergency surgery: Now rarely required.

Upper GI Haemorrhage & Ascites

- Consider commencing patients with ascites on iv antibiotics (ie third generation cephalosporin) as prophylaxis against SBP with some data suggesting that this also reduces the risk of rebleeding.

LOWER GI BLEEDING

Ceases spontaneously in 80% of patients most of who do well with no further bleeding.

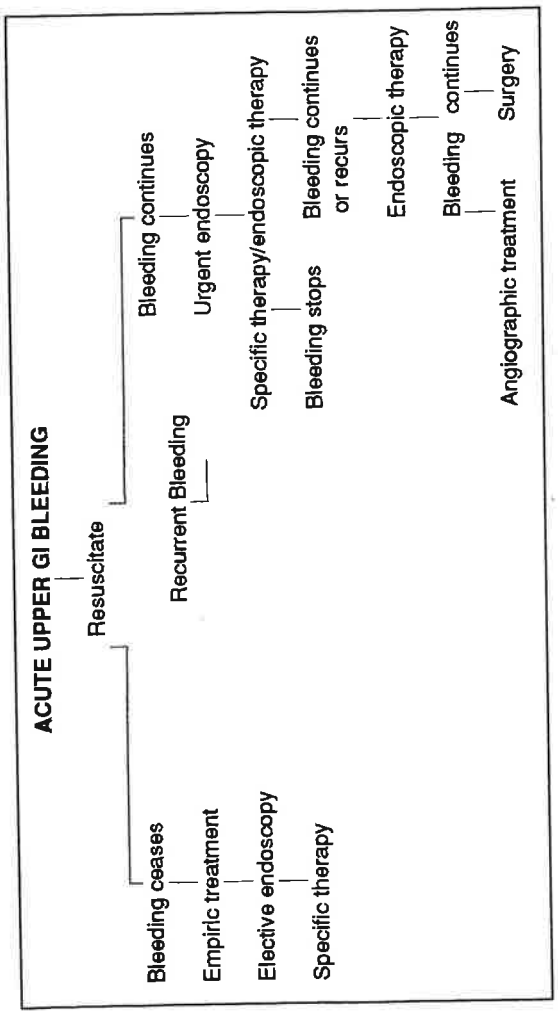
- **Identifying the source of bleeding in cases of 'ONGOING COLONIC BLEEDING' will have a positive impact on survival especially if surgery is required. Thus, colonoscopy after a quick prep is indicated to determine the site of bleeding and**

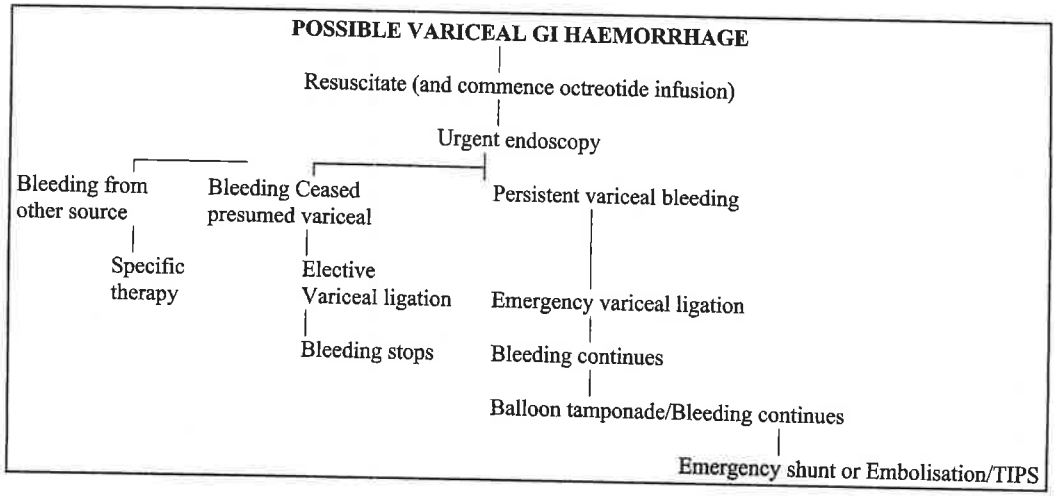
possibly stop the bleeding.

- Consider pan-endoscopy to exclude an upper GI source **(the urea/creatinine ratio is a useful indicator as this rises with upper GI bleeding).**

In those patients who continue to bleed and require intervention:

- CT angiography is very useful in cases of significant bleeding as colonoscopy may not always be able to identify the site of bleeding due to view obscuration by blood and clots
- Selective mesenteric angiography and embolisation can then be performed once the vascular territory is know
- RBC scanning has a less useful role.
- Capsule endoscopy is reserved for haemodynamically stable patients with ongoing overt bleeding requiring transfusion with no definite source on gastroscopy or colonoscopy.




POSSIBLE VARICEAL GI HAEMORRHAGE
Resuscitate (and commence octreotide infusion)
Urgent endoscopy
Bleeding from other source
Specific therapy
Bleeding Ceased presumed variceal
Elective Variceal ligation
Bleeding stops
Persistent variceal bleeding
Emergency variceal ligation
Bleeding continues
Balloon tamponade/Bleeding continues
Emergency shunt or Embolisation/TIPS

7. MASSIVE BLOOD LOSS & TRANSFUSION

Blood Component Therapy

In an emergency, the Transfusion Laboratory at Westmead can provide uncrossmatched ABO compatible blood within 5 minutes. Phone 57700.

Once a properly labelled (hand written with patient's **full** name, MRN and date of collection) and witnessed sample is received, pretransfusion testing can be complete within 30 minutes. Contact the laboratory if the sample is to be treated as urgent. Once pretransfusion testing is completed, blood can be available in the ward within 10 minutes. Samples are valid for 72 hours.

If red cell antibody is present, supply of blood will be delayed depending on availability of suitable units for transfusion. Under these circumstances, attending clinical staff will be notified. To preserve blood supplies, no blood is held in a "crossmatched" status but is supplied at the time of transfusion after a request from a medical officer.

Clinical Practice Guidelines for the Appropriate Use of Blood Components are in place. These guidelines may be found at
http://www.health.gov.au/nhmrc/publications/synopses/cp77syn.htm
and are a joint publication by the NH&MRC and the Australasian Society of Blood Transfusion. The rationale for blood component therapy is required to be collected by the laboratory and must be documented in the patient's notes.

CLINICAL PRACTICE GUIDELINES

Appropriate use of blood components

- Use of blood components for clinical or laboratory indications not listed here is likely to be inappropriate. Consult the NHMRC/ASBT guidelines for further details http://www.health.gov.au/nhmrc/publications/synopses/cp77syn.htm.
- Clinical and laboratory indications for use should be documented.

RED BLOOD CELLS

Hb*	Considerations
<70g/L	Lower thresholds may be acceptable in patients without symptoms and/or where specific therapy is available.
70-100g/L	Likely to be appropriate during surgery associated with major blood loss or if there are signs or symptoms of impaired oxygen transport.
>80g/L	May be appropriate to control anaemia-related symptoms in a patient on a chronic transfusion regimen or during marrow suppressive therapy.
>100g/L	Not likely to be appropriate unless there are specific indications.

* **Hb** should not be the sole deciding factor:
Consider also patient factors, signs and symptoms of hypoxia, ongoing blood loss and the risk to the patient of anaemia.

PLATELETS
Use of platelets is likely to be **appropriate as prophylaxis:**

Indication	Considerations
Bone Marrow Failure	At a platelet count of $<10x10^9$/L in the absence of risk factors and $<20x10^9$/L in the presence of risk factors (eg fever, antibiotics, evidence of systemic haemostatic failure).
Surgery/ invasive procedure	To maintain platelet count at $>50x10^9$/L. For surgical procedures with high risk of bleeding (eg ocular or neurosurgery) it may be appropriate to maintain at $100x10^9$/L.
Platelet function disorders	May be appropriate in inherited or acquired disorders, depending on clinical features and setting. In this situation, platelet count is not a reliable indicator.

PLATELETS
Use of platelets is likely to be **appropriate as therapy:**

Indication	Considerations
Bleeding	May be appropriate in any patient in whom thrombocytopenia is considered a major contributory factor.
Massive haemorrhage/ transfusion	Use should be confined to patients with thrombocytopenia and/or functional abnormalities who have significant bleeding from this cause. May be appropriate when the platelet count is $<50x10^9$/L($<100x10^9$/L in the presence of diffuse microvascular bleeding).

FRESH FROZEN PLASMA
Use of fresh frozen plasma is likely to be **appropriate:**

Indication	Considerations
Single factor deficiencies	Use specific factors if available.
Warfarin effect	In the presence of life-threatening bleeding. Use in addition to vitamin-K-dependent concentrates.
Acute DIC	Indicated where there is bleeding and abnormal coagulation. Not indicated for chronic DIC.
TTP	Accepted treatment.
Coagulation inhibitor deficiencies	May be appropriate in patients undergoing high-risk procedures. Use specific factors if available.
Following massive transfusion or cardiac bypass	May be appropriate in the presence of bleeding and abnormal coagulation.
Liver disease	May be appropriate in the presence of bleeding and abnormal coagulation.

CRYOPRECIPIATE

Use of cryoprecipitate is likely to be **appropriate:**

Indication	Considerations
Fibrinogen deficiency	May be appropriate where there is clinical bleeding, an invasive procedure, trauma or DIC.

Abbreviations: Hb = haemoglobin
DIC = disseminated intravascular coagulation
TTP = thrombotic thrombocytopenic purpura

EPILEPTIC SEIZURES

Epilepsy is a syndrome characterised by two or more unprovoked epileptic seizures.

Epileptic seizures may be:

- Generalised (most commonly tonic-clonic).
- Focal.

CAUSES

First seizure:

- Patients presenting with suspected first ever seizure should be managed as per the 'First seizure in adults' protocol. See Chapter 2.
- Further investigations/treatment should only be undertaken after consultation with a neurologist.

Symptomatic seizures in a person known to have epilepsy:

- Subtherapeutic drug concentration (poor compliance, drug interaction).
- Primary CNS disease (infection, stroke, trauma etc.).
- Encephalopathy due to toxic/metabolic disturbances.
- Intercurrent illness, infection, fatigue, stress.

Isolated presentation:

Patients presenting with suspected first ever seizure must have:

- ECG, FBC, glucose, U&Es, (toxicology if indicated) LFTs, calcium, magnesium.
- If recovered may be discharged, and referred to "first seizure" clinic (Dr Davenport, Consultant Neurologist, RIE): see referral sheet in Chapter 2.
- Inform patient and document advice regarding DVLA (patients have legal obligation to inform DVLA regarding any suspected epileptic seizures or episode of disturbed consciousness not explained by vasovagal syncope). The patient should not drive until further assessment.
- Further investigations/treatment should only be undertaken after consultation with neurologist.

STATUS EPILEPTICUS

Defined as more than 30 minutes of:

- continuous seizure activity or;

- two or more sequential seizures without full recovery of consciousness between seizures.
- This summary is for tonic/clonic status.

i In 50% of patients it is the first seizure. The longer status goes on the harder it is to control and the greater the cerebral damage and systemic effects.

COMPLICATIONS OF STATUS EPILEPTICUS

- Systemic and cerebral hypoxia
- Neurogenic pulmonary oedema
- Rhabdomyolysis, acute renal failure, hyperkalaemia
- Lactic acidosis
- Hepatic necrosis
- DIC
- Death

MANAGEMENT

- Airway: assess, open and maintain, high concentration oxygen. Naso-pharyngeal airway may be helpful.
- Breathing: assess and support.
- Circulation: assess, IV access (check blood glucose), IV fluids. Use 0.9% sodium chloride and avoid 5% dextrose.
- Drugs: abolish seizure activity (below).
- Monitoring: pulse oximeter, ECG, BP, GCS, pupils.

Urgent investigations

- Blood glucose.
- U&Es, Ca^{++}, Mg^{++}, CK.
- ABG
- LFTs
- FBC and coagulation screen.
- The specific cause may be crucial e.g. meningitis, subarachnoid haemorrhage and so on. See below for details of these.
- Discuss with Neurology Registrar: contact via switchboard WGH.

DRUGS

Initial treatment is with **DIAZEPAM** emulsion (Diazemuls).

- 2mg increments IV initially up to 10mg over 5 minutes.
- Alternative is IV lorazepam 4mg slow IV into a large vein.
- Benzodiazepines may cause respiratory depression and hypotension.
- Repeat Diazepam once 15 minutes later up to total 20mg if required.
- Repeat lorazepam once 15mins later up to a total of 8mg, if required.
- Usually effective but wears off allowing recurrent seizures in many.

Second line therapy for seizures persisting despite benzodiazepines is PHENYTOIN.

For patients NOT already on phenytoin:

- Give by IV infusion diluted in 100ml 0.9% sodium chloride.

Recommended maximum concentration is 10mg/ml. Sodium chloride is the ONLY suitable diluent.

- For otherwise fit adults a loading dose of 15mg/kg given no faster than 50mg/min is used.
- The solution is liable to precipitation and a 0.2µm filter should be used in the line.
- To avoid local venous irritation flush cannula with 0.9% sodium chloride before and after infusion.
- Monitor ECG continuously as heart block may occur.
- Measure BP frequently as phenytoin causes hypotension.
- Maintenance: IV 100mg phenytoin 8 hourly (or 300mg phenytoin od orally/NG) until the need for ongoing anti-epileptic treatment is reviewed by a neurologist.

In the elderly or in patients with cardiac disease a lower loading dose should be used e.g. 10mg/kg and can be divided into two separate doses.

- Refractory status, continuing for >30 mins despite the above therapy requires expert involvement from Intensive Care and Neurology.
- **Call the duty anaesthetist and inform the ICU Consultant on call.** The next line of therapy involves the use of IV general anaesthetic drugs, tracheal intubation and assisted ventilation.
- Remember specific causes especially meningitis, encephalitis and other intra-cranial pathology.

ALCOHOL WITHDRAWAL

Clinical Features of Alcohol Withdrawal

Onset of withdrawal is usually 6-24 hours after the last drink, or major reduction in alcohol intake. Uncommon if < 8 - 10 standard drinks (80 - 100 gm alcohol) daily.

Usually, withdrawal is brief, and resolves after 2-3 days without treatment; occasionally, withdrawal may continue for up to 10 days. Syndrome varies widely in severity, ranging from mild anxiety to life threatening delirium tremens.

Main signs and symptoms of alcohol withdrawal

Autonomic overactivity

- Tremor (not hepatic asterixis)
- Sweating
- Restlessness and agitation
- Insomnia
- Tachycardia
- Systolic hypertension
- Fever

Gastrointestinal

- Anorexia
- Nausea
- Vomiting
- Dyspepsia

Cognitive and perceptual changes

- Anxiety
- Vivid dreams
- Hallucinations
- Delirium

Except for agitation and inattentiveness, mentation remains intact during early withdrawal. Altered mentation suggests the presence of other disturbances, particularly Wernicke-Korsakoff syndrome, seizures, meningitis or subdural haematoma.

Delirium tremens is the most severe form of alcohol withdrawal syndrome, and a medical emergency. It usually develops 2-5 days after stopping or significantly reducing alcohol consumption. The usual course is 3 days, but can be prolonged by concurrent benzodiazepine use. Its clinical features are:

- Confusion and disorientation
- Extreme agitation or restlessness
- Gross tremor
- Autonomic instability (e.g. fluctuations in blood pressure or pulse), disturbance of fluid balance and electrolytes, hyperthermia
- Paranoid ideation, typically of delusional intensity
- Distractibility and accentuated response to external stimuli
- Hallucinations affecting any of the senses, but typically visual

Delirium tremens is rare and is a diagnosis by exclusion, so before commencing treatment, screen for other factors contributing to delirium, in particular:

- Subdural haematoma
- Head injury
- Wernicke's encephalopathy
- Hepatic encephalopathy
- Hypoxia
- Sepsis
- Metabolic disturbances
- Intoxication with or withdrawal from other drugs.

Major psychotic disorders can sometimes mimic this state.

Investigations include

- FBC, electrolytes, urea, creatinine, LFT's, amylase
- Sputum, urine and blood cultures
- CXR, ABG
- LP/CT scan if indicated.

Management of Alcohol Withdrawal

The principal management is reassurance and good nursing and supportive care, particularly adequate fluid replacement.

The patient should be nursed in a low stimulus, reduced light environment using non-medical measures as a first option.

Observations should commence as soon as possible.

It is the progressive increase in the severity of withdrawal symptoms and signs that may warrant the use of a sedative regimen. The use of an **alcohol withdrawal scale** (AWS, available on wards) assists nursing and medical staff in quantifying the relative severity of the features and their change over time. However, it is critical to recognise that an AWS is a *monitoring* tool not a *diagnostic* tool. A wide variety of other medical conditions can also cause elevated scores on an AWS, and an elevated AWS score does not prove that the underlying condition is alcohol withdrawal. The AWS is specifically designed to monitor changes caused by *alcohol withdrawal*, and should not be used to monitor withdrawal from other substances.

Supportive nursing and a suitable environment may be all that are necessary to manage mild to moderate alcohol withdrawal symptoms. Encourage oral fluids or IV if necessary (3-4 l/day).

Thiamine

Always give **parenteral thiamine** (100 - 300 mg IV) prior to administering dextrose solutions to any patient suspected of having nutritional deficiency **OR** an alcohol intake >40 gm/ day, to prevent the acute precipitation of iatrogenic Wernicke's encephalopathy.

All patients commenced on an AWS and all patients suspected of having an alcohol intake ≥ 4 standard drinks (40 gm)/ day should be given thiamine supplementation.

If in apparently "good health", without alcohol withdrawal

- 100 mg IM single dose, then 100mg oral twice daily.
- Continue parenteral administration if decreased absorption suspected, eg vomiting or diarrhoea.

If withdrawal symptoms present, or nutritional deprivation:

- 300 mg IM or IV three times daily for 3 - 7 days.
- Infuse over 1 hour if giving IV thiamine, as vascular collapse has been cited, although extremely rare.

Sedative Treatment of Alcohol Withdrawal

A long-acting benzodiazepine (diazepam) is the treatment of choice for alcohol withdrawal (Mayo-Smith 1997). **Contraindications to diazepam include respiratory failure, significant liver impairment, possible head injury or cerebrovascular accident. In these situations, specialist consultation is essential.**

Diazepam treatment is best used early in the course of alcohol withdrawal, to prevent progression to more severe withdrawal. Commonly used approaches are:

- Diazepam loading regimen, which involves giving a large dose on day 1, then no further diazepam.
- Tapering dose regimen, where a predetermined dose of diazepam is administered in tapering doses over 2 - 6 days (recommended for out-patient withdrawal)
- Symptom-triggered regimen, where doses of diazepam are administered according to the severity of withdrawal symptoms (recommended for inpatient withdrawal).

Overview of alcohol withdrawal treatment for a specialist residential or hospital setting

Diazepam loading regimen

On development of withdrawal symptoms, initiate the diazepam loading: 20 mg initially, increasing to 60 mg over 4–6 hours, or until patient is sedated (medical review required if dose required exceeds 60 mg).

Symptom-triggered sedation

Mild withdrawal (AWS score < 4):

- Supportive care, observations 4-hourly.
- If sedation necessary: 5 - 10 mg oral diazepam every 6 hours for first 48 hours.

Moderate withdrawal (AWS score 5 - 14):

- Medical officer to assess.
- If alcohol withdrawal confirmed: hourly observations give 10 - 20 mg oral diazepam immediately; repeat 10 mg diazepam hourly or 10 - 20 mg every two hours until the patient achieves good symptom control (up to a total dose of 60 mg).
- Repeat medical review after 60 mg of diazepam and if patient is not settling, consider olanzapine 5 - 10 mg and HDU support.

Severe withdrawal (AWS score > 14):

- Urgent management. Give a loading dose.
- Review more frequently until score falls.

A rising score indicates a need for more aggressive management.

Alcohol Withdrawal Seizures
When there is a history of withdrawal seizures, early prophylaxis with diazepam is indicated (e.g. diazepam 10 mg po qid).
Prophylactic treatment with anticonvulsants (e.g. phenytoin, carbamazepine and sodium valproate) has no benefit in preventing alcohol withdrawal seizures. If a seizure occurs, medical assessment is required to exclude other contributing factors (e.g. head injury, electrolyte disturbances or other medical conditions).

WERNICKE'S ENCEPHALOPATHY

This is a thiamine deficiency disorder seen most commonly in alcohol dependent individuals with a poor nutritional status, or following the administration of intravenous dextrose or glucose without thiamine supplementation to poorly nourished patients.
It is a medical emergency.
The classic **triad** consists of:

- **Ophthalmoplegia** ranges from nystagmus, lateral rectus palsy, gaze palsy to total ophthalmoplegia.
- **Gait ataxia**
- **Confusion / disorientation** (severe short term memory impairment also occurs when Korsakoff syndrome is present).

However, only one or more of the triad is necessary for the diagnosis of Wernicke's encephalopathy and less than 1/3 of patients have the complete triad

There is often a history of a prolonged bout of heavy alcohol intake and poor nutrition for 4-6 weeks leading up to the presentation, which may then be precipitated by a fall or other medical event.

Management
If suspected, give **thiamine:**

- 300mg IV immediately
- 300mg IV tds for 3 - 5 days, changing to IM only if IV access is not possible.
- Then 100mg IV or IM tds for days 5 - 10.

BENZODIAZEPINE WITHDRAWAL

Patients vary in the rate of developing dependence. Few users of prescribed benzodiazepines become dependent with less than 3 months of use. With between 3 and 12 months of use, 10% - 20% of patients become dependent, rising to 20 - 40% after more than a year of use.
If low dose therapy is continued longer than 6 weeks, tolerance and symptoms of withdrawal will affect 15 - 50% of patients.
Abrupt cessation from high dose benzodiazepine (>50 mg diazepam or equivalent per day) without withdrawal symptoms has been observed, but the incidence is unknown. High dose use is more likely to produce withdrawal with more severe symptoms.

Onset and duration of benzodiazepine withdrawal
Onset occurs between 2 - 5 days after stopping, reaching a maximum on days 7-10, and usually abating by the end of the second or third week. Withdrawal may occur earlier of later depending on the half-life of the benzodiazepine involved.

Signs and symptoms of benzodiazepine withdrawal
Most patients discontinuing benzodiazepines experience a degree of "rebound" anxiety and insomnia. Specific withdrawal symptoms are subjective, with few observable signs.

Signs and symptoms of benzodiazepine withdrawal

Common
- Anxiety
- Insomnia
- Restlessness
- Agitation
- Irritability
- Poor concentration
- Poor memory
- Depression
- Muscle tension
- Twitching
- Myalgia

Less common
- Nightmares
- Agoraphobia
- Panic attacks
- Depersonalisation
- Nausea
- Dry retching
- Anorexia
- Weight loss
- Sweating
- Lethargy
- Headaches
- Blurred vision
- Palpitation
- Tremor
- Ataxia
- Increased temperature

Uncommon
- Delusion
- Paranoia
- Hallucinations
- Seizures
- Persistent tinnitus
- Confusion

Management of Benzodiazepine Dependence and Benzodiazepine Withdrawal Syndrome
Generally, therapeutic dependence should be managed by the patient's general practitioner.

Unplanned withdrawal
Patients in hospital for other reasons may undergo benzodiazepine withdrawal from even low doses of regular, long-term benzodiazepine use. This can be a particular problem in elderly patients, who may develop delirium due to benzodiazepine withdrawal. For hospitalised patients:

- Take a history of benzodiazepine use
- Do not abruptly discontinue benzodiazepines, even at low doses, because of the risk in the sick and the elderly of precipitating withdrawal. Generally, maintain benzodiazepine use at preadmission levels for therapeutic dependence. Hospitalisation and sickness may be an inappropriate context for initiating elective withdrawal.
- Patients taking high doses, or polydrug users, should be converted to a long-acting benzodiazepine (preferably diazepam), at a dose about 40% of their regular intake (or 80 mg/day whichever is lower) prior to dose reduction. As an in-patient, the daily dose of 80 mg may reduce by 10 mg per day until it reaches 40 mg, followed by a more gradual reduction (e.g. by 5 mg per day) to zero.

Equivalent doses of common benzodiazepines*

*Based on manufacturer's product information

Conversion equivalents:

Diazepam	5mg	Lorazepam	1mg
Alprazolam	0.5mg	Nitrazepam	5mg
Bromazepam	3mg	Oxazepam	30mg
Clobazam	10mg	Temazepam	10mg
Clonazepam	0.5mg	Triazolam	0.25mg
Flunitrazepam	1mg	Zolpidem	not known

4. INDICATIONS FOR URGENT CT SCANS

In general, urgent scans are performed to exclude diagnoses requiring neurological intervention or if initial management depends greatly on diagnosis. Some indications are:

- Recent head injury with impairment of consciousness, neurological deficit or skull #.
- Impaired consciousness of unknown cause where metabolic factors have been excluded.
- History suggestive of recent subarachnoid haemorrhage.
- Patients with a history of recent ischaemic event in whom anti-coagulation is contemplated. The main purpose is to exclude intracranial haemorrhage, tumour, established cerebral infarction or haemorrhagic infarction.
- Suspected stroke in a patient without risk factors.
- Suspected cerebral abscess.

However, in patients with evidence of acute meningitis and normal consciousness, no seizures and normal neurology exam a lumbar puncture should not be delayed while a CT scan is performed.

In those with an atypical presentation of meningitis (eg. depressed LOC, sub acute onset, papilloedema, fits or focal signs), the CT scan should be done urgently and it should precede the lumbar puncture.

- Clinical evidence of raised intracranial pressure.
- New onset of seizure disorder (especially if focal onset) with incomplete recovery.

Indications for Urgent MRI Scans

- Spinal cord compression, diagnosis and exclusion
- Sagittal sinus thrombosis

5. CARE OF PATIENTS WITH DEPRESSED LEVEL OF CONSCIOUSNESS

Airway and Respiration

- Nurse in 3/4 prone position, with neck extended and jaw forward.
- Regular chest physiotherapy (q2-4h) including percussion and oropharyngeal suction if necessary.
- Frequent clinical and radiological chest examination.
- Consider NG tube, intubation and ventilation for airway protection, and prevention and treatment of cerebral oedema. **Do not use NG tube if patient has a suspected or known # base of skull.**

Fluids and Nutrition

- Fluids, usually IV initially, often restricted (60ml/hr).
- NG tube may be required initially for aspiration of gastric contents and later for feeding.

6-Step Approach

1. Plan on being stupid.

"Cognitive abilities vary between people…[and] may be influenced by numerous factors such as emotion…hunger, sleep deprivation, illness or by the environment in which they work."

6-Step Approach

2. IV / O_2 / Monitor / Airway Cart and Defibrillator to bedside

- All anti-arrhythmics can be pro-arrhythmic.
- Electricity is pro-arrhythmic.

6-Step Approach

3. Stable or Unstable?

- Stability is a spectrum, not a yes/no decision.
- The endpoint of all bad (unstable) arrhythmias is electricity.

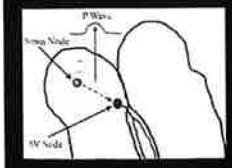
6-Step Approach

3. Stable or Unstable?

Hypotension ? Unstable

6-Step Approach

4. P-waves: Present or Absent?



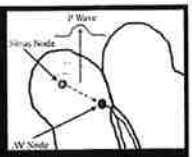
P-waves → 1:1 with QRS

P-waves = sinus rhythm

NSR = NO Electricity!

6-Step Approach

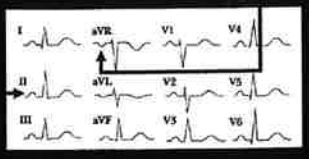
4. P-waves: Present or Absent?



How can you tell if a P-wave originates from the Sinus Node?

Negative P-wave in aVR

Upright P-wave in lead II



If not, check the limb leads!