Skl: BLS Resuscitation

Hazards safe apporach
Hello? shake & shout for responsiveness
Help! shout for help

A AIRWAY

☑ Assessment
- exclude cervical spine injury
- turn on back
- check mouth for obstruction (dentures, suction if blood/vomit)

☑ Open Airway
1. airway manoeuvres – head-tilt + chin lift (jaw thrust if C-spine injury)
2. oropharyngeal Guedel airway – size from lips to angle of jaw (ensure no gag-reflex)
3. nasopharyngeal airway – size by diameter of little finger (if gag reflex)
4. definitive airway – cuffed endotracheal tube

B BREATHING

☑ Assessment
- look, listen & feel for 10s (ear over mouth watching chest)
- if breathing = recovery position

☑ Ventilation
- **crash call 2222**
- 2 effective rescue breaths / bag-valve mask (attach 15L/min oxygen to mask)
- if unsuccessful after airway open, 5 attempts & move on

C CIRCULATION

☑ Assessment
- carotid pulse for 10s
- if pulse = continue ventilation

☑ Cardiopulmonary Resuscitation
- chest compressions (heels of interlocked hands, two finger lengths above xiphosternum)
- 100/min 15 compressions : 2 breaths ratio

Skl: ALS Resuscitation

→ Precordial Thump
→ BLS

1. Assessment

1. **Rhythm** → attach defibrillator/monitor
2. **Pulse** → carotid pulse
   - Shockable = VF, Pulseless VT
   - Non-Shockable = PEA, Asystole

2. Shock Cycle

1. **Preparation**
   - gel pads below R clavicle & outside apex beat
   - position paddles on L & R pads
2. **Defibrillate**
   - charge paddles to 200J
   - Check: 1. self (no contact)
     2. team ("all clear")
     3. oxygen ("oxygen away")
     + visual check
   - Defibrillate
   - assess rhythm ± pulse
   - continue 200J→200J→360J (10s between shocks)
3. **CPR**
   - continue CPR for 1 minute
   - During CPR: 1. assess rhythm & rate
     2. assess electrodes, gel pads
     3. assess/attempt iv access + intubation
     4. adrenaline 1mg. (every 3min)
     5. amiodorone → lidocaine → atropine

3. Non-Shock Cycle

1. **CPR**
   - continue CPR for 3 minutes
   - During CPR: as for shock cycle

4. Considerations

Identify & treat potential reversible causes:

Hypoxia
Hypovolaemia
Hypothermia
Hypocalcaemia / Hyperkalaemia & Acidosis
Tension Pneumothorax
Tamponade
Thromboembolism
Toxic disorder

Skl: Primary & Secondary Survey

PRIMARY SURVEY

- Observe
- Introduce ± shake & shout for responsiveness

1. **Airway & C-Spine**
   1. **C-Spine**
      - assess C-spine clinically
      - immobilise manually
      - immobilise with stiff collar
        (size by finger breadth between trapezius & angle of jaw)
      - sandbags either side & tape across forehead
   2. **Airway**
      - assess airway
      - clear any obvious obstruction ± suction
      - secure airway
        (head tilt, chin left → jaw thrust → airways)

2. **Breathing & Ventilation**
   1. **Breathing**
      - assess breathing (look, feel, listen)
      - observe: chest movements, depth of respiration, chest injuries?
      - palpate for tracheal shift
      - palpate, percuss & auscultate chest
      - monitor = pulse oximeter
   2. **Ventilation**
      - bag-valve-mask + 15L/min oxygen
      - ± oropharyngeal airway, endotracheal airway

3. **Circulation & Haemorrhage**
   1. **Haemorrhage**
      - observe: visible haemorrhage (PLACE)
      - direct pressure over any haemorrhage
   2. **Circulation**
      - assess circulation (pulse + skin colour, capillary refill)
      - monitor = ECG, BP
      - fluid replacement
        1. 2 large-bore 14G cannulas (arms, femoral, jugular)
        2. blood sample for group & cross-match
        3. 2x1L warmed Hartmann's solution

4. **Disability & Pupils**
   1. **Disability**
      - assess AVPU
        1. A alert
        2. V responds to voice
        3. P responds to pain
        4. U unrepsonsive
   2. **Pupils**
      - assess pupils (size & reactivity)

5. Exposure & Environment

1. **Exposure**
    - remove all clothes
    - log roll to inspect back and front
2. **Environment**
    - cover with space blanket
    - monitor = thermometer

SECONDARY SURVEY

- Once patient is stable
- **AMPLE History**

  A allergies
  M medications
  P previous medical history
  L last meal
  E events leading to injury
- **Full examination**
- **Monitoring**
- **Investigations**

  Bloods = FBC, coagulation profile U&Es, LFTs, amylase, glucose, toxicology screen
  X-rays = cervical spine (3 views), chest, pelvis
  + ABG
  + urinary catheter
- **C-Spine Clearance**

  Clinical = alert, no head injury, no alcohol/drugs, no neck pain, no abnormal neurology, no distracting injury
  + pain-free active movement
  + normal examination (tenderness, deformity, bruising)

  Radiological = 3 view plain film series
  i.e. lateral, AP, open-mouth

Skl: Suturing

1. **Introduce & Consent**
2. **Mention history and examination of wound**
    - Hx – general health, wound history
    - Ex – distal circulation, sensation and underlying structures
    - Ex – wound depth, contamination
    - Ix – X-ray (foreign debris)

3. **Prepare equipment**
    - sutures
    - suture kit
        1. non-tooth forceps
        2. tooth forceps
        3. needle holder
        4. (artery clip)
        5. scissors
    - local anaesthetic
        1. two needles (large & small)
        2. Lidocaine (1%)
        3. syringe

4. **Mention sterile field**
    - wash hands, sterile gloves, sterile drapes
5. **Mention local anaesthetic**
    - 23G needle to draw up LA, 25G needle to inject LA
    - aspirate before injecting
    - wait until anaesthetised area numb
    - warn patient of signs of toxicity
6. **Mention cleaning wound**
    - normal saline or chlorhexidine
    - from middle out to edges

7. **Suturing**
    - ☑ placement of needle in needle holder (1/3 2/3)
    - ☑ hold skin with tooth forceps
    - ☑ needle through edges separately
    - ☑ correct lengths of thread
    - ☑ effective knot
    - ☑ correct 1 cm. spacing of sutures

8. **Closing**
    - assess for Tetanus booster
    - advice to keep clean
    - advice to return for removal of sutures

Skl: Cannulation & IV Infusion

1. **If awake, introduce and consent (no need for GA!)**

2. **Prepare equipment**
   - Cannulation
     1. gloves
     2. tourniquet
     3. alcohol wipe
     4. cannula (small size for ward or large for theatre)
     5. sharps bin
     6. bandage or 2x adhesive tape
   - IV Infusion
     1. fluid bag (check correct label, expiry date, no holes)
     2. giving set (close clamp, ensure ends not contaminated)

3. **Run through IV infusion set**
   - remove fluid from bag and hang on drip stand
   - expose spike and pierce bag (keep sterile)
   - squeeze chamber to ½
   - slowly open clamp and hold end at same level as chamber (tap or run through to get rid of bubbles)
   - close & hang end on clamp

4. **Cannulation**
   - gloves
   - tourniquet
   - select vein & alcowipe (mention allow to dry)
   - "sharp scratch"
   - cannulate
     a. cap off
     b. flashback
     c. withdraw needle & advance cannula
     d. finger pressure on vein and tourniquet off
     e. remove needle & cap cannula
   - needle in sharps bin
   - secure cannula with adhesive tape
   - attach infusion set
   - open drip to 80/min

5. **Closing**
   - sign fluid chart (signature, date, fluid lot number)

Hx: Pre-operative Assessment

1. Anaesthetic History

- previous anaesthesia?
  (adverse reaction, difficult intubation, post-operative N&V)
- family history?
  (adverse reactions esp. breathing problems and deaths, malignant hyperpyrexia, suxamethonium apnoea)

2. Medical History

- PC
- PMH
  1. CV = HypT + cardiac disease/surgery
  2. RSP = asthma, SoB + URTI
  3. Other = DM, RA, clotting disorder + CVA, epilepsy, LMP, PUs

3. Drug History

- current prescribed medications (incl. steroids, anticoagulants)
- recreational drug use
- smoker?
- drug allergies (incl. iodine, elastoplast, latex)

4. Examination

a. assess mouth opening
   (Mallampati criteria, open mouth & stick out tongue, uvula?)
b. neck extension
   (Thyromental distance, fully extend head, chin to thyroid cart.)
c. final questions
   i. loose dentition?
   ii. starved? (food 6h, fluids 2h)

5. Closing

- "is there anything you would like to ask or are worried about?"
- reassurance (1 in 200,000 mortality)
- mention respiratory and cardiovascular examination

Ex: GALS Examination

WICEPP

- Introduction = name, age & occupation
- Exposure = undergarments
- Position = **standing**

Screening Questions

1. *Pain or stiffness in muscles, joints or back?*
2. *Difficulty in climbing stairs?*
3. *Difficulty dressing or washing yourself?*
    - YES = further history; NO = unlikely Rheumatic disorder

1. Gait

- Rhythm, Speed, ?limp (loss of symmetry) + Turn

2. Spine

Look Inspect spine from behind & side standing (? deformity, muscle wasting)
Feel Palpate spine for tenderness

Move
1. Spine flexion-extension (touch toes)
→ **sitting**
2. Spine rotation (rotate shoulders)
3. Neck lateral flexion (ear on shoulder)
4. Neck flexion-extension (chin on chest)

3. Arms

Look (hands both sides)

Skin	nail signs, nodules, rashes
Muscles	wasting
Joints	asymmetry, swelling, deformity

Feel Palpate MCP & Carpal joints for warmth, tenderness & effusion

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Move
1. Power grip + test (squeeze finger)
2. Pincer grip + test (break ring)
3. Wrist flexion-extension
4. Elbow flexion-extension
5. Forearm pronation-supination
6. Shoulder external rotation and abduction (hands behind head)

4. Legs

→ **lie supine**

Look

Skin	rashes, nodules, calluses on feet
Muscles	wasting (quads)
Joints	asymmetry, deformity, swelling

Feel Palpate knee joints & MTP joints for warmth, tenderness & effusion

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Move
1. Hip & Knee flexion (bend and hold knee)
2. Hip passive internal rotation
   (hip & knee 90°, push out foot)
3. Knee passive flexion & extension
   (move with hand over knee & feel)

Finish

- Thank patient & offer to help redress
- Summarise finding of appearance (A) & movement (M) in each category (GALS)

Ex: Back & Neck Examination

WICEPP
- Introduction = name, age & occupation
- Exposure = undergarments
- Position = **standing**

Screening Questions

1. *Pain* – site, onset, radiation, timing, alleviating/exacerbating factors, severity
2. *Associations* – leg weakness or tingling, bowel & bladder control, mobility
3. *General Health* – weight loss, fatigue

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1. Look

1. Gait – pattern
2. Posture – deformities front, back (scoliosis)& side (kyphosis, loss of lordosis)
3. Skin – scars, pigmentation/hair

2. Feel

1. Palpate spine for tenderness (spinous process & paraspinal muscles)
2. Palpate sacroiliac joint (sacroiliits)

3. Move

1. Spine flexion (knees straight, fingers on spine for movement)
2. * Schober's test
   - finger 5cm below and 10 cm above PSIS (SI joint/L5)
   - on flexion, should be increase of more than 5cm.
3. Spine extension (lean back)
4. Spine lateral flexion (slide hand down thigh)

→ sitting

5. Neck flexion-extension (chin on chest)
6. Neck lateral flexion (ear on shoulder)
7. Neck rotation (look left/right)
8. Spine rotation (rotate head & shoulders, view from above)
9. * Chest expansion (measure, min. 5cm)

→ lie supine

9. Straight Leg Raise
   - passive hip flexion with knee extended (normal 80°)
   - report when pain felt or tingling felt (limit)
   - reinforce by gently dorsiflex ankle at limit (Bragaard test)
   - limited by pain in lower lumbar disc prolapse (resticted hip flexion)

→ lie prone

10. Femoral Nerve Stretch
    - flex knee slowly & report when pain felt
    - reinforce with gentle hip extension at limit
    - limited by pain in lumbar roots

Neurological Screen

Power

- L234	knee & hip flexion	(knee to chest)
- L234	hip adduction	(squeeze fist between knees)
- L5	ankle & big toe dorsiflexion	(or walk on toes)
- S1	ankle plantarflexion	(or walk on heels)

Sensation

Tone & Reflexes

Vascular Screen

posterior tibial pulse

dorsalis pedis pulse

Finish

- Imaging = plain spinal XR (loss of joint space, vertebral disease), MRI (prolapsed disc)
- Thank patient & offer to help redress

Ex: Hip Examination

WICEPP
- Introduction = name, age & occupation
- Exposure = undergarments
- Position = s**tanding**

Screening Questions

1. *Pain* – site (knee, anterior groin), radiation, alleviating/exacerbating factors
2. *Stiffness* – worse morning? worse after sitting in fixed position?
3. *Mobility* – limp ± pain?, walking distance, stairs, transfers, walking aid?
4. *Other joints*

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1. Look

1. Gait – pattern (antalgic, short-limb or Trendellenburg)
2. Trendellenburg's Test
   - stand on each leg in turn (watch from behind)
   - positive if pelvis drops on unsupported side (normal unsupported lifts)

→ lie supine

3. Skin – scars, erythema
4. Muscle – quadriceps wasting, gluteal wasting
5. Joint – asymmetry, deformity (limb shortening, limb rotation, fixed abduction/adduction/flexion deformity)
6. Measure limb lengths
   - true length = ASIS to medial malleoli (hip disorder on shorter side)
   - * apparent length (if true equal, but shortened)
   - * quadriceps circumference

2. Feel

- "Any tenderness?"

1. Palpate greater trochanters & femoral head for tenderness

3. Move

- passive movements

1. Hip flexion (knee to chest with pelvis stabilised)
2. Hip rotation (flexed, external = medial, internal = lateral, normal 45°)
3. Hip abduction (flexed, normal 45°)
4. Hip adduction (extended, stabilise other side pelvis, normal 30°)
5. Thomas' Test
   - keeping hand on back, hold one hip flexed and straighten other leg
   - positive if cannot be straightened (fixed flexion deformity)

→ lie prone

6. Hip extension (hand on SI joint, normal 30°)

Finish

- * Examination: knee & back (incl. straight leg raise)
- * Examination: Neurological lower limb
- * Examination: Vascular lower limb
- Imaging: = plain XR (osteophytes, loss of joint space, subarticular sclerosis, bony cysts)
- Thank patient & offer to help redress

Ex: Knee Examination

WICEPP
- Introduction = name, age & occupation
- Exposure = undergarments
- Position = **standing**

Screening Questions

1. *Pain* – site (diffuse, localised) radiation, alleviating/exacerbating factors
2. *Swelling* – acute (immediate/delayed) or chronic
3. *Stiffness* – morning (inflam) or after inactivity or movement (OA)
4. *Locking or Giving Way*
5. *Mobility* – limp ± pain?, walking distance, stairs, walking aid?

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1. Look

- Deformity - valgus/varus
- Gait – pattern (limp, antalgic, short-stepping)

→ lie supine
- Skin – scars, lumps
- Muscle – quad wasting
- Joint – swelling, deformity, ?fixed flexion

2. Feel

- "Any tenderness?"

1. Palpate flexed knee joint (bony margins, ligaments)
2. Palpate extended knee joint (patellofemoral joint + patellar friction test)
3. Patellar tap test
4. Bulge test
5. * Measure quadriceps circumference

3. Move

1. Active knee flexion-extension

- passive movements + feel for crepitus

2. Knee flexion (normal 135°)
3. Knee extension (normal 5°)
4. Collateral ligaments test (varus/valgus strain)
5. Cruciate ligaments test (anterior/posterior drawer test + sag sign)
6. Lachman's test (knee 30°, pull up on tibia while stabilising femur)
7. * McMurray's test (if meniscial injury suspected, passively extend with foot internally rotated)
8. *Patellar apprehension test (if patellar instability suspected lateral patella pressure while flexing)

→ lie prone

9. Popliteal fossa inspection & palpation
10. Apley's grinding test (knee flex 90° & rotated under compression)

Finish
- * Examination: Rheumatological hip & ankle
- * Examination: Neurological lower limb
- * Examination: Vascular lower limb
- Imaging: = plain XR (osteophytes, loss of joint space, subarticular sclerosis, bony cysts)
- Thank patient & offer to help redress

Ex: Hand Examination

WICEPP

- Introduction = name, age & occupation
- Exposure = elbows to fingers

Screening Questions

- *Pain* – site (diffuse, localised), severity + radiation, alleviating/exacerbating factors
- *Swelling* – acute (immediate/delayed) or chronic
- *Stiffness* – morning (RA) or after inactivity or movement (OA)
- *Neurological* – tingling, weakness
- *Function* – dressing (esp. buttons & zips), bathing, washing, cooking, feeding, cut food + help at home?

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1. Look

1. Skin
   - elbows
   - nails (psoriatic pitting & onycholysis)
   - rheumatoid nodules
   - scars
2. Muscles
   - wasting (hypothenar & thenar)
3. Joints
   - swelling
   - deformity

     [RA = ulnar deviation, Boutonniere deformity (PIP fixed flexion), Swan neck deformity (PIP hyperextension), Z-shaped thumb]

     [OA = Heberden's nodes (DIP) or Bouchad's (PIP)]

2. Feel

1. Wrist + ulnar & radial heads
2. Anatomical snuff box
3. MCP joints
4. PIP & DIP joints

   (palpate with thumbs dorsal & fingers palmar on hand)

   (tenderness, warmth, effusion? + consistency of swellings/nodules)

3. Move

- Wrist (active)
  1. extension (prayer sign)
  2. flexion (reverse prayer sign)
- Wrist (passive)
  1. flexion-extension
  2. radial-ulnar deviation
  3. pronation-supination
- Thumb (active)
  1. extension (out to side)
  2. abduction (up to ceiling)
  3. adduction (down to palm)
  4. opposition (across to fingers)

- Fingers (active)
    1. flexion-extension (fist & then straighten)
    2. adduction
    3. abduction
    4. power grip (squeeze finger)
    5. pincer grip (ring with thumb & index finger)
    6. function test (pick up coin, undo button)
    7. * flexion-extension individual fingers

4. <u>Special Tests</u>

- * Tinel's test = extend wrist & tap on median nerve
- * Phalen's test = forceful flexion (reverse prayer position) for >30s (CTS – paraesthesia median nerve distribution)
- * Flexor superficialis = flex finger while other fingers held extended
- * Flexor profundus = flex finger at DIP while finger held extended at PIP

Finish

- * Examination: Neurological upper limb
- * Examination: Vascular hand
- * RA = lungs (Caplan's syndrome) , eyes (uveitis), liver/spleen (Felty's syndrome)
- Thank patient & offer to help redress

Explain Chronic Pain

1. **Check understanding**
2. **Assessment of pain**
3. **Treatment**
4. **Medications & side-effects**
5. **Prognosis**
6. **Clarify understanding & Any questions?**

Assessment

S site
O onset
C character
R radiation
A associations
T timing
E exacerbating & relieving factors
S severity
\+ effect on life

Conditions

- Post-Herpetic Neuralgia
  → P: persistent pain in dermatome of previous shingles
  → CF: shooting/burning allodynia (ie. pain on touch) eg. temperature change, touch
  pain persists longer than 6m
  10% shingles (elderly)
  → M: 1. carbamezapine, gabapentin (AC)
  2. topical capsaicin
- Trigeminal Neuralgia
  → P: idiopathic or secondary (MS, V nerve compression)
  → CF: shock allodynia eg. touch, temperature change, shaving, chewing
  brief paroxysmal episodes
  → M: 1. carbamezapine (AC), amitryptilline (AD)
  2. surgery (nerve ablation procedure, microvascular decompression)
  → PR: lasts for years, either remits or worsens
- Chronic Low Back Pain
  → P: "mechanical" + biopsychosocial interactions
  → CF: aching lower back pain
  → M: 1. NSAIDs, weak opiods, TENS
  2. physiotherapy & exercise problems
  3. pain management programmes (incl. CBT)
  4. alternative medicine (acupuncture)

Treatment

- Opioids
  e.g. tramadol (neuropathic pain)

- Tricyclic Antidepressants
  → MoA: increase descending inhibitory pathway (low dose)
  → I: neuropathic pain
  → S/E: antimuscarinic (dry mouth, sedation, urinary retention)
  cardiac (arrhythmias, hypotension)
  e.g. amitryptilline, prothiadine (off-licence prescription)

- Anticonvulsants
  → MoA: ?reduced depolarisation threshold
  → I: neuropathic pain
  → S/E: sedation, weight gain
  e.g. carbamezapine, gabapentin

- Other methods
  e.g. TENS
  Acupuncture
  Physiotherapy
  Occupational Therapy
  Psychological Therapy (CBT)