UK HEMS

Clinical Excellence in Helicopter Medicine

Haemorrhage control, vascular access, fluid resuscitation

Aims

- Describe the principles of haemorrhage control
- Describe the indications for fluid infusion.
- Describe position and types of venous access.

Background:

Every effort should be made to minimise blood loss, maximise clot formation and minimise clot disruption. It is therefore essential to consider handling and splintage and their effects on natural tamponade as a fundamental part of “volume resuscitation”. All fractured limbs should be drawn out to length and splinted. Using these techniques reduces the limb circumference and the soft tissue volume into which bleeding can take place. Similarly, careful handling will minimise clot disruption in the chest wall, peritoneum and pelvis. Appropriate cutting of clothes and “skin to scoop” packaging are essential elements of this care. Direct pressure should be used to limit visible bleeding. Intravenous fluid administration is not routine and should only follow specific indications (see published national guidelines)

Policy:

In the multiply injured patient demonstrating shock every effort should be made to exclude a ventilatory cause for the clinical picture. Thereafter every effort should be made to maximise natural tamponade / clot production and as a “last resort” fluid transfusion should be considered.

Fracture Reduction / Splintage

- Fractured femur – draw out to length and splint with an appropriate traction splint.
- Fractured pelvis – reduce to anatomical position and apply pelvic splint.
- Unstable pelvis and femur – consider the use of the pneumatic anti-shock garment
- Fractured tibia/fibula – draw out to length and apply a suitable splint (options may include a vacuum splint, a box splint or a Benecast splint)
- Fractured humerus – draw out to length and apply an appropriate splint (options may include a vacuum splint or a Benecast splint)

Doctors and paramedics must make themselves familiar with manufacturers' guidance for all splintage devices in use in the HEMS and local Ambulance Service

Bleeding Wounds

- Should be compressed directly. Limbs should be elevated and a windlass dressing applied if appropriate
- "Interim" suture may be considered (eg. for bleeding scalp wounds)
- Blast bandages and other haemostatic dressings can be considered
- Consider indirect pressure proximal to the bleeding site (eg, femoral artery compression)

Penetrating Wounds to Limbs

If simple compression fails to control blood loss the Combat Application Tourniquet
may be used. It is essential to record and hand over the time of tourniquet application to the receiving hospital team

Use of intravenous fluids

When splintage and haemorrhage control has been maximised then fluids should be administered according to the following guidelines:

Head Injury:

- Infuse 250 ml boluses of crystalloid to achieve systolic blood pressure of 100mmHg

Blunt Injury (without head injury) and penetrating injury:

- Infuse 250ml boluses of crystalloid to achieve verbal contact which is taken to indicate adequate cerebral perfusion. The absence of a radial pulse should also prompt consideration of intravenous fluid administration
- Where verbal contact is not achievable (unconscious / ventilated patient) – infuse 250ml boluses of crystalloid to achieve systolic blood pressure of 80mmHg.
- Where patients demonstrate signs of haemodynamic compromise, the receiving Emergency Department should be informed during the pre-alert call, and consideration given to requesting that blood and clotting factors be made available. With blood available the decision to transfuse or not can be made by the receiving trauma team.

Vascular access

- Standard access is a 14 or 16 gauge cannula in the antecubital fossa. Where possible choose an arm that is uninjured and not associated with ipsilateral chest injuries.
- Some patients who do not require urgent fluid or intravenous drug administration (such as sedation for extrication) may not require venous access at the scene and attempts may be made to secure venous access en route to the hospital
- Make every effort to secure the line. One method of securing is:
    - Tape as diagonal x2
    - Tape as horizontal x1
    - Loop the giving set through 1st web space and back along forearm. Tape x 2
    - Cling bandage where possible

Failure to establish peripheral venous access – alternative venous access

- Alternatives to peripheral venous access include
    - Femoral vein and external jugular vein
    - Subclavian and internal jugular can be considered but may be less practical in pre-hospital care.
    - A surgical cut down to access the greater saphenous vein (at the ankle or at the groin) or the basilic vein (at the elbow) are also alternatives
- Where there is likelihood of pelvic or IVC disruption, ensure there is a patent line above the diaphragm.

Failure to establish peripheral venous access – intraosseous access

- This route is useful in critically unwell children and is becoming more common in adults
- Venous administration of drugs and fluids is preferable to intraosseous administration
- The HEMS team should be familiar with the insertion techniques of the devices carried

Additional Information

- Revel K, Porter K, Greaves I. Fluid resuscitation in prehospital trauma care: a consensus view. Emerg. Med. J. 2002. 19: 494-498