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ANAESTHESIA AND PERIOPERATIVE CARE

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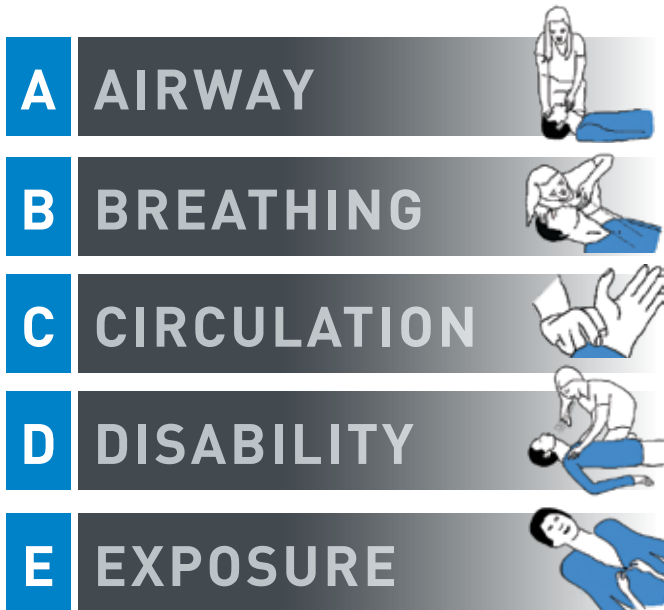


Figure 1. ABCDE steps for Initial Assessment (ICRC)

SCENARIO

A 30-year-old woman arrives in the emergency room after receiving a gunshot wound in the left arm. She is in severe pain and appears pale and sweaty. The arm is bleeding and covered with a dirty cloth. You are the first health provider she encounters since the injury happened. What are the first steps you should take now?

INITIAL ASSESSMENT

- » Assessments of: Airway, Breathing, Circulation, Disability, Exposure (Figure 1).
- » Control **catastrophic haemorrhage** with direct pressure.
- » Complete the adjuncts to the primary survey if they are available, particularly chest X-ray, C-spine or pelvic images, if indicated.
- » Once the primary survey is complete, provided there is no imminent unaddressed threat to life or limb, proceed to the **secondary survey** with adjuncts.

HOW TO ASSESS A PATIENT WITH LIMB INJURY

HISTORY

- » Past medical history, current medications, known allergies, last oral intake, beliefs around medical care
- » Description of the event causing the injury: mechanism, date and time, effects on the patient, interventions to date

SIGNS AND SYMPTOMS

- » Pain
- » Loss of function
- » Reduced mobility
- » Abnormal movement
- » Crepitus

PHYSICAL EXAMINATION

- » **Look:** Change of position pattern, gait pattern, bruising, swelling, joint effusion and limb alignment
- » **Feel:** bony tenderness, joint effusion, distal circulation and sensation
- » **Move:** active before passive movement, do not force patient to move beyond what they can tolerate

INVESTIGATIONS

- » Plain radiological imaging in two planes at 90 degrees to each other
- » Include the joint above and below a suspected fracture
- » Radiological images are not essential to diagnose a fracture
- » Radiological images are not required to initiate treatment

KEY POINT

The clinical assessment of a limb must be adequate to evaluate for the presence of fractures or dislocations (deformity, tenderness, crepitus, active and passive range of movement), as well as joint stability, vascular status, nerve function, and distal status of the extremity.

PITFALL

- If patient is referred to your facility, do not assume the prior care provider fully assessed the patient and the limb and provided appropriate care.
- Absence of active movement does not confirm a fracture.
- Presence of active movement does not exclude a fracture.

PRE-OPERATIVE CONSIDERATIONS

- » Ensure **patient privacy** for all procedures: a mobile screen system is necessary in wards and in operating theatres with more than one table.
- » **Always** explain all procedures to the patient before any intervention, repeat this multiple times and obtain a translator if necessary for understanding.
- » **Surgical stores** should be kept adjacent to the operating room and protected from the environment. If there is not a pharmacist within the team, another health professional should be in charge of managing all medicines and disposables to avoid stock-outs. Laws regarding narcotics vary widely, so teams should be prepared to work with local governments in order to minimize delays at customs.
- » In the case of emergency surgery, ensure a **prepared tray** of sterile instruments is immediately available for emergency laparotomy, caesarean section, neurotrauma, thoracotomy and vascular injuries in limbs.
- » The **planning of the day's operating list** should involve surgeons, anaesthetists and nurses for optimal efficiency and should be communicated on a communal white board.
- » The order of the operating list should reflect a progression throughout the day from clean to contaminated cases with children being done first whenever possible.
- » To optimize patient flow practice ingress and egress of multiple patients through the operating room.
- » Clean and dirty areas within the operating room should be differentiated.
- » Prevention of hypothermia is important in surgical patients, particularly trauma, burn, and paediatric patients. Operating theatre temperatures should be kept between 27-40°C. All fluids, blood products, and blankets should be warmed for surgical patients.



Figure 2. Operating theatre with multiple teams (Baumgartner-Henley)

PRE-OPERATIVE SCRUB PREPARATION FOR LIMB SURGERY

- » Place an impervious layer between the limb and the operating table—ideally an absorbent layer.
- » Scrub the limb to remove skin and wound contamination. A plain brush, soap and water will work, as well as iodine based or chlorhexidine scrub brushes .
- » Copiously irrigate any limb wounds over a large dish with 3-12 L of fluid, depending on the degree of contamination.
- » Dry the limb.
- » Discard the absorbent layer.
- » Apply a tourniquet proximally on the limb, set the inflation pressure but do not inflate until required.
- » A staff member should be identified who is responsible for marking down the time the tourniquet is inflated so that tourniquet time is accurately recorded.
- » Patient pressure points should be checked to ensure adequate padding prior to beginning the case.

EXPERT TIPS

Wound irrigation with low pressure is preferred in most circumstances. Preserve any pulse lavage units for wounds with established infection.

Potable (drinkable) water is adequate for wound washouts; warm it to 38–41 degrees C. This temperature is that of a warm shower. In other words, warm to the touch but tolerable to keep ungloved hands immersed.



Figure 3. Scrub preparation for limb surgery (Kay)

POST-OPERATIVE CARE

An area for post-operatively recovery is mandatory.
It should be located next to theatre, not on the ward.

MAIN TASKS FOR NURSING STAFF IN THE RECOVERY ROOM

- » Assess and record patient's **vital signs** (HR, RR, BP, SpO₂, and temperature).
- » Identify and report abnormal vital signs or evidence of clinical deterioration.
- » Prepare **oxygen** concentrator and masks for oxygen therapy. Patients must be awake enough to protect their own airway before returning to the ward.
- » Prepare to set up and use **suction** to clear vomit/secretions from upper airway.
- » Assess and record level of consciousness using AVPU scale (A=Awake, V=responds to verbal stimuli, P=responds to painful stimuli, U=unresponsive).
- » Assess **pain** using agreed pain score and give prescribed medications. Pain should be under control before returning to the ward.
- » Assess **nausea and vomiting** and give prescribed medications.
- » Set up an **IV infusion** and record urine output if required.
- » Observe and assess **surgical sites and drains** for bleeding. Reinforce dressings as needed and inform surgical team if concerned.
- » Understand and recognize the **criteria for discharge** from recovery, and initiate physiotherapy as soon as possible following surgery.

DEEP VEIN THROMBOSIS (DVT) PROPHYLAXIS

The main options to prevent DVT and pulmonary embolism in adult surgical patients are pharmacological and mechanical prophylaxis:

- » Early mobilization and mechanical prophylaxis will cover most short surgical procedures .
- » Chemoprophylaxis will add a layer of complexity in the treatment but will be required in some cases.

Recommendations for clinical decision making:

- » Follow standard DVT guidelines and allow teams to adapt according to their resources, local protocols and individual patient factors.
- » Example ICRC guidelines for DVT prophylaxis is included in this book as an annex. (*See page 178*)

HEALTH STAFF CONSIDERATIONS

- » **Physician assistants** may face credentialing or licensing issues and if deployed should always be under the supervision of a qualified specialist.
- » **Nurse anesthetists** can face similar issues with credentialing, depending on individual country laws. Nurse anesthetists must work under the supervision of a licensed anesthetist.
- » **Medics and paramedics** are versatile team members in disaster response. Their medical training and understanding makes them ideal for supporting activities in an emergency department or in an operating theatre. In any of these roles, supervision is required.
- » For perioperative nurses the team is often best served by having the most experienced member of the team serve as the circulating nurse.
- » **Military medics or corpsman** working within a military medical team can offer significant military knowledge and expertise that may be a vital part of the team competencies required.



Figure 4. Health staff involved in preoperative procedures (*Baumgartner-Henley*)

ANAESTHESIA & PAIN MANAGEMENT

SAFE PRACTICE OF ANAESTHESIA

Current international standards apply:

World Federation of Societies of Anesthesiologists's (WFSA) International Standards for a Safe Practice of Anaesthesia, 2016



TYPE 1

- » No general anaesthesia provided
- » Basic life support capacities
- » Local anaesthesia for minor procedures
- » Analgesia for treatment
- » Analgesia for transfer:
 - Appropriate dressings and fracture splinting
 - Peripheral nerve block for transfer recommended, with clear documentation of block performance and pre-block examination
- » Prevention of hypothermia in transfer



TYPE 2

- » Type 1 capacities plus:
- » At least 1 anesthetist
- » Damage control resuscitation and advanced life support capacities
- » Regional anaesthesia – spinal anaesthesia (mandatory), plexus and peripheral nerve blocks (recommended). Epidural anaesthesia/analgesia not recommended in this setting
- » Intravenous or inhalational general anaesthesia for adult and paediatric patients
- » Analgesia for inpatient treatment



TYPE 3

- » Type 2 capacities plus full ICU facilities

CONSIDERATIONS FOR THE PERFORMANCE OF REGIONAL BLOCKS

- » Clinically examine the patient's limb for **neurovascular status** and record this prior to performing a regional block.
- » Peripheral nerve blocks should be performed with the use of **ultrasound guidance**.
- » Peripheral nerve blocks **mask the symptoms of compartment syndrome**—if you cannot watch the patient closely, consider performing a fasciotomy.

PAIN ASSESSMENT

- » **Pain score charts** are appropriate for adults and children and are mandatory in caring for patients with limb injuries. They must be understandable across cultures – for example charts using faces 😊, may be more useful than numbered scales.
- » Pain must be assessed and recorded **both at rest and with movement**.
- » Monitor patients with regional blocks post-operatively paying particular attention to pain scores.

CONSIDERATIONS FOR ANALGESIA

- » Pain relief is a human right!
- » Distraction therapy is effective, as is splinting soft tissue injuries and fractures.
- » Paracetamol, narcotics and blocks are the preferred post-operative analgesia.
- » A ketamine infusion may be used on an open ward with a syringe pump—50mg in 500ml over 8 hours.
- » Ketamine can be as useful drug in the management of the limb injuries. Team members should be familiar with its side effects, including its propensity to induce dysphoric reactions in adults.

KEY POINT

- **Avoid NSAIDs in the first 48hrs in trauma patients due to risk of renal injury particularly in patients with severe dehydration, haemorrhage, crush or burns.**
- **Limit NSAIDs to short courses and consider GI ulcer prophylaxis with use.**

PATIENT RECORDS

- » Patients involved in a disaster without local civil unrest may safely wear an identification bracelet.
- » Records of all care provided must be kept.
- » **Patients need to have the original or a copy of their records** to keep and use for subsequent care.
- » EMTs may keep their own records by photographing patient documents (notes, x-rays, images of injuries) Images need to be secured by the authority and removed from personal devices such as phones, tablets, and cameras as quickly as possible.
- » The ministry of health in the country may request a copy of the medical records for the care provided in the facility.
- » Many patients require on-going care post disaster. Being registered by their government as people with disaster related injuries may provide increased access to care in the reconstructive phase.
- » Maintenance of careful, accurate records is of extra importance in patients who will require long term follow up once the situation on the ground has stabilized, such as amputees or patients with spinal cord injury.
- » For more information on patient records please refer to the WHO Classification and Minimum Standards for Emergency Medical Teams in Sudden Onset Disasters and Handicap International's Rehabilitation in Sudden Onset Disasters.

SPECIAL CONTEXTS: CONFLICT

- » Patients in war zones may be safer if they carry a card with a numeric identifier rather than their name. Issuing a card that can be concealed, rather than an ID bracelet, may protect patients in conflict zones.
- » Consider providing de-identified data to protect patients if governments demand a record of the medical care provided.

SUGGESTED MAIN ITEMS IN DATA COLLECTION FORM

- » Date of arrival at the medical facility
- » ID number
- » Surname and first name
- » Gender
- » Age
- » Mobile phone number
- » Sudden onset disaster related incident: yes/no
- » Date of injury
- » Date of admission
- » Nature of first medical care if provided prior to current medical facility
- » Diagnosis
- » Comorbidities
- » Surgical procedures performed inside and outside the operating room.
- » Follow up: nursing/rehab/physician/none required
- » Date of discharge

UPDATES IN DATA COLLECTION AND REPORTING

The WHO has recently developed a standardized form to allow EMTs to accurately and efficiently report to the relevant health authority.

POSSIBLE KEY PERFORMANCE INDICATORS TO USE

- Unplanned return to operating room: yes/no
- Fracture stabilized within 12 hours of admission: yes/no

CONTROVERSY!

Who should keep the medical records in disaster situations? The patient, the government of the affected country or the health provider? How to ensure the data is protected and confidentiality is preserved?

SUGGESTED RESOURCES

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2. Berry RD, Birt DJ. Delivering anaesthetic services in UK military field hospitals. *Anaesthesia & Intensive Care Medicine* 2008; **9**(9): 413-5.

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8. Skelton P, Harvey A, eds. Rehabilitation in Sudden Onset Disasters. 1 ed. Online: Handicap International, UK Emergency Medical Teams; 2015.

EMT Website: <https://extranet.who.int/emt/page/home>
 AO/ICRC/WHO Training Resources: <http://www.aofoundation.org/icrc>