# JO RUDD'S BOOK OF OSCE WISDOM

## General advice

- Recipe for success
  - Introduces and informs what task is about
  - Logical sequence and structure
  - Looks polished
  - Confident
  - Calm and professional
  - Completes tasks within time
- LIPS -ED
  - Label scenario
  - Issues
  - Priorities
  - Send for help
  - Equipment
  - Drugs
- Outside the door
  - Read domains
  - Read domains again
  - What are the tasks?
  - Key points to cover
  - What investigations might there to be interpret
  - Interpret provided Inx and formulate summary statement
  - Where could this go
  - Read again for hidden information
  - What will I say when I walk in?
  - Read the tasks again.

## Simulation/Resuscitation

- Preparation PMED
  - People
    - Introduce self
    - Team member names
    - Assign tasks based on level of experience
    - Are other people needed
      - anaesthetics/paeds/obs/SW/Security
  - Monitoring
    - ECG leads/Pads
    - SPO2, NIBP, EtC02

        - Defibrillator and assign someone to operate
            - “Are you happy to operate the defib using the “coached algorithm?”
    - Equipment
        - A - 02, suction, airway trolley, intubating equipment
        - B - Masks, BVM
        - C - Defib + pads, IV, IO, USS
        - D - Warmer, fluids
    - Drugs
        - Resus - Adrenaline
        - RSI
        - Specific
            - Antidotes
            - Blood products
            - MTP
            - ABx
- Running the scenario
    - 1. Medical
        - Assess A------E assessment + Initiate management
        - Follow algorithms
        - Key diagnostics
            - BSL, VBG, ECG, CXR, TTE
    - 2. Communication
        - Think ahead and communicate with team
        - Gather information about patient
        - Assign team member to family
    - 3. Control/Leadership
        - Stand back as team leader
        - Clear and confident instruction
        - Closed loop communication
        - Discuss with team if unsure
        - Inform of next steps
        - Check the following
            - Effective chest compression
            - Appropriate ratio to breaths
            - Safe defibrillation practices
    - 4. Decision making
        - Consider 4H and 4T
    - 5. Closure
        - Ongoing care ---- Disposition
        - Clearly state what needs to happen to patient next with priorities
        - Communicate with family
        - Thank team
- BLS (Likely teaching station)

- Dangers (Safety, PPE)
- Response (Shake shoulder)
- Send for Help
- A - Open Airway
- B - look for signs of life (breathing)
- C - Start CPR
    - 100/min
    - 30:2
    - Lower ½ sternum
    - ⅓ chest
    - Full recoil
    - BVM and 02
        - Good seal
        - 1 second inspiration
        - Observe chest rise
- D - Connect to De-fib ASAP

- ALS - ADULT - Non-Shockable
    - Arrest Identified
        - Priorities
            - Good quality CPR with minimal interruptions
            - Early defibrillation
        - Commence CPR 30:2 - assign team member ask to inform if fatigued
        - Full monitoring + EtC02
        - Attach pads and assign defib role “are you happy to run through the COACHED safe defib algorithm?”
        - Assess rhythm
            - Continue compressions
            - Oxygen away
            - All clear
            - Charging
            - Hands off
            - Evaluate rythm - NON - Shockable
            - Dump charge +
                - Pulse check if PEA
        - Recommence CPR (unless ROSC)
            - 1mg Adrenaline IV
            - Then every second cycle
                - Please give 1mg IV adrenaline and repeat every second cycle after rythm check.
        - Use CPR time to Exclude/treat 4H’s 4T’s
            - Hypoxia - 02
            - Hypovolaemia - Bolus
            - Hypothermia - Temperature
            - Hyper/Hypo

        - K
        - Ca
        - BSL
        - VBG
    - Tension - USS/CXR
    - Tamponade - USS
    - Thrombosis - ECHO (PE)
    - Toxins - Reclarify Hx - NaHC03
- ALS Adult - Shockable
    - Arrest identified
        - Monitored arrest
        - 3 x Stacked shocks 200j, 360j, 360j
    - Commence CPR 30:2
        - Assign team member and ask to inform if fatigued
    - PADS on and assign someone to Defib
        - “Are you comfortable to run the COACHED algorithm for safe defib?”
    - Asses rhythm
        - Continue compressions
        - Oxygen away
        - All else clear
        - Charging defib
        - Evaluate rhythm - Shockable
        - Deliver shock
    - Continue CPR 2 minutes
    - Adrenaline after 2nd shock
        - Please give adrenaline after the second rhythm check and every second cyle thereafter
    - Amiodarone after 3rd shock
        - Please give amiodarone 300mg after the third rhythm check
    - Prolonged/Refractory
        - 4H’s, 4T’s
        - Amiodarone 150mg
        - LMA/ETT
        - HCO3
            - Tox
            - Hyperkalaemia
        - Mechanical CPR device
        - ??? Thrombolysis in select circumstances
- Special circumstances in arrest
    - Pregnancy
        - Early O+G / Paeds involvement
        - Manually displace uterus to left
        - Early airway control (ETT)
        - Peri-Mortem C-section if > 20 weeks

        - Within 5 minutes of arrest
    - Consider
        - PE ----- Thrombolysis
        - PPH ----Coagulopathy
- Poisoning
    - Get advice
    - Prolonged resus
    - Decontamination post ETT
    - Antidotes
- Hypothermia
    - Look for signs of life up to 1 Minute
    - Warm
    - Attempt shock but if unsuccesful withold until temp >30
    - Withold drugs until temp > 30
        - Double interval until > 35
- Drowning
    - Early airway control
    - High PEEP
    - C-Spine immobilisation
    - IV fluids to correct hypovolaemia

- Post arrest care
    - Re-evaluate ABCDE
    - Intubate
    - Aim Sp02 94-98%
    - Inx
        - 12 lead, CXR, BSL, VBG
    - Normothermia
    - Normoglycaemia
    - PCI
    - In COMATOSE
        - TTM 36 degrees 24hrs
        - CTB if no clear cause for arrest
        - ICU
- APLS Calculations (WETFMAG)
    - Weight
        - Term 3.5kg
        - 6/12 8kg
        - (Age + 4) x 2
    - Energy
        - 4j/Kg
    - Tube
        - Newborn 3.0 Uncuffed
        - < 1 Year 3.5 Uncuffed
        - (Age/4) + 4

        - DEPTH = (Age/2) + 12
            - Term 9cm
            - 1yr 12cm
    - Fluids 0.9% 10mls/kg
    - Midazolam
        - 0.15mg/kg IV/IM
    - Adrenaline 10mcg/kg
    - Glucose 10mls/kg 10% dextrose
    - EXTRAS
        - Allocate team member to carers or enquire on whereabouts
        - Laryngoscope
            - Newborn 0-1 Straight (1 for term to 12 months)
            - 1year 1.5 straight
            - 4-10 2.0 Mac
            - > 11 3.0 Mac
- ALS - Paeds
    - Danger
    - Response
    - Send for help
    - A - Open airway
    - B - 2 RESCUE BREATHS BEFORE CPR
    - C - Pulse check, start CPR 15:2
    - D - Defib attatche and monitoring
    - Assess rythm
        - Assign role if able “are you comfortable to operate the defib and practice the COACHED algorithm?”
        - Continue compressions
        - Oxygen away
        - All clear
        - Charge defib
        - Evaluate rythym
        - DEFIB/DUMP
    - Drugs
        - Adrenaline 10mcg/kg
            - Shockable after 2nd shock then every other
            - Non-shockable immediately then every other
        - Amiodarone 5mg/kg
            - Shockable after 3rd shock
        - Bicarb (for selected indications)
            - 2mmol/kg
    - Reversible causes
        - Hypoxia likely
        - Consider toxic ingestions
- Neonatal Resuscitation

- Dry/Warm/Stimulate
- Goals of resus = HR > 100.
- Listen to HR (Tap out for rest of team)
- > 100 = Stimulate, warm
- < 100 or gasping/apnoeic = PPV 30/5
- < 60 = CPR
    - Access IV/UVC/IO
    - Adrenaline 10mcg/kg (TERM = 0.5ml 1:10 000)
- Reversible
    - Volume 0.9% Nacl 10mls/kg
    - Sugar <3.5 = 2mls/kg 10% dextrose
    - Cyanosis (not newborn)
        - 0.1mcg/kg/min PGE
    - Naloxone 0.1mg/kg IV (Maternal opiates)

- Life threatening asthma
    - 02 15L/min via NRBM sats >92%
    - Nebulised salbutamol 10mg
    - 3 x 20 Mins Ipatropium 250/500mcg
    - Hydrocortisone 100mg IV (4mg/kg)
    - MgS04 10mmol (2g) IV
        - Paeds = 0.2mmols/kg
    - Intravenous salbutamol
        - Adults
            - 250mcg Bolus
            - 1-5mcg/kg/min
        - Paeds
            - 5mcg/kg/min for 1 hr (LOAD)
            - 1-2mcg/kg/min thereafter
    - Aminophyline
        - Adults = 5mg/kg
        - Paeds 10mg/kg over 1hr
    - EXCLUDE PNEUMOTHORAX
    - ABG
    - Trial NIV
    - RSI
        - Fluid bolus (They are dry)
        - Ketamine induction
        - Adrenaline infusion (0.05-0.5mcg/kg/min)
    - Ventilator settings
        - Vt 6mls/kg (450)
        - RR 6
        - I: 1:4
        - PEEP 0 - 5
        - Fi02 1.0

- Ppeak 40cmh20
- Plateau pressure < 30 (decrease RR as needed)
- Permissive hypercapnia (Aim for pH >7.2) increase RR as needed
- Consider disconnection and decompression with BVM prior to putting on vent

- Anaphylaxis
  - Remove precipitant
  - Adrenaline 10mcg/kg IM
    - > 12yrs = 0.5ml of 1:1000 (500mcg)
  - Adrenaline IV (after 2 IM doses)
    - 0.05mcg/kg/min
  - Airway control
  - High flow 02
  - 20mls/kg Crystalloid
  - Consider bronchodilators
  - Hydrocortisone 200mg IV or 4mg/kg IV (no immediate benefit)
  - Antihistamines when settled
- Adrenaline infusion Points
  - 6mg Adrenaline in 100mls 5% = 60mcg/ml
  - 1ml/hr = 60mcg/hr = 1mcg/min
  - 0.1ml x weight / hr = 0.1mcg/kg/min
    - E.g 80kg male
      - 80 x 0.1 = 8mls/hr = 8mcg/min = 0.1mcg/kg/min
- Seizure
  - Assessment
    - A - Open airway
    - B - 15L Via NRBM
    - C - IV/IO access, BSL
      - If < 3.5 = 50mls/50% or 2mls/kg 10%
    - D - Pupils, focal movements, lateralising signs
    - E - Rash, Trauma, Fever
  - Management
    - 1st line
      - Adult
        - Midazoloam 5mg IV
      - Paed
        - 0.15mg/kg IV/IM (0.3 IN)
      - Repeat at 5 mins
    - 2nd Line
      - Levetiracetam 40mg/kg (Max 3g - likely adult dose)
        - NB: this is my own estimation not taken from source (off licence)
    - 3rd Line (Decision to RSI is already made - simultaneous management)
      - Phenytoin 20mg/kg IV

- 3rd Line (Ongoing seizure or altered conscious level at 30 mins)
    - Propofol induction
        - HD well 2mg/kg
        - HD unwell 1mg/kg
    - Propofol infusion 2mg/kg/hr
- Management in specific situations
    - Hypoglycaemia = Dextrose
    - Trauma = Assume significant TBI
    - CNS Infection
        - Dexamethasone 0.15mg/kg (10mg) IV
        - Ceftriaxone 100mg/kg IV (4g)
        - +/- Acicovir 10mg/kg IV
    - Eclampsia 4g MgS04 over 15 mins
    - Tox
        - 100meq NaHC03 (8.4%)
        - Respiratory alkalosis
    - Hyponatraemia
        - 150mls 3% over 20 mins

- Severe sepsis
    - Source unknown
        - Adult
            - Flucloxacillin 2g
            - Gentamycin 5mg/kg
        - Child
            - Cefotaxime 50mg/kg
            - Flucloxacillin 50mg/kg
        - Neonate < 2/12
            - Cefotaxime 50mg/kg
            - Ampicillin 50mg/kg
    - Febrile Neutropaenia
        - Tazocin 4.5g IV
        - Gentamycin 5mg/kg IV
    - Peritonitis
        - Ampicillin 2g
        - Gentamycin 5mg/kg
        - Metronidazole 500mg
    - Necrotising Fascititis
        - Meropenem 1g
        - Vanc 15mg/kg
        - Clindamycin 600mg
    - Meningitis
        - Ceftriaxone 100mg/kg
        - Dexamethasone 10mg
        - +/- Benpen 60mg/kg

        - +/- Vancomycin 15mg/kg
    - Noradrenaline
        - 0.05-0.5mcg/kg/min for MAP >65
- Supraventricular tachycardia
    - Vagal manouvres
        - Dive reflex
        - Valsalva
    - Pharmacological
        - Adenosine
            - Adult: 6mg, 12, 18 via large vein fast push big flush
                - 3 way tap, 20ml flush
            - Paed: (mg/kg) 0.1, 0.2, 0.3, large vein fast push big flush
            - Warn about side effects
            - Contraindicated in severe asthmatics
        - Verapamil (Consider 1st line in young adults)
            - 5-10mg IV
    - Electircal SYNCHRONISED DC Cardioversion
        - Adult
            - Procedural sedation
            - 100J
        - Paeds
            - Procedural sedation
            - 1- 2J/Kg
- Paediatric stridor
    - Minimised distress
        - Keep with parent unless altered LOC
    - Oxygen
    - Adrenaline 5mg neblised (5mls 1:1000)
    - Dexamethasone
        - Mild-mod 0.15mg/kg PO
        - Severe 0.6mg/kg IV/IM/IO
    - Consider significant differentials
        - Epiglottitis - unimmunised/toxic - 50mg/kg IV Ceftriaxone
        - FB - History
        - Lateral neck XR may help
    - Refractory to treatment
        - Early escalation/call for help especially if thinking epiglottitis
        - Secure airway
            - Gas induction in OT + Fibreoptic
            - Anticipate difficulty
            - <8 years = Needle cric
        - Explain to parents
- Bradyarrythmia
    - Atropine 600mcg IV x 3 (Paed 20mcg/kg)

- Adrenaline infusion
    - 0.05-0.5mcg/kg/min
- Pacing
    - Explain
    - Analgesia/sedation
        - Fentanyl 50mcg + infusion
        - Midazolam 1-2mg + infusion
    - PADS and leads (Cant monitor and pace off pads)
    - Demand mode, synchronous (unless Asystole)
    - Rate 60/min
    - Turn pacing mode on
    - Increased output by 10mA until electrical and mechanical capture
    - Set 10mA above threshold
- Specific circumstances
    - Hyperkalaemia - correct
    - Tox -
        - BB/CCB overdose
            - HIET
                - 50mls 50% Dextrose Push
                - 1unit/kg Push
                - 0.5u/kg/hr infusion
                - Dextrose 50% - 50mls/hr
        - Wide QRS = NaHC03 100meq
        - Intralipid
        - ECMO

- Tachyarrhythmia
    - 02, Defib, Monitoring
    - ABC
    - IV/IO, VBG
    - ECG
    - Low BP = IVF bolus
    - UNSTABLE
        - DCCV
        - Judicious fent/midaz
        - 100J/150J/200J (or go straight to 200)
        - Repeat ECG if change in rhythm
    - STABLE
        - VT: Amiodarone 150mg IV x 2
        - SVT: Vagal/Adenosine
        - AF: <48 DCCV or Flecainide/Amiodarone
        - AF > 48: Rate control and anticoagulation
    - Specific circumstances
        - Consider TCA overdose
            - NaHC03 100Meq

        - I+V to pH 7.55
    - Torsades
        - MgS04 2g over 2 mins
- Toxicological arrest
    - Digoxin
        - Digi-Fab
            - Acute
                - Arrest: 20 Ampules
                - Unstable 10 Ampules
                - Stable 5 Ampules
            - Chronic
                - 2 Ampules
        - Treat Hyperkalaemia
            - Avoid Calcium
            - NaHC03
            - Insulin+Dextrose
        - VT = Lignocaine 1mg/kg
        - AV Block = Atropine, pacing
    - Box Jellyfish
        - 6 Vials antivenom
            - Undiluted rapid IV push
    - Hydroflouric Acid
        - Ca Gluconate 10%
            - 60mls Q5Min until sinus rythm
        - NaHC03
        - MgS04
        - I+V to respi alkalosis
    - LA Toxicity
        - NaHC03 100mEq Q2Min for arrhythmia
        - Lipid Emulsion 1.5ml/kg 20% + Repeat
        - Fluids and Inotropes for hypotension
        - Benzodiazapines for seizure
- TRAUMA
    - MIST Handover
        - Mechanism
        - Injuries
        - Symptoms and signs
        - Treatments to date
    - AMPLE History
        - Allergies
        - Medications
        - Past history
        - Last meal + Tetanus
        - Events surrounding injury/incident

- Trauma Call
    - Consider MTP
    - Allocate roles
    - Handover departmental flow
    - Primary survey
        - A
            - 02, open airway +/- Take airway
            - C-Spine protection
        - B
            - Exclude tension +/- finger throacostomy
            - Asses for open wound
        - C
            - Stop active external bleeding
            - 2 large bore IVC
                - FBC, VBG, X Match
            - Minimal crystalloid
            - Permissive hypotension
            - TXA 1gIV
            - Reverse anticoagulation
        - D
            - GCS
            - Pupils
            - Limb weakness
            - Neurogenic shock
        - E
            - Temp
            - Expose and log roll
    - Imaging
        - CXR - AP
        - PXR
        - E-FAST
        - CT imaging if stable enough
    - Secondary survey
    - Communication with family
    - Disposition
- Burns
    - Dont forget first aid
    - Assess and treat
        - A -
            - Early ETT if airway burn
            - C-Spine precautions if associated trauma
            - Assess for circumfrential burn requiring escharotomy
        - B
            - 02

        - Bilateral air entry
        - Assess for circumfrential burn requiring Escharotomy
    - C
        - IV access x 2
        - Fluids
            - Resus 10-20mls/kg to normalise physiology
            - Parkland
                - Applies to
                    - Adults > 20% burns
                    - Paeds > 10% burns
                - 3mls x kg x TBSA %
                - 50% in first 8 hrs
                - 50% Subsequent 16hrs
            - Hartmanns
            - If child add maintainence
            - Warmed fluids
        - Bloods
            - Lactate --- Consider cyanide
            - K
            - COHB
    - D
        - GCS
        - BSL
        - Analgesia
    - E
        - Keep warm
        - Assess burn
            - Depth
            - BSA
        - Cover burns - Cling film
        - ADT
        - Circumfrential limb = Escharotomy
        - Exclude other injuries
    - F
        - IDC
        - UO > 0.5ml/kg/hr
- Airway checklist (Mine not Jo's)
    - **Opening statement/Risk assessment**
        - This patient has …….
        - We need to be perform a rapid sequence induction for the following indications…..
        - The anticipated case specific complications are…..
    - **People**
        - Assign roles

        - Airway Dr/Nurse
        - MILS
        - Drugs
        - TL
        - 1-2 suction operators in selected situations
        - ELM/Cricoid
        - Family ?
    - Support
        - Anaesthetics
        - Paeds if very young
- **Preparation**
    - Proper Equipment
        - BVM
        - LMA/OPA/NPA
        - Suction
        - EtC02 - waveform
        - Full Non invasive monitoring
        - Bougie
        - ETT + 1 down
        - Laryngoscope +/- VL
        - Ventilator
        - Difficult airway trolley - surg Kit
    - **Propriate Drugs**
        - Induction
            - Ketamine 2mg/Kg (1mg/kg if sick)
                - Status/Severe hypertension Propofol 2mg/kg
                    - 1mg/kg if Hypo/Normotensive
                - Raised ICP: 3mcg/kg Fentanyl...3 mins...1mg/kg Ketamine
            - Rocuronium 1.2mg/kg
        - Emergency
            - Adrenaline 20mcg boluses (10ml syringe, 9mls 0.9% NaCl + 1ml 1:10 000 = 10mcg/ml 1:100 000)
            - Metaraminol 0.5mg boluses
            - Atropine 600mcg
            - Fluid pump set
        - Sedation
            - Morphine + Midazolam  5mg/5mg/Hr
            - Propofol 5mcg/kg/min (seizures/Hypertension_
            - Ketamine 0.5mg/kg/hr (Asthma)
    - **Position**
        - Ear to sternal notch
        - Ramping for obese
        - Left lateral for pregnant

        - Trauma - Neutral collar open MILS
    - **Preoxygenation**
        - Apnoeic/compliant
            - BVM +/- Bagging
        - Most Patients
            - NRBM 15l/MIN
        - Apnoeic
            - 4L/min - up to 15 when apnoeic (assign to airway team)
    - **Physiology**
        - Fluid load (don't forget in bronchospasm)
        - Adrenaline infusion 0.1mcg/kg/min
        - Noradrenaline infusion (sepsis, tachycardia) 0.1mcg/kg/min
    - **Plan for specific complications**
        - Double suction
        - Fibreoptic
        -
    - Airway **Plan** (second operator will rarely be applicable first go best go
        - A - STATE - “First attempt best attempt”
            - Bougie assisted +/- VL
            - (upper airway obstruction - consider fibre optic)
            - Desaturation stop point 88%
                - BVM
        - B LMA
                - BVM
        - C - CICO
            - Surgical cricothyroidotomy
                - Scalpel
                - Bougie
                - Size 5 tube
                - < 8 = Needle
    - **Check in** prior to commencing
        - Clear roles
        - Clear with plan
        - Questions/Concerns
        - Happy to proceed?
- Airway checklist Alexs Retrieval list (SPEEDBOMB) adapted by me
    - Special requests
        - Suction x 2
        - Physiology - Fluid/Pressors
    - Positioning
        - Tragus to sternum
        - Ramping
        - MILS
    - Equipment

        - VL with MAC blade
        - Direct MAC blade
        - ETT + Size down
        - Syringe
        - Bougie
    - EtC02
        - In line on BVM
    - Drugs and IV access
        - 2 x IVC
        - Drugs
            - Induction
            - Paralytics
            - Emergency
    - Back up airway
        - BVM + Adjuncts
        - LMA
        - Surgical
    - Oxygen
        - Pre ox
            - BVM or NRBM
        - Apnoeic O2 4L ==== 15L
    - Monitoring
        - HR
        - BP Q3 Min
        - Sp02 and ECG
    - Briefing
        - This is a …. With …… we are intubating because….
        - Anticipated complications in this case are …….
        - Plan A ====== D
            - DL - Bougie
            - VL - Bougie
            - LMA
            - Bagging with adjuncts between each attempt
            - If at any time we encounter a cant intubate, cant ventilate situation we will proceed to
            - Plan D - Surgical cricothyroidotomy
- Intubation in head trauma
    - Fundamentals
        - Target MAP >80mmHg
        - Volume replacement pre-induction
        - Fentanyl pre-mediciation 3mcg/kg 3 Mins before induction
            - Mind apnoea and hypotension
        - Ketamine induction 1mg/kg
    - MILS

- Aims
    - PaC02 35
    - Pa02 100
    - Normothermia
    - Euglycaemia
- Head up 30
- Tapes not ties
- Sedation
- Seizure prophylaxis if occured or Nsx discretion
- Raised ICP
    - 3% NaCl 150ml (3ml/kg)
    - Mannitol 20% 1g/kg
- CT
- Dispose
    - NSx/ICU/OT

- Failed intubation algorithm
    - Identify
        - Sats < 88% on laryngoscopy attempt
        - No confirmation of ETT placement
    - Remove ETT/Laryngoscope
    - BVM with adjuncts
        - Reoxygenate to 100% if able
    - ABLE to ventilate
        - Discuss reason for failure ? modifiable
            - VL
            - BURP
            - Position
            - ETT size
            - Bougie/stylet
            - Operator
        - Check equipment
        - Check position
        - Adequate paralysis?
        - Reattempt only if something modifiable has been identified
    - NOT ABLE to ventilate
        - BVM with Tripod airway
        - LMA
        - Surgical
        - > 8 Cricothyroidotomy
        - <8 Needle
- Surgical airway
    - Indications
        - CICO
    - Contraindications

        - <8 Years
        - Tracheal transection/Fracture
        - Obstruction below cricoid
    - Complications
        - Acute
            - Bleeding
            - Malposition
            - Vellel injury
        - Late
            - Infection
            - Subglottic stenosis
            - Scarring
    - Steps
        - 1 Vertical midline incision and blunt dissection to membrane (skip if super easy anatomy)
        - 2 - When membrane identified
            - Horizontal stab incision
            - Finger
            - Bougie
            - Size 5.5 tube
            - Cuff up
            - Ventilate
            - Secure
            - Check depth (easy bronchial intubation)
- Post intubation checklist
    - A
        - etC02 - continuous trace
        - Depth check/auscultate
        - Secure
        - Cuff pressure (20-30cmH20)
        - OGT /NGT
    - B
        - Ventilator - check settings
        - CXR
        - ABG
        - 30 degrees head up
    - C
        - Check IV access
        - ART
        - CVC
        - Fluid/blood products
        - IDC
    - D
        - Sedation

        - Analgesia
    - E
        - Temperature control
    - Other
        - Temp control
        - Documentation
        - Family
        - Specific treatments
            - Abx
            - Dressings
- Ceasing resuscitation
    - Key questions
        - Witnessed
        - Bystander CPR (and quality)
        - Initial Rythm
        - Time to Defib/CPR/ROSC
        - Drugs
    - Patient factors
        - Pre-morbid state
        - ARP
        - Time of arrest
        - Hypothermia
        - Trauma
    - Resuscitation provided
        - Total downtime
        - Shocks
        - Drugs
        - ROSC/Signs of life
        - Rythm (Asytole = poor prognosis)
    - Reversibility
        - 4H/4T identified and treated?
    - Clinical
        - eTC02 persistently < 10
        - No cardiac activity on bedside ECHO
        - pH < 7
        - Lactate >10
        - Pupils ???
    - CEASE if
        - > 20 mins no ROSC + No viable rythm + Nil reversible
        - Unsurvivable illness/injury
        - Pre-existing severe chronic illness
    - POST Ceasing
        - Coroners? - Leave all lines in
        - Hot debrief

        - Documentation
        - Talk to family
        - Follow up debrief and offer support
- Troubleshoot the De-Fib
    - Patient
        - Impedence (Hair, Water)
        - Corerect Pad position: AP
        - Leads and Pads plugged in
    - Machine
        - Power
        - Settings (e.g synchronisation)
    - Operator
        - Happy/Confident to use
    - Increase Joules
        - Try manual/unsynch
        - Prepare for R on T and VT - brief team
- Paediatric Airway (All tubes cuffed)
    - Neonate (TERM)
        - 3.5kg
        - LMA 1
        - Miller 0
        - Size 3.0 ETT to 9cm
    - 6/12
        - 8kg
        - LMA 1.5
        - Miller 1
        - ETT 3.5 to 10cm
    - 1 Year
        - 10kg
        - LMA 1.5
        - Miller 1.5
        - ETT 4.0 to 12cm
    - 2 Year
        - 12kg
        - LMA 1.5
        - Mac 1
        - ETT 4.0 to 13cm
    - 4 Year
        - 16kg
        - LMA 2
        - Mac 1
        - ETT 4.5 to 14cm
    - 6 Year
        - 25Kg

        - LMA 2.5
        - Mac 2
        - ETT 5.0 to 15cm
    - 8 Year
        - 30kg
        - LMA 3
        - Mac 2
        - ETT 5.5 to 16
    - 10 Years
        - 40kg
        - LMA 3-4
        - ETT 6-6.5
        - To 17cm depth
- Post-Partum Haemmorhage (for simulation purposes.)
    - Fundal massage
    - ABC
        - 02 15L
        - 2 x Large bore IVC
        - Send blood
            - FBC, VBG, Coag, G+H, DIC screen
        - 2 Units O neg or X-Matched
        - MTP
    - Syntocinon
        - 10Units IM at birth
        - 10 Units IV
        - 10 Units/hr
            - (30 units in 500mls)
    - Ergometrine
        - 500mcg IV
    - Misoprostol
        - 1g PR
    - TXA
        - 1g IV
    - IDC
    - Intramyometrial PGF2x
    - Haemostatsis
        - Bimanual compression
        - Bakri balloon
        - Aortic compression
        - Embolisation ??
        - OT
    - Exclude trauma
    - Reverse coagulopathy
- Traumatic cardiac arrest

- PPV
- Volume (blood products)
- Bilateral thoracostomy
- Resuscitative Thoracotomy
    - Indications
        - 1. Cardiac arrest with
            - Isolated penetrating thoracic trauma
            - Signs of life < 10 minutes
        - 2. Persistant severe hypotension with evidence of:
            - Intrathoracic haemmorhage
            - Pericardial tamponade
            - Systemic air embolism
    - Contraindications
        - Head injury
        - Blunt trauma (<3% survival) ? relative
        - Absence of signs of life on scene and on arrival with > 5mins CPR
    - Procedures possible
        - Release pericardial tamponade
        - Control massive Haemothorax
            - >1500 straight up
            - >200mls/hr >2hrs
        - Control massive air embolisim
        - Open cardiac massage
        - Aortic cross clamping
    - Procedure
        - Clamshell approach
            - Incision in 5th intercostal space M.A.L to 1 finger breadth from left sternal edge
            - finger/closed scissors to breach pleura
            - Open scissors and sweep to open pleural space along incision
            - Finochietto rib retractor
            - Open pericardium (grasp with forceps, enter with scissors avoiding phrenic)
            - Deliver heart from pericardium
            - Remove clots, finger pressure to bleeding sites
            - Staple wounds
            - Internal CPR if indicated
            - Defibrillation 15j if indicated
            - Anticipate rebound hypertension/awareness
            - Urgent transfer to OT

- Drowning
    - Predictors of poor outcome
        - Scene

        - Immersion > 5 mins
        - Time to CPR > 10 minutes
        - Precipitant (MI, Trauma)
    - In Emergency
        - Asystole
        - GCS < 5
        - Pupils fixed and dilated
        - CPR > 25 mins
        - pH <7, Lactate >10
    - Orlowski
        - Age < 3
        - Submersion > 5 mins
        - No resus first 10 mins post rescue
        - Coma on arrival
        - pH< 7.1
        - > 3 = 5% recovery
        - 1-2 = 90% recovery
- Management
    - Respiratory support PPV and PEEP
    - Correct hypovolaemia
    - Warm/dry - (active to 34 degrees only)
    - C-Spine precautions and other trauma
    - Underlying cause
        - ECG
        - BSL
        - Trauma
        - Seizure
    - If intubated
        - NGT, IDC, Sedation
    - ICU/Retrieval
    - Talk to parents
    - Debrief
- Hypothermia
    - Severity
        - Mild < 35
        - Mod < 32
            - Loss of shivering
            - Cardiac effects
                - Slow AF
                - Osborn/J waves
                - Long PR, QT, QRS
                - VF Asystole
        - Severe < 28
    - Rewarming

- Passive
    - Warm room, warm dry clothes/blanket
- Active external
    - Bair-Hugger, Radiant heat lamp
- Active internal
    - Warm humidified 02
    - Warm IVF
    - Bladder/Thoracic/Peritoneal lavage
    - Dialysis
    - ECMO

- Advanced life support modifications
    - Pulse check 1 minute
    - Withold defib until >30 degrees
    - Drugs > 30 then double interval
    - Prolonged resus
    - Active rewarming
    - Pacing - ineffective
- Non-Salvageable
    - K > 10
    - Temp <7
    - pH<6.5
    - Intracardiac thrombus

- Heat related illness
    - Differential diagnosis
        - Heat stroke
            - Classical
            - Extertional
        - Sepsis/CNS infection
        - Thyroid storm
        - Toxidrome
            - Sympathomimetics, anticholinergic, serotonin, NMS
        - Withdrawal
    - Cooling
        - External
            - Remove clothing
            - Evaporative
            - Immersion
            - Ice packs
        - Internal
            - Cooled IVF UO 1-2mls/kg/hr
            - Peritoneal/thoracic lavage
            - ECMO
        - Control shivering/seizure
            - Benzos

        - NMB
- Thyroid storm management
    - PTU 1g PO/NGT Loading (Propylthiouracil)
    - Propanolol 1mg/min up to 10mg IV
    - Lugols iodine 5 drops TDS
    - Hydrocortisone 100mg IV
    - Correct fluid and electrolytes
    - Cool if temp > 40
    - Seek and treat precipitant
- Eclampsia
    -
        - MgS04 4g IV over 15 mins
        - 1g/hr Infusion
    - Airway
        - Open/support 15L via NRBM
    - BP control
        - Aims
            - SBP <140
            - DBP<90
        - Hydralazine 5mg IV
        - Metoprolol 2.5mg IV
        - GTN 0.5-5mcg/kg/min
    - Foetus
        - CTG
        - Urgent delivery via CS
        - Betamethasone if premature 11.4mg IM
        - +/- IV antibiotics Benzylpenicillin 3g load
- Atrial Fibrillation
    - History
        - Time of onset (48hrs)
        - Unstable
            - Hypotensive
            - Chest pain
            - CCF
        - Underlying structural heart disease
        - Precipitant
    - Unstable
        - Resus
        - Consent
        - Monitoring + 02
        - Pads and leads
        - Sedation
            - Fent 50mcg
            - Midazolam 2mg

- Synchronised 100j shock
    - 50j increments if unsuccesful
- Stable
    - < 4 hrs
        - MgS04 +/- fluid and wait
    - 4-48 - Consider rythm control
        - (probably appropriate for young/active/symptomatic)
        - Chemical
            - Flecainide 150mg (normal heart)
            - Amiodarone 300mg IV (structural heart disease)
        - DCCV
    - > 48
        - Rate control and anticoagulation
        - OPD TOE cardioversion at discretion of cardio
    - Rate control
        - Metorpolol 1mg - 5mg IV
        - Verapamil 1mg - 5mg IV
        - Digoxin 250mcg IV/PO (elderly/CCF)
    - Anticoagulation
        - CHA2DS2VA
            - Scoring
                - CCF
                - Hypertension
                - Age 65 -75 =1, >75 = **2**
                - DM
                - Stroke Hx **(2)**
                - Vascular disease
            - Score = 1 = aspirin (but NOAC may perform better)
            - Score >1 = Warfarin or NOAC

- Epistaxis
    - First aid
        - Sit up
        - Ice in mouth
        - Pressure on nares 15 minutes
    - Failed 1st line
        - IV access
        - Haemostatic resuscitation if hypotensive
        - BP control if hypertensive
            - Aim DBP < 90
        - Reverse anticoagulation
        - Co-phenylcaine spray
        - Cauterise bleeding points - silver nitrate
    - If not resolving
        - AP rapid rhino

        - Ampicillin/clindamycin
        - ENT for posterior cautery/embolisation/ligation
    - Severe posterior bleed
        - Bilateral foley, tape traction, anterior packing
    - Rapid Rhino insertion
        - Soak in sterile water 30 seconds
        - Insert into nostril parralell to septal floor
            - Sit upright against bed
            - Vomit bag for clots
            - Carefully explain to patient
        - Inflate posterior balloon with air then anterior
        - Cuff should be taught not hard
        - Remove 24-72 hrs, deflate, wait, remove.
- Ventilator Trouble shooting DOPES
    - Disconnect from ventilator
        - Manually bag with etC02
            - Difficult
            - Tube position check
    - Displacement of ETT
    - Obstruction of ETT
    - Patient factors
        - Tension Ptx
        - Anaphylaxis
        - Worsening of underlying disease
            - Repeat VBG
            - Treat
        - Sedation/NMB issue
        - NGT (esp Paeds)
        - Patient positioning
    - Equipment (vent)
        - Tubing - Kinks/leaks
        - 02 connected and on
        - Adjust settings
            - Mode vT, I:E, RR, Fi02
            - Need fancy vent?
    - Stacking - dont forget

## Examination

- General points
    - Introduce yourself
    - Explain what you intend to do
    - Ask if pt has pain and offer analgesia

- Be careful examining painful areas
- Wash yo hands
- Verbal consent for examination

- Joint Examination
  - General Points
    - Intro and consent
    - Offer analgesia
    - Expose
    - Inspection
      - Position, skin colour, swelling, scars
      - Atrophy
      - Deformity
      - Effusion
      - Compare with other side
    - Palpation
      - Warmth (Back of hand)
      - Bony tenderness
      - Muscle tenderness
      - Joint effusion
    - Movements
      - Active ROM
      - Passive ROM
      - Strength
    - Special tests
      - Joint dependant
    - Neurovascular assessment
    - Examine Joint above and below
      - Quick screen
    - Finishing statement
      - Examine above and below
      - Full set of obs
      - Temperature
  - Ankle and Foot
    - Inspection
      - Deformity
      - Swelling
      - Walking
        - Foot drop
        - Toe-heel
    - Palpation
      - Ankle
        - Medial and lateral malleoli
        - ATFL at Lateral Maleolus
        - Deltoid ligament at Medial malleolus

        - Tibialis and achiles tendon
        - Pulses
            - Dorsalis pedis
            - Tibialis Posterior
    - Foot
        - Calcaneum
        - Navicular
        - BO 5th
        - Head of 1st and 5th
        - Toes individually
- Movement
    - Active
    - Passive
    - Weight bear
        - > 4 steps
- Special tests
    - Calf squeeze for achilles (Prone)
- Ottowa rules
    - Ankle
        - X ray if Pain in Malleolar region + one or more of:-
            - Tender medial malleolus (distal 6cm)
            - Tender lateral malleolus (distal 6cm)
            - Unable to WB 4 steps
                - At time of injury
                - In ED
    - Foot
        - X-Ray if pain in the midfoot + one or more of
            - Navicular tenderness
            - Base of 5th Tenderness
            - Unable to WB 4 Steps
                - At time of injury
                - In ED

- Knee
    - Inspection
        - Standing
            - Front, side, back
            - Valgus = needs toilet
            - Varus = Cowboy
        - Skin and swelling
        - Discolouration
        - Defformity
        - Effusion
        - Gait
    - Palpation

        - Warmth
        - Effusion
            - Milk n Tap
        - Bony prominences
        - Joint line
            - In 90 degrees of flexion
        - Politeal fossa
    - Movements
        - Straight leg raise
        - Flexion/extension
            - Active/Passive
            - With passive knee hyperextension
                - >10 degrees abdnormal
        - Power
    - Special tests
        - Medial/Later Collateral ligament
            - Valgus/Varus stress test
                - Mild external rotation and extension
                - 40 deg flexion
        - Crutiates
            - Anterior
                - Lachmans
                - Anterior drawer
            - Posterior
                - Posterior Drawer
        - Menisci
            - Mcmurrays test
                - Take knee through flexion ROM in
                    - Internal rotation
                    - External rotation
        - Patella - Apprehension test
            - Push patella laterally while flexing knee
    - Neurovascular assesment
- Hip
    - Inspection - standing
        - Gait
            - Atalgic
            - Trendelenburg
        - Trendelenberg test
            - Stand on one leg
            - Pelvis dips on lifted side = positive
    - Inspection - Supine
        - General inspection
        - Leg length

        - Apparent = umbilicus to MM
        - True = ASIS to MM
    - Palpation
        - Warmth
        - Tenderness
        - Greater trochanter
    - Movement
        - Active passive
            - Flex/ext
            - Int/Ext rotation
    - Special Tests
        - Thomas test (is lumbar lordosis compensating for flexion deformity of hip)
        - Positive if extended lifts from table
    - Neurovascular assessment
- Back
    - Inspection
        - Scolliosis/Kyphosis/Lordosis
        - Scars
        - Erythema
    - Palpation
        - All spinous processes
    - Movement
        - Flexion forward/lateral
        - Rotation
        - Extension
    - Special tests
        - SLR +ve if pain < 30 degrees flexion
    - Neurology
        - Gait
            - Heel walk = L5
            - Toe walk = S1
        - Tone
        - Power
        - Reflexes
            - Knee L3/L4
            - Ankle S1/S2
        - Sensation
        - Anal tone
        - Babinski
            - Upgoing = UMNL
- Neck
    - Inspection
        - Skin change, swelling

        - Deformity, scars
        - Horners
            - Abnormal voice/breathing
    - Palpation
        - Vertebrae
        - Anterior neck
    - Movement
        - Flex/ext
        - Lateral flex
        - Rotation
    - Special tests
        - Brudzinski
            - Forced neck flexion ellicits hip flexion
        - Kernigs
            - Cant straighten knee with hip flexed
        - Adson (Thoracic outlet syndrome)
            - Arm extended and externally rotated
            - Head turned to affected side
            - Positive if loss of radial or symptomatic
    - Neurovascular
        - Biceps C5 C6
        - Triceps C7 C8
        - Brachioradialis C6 C7
- Shoulder
    - Inspection
        - Assymetry
        - Swelling/deformity
        - Look in axilla
    - Palpation
        - SCJ + Clavicle
        - ACJ and humeral head
        - Scapula
    - Movement
        - Screen
            - Hands behind head
            - Hands behind back
        - Active and passive movements
            - Inc rotation with shoulder flexed 90
    - Special tests
        - Winging of sacpula
            - Push against wall
            - Serratus anterior
            - Long thoracic nerve
        - Empty can test

            - Supraspinatus impingement
        - Full can test
            - Rotator cuff injury (distinguishes from impingement if empty +ve)
        - Resisted internal rotation
            - Infraspinatus
        - Gerbers lift off test
            - Subscapularis
        - Drop test
            - If drops midway = supraspinatus tear
            - Or painful arc
        - Apprehension test
            - 90 abduction and ext rotation
            - Positive = shoulder pain
                - Anterior = Subacromial impingment
                - Internal posterosuperior glenoid impingement
- Elbow
    - Inspection
        - Carrying angle
        - Assymetry/deformity
        - Swelling/Scars/Skin changes
    - Palpation
        - Temp
        - Medial and lateral epicondyles
            - Form isoceles triangle at 90 degrees flexion
        - Radial head
            - In pronation and supination
        - Biceps tendon
        - Brachial artery
    - Movement
        - Flex/Ext
        - Pron/Sup
    - Special tests
        - Tennis elbow = Lateral epicondyle
            - Pain over common extensor origin in
                - Elbow promation
                - Wrist dorsiflexion
        - Golfers elbow = Medial epicondyle
            - Tenderness at medial epicndyle on
                - Supination
                - Wrist/finger extension against resistance
- Hand Exam

- Neuro Examinations
    - Cranial Nerve exam

- Inspection
    - Unequal pupils
    - Ptosis
    - Facial assymetry
- I - Olfactory ask about sense of smell
- II - Optic
    - Visual acuity
    - Pupils
        - Size, direct, consensual, RAPD
    - Fields
    - Fundoscopy
- III, IV, VI
    - ROM EOM - H shape
    - Ptosis, Diploplia, Nystagmus
    - Palsies (S04 LR6 all the rest 3)
        - III (Occulomotor)
            - Ptosis, down and out, large pupil
        - IV (Trochlear)
            - SO4
            - Diplopia on looking down and in
        - VI (Abducens)
            - LR6
            - Diplopia on lateral gaze
- V - Trigeminal
    - Muscles of mastication
        - Palpate with teeth clenced
    - Facial sensation
        - V1 - Opthalmic
        - V2 - Maxillary
        - V3 - Mandibular
    - Corneal reflex and jaw jerk (describe)
- VII - Facial
    - Look up and wrinkle forhead
        - Forehead sparing in UMNL
    - Close eyes, smile, show teeth, puff cheeks
    - Taste anterior ⅔ tongue
- VIII - Vestibulocochlear
    - Rhinnes - Air Vs Mastoid (Air should be > Mastoid)
    - Weber - Forhead vibration shouldnt localise
- IX, X, XII
    - IX, X (Glossopharyngeal, vagus)
        - Symmetry uf uvula
        - Gag reflex
        - Abnormal cough

        - XII (Hypoglossal)
            - Tongue - fasiculation/deviation
        - XI (Accessory)
            - Shrug shoulders
            - Turn head against resistance
- Cerebellar examination
    - General
        - Mobility aids etc around bed
        - Posture (truncal ataxia)
    - Gait
        - Stance (broad = cerebellar)
        - Stability (staggering/unsteady)
            - In unilateral cerebellar disease may veer towards side of lesion
        - Heel-toe
            - Sensitive for cerebellar dysfunction
            - First function to be lost in alcoholic cerebellar cortical degeneration
        - Rhombergs test
            - Test of proprioception not cerebellar disease
            - Swaying with correction may occur in cerebellar disease (not a positive test)
            - Falling without correction = abnormal proprioception
    - Head
        - Speech
            - Slurred staccato speech is characteristic of cerebellar dysfunction
            - Ask patient to repeat
                - Bristish consititution
                - Baby hippopotamus
        - Eye movements
            - Nystagmus
            - Dysmetric saccades
            - Impaired smooth pursuit
    - Arms
        - Finger nose coordination
            - Past pointing
            - Intention tremor
        - Rebound phenomenon
            - Failure to rebound to normal position after pushing against resistance and resistance removed
        - Tone
            - Hyoptonia (unreliable)
        - Dysdiadokinesis

- Legs
    - Reflexes
        - Pendular reflexes
    - Coordination
        - Heel shin test
        - (note weakness will also make this test positive)

- Upper limb neuro
    - Inspection
        - Scars/deformity
        - Wasting/fasiculation
    - Tone
        - Flaccid
        - Rigid
        - Cogwheel
    - Power
        - Shoulder abduction (C5/Axillary)
        - Elbow flexion (C5/Msculocutaneous)
        - Elbow extension (C7, Radial)
        - Wrist flexion (C8, Median + Ulnar)
        - Wrist extension (C6)
        - Finger abduction (T1, Ulnar)
        - Thumb abduction (C8, Median)
        - **Grading power (0-5)**
            - 1 = flicker
            - 3 = move against gravity
    - Reflexes
        - Biceps C5 - C6
        - Brachioradialis C6 - C7
        - Triceps C7 - C8
    - Sensation
        - Light touch/pinprick
        - Vibration
        - Proprioception
    - Coordination
        - Finger-nose
        - Dysdiaddokinesis
- Lower Limb Neuro
    - Gait
        - Ataxic
        - Antalgic
        - Parkinsonian
        - Spastic
        - Foot drop
        - Circumduction

- Inspection
    - Scars
    - Deformity
    - Fasiculation
- Tone
    - And clonus
- Power
    - Hip flex L1-2, Femoral
    - Hip ext L5 S1 Inferior gluteal
    - Knee extension L3 L4 Femoral
    - Knee flexion S1, Sciatic
    - Ankle dorsiflexion L4, Deep peroneal
    - Ankle plantarflexion S1 S2, tibial
    - Big toe extension L5, Deep peroneal
- Reflexes
    - Knee L3 L4
    - Ankle S1 S2
    - Plantar (Up = UMNL)
- Sensation
    - Light touch and pinprick
    - Proprioception
    - Vibration
- Coordination
    - Heel shin
    - Heel toe

- Dermatones
    - C4 - Shoulder tip
    - C5 - Lateral aspect upper arm
    - C6 - Lateral forearm and thumb
    - C7 - Middle finger
    - C8 - Little finger
    - T1 - Medial foream/upper arm
    - T4 - Nipple line
    - T7 - Xiphisternum
    - T10 - Umbilicus
    - T12/L1 - Inguinal
    - L2 - upper thigh
    - L3 - Anterior knee
    - L4 - Medial leg
    - L5 - Lateral leg and medial foot and sole
    - S1 - Lat foot + Sole + posterior Leg
    - S2 - posterior thigh
    - S3 - S5 - Saddle
- Visual field defects

- Unilateral Monocular vision loss
    - Optic nerve or eye lesion
        - Tumour, vasculitis, CRAO, CRVO, temporal arteritis, optic neurtis
- Bitemporal hemianopia
    - Optic chiasm lesion
    - Pituitary tumour, aneurysm, sella meningioma
- Homonymous hemianopia
    - Optic tract or cortec
        - Vascular (ICH/Infarct), Tumour
- Upper Homonymous quadrantopia
    - Temporal lobe lesion
- Lower Homonymous quadrantopia
    - Parietal lobe lesion

- Cardiovascular exam
    - Prep
        - Expose
        - Position at 45 degrees
    - Inspection
        - Pallor
        - Hands
            - Clubbing
            - IE sigmata
        - Radial pulse - Delays, nature
        - BP + postural
        - JVP
        - PPM box
        - Chest wall - scars etc
    - Palpation
        - Apex beat
        - Heaves/Thrills
    - Auscultation
        - Systolic/Diastolic - Time with carotid pulse
        - Radiation
        - Dynamic manouvres
            - Inspiration
            - Expiration
            - Lean forward
            - Left side roll
            - Standing/squatting (consider)
            - Valsalva
    - Special tests
        - Lung bases + Sacral oedema
        - Liver

        - Peripheral oedema
    - Murmurs
        - Systolic
            - Pan
                - MR
                - VSD
            - ESM
                - HOCM
                - AS
        - Diastolic
            - AR - Early diastolic decrescendo
            - MS - Low pitched rumbling, opening snap, early to mid-diastolic
        - Dynamic manouvres
            - Valsalva (decresed preload)
                - HOCM - Louder
                - AS - Softer
            - Squatting/Leg raise (increased preload)
                - HOCM - Softer
                - AS Louder
- Respiratory
    - Inspection (ensure to look under arms and posterior)
        - Chest wall deformity
        - Hyperexpansion
        - Scars
        - PPM
        - Accessory muscle use
        - RR
        - HANDS
            - Clubbing
            - Tar staining
            - Wasting
            - Asterixis
            - Bounding pulse
        - FACE
            - Central cyanosis
            - Purse lip
            - Horners
        - NECK
            - JVP
            - Trachea midline
            - Massess
            - Cervical lymph nodes
    - Palpation

        - Expansion
        - Percussion
    - Auscultation
        - A+P
        - Breath sounds
        - Vocal resonance/fremitus
    - Extras
        - Signs of cor pulmonale (oedema, JVP)
    - Complete examination
        - PEFR
        - Spirometry
        - Saturations
        - Observations
- Abdominal examination
    - Position - Flat with arms by sides
    - Inspection
        - Jaundice
        - Gynaecomastia, spider naevi, caput medusae
        - Abdominal distension, scars, stoma, herniae
        - HANDS
            - Palmar erythema
            - Dupuytrens
            - Asterixis
        - FACE
            - Pale conjunctiva
            - Oral ulcers
        - NECK
            - Vichows node
            - JVP
    - Palpation
        - Superficial and deep
        - Liver edge and span
        - Murphys
        - Spleen (start in RIF)
        - Kidneys
        - Aorta
    - Percussion
        - Liver, spleen
        - Ascites - shifting dullness
    - Auscultate
        - Bowel sounds - 30 seconds
        - Bruit (aorta, renal)
    - Other/Special
        - PR

        - Genitalia
        - Hernial orifices
        - Urinalysis
        - Observations
- MMSE
    - Orientation (10 points)
        - Date
        - Month
        - Year
        - Day
        - Season
        - Location
        - Ward
        - Suburb
        - City
        - State
    - Registration 3 points
        - Repeat the names of 3 objects
            - Pen
            - Watch
            - Shirt
    - Attention and calculation 5 points
        - Say WORLD backwards
    - Recall 3 points
        - Recall 3 items
    - Language (9)
        - Name 2 items (2)
            - Pencil
            - Watch
        - Repeat “no ifs ands or buts” (1)
        - Follow 3 stage command (3)
            - Take paper, fold in half and put on floor
        - Read instruction and obey (close your eyes) (1)
        - Write a sentence (1)
            - Score if sensible and has a subject and verb
        - Copying intersecting pentagons (1)
            - All 10 angles must be present with intersect
    - Interpretation
        - < 9 severe
        - 10-20 moderate
        - 21-24 mild
        - >25 normal
- AMSE
    - What is your age?

- What is time (nearest hour)?
- Give an address - 42 west street
- What is the year?
- Where are you now?
- Can you recognise two people?
- What is your date of birth?
- When did WW2 end?
- Name the prime minister
- Count backward from 20-1
- Recall address from previous
- SCORING
    - < 6= delirium or dementia

- Higher centres examination
    - General inspection
        - Cranial nerve lesions
        - Limb Lesions
        - Left or Right handed
    - Orientattion
        - Time, place, person
    - Speech
        - Full name and date
        - Name objects
        - Free speech - e.g. describe this
        - Phonation - e,e,e,e,e,e,e,e
        - Articulation - la, la, la, la, la
    - Parietal losses
        - Dominant: Gerstmans syndrome
            - Agraphia
            - Acalculia
            - L-R disorientation
            - Finger agnosia
        - Non- Dominant
            - Dressing apraxia
            - Spatial neglect
        - Both
            - Sensory or visual inattention
            - Loss of 2 point discrimination
            - Constructional apraxia
    - Memory (temporal)
        - Short and long term
    - Frontal Lobe
        - Reflexes - Grasp - Pout
        - Proverbial/metaphorical interpretation
            - A rolling stone gathers no moss

        - Smell
        - Fundi
        - Gait
    - Other
        - Visual fields
        - Bruit

## Procedures

- If teaching procedure
    - Introduce
    - Check prior knowledge/experience
    - Set objectives
    - Indications, contraindications, complications
    - Demonstrate skills in stages
    - Ask student to repeat or recap
    - Correct technique, give feedback
    - Reinforce **important** steps
    - Any questions?
    - Direct student to consolidate learning - resources
    - Plan future assessment and review
- Pericardiocentesis
    - Indications
        - Treat tamponade
        - Diagnostic (? the right person for the job)
    - Temporising measure
        - Collapse = blind approach
        - Semi-stable USS guided
    - Relative Contra-indications
        - Coagulopathy
        - PPM/Cardiac device
        - Effussion not easily visualised on ECHO
    - Approach
        - Subxiphoid
            - Consent, sedation, monitoring
            - Sitting 30-45 degrees
            - LA + Sterile
            - 18G Spinal needle (long) + 10ml Syringe
            - USS - identify largest pocket
            - Needle
                - 1cm below left xiphocostal angle
                - 30 degrees to skin

                - Aiming left shoulder
            - Aspirate while advancing
            - Drain effussion
                - +/- advance guidewire
                - Dilator
                - Pigtail catheter
    - Apical - USS guided
- Non-Invasive ventilation
    - Indications
        - Exacerbation of COPD
            - Hypercapnic failure
            - Hypoxic
            - Fatigue
        - Neuromuscular conditions
        - Severe APO
            - LV support (Decreased pree and afterload, decreased cardiac work)
            - Alveolar recruitment
                - Decreased WOB
                - Increased compliance
            - Redistrubutes pulmonary fluid ?
        - Bridge to intubation
    - Contraindications
        - Reduced LOC/Not initiating breaths
        - Combative/uncooperative
        - Vomiting
        - Facial trauma/Haemoptysis
        - Ptx
    - How to set up
        - Move to resus
        - Sit upright
        - Explain to Pt and NOK
        - Anxiolytic if required
        - Fit mask
        - Settings
            - Fi02 1.0
            - IPAP 10 - 12
            - Epap 5- 7
            - Titrate to end points
                - Vt 6-8ml/kg
                - Sp02 >90%
        - Monitor tolerance
        - Repeat VBG 30-60 mins
    - Complications

- Gaseous distension
    - Vomiting
    - Hypotension
- Ptx
- Pressure sores - eyes
- Failure to improve

- E-Fast (Extended focused assessment with sonography in trauma)
    - Indications
        - Blunt or penetrating trauma
            - Most useful if HD unstable
            - Guide fluid Rx, Inx, OT
    - Looking for
        - Intraperitoneal FF
        - Pericardial effussion/tamponade (Haemopericardium)
        - Haemo pneumo thorax
    - Views
        - RUQ
            - M.A.L near lower ribs
            - Probe horizontal
            - When liver identified turn oblique and see between ribs, fan back and forth through hepatorenal angle
                - Exclude FF
            - Slide up to pleura for effusions
        - LUQ
            - M.A.L near lower ribs
            - Probe horizontal
            - When spleen identified turn oblique and see between ribs, fan back and forth through hepatorenal angle
            - Get above spleen
            - Assess paracolic gutters
                - Exclude FF
            - Slide up to pleura for effusions
        - Pelvis
            - Horizontal and vertical planes
            - FF
                - either side of bladder
                - Retrovesical
                - Retrouterine
                - POD
        - Cardiac
            - Subxiphicostal view
                - Use liver as window
                - Comment on pericardium +/- IVC
        - Chest

        - L+R multiple zones
            - Lung sliding
                - M-Mode
            - Lung point
            - A+B lines
- Compartment syndrome
    - > 30mmHg = Muscle ischaemia
    - Delta blood pressure
        - DBP - Compartment pressure < 30 = Bad
    - Clinical features
        - Pain (out of proportion, passive stretch)
        - Pallor
        - Pulselessness
        - Parasthesiae
        - Paralysis
    - Checking pressure
        - Stryker needle
        - 3ml syringe filled with 0.9%NaCl
            - Chamber and needle (specific kit)
        - Injectsaline into chamber at 45 degrees ensuring no bubbles
        - Load into pressure monitor
        - Zero at same angle of insertion
        - Aseptic
        - Local (low volume)
        - Insert into compartment at 2cm depth, inject 0.3ml
        - Aboserve pressure
    - Management
        - Elevate to level of heart
        - Remove dressings
        - Analgesia
        - Fasciotomy
-

## History Taking

- Travel
    - Dates and places visited
        - Urban Vs Rural
        - Pre-travel immunisation/prophylaxis
            - Adherence
        - Timing of symptoms onset

- Individual exposures
    - Drinking water
    - Raw meat/Seafood
    - Bites - Insect/Animal
    - Tattoos/IVDU
    - Sexual activity
    - Medical treatments
        - Injections
        - Blood transfusions
- PMH
- DH
- Allergies
- Exam
    - Jaundice
    - Hepatosplenomegaly
    - Encephalitis
    - Lymph notes
        - Rabies
        - Bites
    - Cardio-resp
    - Minigism
    - Bleeding
- Investigation
    - FBC, EUC, LFT
    - BC
    - Thick and thin
    - Malaria serology
    - Dengue serology
    - HIV/Hep screen
    - CXR
    - Urine, stool MCS OCP

- Sexual history
    - Intro/Rapport
    - “I’m going to ask some personal questions now, is that ok?”
        - Are you sexually active
        - Sex with men or women or both
        - Previous STI
        - Number of partners
        - Do you use contraception
    - Symptoms
        - Discharge
        - Pain (Deep/superficial dysparenuria)
        - Rashes
        - Skin lesions

        - oral/throat/perianal
    - LMP
        - Could you be pregnant
- Specific encounter questions
    - Was sex consensual
    - Route vagina/oral/anal (Giving or recieving)
    - Were condoms used
    - Partner Hx
        - Sex worker
        - IVDU
        - Tattoos
        - Visitor/resident of high prevalence country
- 5 P's (and dont forget non-consensual)
    - Partners
    - Practices
    - Protection
    - Pregnancy
    - Past STI

- Sexual Assault
    - Medical care and physical injures
    - Contraception/pregnancy prevention
    - STI check + Blood bourne
    - Forensic involvement (evidence collection and documentation)
    - Mental Health
    - Investigation/Management
        - Injuries: First Aid, ADT
        - Pregnancy Test
            - If negative: Levonorgestrel 1.5mg
            - 85% effective in 72 Hrs
            - SE= NV
                - Repeat dose if vomits post
            - Ulipristal acetate 30mg more effective up to 5 days
            - Mirenal effective 99% to 5 days
        - STI's
            - Chlamydia/Ghono
                - 1st pass urine
                - Endocervical swab
                - Azithromycin 1g PO stat, repeat at 1 week
                - Ceftriaxone 500mg IV/IM
            - Trichomonas
                - Metronidazole
            - Hep B/C, syphillis, HIV
                - Baseline testing
                - Consider Hep B immunisation

- HBIG (<72hrs) if not immune
- PEP for HIV exposure if <72hrs
    - 4/52 course
- Repeat serology 6/52, 3/12, 6/12
- Prevention
    - Safe sex
    - Injecting
- Follow up at sexual health clinic
    - Contact tracing

- Blood Bourne virus transmission
    - Risk if non-immune and source positive
        - Needlestick
            - HIV 0.3%
            - Hep C 3%
            - Hep B <30%
        - HIV Specific
            - Receptive Vaginal 0.1%
            - Receptive Anal 1.3%
            - Insertive anal 0.6%
            - Shared needle 0.6%
            - MM exposure < 0.1%
        - Work exposures
            - First aid
            - Type of needle
            - Source Vs staff member/pt status
            - Some PEP advice/Occ health
            - Hep B, ADT
            - Follow up
            - Advice of safe sex
- Febrile convulsion
    - 6 months - 5 years
    - By definition
        - No Hx Afebrile seizure
        - No CNS infection
        - No focal neurology
    - Simple
        - GTC
        - < 15 Mins
        - Does not reoccur within same illness
    - Complex
        - Focal features at any point
        - > 15 Minutes
        - Recurrence
        - Incomplete recovery @ 1 hr

- Stats
    - Occur in 3% healthy kids
    - Recurrence rates higher if younger
        - 1 year = 50%
        - 2 year = 30%
    - No increased risk of epilepsy for simple febrile convulsions even if multiple
    - Same as population risk (1%)
- Risk increased if
    - FHx Epilepsy
    - Neurodevelopmental issues
    - Complex
    - 1 factor = 2%
    - > 1 factor 10%
- DC Criteria
    - Simple and return to normal neurology
    - SBI excluded or treated
    - Parental education
- Investigations
    - Nil if simple
    - BSL, UA, CXR, FBC, UEC, BC, CTB, LP could be considered if complex
- Explanation
    - A seizure caused by your childs body temperature rising suddenly
    - Very alarming but not harmful
    - Usually viral infection
    - Risk of having more but not after 6 years
- What to look out for
    - LOC
    - Muscle stiffening/jerking, Red/Blue
    - May last several minutes, when stops should regain conciousness, may be sleepy
- What to do
    - Dont panic
    - Lie of soft ground on side
    - Time it, if > 5 mins call ambulance
    - If stops breathing, not waking, looks sick- call ambulance
- Panadol/Nurofen for miserable kids with fever
    - Will not stop seizures occuring

- Brief, Resolved, Unexplained Event. BRUE
    - Rule of 1
        - < 1 Year old
        - < 1 Min duration
        - >/= 1 of
            - change in colour

        - Breathing
        - Tone
        - LOC
        - WITH NO IDENTIFIABLE CAUSE
    - History
        - Description of event
        - Circumstances and environment prior
            - Awake/Asleep
            - Feeding
            - Choking
            - Unwell
        - Cessation
            - Duration
            - CPR
            - Self resolved
        - Other
            - PMH
            - Previous events
            - Childhood illnesses
        - LOW Risk = No Inx
            - Age > 60 Days
            - Born > 32 Weeks + CGA > 45/40
            - No CPR by Healthcare professional
            - First Event
            - Duration < 1 minute
        - BSL
        - ECG, FBC, EUC,
        - Admit for obs
        - Consider injury during attempts to wake
        - Consider NAI
- Discharge against medical advice
    - Explore why
        - Apologise and adress concerns
        - Ask what we can do to persuade to stay
            - Tests, analgesia, treatment, food, blanket
            - Social supports
                - Social work
                - Family to look after children/pets
            - Timeframe for disposition/planning may help
            - Involve family/supports
    - Screening
        - PMH/Meds
        - Drugs and Alcohol (CAGE, Seeking behaviour)
        - MH Suicide risk

- Assess capacity
    - Capacity
        - Understand
        - Weigh
        - Retain
        - Communicate
    - Express concernabout them leaving
        - Potential diagnosis
        - Consequences of refusing treatment
        - Repeat back and explain reasons for choice
    - Safety netting
        - Support at home
        - Ability to return
        - GP review
        - Return if

- Pre-eclampsia
    - Diagnostic criteria
        - Onset > 20/40 + BP > 140/90
        - Proteinuria
        - End organ dysfunction
            - CNS
            - Pulm
            - Hep
            - Renal
            - Haem
            - Foetal
    - History
        - PC/HPC
        - Screening questions
            - Oedema face/feet
        - RUQ pain, vomiting
        - Headache
        - Visual disturbance/scotoma
        - Foetal movements
    - PMH
    - DH
    - Allergies
    - Obstetric Hx
        - Previous pregnancies
            - Complications
            - Pre-eclampsia
        - Current pregnancy
            - Dates
            - Scans

        - BP so far
    - Complications
        - GDM
        - Hypertension in early pregnancy
- SH
    - Smoking
    - ETOH
    - Drugs
    - Demographic
- Exam
    - BP
    - RUQ tenderness
    - Clonus/Increased reflexes
    - Papilloedema
    - Jaendice
    - Oedema
    - IUGR/SGA
- Inx
    - Urine protein:creatinine ration
    - FBC: Anaemia, DIC
    - LFT's: HELLP, Hepatopathy
    - Coags, Fib, LDH, Uric acid - DIC, HELLP
    - CTG+USS: Foetal wellbeing
- Management
    - Definitive = deliver foetus and placenta
    - BP control
        - Labetelol 100mg PO/20mg IV
        - Nifedipine 20mg PO
        - Hydralazine 5-10mg IV
    - Analgesia and antiemetics
    - IVF
    - Keep NBM
    - Q1Hr BP monitoring
    - Early O+G consult
    - Betamethasone 11.4mg IM

- Mental state exam - ABC-MISTS
    - Appearance
    - Behaviour
    - Cognition
        - AMSE
            - How old are you?
            - What hour is it?
            - Give address for recall (42 west street)
            - What year is it?

        - What is the name of this place?
        - Can you recognise two relevant persons
        - What is your DOB?
        - When was WWII
        - Who is the prime minister?
        - Countdown from 20----1.
        - Recall address
    - Mood and affect
        - Subjective
        - Objective
    - Insight and judgement
    - Speech
        - Rate and volume
        - Pressured, jumbled, confused,
        - Confabulation
    - Thoughts (content and form)
        - Delusions
        - Hallucinations
        - Suicidal/homicidal ideation
            - Plan
            - Attempts
        - Flight of ideas
    - Suicidal/Homicidal ideation (if not already discussed)
- HEEADSSS Assessment
    - Home
        - Where, who, violence
    - Education/Employment
        - Performance, attendance, bullying
    - Eating
        - weight , diet, exercise, disorder
    - Activities
        - Sports, Hobbies, Parties, screen time, risk behaviour
    - Drugs and alcohol
        - Patient, friends, family
    - Sexuality
        - Gender and number of partners
        - Safe sex, STI's
        - Risk of pregnancy
    - Suicide/depression/self harm
        - Current feelings
        - Supports
        - Self harm
            - Thoughts
            - Actions

        - Suicide risks
            - Plans
            - Attempts
    - Safety from injury/violence
        - Risk taking behaviour
        - Problems with Law
- SAD-PERSONS (Risk of suicide. Specific but not sensitive)
    - Questions
        - Sex - Male
        - Age (<19 or >45)
        - Depression
        - Previous attempts
        - ETOH/Drug abuse
        - Rational thought loss
        - Social supports lacking
        - Organised plan - Access to lethal means
        - No partner
        - Sickness (chronic illness)
    - Probes
        - “When people feed down and depressed they can feel like life is not worth living, have you ever felt like this?”
        - “Have you had thoughts about harming yourself or taking your own life?”
        - “Have you thought about how you might do this or made any plans?”
        - “What are your thoughts about the future?”
    - Dont forget
        - Sleep
        - Appetite
        - Weight loss
        - Hopelessness
        - Loss of interest
        - Poor concentration
- Domestic Violence
    - Introduce self
    - Ask partner to leave
        - food/drink
        - Departmental policy to speak to patients alone
    - Ask how patient is doing
    - Assessment
        - Warning shot “i’m a bit worried about your safety”
        - Has anyone hurt you?
        - Your injuries and how they happened make me worry that your partner may have done this to you
        - It is never ok for someone to hurt you
    - Risk assessment tool HITS

        - Hurt
        - Insulted
        - Threatened
        - Screamed
    - Reinforce confidentiality
    - Get more information
        - Has this happened before
        - Do you feel safe at home
        - CHILDREN AT HOME
            - At risk
            - Mandatory reporting
    - Plan
        - Option to involve police
        - Documentation
        - Temporary accommodation
        - Social worker/other support
        - Management of injuries
- Non-Accidental injury
    - Opening
        - Introduce self and role
        - If not with child explain child is safe and will be able to see soon
        - Assess what they know so far
    - Explain the presentation
        - Mechanism of injury
        - Who was present
        - First aid
        - Reason for delayed presentation
        - Social and PMH
    - Explain investigation
        - Skeletal survey
        - Exam
        - Fundoscopy
        - Bloods
        - Treatment required
    - Warning shot
        - " need to discuss some concerns we have"
        - The injuries that child has are not expected from childhood accidents
        - We are obliged by law to report these findings to child safety
        - Our priority is the safety of child
        - I understand you are upset but this is the right thing to do for your son/daughter
        - We are not making accusations but we need to refer your child to protective services who have the experience to investigate this situation and work it out

- Explain the process
    - Child may be kept in hospital if there are serious concerns for their safety at home
    - Child safety/protective services team will talk to you, your partner and others if required. After that they will make a recommendation on what has to be done.
    - Do you have any questions?
    - Summarise
    - Check understanding
    - Re-iterate

- Syncope
    - HPC
        - Circumstances prior
            - Exertion, rest, posture
        - Preceeding sx
            - CP, Palpatations, SOB
        - LOC and duration
        - Seizures, incontinence, tongue biting
        - Recovery phase vs post ictal
        - Injuries sustained
        - Previous episodes
        - Recently well?
        - Travel
    - PMH
        - New/current meds
        - FH: SCD, MI
        - Social - ETOH/Drugs
    - Exam
        - General, CVS, resp, neuro
    - Tests
        - Postural BP
        - ECG
        - BSL
        - Bloods
    - Risk assessment (SFS Score) score > 0 = high risk for serious outcome
        - CHF History
        - HCT < 30%
        - Abnormal ECG
        - SOB Hx
        - SBP < 90 at triage
    - Differential Diagnosis
        - Vasovagal
        - Orthostatic
        - Arrythmia

        - AS/HOCM
        - PE
        - AAA/Disection
        - GIB
- Epi-Pen education
    - Review presentation
        - Is this true anaphylaxis
        - Have symptoms resolved and observation period complete
    - Explain diagnosis and seriousness
    - Prevention
        - Avoiding allergens/triggers
    - Recognising a reaction
        - Difficulty breathing, facial swelling
        - Rash
        - Cramps, vomiting, diarrhoea
        - Lightheadedness/collapse
    - What to do
        - Lie down
        - Epi-pen
        - Call ambulance
    - Epipen instructions
        - Keep at room temperature
        - Be aware of expiry date and ensure replacement
        - Administration
            - Remove blue safety cap
            - Orange end to thigh
            - Can go through clothing
            - Grip with fist and push down until click
            - Hold for 3 seconds
        - Side effects
            - tachycardia/Palpatations
            - Anxiety
        - Demonstrate on orange and watch them practice
    - Always come to hospital after administration
    - Discharge
        - Script (pen in hand if OOH)
        - Written information
        - Refer imunology
        - Check home supports/safety
- Threatened misscarriage
    - HPC
        - Bleeding - quantify
            - Pads
            - Clots

        - Abdo pain
    - History of pregnancy
        - LMP
        - Confirmed intrauterine?
        - Other medical Hx
        - Meds
        - Social Hx
    - If possible misscarriage
        - Common - occurs in 25% pregnancies
        - Not their fault
        - If threatened 50% can go on to have a normal pregnancy
        - Check supports
        - Clear follow up plan
            - Early pregnancy clinic
            - ED return for
                - Heavy bleeding
                - Dizziness
                - Severe pain
                - Other concerns
        - FBC + G+H
            - Anti - D (for rheus negative women)
                - < 12 weeks = 250IU
        - Gestation and tests
            - 5/40
                - BHCG >1500
                - Gestational sac on TV USS
            - 6/40
                - BHCG >6500
                - Yolk sac on TV
                - Gestation sac on trans abdominal
            - 7/40
                - TV USS = embryo and cardiac activity
                    - Cardiac when CRL > 7mm
                - TA USS = yolk sac
        - BHCG doubles every 48hrs between 4/40 and 8/40
- Toxic ingestion Rsesus RSI-DEAD
    - R - Resus
        - ABC
        - BSL
        - Seizures
        - Emergency Antidotes
    - Risk assessment
        - Agent
        - Dose

        - Time
        - Symptoms
        - Patient factors (Background, PMH, Risk group)
    - Investigation
        - ECG
        - BSL
        - Bhcg
        - Paracetemol level
    - Decontaminate
        - Activated charcoal 50g (1g/kg)
        - WBI
            - PEG via NGTb @ 2L/Hr (25ml/kg/hr)
            - ETT/NGT/Metaclopramide/Monitor BS
            - Until clear effluent
    - Enhanced Elimination
        - MDAC 25g Q2hrly
        - Urinary alkalisation 100ml 8.4% NaHC03 then 150mmol in 850ml 5% dextrose @ 250mls/hr. Add 20mmol KCL to maintain K
        - Dialysis
            - Lithium, Aspirin, Toxic Alcohols, Metformin, Potassium, Carbamazepine
    - Andtidotes
    - Disposition
- Vertigo
    - HPC
        - Onset - Sudden vs Gradual
        - Duration - Intermittent vs constant
        - Previous episodes
        - Change with posture
        - Nausea and Vomiting
        - Hearing loss/Tinnitus
        - Falls?
    - BG
        - PMH/Meds/Social/Home situation
    - Exam
        - Gait and Rhombergs
        - Cerebellar signs - DANISH
    - Hints exam (needs to have constant vertigo)
        - Components
            - Head Impulse
            - Nystagmus
            - Test of Skew
        - Findings in CVA
            - Negative Head impulse

        - Direction changing/Vertical nystagmus
        - Abnormal test of skew
    - Approach
        - Central = Admit, bloods, ECG, CT, NRI
        - Peripheral = Prochlorperazine, Epleys ? DC
    - BPPV
        - No nystagmus at rest or on eye movement
        - Confirm with Dix-Hallpike
            - Explain may worsen symptoms
            - Start with likely unaffected side
            - Sit with head rotated 45
            - Lie down with head 30 degrees below horizontal
            - +ve = Delayed, unidirectional nystagmus towards the lesion
            - Latency up to 30 seconds
            - Rotational fatigue
            - If positive start Eplys manouvre from this position
        - Epleys
            - Sit with head 45 degrees towards lesion
            - Bring to supine for 60 seconds
            - Rotate head 90 degrees to other side 60 seconds
            - Turn on side so now looking at floor 60 seconds
            - Return to sitting, head forward 60 seconds
    - Differential diagnosis
        - Central -
            - Stroke
            - Tumour
            - Vertebrobasilar insufficiency/dissection
            - MS
            - Migraine \Lateral medullary syndrome
        - Perioheral
            - BPPV
            - Vestibular neuritis
            - Acute Labyrinthitis
            - Menieres
            - Ototoxicity
            - CVIII acoustic neuroma
            - CPA tumour
            - Post traumatic
- Snakebite
    - Risk assessment
        - Time of bite, number of strikes
        - Witnessed/Identified snake
        - Geographic area
        - Immediate symptoms

        - Collapse, Nausea and vomiting
    - Local effects
        - Pain, swelling, Lymph nodes
    - Systemic effects
        - Nausea and Vomiting
        - Abdominal pain
        - Headache
        - Bleeding
        - Ptosis, drooling, weakness
        - Myoglobinuria, myalgias
    - First aid - P.I.B
- PMH
- Meds/Allergies
- Social
- Exam - as above
- Investigations
    - VICC: INR/PT, D-Dimer, Fibrinogen
    - Rhabdo: CK/UEC
    - FBC/G+H
    - VDK - Site and urine
- If clinically well and bloods normal
    - Remove PIB
    - Bloods at 1, 6, 12 Hrs
- ADT
- Antivenom
    - 1 vial Mono or poly
    - Anaphylaxis
        - Mono= 15%
        - Poly = 40%

- Funnel web spider
    - Onset 30 mins- 2 hrs
        - Local pain
        - Abdo pain, headache, vomiting
        - Cholinergic
            - Sweaty, salivation, lacrimation, Pilo-erection
        - Neuro: Fasiculations, spasms
        - CVS" Pulmonary oedema, Haemodynamic changes
        - PIB
        - ABC's
        - Analgesia
        - Atropine if cholinergic
        - Antivenom
            - 2 Vials if symptomatic
            - 4 If severe/arrest

- CPAP for APO

## SCBD

- Pulmonary Embolus in pregnancy
  - Key points
    - 10 fold increased risk compared to non-pregnant patient
      - (1/10000 vs 1/100000)
    - Normal physiologic changes can mimic PE
    - Wells cannot be used (excluded from original study)
    - D-Dimer begins to rise in 2nd trimester and stays elevated 4-6 weeks post partum
  - Approach
    - If high risk (differential unlikey)
      - Imaging
    - If 1st trimester and other posible diagnosis
      - D-Dimer and stop if -ve
    - If D-dimer +ve or high risk
      - CXR
      - Dopper lower limbs
        - If +ve treat
    - Normal CXR
      - VQ
      - Half dose perfusion scan
      - Proceed to ventilation scan if defect identified
    - Abnormal CXR or equivocal VQ
      - CTPA
    - Radiation
      - CTPA - increased breast radiation
      - VQ less radiation
        - - Pre hydration
        - IDC
        - Void post
  - Evidence (or lack thereof)
    - Kline advocates using PERC as possible rule out and if positive
    - + altered D-Dimer threshold
      - 1st Trimester > than 50% Upper limit normal
      - 2nd Trimester > than 100% Upper limit normal
      - 3rd Trimester > than 125% Upper limit normal
  - Management of massive PE
    - Thrombolysis
      - Alteplase 10mg IV bolus + 90mg Infusion
        - (50mg bolus in arrest)
      - Heparin once APTT < 2 x Upper limit normal

        - Embolectomy
        - ECMO
    - Submassive PE
        - PE without hypotension with
            - RV dysfunction/myocardial necrosis
- Cervical spine clearance
    - Nexus - Low risk i.e. suitable for ROM assessment if all 4 met
        - Sens 99%, Spec 12.9
        - No midline tenderness
        - Normal alertness
        - No intoxication
        - No painful distracting injury
        - No focal neurological defecit
    - Canadian - Sens 100%, Spec 42.5%
        - Inclusion
            - >= 16 years
            - Trauma
            - Stable
            - GCS 15
        - High risk - CT if yes to any
            - Age > 65
            - Dangerous mechanism
                - 3 feet/5 stairs
                - Axial load
                - MVC > 100kmph, rollover, ejection
                - Motorised recreation vehicle
                - Bicycle struck or collision
            - Extremity parasthesia
        - Low risk - If none - CT
            - Simple rear end collision
            - Sitting position in ED
            - Ambulatory at any time
            - Delayed onset neck pain
            - No midline c-spine tenderness
            - If yes to one
                - L and R rotation 45 degrees
                - If unable - CT
- Unstable C-Spine injury
    - Jefferson - Burst C1 - Axial load
    - Bilateral facet dislocation - Hyperflexion with rotation
    - Odontoid/peg/debs fracture 1 = tip, 2 = waist, 3 = base/body. 2+3 Unstable
    - Hangmans: Bilateral fracture through C2 pedicles (hyperextension)
    - Teardrop = flexion C5/C6
- Head injury adult

- Nexus 2 - CT if any of
    - Age > 65
    - Skull fracture
    - Scalp haematoma
    - Neuro defeceit
    - Latered LOC
    - Abnormal behaviour
    - Coagulopathy
    - Recurrent forceful vomiting
- Canadian CT Head rule
    - Inclusion
        - >=16, GCS 13-15, not anticoagulated
    - High risk (CT if any)
        - GCS < 15 at 2 hrs
        - Open/Depressed skull fracture
        - Signs of BOS fracture
        - Vomiting > 1
        - Age > 65
    - Medium risk (consider CT)
        - Retrograde amnesia > 30 mins
        - Dangerous mechanism
            - Ped Vs Car
            - Fall > 1 M
            - Ejected from vehicle

- Head injury in children
    - PECARN (only prospectively validated) RULE OUT. Sens 98.6, Spec 53.7%
        - < 2 years
            - Mandatory CT
                - Altered mental state
                - Palpable skull fracture
                - GCS <= 14
            - Observation Vs CT
                - Scalp haematoma
                - LOC > 5 seconds
                - Severe mechanism
                    - Fall 1m
                    - Struck by motorised vehicle
                    - projectile
                - Acting abnormal
    - Challice (sens 92-98, Spec 78-87)
        - CT if any of
            - Hx
                - LOC/Amnesia > 5 Min
                - Drowsy

                - >5 Vomits
                - Suspected NAI
                - Seizure
            - Examination
                - Open fracture
                - Signs of BOS
                - GCS <14 (<15 if 1 year)
                - Tense fontanelle
                - Focal neurology
                - >5cm bruise if < year
            - Mechanism
                - High speed MVA
                - Fall >3M
                - High speed projectile
- Framework for teaching neonatal Jaundice
    - Introduction
        - Common condition affects 60% term babies
        - Usually not dangerous but it is important to do a thorough assessment
            - May be PC of serious disease (e.g. sepsis)
            - Kernicturus is a life/brain threatening condition
    - Discuss pathophysiology
        - Haemolysis
            - **ABO/Rheus incompatibility**
            - **Sepsis**
            - Abnormal red cells
        - Decreased hepatic uptake/conjugation
            - Biliary atresia
            - Hypothyroidism
            - Hepatitis
        - Physiological
            - Breast milk
            - Dehydration/poor feeding
            - Physiological
    - History
        - General
            - Maternal
            - Antenatal
            - Birth
            - Neonatal
        - Specific
            - Onset
                - < 24 = pathological/emergency
                - **24hrs - 2 weeks - Likely physiological**
                - > 2 weeks - prolonged/pathological

        - Risk factors
            - Sepsis/fever
            - Haemolysis RF (e.g. O or Neg maternal group)
            - Feeding
                - Breast fed
                - Poor feeding
            - Gestation
            - Haematoma
    - Examination
        - Full examination focusing on
            - Precipitants
                - Dehydration/ > 10% loss of BW
                - Sepsis signs
            - Sequale
                - Level of jaundice
                - Kernicterus/ encephalopathy
    - Tests
        - Bilirubin total/conjugated
            - Conjugated = Hepatic problem - surg emerg
        - Unconjugated
            - Plot on nomogram
                - Phototherapy with RF
                - Phototherapy
                - Exchange transfusion
                    - Emergency - needs tertiary care
            - Term baby with Bili < 250 = physiological
    - Disposition
        - Inpatient if needs phototherapy or likely pathological
        - If below treatment/physiological
            - Home with GP/Midwifery follow up
        - Consider lactation advice if poor feeding
    - Follow up
        - Lets examine baby together
        - We can plot the nomogram together
        - Read the QLD Neonatal jaundice guideline
- Diabetic Emergencies
    - DKA
        - Adults fluid
            - 500mls 0.9% Nacl bolus until physiology restored
            - 1000mls over 1st hr
            - 1000mls of following 2 hrs
            - Then 250mls/hr or replacing fluid deficit over 24 hrs
        - Kids fluid
            - 10mls/kg bolus until physiology restored

        - 5mls/kg first hour
        - Then replace defecit + maintenance over 48hrs
    - Potassium
        - Replace once k <5
            - 4-5 10mmols/hr
            - 3-4 20mmols/hr
            - <3 40mmols/hr (consider pausing insulin)
            - KIDS: Start with K 40mmol/L and titrate to keep K within normal range
    - Insulin 0.05 - 0.1 units/kg/hr
        - Aim to decrease BSL by 2-3mmol/hr
        - When BSL < 12 reduce to 0.05
        - When BSL < 15 commence dextrose infusion
- HHS
    - Insulin 0.05u/kg/hr
        - Aim reduce BSL by < 3mmol/hr
    - Calculate free H20 defecit
        - Use 0.45% to replace over 2-3 days
        - Aim to reduce Na by < 10mmol per 24 hours
    - Replace electrolytes
    - DVT prophylaxis
    - Seek and treat underlying cause
        - Sepsis
        - AMI
        - CVA
- Management of cerebral oedema in DKA
    - Reduce fluid input to ⅓
    - Head up 30 degrees
    - Mannitol 20% 0.5g/kg over 20 mins
    - Intubate +/- CNS imaging
    - Disposition - ICU
    - Talk to parents
- Acute angle closure glaucoma
    - Risk factors
        - Fhx
        - Long sighted
        - Female
        - Asian
        - Increased age
    - Precipitants
        - Drugs
            - Anticholinergics
            - B-Agonists
            - Mydriatics

        - Low lighting
        - Emotional upset
    - Signs
        - IOP>30
        - Hazy cornea and shallow anterior chamber
        - Decreased visual acuity
        - Semi-dilated, non reactive pupil
    - Treatment
        - Analgesia and antiemetic
        - Decreased intraocular pressure
            - Acetezolamide 500mg IV
            - Mannitol 1g/kg IV
        - Increased aqueous outflow
            - Pilocarpine 2% T q5mins x3 then T Q30mins
            - Timolol 0.5% T Q30mins
            - Lantanoprost T
        - Laser - Peripheral iridotomy
- Warfarin Reversal
    - Life threatening bleeding + I.N.R > 1.5
        - Vit K 10mg IV
        - Prothrombin concentrate 50IU/Kg
        - FFP 300mls or 15mls/kg (If prothrombin concentrate unavailable)
    - Otherwise
        - Omit dose
        - > 10 + high risk = 5mg Vit K + consultant haem
        - > 10 + not high risk 5mg Vit K PO
        - 4-10 1-2mg PO vit K
- NOAC reversal
    - Get haematology advice
        - Charcoal if ingestion < 4hrs (Dabig, Apix, Rivarox)
        - FFP 15mls/kg
        - TXA 1g
        - PTX 50 IU/Kg
        - Consider Recombinant factor 7a
    - Dabigatran
        - Charcoal
        - Maintain urine output
        - Consider dialysis
        - Iraducizumab 2 x 2.5g vials (life threat)
- Aspirin Overdose
    - Risk assessment
        - 150-300mg/kg = Mild-Mod
            - Tachypnoea, tinnitus
        - >300mg/kg = severe

        - Metabolic acidosis
        - Altered mental state
        - Seizures
    - Features
        - HAGMA and respiratory Alkalosis
    - Treatment
        - Activated charcoal 50g within 8hrs
        - Urinary alkalisation
            - 100mls NaHC03 8.4% stat
            - Then 150mls in 850mls 5% over 4 hrs
                - Aim Urine pH  8
                - Serum pH >7.5
        - Dialysis if severe or associated renal injury
- Iron overdose
    - > 60mg/kg = systemic toxicity
    - AXR to confirm quantity ingested
    - Bloods
        - FBC - increased WCC
        - VBG - HAGMA
        - Derranged LFT's
        - AKI
        - Iron level TAKE AT 4-6hrs
            - >90 micromol/L = systemic toxicity
    - IV fluids
    - Decontamination (no charcoal)
        - Endoscopy
        - WBI (Polyethylene glycol electrolyte solution)
            - 2L hr
            - 25ml/kg/hr children
            - Control airway and use NG if indicated
            - Continue until clear effluent then confirm AXR -ve
            - Dedicated nurse
        - Desferrioxamine
            - 15-40mg/kg hr max 24hrs
            - Cease when Iron level <60micromol/L and clinically stable
- STEMI Criteria
    - >= 2 Contiguous leads with
        - V2-V3
            - >2.5mm in males <40 years
            - > 2.0mm in males >40 years
            - > 1.5mm in all females
        - Limb leads
            - >1mm
    - Modified Scarbosa

- J-Point and ST elevation should be discordant with QRS complex deflection
- >= 1 lead with
  - V1-V3
    - Concordant STE > 1mm
    - Concordant STD > 1mm
  - Excessively discordant STE any lead (Least sensitive)
    - >25% depth of preceding S wave
    - Or 5mm

- Coronary territories
  - Posterior MI
    - Suggested by
      - V1-V3
        - Horizontal ST Depression
        - Tall, broad R waves
        - Upright T waves
        - Dominant R wave V2
    - Confirmed by
      - Posterior leads (move lateral 3 chest leads)
        - V7 posterior axilliary line
        - V8 Tip of scapula
        - V9 Paraspinal
      - > 0.5mm ST elevation confirms MI
  - Right Sided MI
    - Complicates 40% inferior STEMIs
    - Features
      - ST elevation V1
      - ST elevation in III > ST elevation II
      - STE V1 > V2 or STE V1 + STD V2 or isoelectric V1 and STD V2
    - Right sided leads
      - V4R - right MCL 5ICS
      - V3R - V6R (Or just V4R is sensitive) ST elevation
  - Anatomical territories
    - Lateral
      - I, aVL, V5, V6 = Left circumflex or diagonal of LAD
    - Inferior
      - II, III, aVF = RCA and or Left Circumflex
    - Anterior/Septal
      - V1-V4 = LAD
- HEART Score
  - History 0-2
    - How suspicious Non, moderately, highly
  - ECG 0-2
    - 2 = Significant ST depression

        - 1 = Non specific repolarisation abnormality
        - 0 = normal
    - Age 0-2
        - 1 = 45-64yrs
    - Risk factors 0-2
        - 2 = Hx CAD or >2 RF
        - 1 = 1-2 RF
    - Troponin 0-2
        - 2 = 3 x ULN
        - 1 = 1 - 3 x ULN
        - 0 = < ULN
    - Risk of Major cardiac events based on Heart score
        - Low <= 3 = 1.7% (DC with OPD FU)
        - Med = 4-6 = Inpatient observation/investigation
        - High risk >= 7 = Early invasive treatment
- Pacemaker troubleshooting
    - Magnet
        - Inhibits sensing
        - Starts asynchronous pacing
    - Management
        - Lie on Left side to increase capture
        - Magnet
        - Isoprenaline/Adrenaline overdrive
        - External pacing
    - AICD + Magnet
        - Inhibits Defib function
        - Pacing functions continue
- Pelvic fractures (young burgess)
    - Anteroposterior compression
        - APC 1: SP wide but <2cm
        - APC 2: SP > 2cm, Ant SIJ widened, Post SIJ intact
        - APC 3: Open book. SIJ Disruption anterior and posterior
    - Lateral compression
        - LC 1: Pubic ramus fracture and ipsilateral sacral compression fracture
        - LC 2: Pubic ramus fracture and Ipsilateral posterior ilium fracture/dislocation (disruption of posterior SI ligaments)
        - LC 3: Ipsilater LC1 or LC2. Contralateral external rotation (open book) APC
    - Vertical shear fracture
        - Vertical anterior ring fracture
        - Ligamentous disruption
            - A and P Sacroilliac
            - Sacrospinous
            - Sacrotuberous

- Massive transfusion
  - Permissive hypotension if not head injured
  - RBC:FFP:Plats 1:1:1
  - Txa 1g over 10 mins
  - Cryo if fibrinogen < 1.0
  - Aims
    - Temp>35
    - Plat > 50
    - INR < 1.5
    - Fibrinogen > 1
    - pH > 7.2
    - BE > -6
    - Lacate < 4
    - Ionised Ca > 1.1
- STEMI Management
  -

## Communication

- Breaking bad news
  - Introduce
    - Hello my name is …. I am the senior emergency doctor looking after your wife, husband, son if known
    - Establish relationship if not known “are you her partner?”
  - ASK
    - Is there anyone else you would like to be present?
    - Ask them what they know so far
  - Warning shot (my own take)
    - “I’m sorry that the news I have for today is very bad” (dead)
    - Or “I’m very worried about X he’s very very sick” (Sick)
  - Get to the point
    - I’m very sorry your father died shortly after arriving at the hospital
    - Is very sick and is on life supprt but is going to die
    - Or is very sick and is not going to survive these injuries
  - Silence/Pause
    - Sit in the silence, do not fill
    - Tissues
    - I am so sorry for your loss
  - Explain events/treatments
    - Unable to revive
    - Tried everything (or not everything was in best interests)
    - Would you like to see …..?
    - Warn of environment, lines etc

- Coroner - brief discussion
- Organ donation
- Social work
- Religious needs
- Bereavement pack

- Organ donation
  - Planning
    - Ideally not done in ED but may be unavoidable (e.g. regional)
    - Not done by the same person that breaks bad news
    - Refer to Specialist nurse/team (ICU)
    - Clarify clinical situation
    - Seek evidence of prior consent to donation
  - Confirm understanding and Acceptance
    - Brain death has likely occurred (we wont have done testing, may be transferring for consideration)
    - Cardiac death will inevitably occur after removal of futile treatment
    - Only raise donation if it is clear family have accepted and understood the clinical scenario
      - Frame in a positive way
        - I would like to talk to you about something you might not be expecting and that is organ donation. John has the opportunity to help a lot of people.
- Open Disclosure
  - Introduce and role
    - My name is Andrew, I am the senior Emergency doctor involved in your/family members care.
    - I have come to give you an update
  - Clarify understanding and reassure
    - Do you know what has happened
    - X is stable now and you will be able to see her soon
  - Open disclosure and early Apology
    - Explain events
    - What is being done now
    - Say sorry
      - I would like to apologise for what has happened
    - Errors like this are not common and we take them very seriously
    - Allow family to speak/ask questions
    - Discuss potential consequences
  - Investigation process
    - There will be a formal investigation to identify exactly what went wrong here and what needs to be changed to prevent it from happening in the future
    - You can be kept informed as the investigation progresses if you like?
  - Closure

        - I can see this is very distressing for you, i'd like to take you to see 'X'.
        - I will contact you in 48 hours about what we have found so far and what the next steps will be
- Discussing a complaint
    - I understand, we do have a formal complaints avenue available
    - I would like to reassure you that we are taking this event very seriously
    - A full investigation will be completed, that includes
        - Speaking with staff involved
        - Reviewing all the notes and discussing these events at our departmental meeting
        - An independant investigation called a "root cause analysis" will be performed, this will take time
        - Once the findings of our investigation are complete I will contact you for a meeting
        - Quality improvement measures will be put in place to prevent this from happening again
            - Education
            - Local procedures
            - Staffing
        - Is there anything you are concerned about that we haven't addressed during this discussion?
- Angry Patient/Family Member
    - Introduction and confirm identity/relationship to patient
    - Offer to sit
    - Allow time to speak without interuption - LISTEN
    - Enquire about their concerns
    - Clarify the facts as you understand them
    - Deal with the situation
        - Is the patient ok?
        - Is further medical treatment required?
        - Safe and sensible management plan (Mutually agreed)
        - Reassure
    - Explain what will be done
        - Discuss with staff involved
        - Intervention
        - Quality improvement measures
            - We want to find out what went wrong and how to prevent this from happening in the future
- Assess capacity
    - CRPC
        - Comprehend
        - Retain
        - Process information to reach a decision
        - Communicate choice and reason

- If refusing treatment / Discharge against medical advice
    - Ask why, explore reasons
    - Offers to make comfortable
        - Location, tea, food, blanket
    - Explain illness and recommended treatment
        - + consequences of refusing
    - Enlist help of friends or family
    - Ask patient to repeat back to you
        - Situation
        - Options
        - Their choice and reasoning
    - If they have capacity
        - Home with family and friends
        - Give discharge advice
        - Handout
        - Return if unwell, encourage/open invitation, can change their mind
        - GP follow up
    - If not demonstrating capacity
        - MH health act - For psych admission and treatment
        - Duty of care/guardianship for all else

## Administration

- Mentor Meeting (Mistake/Complaint)
    - Opening
        - Explain meeting is confidential
        - Explain why you're here
            - "I understand you had a difficult case on your nightshift and was hoping we could talk about it"
        - Details
            - There version of events
            - Circumstances
                - Business
                - Staffing
            - Patients condition/outcome
            - Explore issues
                - Investigate these
                - Liase with medical indemnity
        - Behaviour
            - Mistake - Reassure
            - Unnaceptable/Dangerous - State this
        - Moving forward - How can we prevent this
            - Education
            - Supervision
            - Suitability for unsupervised practice

- Trainee wellbeing
    - Need time off?
    - Things ok at home/otherwise?
    - Relationships/friends
    - Drugs and alcohol
    - Support
        - Professional
        - DEMT
    - Arrange follow up meeting

- Hospital Disaster Plan
    - Declare external emergency
        - Surge - talk to hospital teams and med director
    - DECANTing patients is key
    - Assign ED leader
    - Establish Communications
    - Clear space for incoming casualties
    - Set up Decontamination and disaster triage
    - Assign areas + Medical and Nursing teams to each
        - P1
        - P2
        - P3
    - Use disaster packs
    - PPE
    - Stockpile
        - Drugs
            - Analgesia, Abx, ADT, IVF
        - Equipment
            - Dressings, POP, crutches, ventilators
    - Staffing
        - Beware of fatigue (Dont have “everyone” on first wave) have rested staff for changeover
        - Staff immediately affected should leave
        - Rest areas
        - Staff rotation
        - Help from other specialties
        - Call in additional staff
    - Security
    - Media liason
    - Areas for family (try to keep out of ED)
    - Social work
    - Post-disaster
        - Stand down
        - Debrief
        - Staffing

        - Re-stock
- Over-crowding/Surge
    - Expressed as % of patients planned for admission but remaining in ED > 8Hrs
    - Solutions (Whole of hospital approach)
        - Reduce demand
            - Increase GP funding
            - HITH, Pall care, care plans
        - Improve flow
            - Triage and RAT
                - Early investigation and management
            - Streaming of patients and early refferal
            - Priority access/expedited
                - Lab tests
                - Imaging
        - Increase capacity
            - Senior decision making 24/7
            - SSU
            - RAT
        - Improve exit
            - Early review by inpatient teams
            - 24/7 discharges and weekends
            - Transit lounge
            - Daily consultant led WR
        - Monitor audit and change practice
        - ACEM statement
            - Whole hospital approach
            - Increasing hospital and alternate care capacity
            - Improved community care to reduce reliance on hospital system
            - Strengthening the evidence base to successfully influence the relevant policy, resourcing and system reform outcomes.
- Complaint - 1st meeting
    - Ensure comfort - offer analgesia
        - Care being sorted?
    - First of all let the complainant tell their story and express their feelings
    - Open disclosure
        - If there was a mistake acknowledge and apologise
        - Explain how it happened
        - Discuss potential consequences
    - Patient care
        - What are we doing today
        - What are we doing going forward
        - How will we ensure good care going forward
    - Patient impact
        - Job/Life

    - How will injury affect ADL's
- Explain what Investigation will take place
    - Talk to dr
    - Education
    - M and M
    - Changes in syetms/processes
    - RCA
- Encourage written complaint
- Meet within 48 hrs
- Meet again?