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.

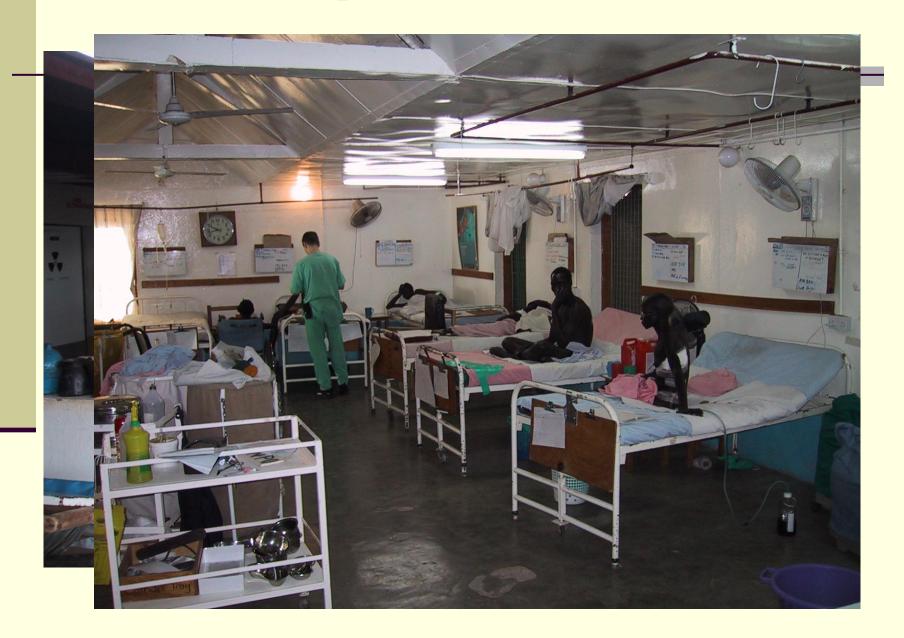
- Anything less than a Level I trauma centre?
- Better care for soldiers deployed than for civilians at home?



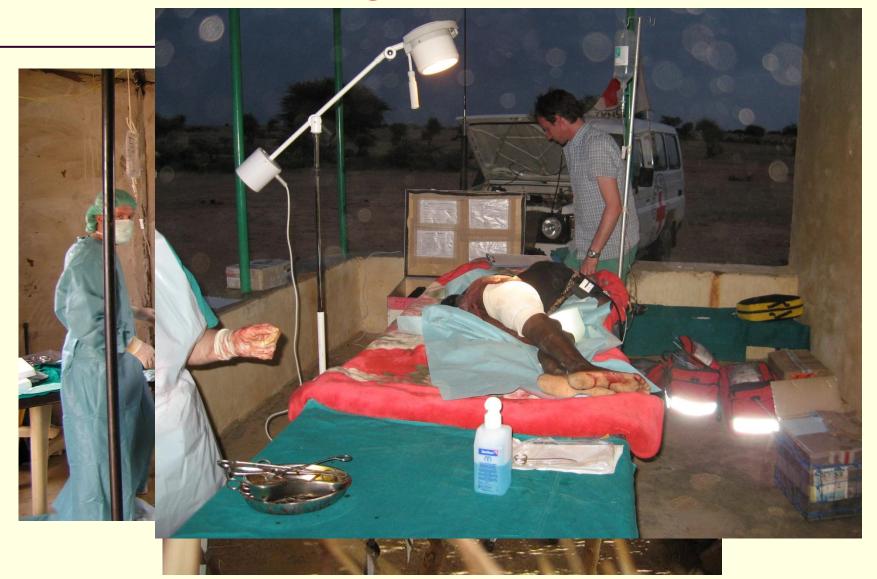
Norwegian RC field hospital: ERU post-tsunami Banda Aceh



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



Field Surgical Team Darfur





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
- Obliged 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