

Management of Casualties in Austere Circumstances: disaster, armed conflict, act of terrorism

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I declare no conflict of interest.

Austere environment

- Limited resources even before the crisis
- Limited resources:
 - Infrastructure
 - Equipment: X-ray, CT, mechanical ventilation, laboratory
 - Supplies: medications, consumables, blood for transfusion
- Limited personnel
 - Number
 - Expertise

Austere environment

- **Finances**
- **Administration & management**
- **Far away: logistics**
- **Climate & topography**
- **(Dis)comfort factor**

For whom?

Military articles

Tubb CC, Oh JS, Do NV et al. Trauma care at a multinational United Kingdom-led Role 3 Combat Hospital: resuscitation outcomes from a multidisciplinary approach. *Mil Med.* 2014; **179(11)**: 1258 – 1262.

- **Anything less than a Level I trauma centre?**
- **Better care for soldiers deployed than for civilians at home?**



Norwegian RC field hospital: ERU post-tsunami Banda Aceh



Lokichokio field hospital: Under-the-roof & ICU (INU)



Field Surgical Team Darfur



Assure the air-flow: non-laminar



Ordinary III World District Hospital



Pathology

- Wounds are dirty and contaminated
- Epidemiology: 50-70% limbs
- Surgical and nursing burden
- Others potentially lethal: 5-10% (ISS > 15)
- Debridement and delayed primary closure

Clinical skills

- **X-rays**
- **Chest tube & laparotomy on clinical basis alone**
- **No place for ER thoracotomy**
- **Limited- or non- use of endotracheal intubation outside the theatre, no mechanical ventilation: tracheostomy**

Limits of surgery =

- **post-operative nursing care**
- **+ anaesthesia (nurse, technician)**
- **+ availability of blood for transfusion**
- **Non-operative management?**
- **Damage control surgery?**

Damage control with limited blood supplies

- **DCR: Hypotensive resuscitation**
- **DC = early use of blood**
- **Obligated to use crystalloids: limits**
- **Do not use colloids**
- **Balancing act: urine output**
- **Head injury, pregnant, children, elderly**

Blood available

- Autotransfusion (not cell-saver technology)
- Whole blood, as fresh as possible
- Family, friends, clan = “walking blood bank”

When to give blood

- **Very short supply: only after control of bleeding**
- **On table: haemodynamically unstable and Hb < 6 g/dl (+)**
- **On table: patient stable, Hb < 6: no**

Organisation

- **Difference between one-off event and continuing combat**
- **Disaster plan:**
 - **Pre-hospital means of transport**
 - **Hospital**
 - **Post-hospital: convalescent area, hospital as hotel**
 - **Security**
 - **Communications: authorities, families, journalists**
- **Triage: mass casualties, surge capacity overwhelmed**

Teşekkür Ederim

Ευχαριστώ