

Call of Duty

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**Defence School of Healthcare
Education**



- Massive haemorrhage is the most immediate threat to the injured person.
- The mortality rate is high unless actively managed from Point of Injury.
- The changing nature of operations and exercises may require the isolated practitioner to plan for transfusion support.
- This presentation aims to provide an overview of transfusion support.



Expeditionary and contingency operations

- Remote location
- Austere environment
- Casualties with severe and complex trauma



Major Haemorrhage scenarios

Gunshot

- Low calibre
- High calibre

Blast

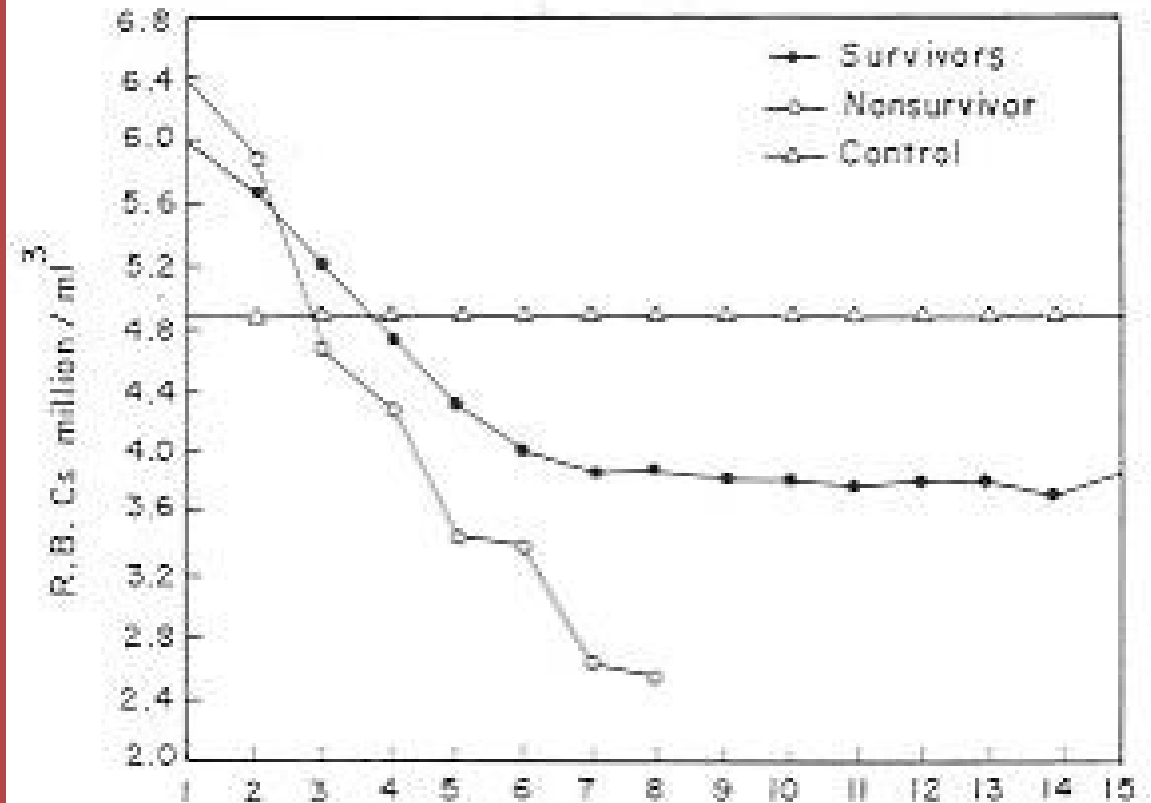
- Shock wave
- Fragmentation
- Amputation

Blunt trauma

- Vehicle vs Soldier

Other

- Burn
- Medical





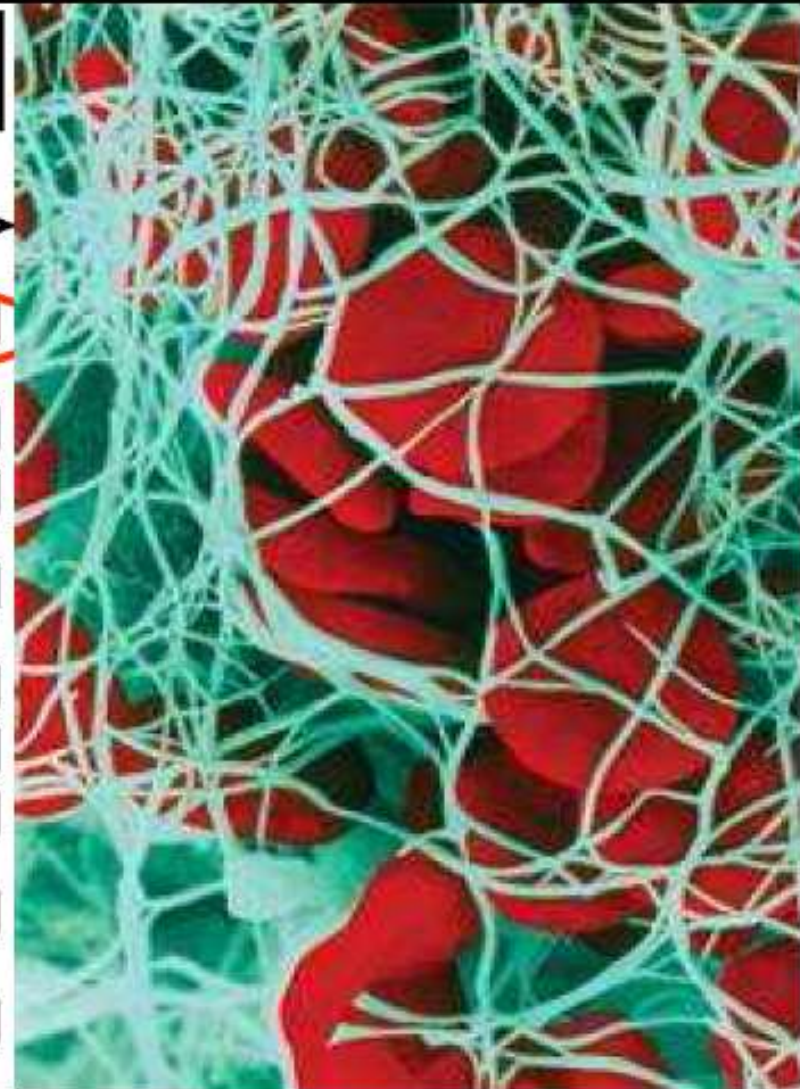
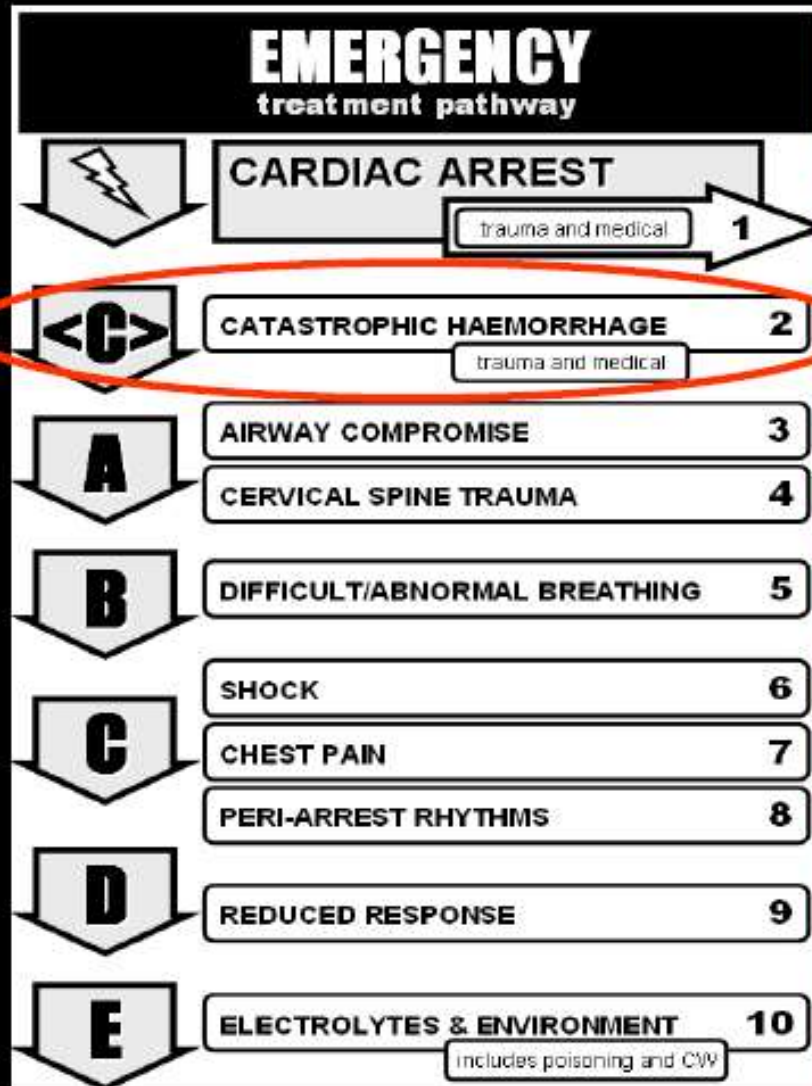
Casualty Care

- Need early care
- Need rapid evacuation
- Need a trauma hospital

However:

- Delayed care
- Delayed evacuation
- Limited medical facilities

Stop the bleeding





Uncontrolled Haemorrhage

Coagulopathy

Loss of factors

- Bleeding
- Depleted

Hypothermia

- Blood loss
- 'Cold' fluids
- Exposed

Acidosis

- Tissue damage
- Restricted airway

Action

Oxygenation

- Circulation
- Airway / Oxygen
- Retain red cells

Stabilise the Clot

- Tranexamic Acid

Correct coagulopathy

- Keep warm
- Correct acidosis
- Replenish factors

Pre-Hospital Emergency Care

Integration of

- (First responder)
- Pharmaceutical
- Transfusion
- Surgical

A
Cricothyroidotomy

<C>
CAT / FFD

B
Thoracostomies

C
Swan
Introducer
IO Access
Drugs/Blood

ROLE 1



ROLE 2



Medical Treatment facilities

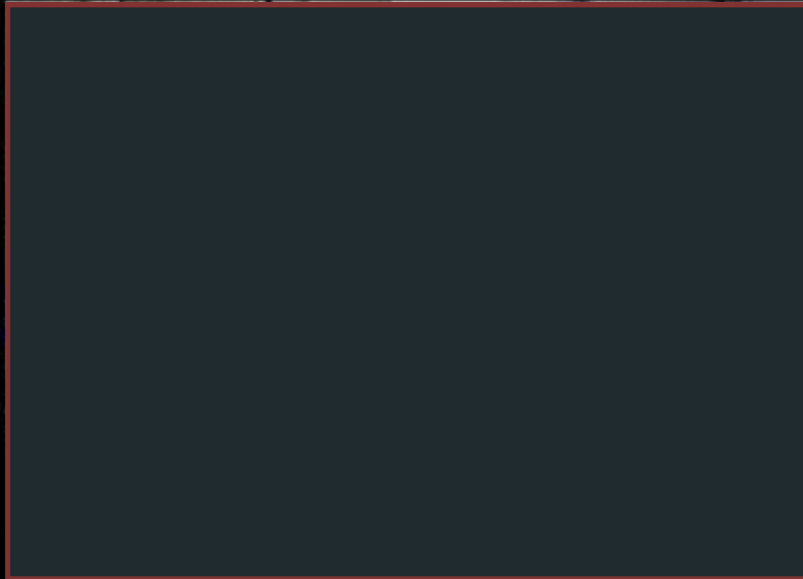


ROLE 2E/3

Transfusion is an integrated part of Damage Control Resuscitation (DCR)

Aims of DCR
include:

- Minimise blood loss
- Maximise tissue oxygenation
- Optimise outcome





Diagnostic Support

Biochemistry

- Blood Gas
- K, Ca, Mg, Lactate

Full Blood Count

- Hb, Hct, Plt

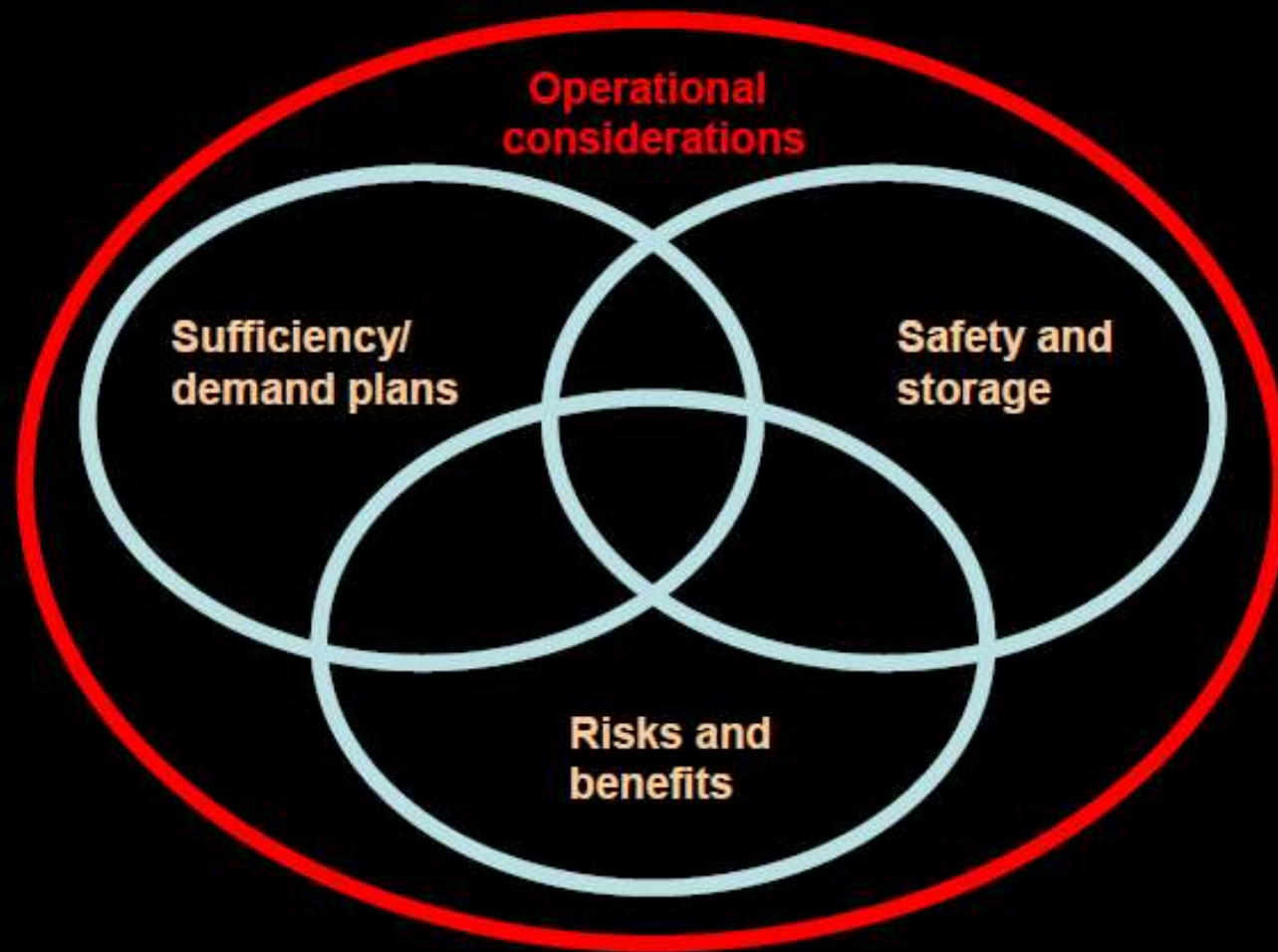
Coagulation

- PT, APTT, Fibrinogen

ROTEM



Transfusion planning





Transfusion support options

Risk Assessment

- C'ABC/DCR
- Alternatives to blood
- UK Blood Services
- Coalition Partners
- Contractors
- Host Nation Support
- Emergency Donor Panel



UK Blood Services



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Freedom from Frozen

LyoPlas N-w (DRK)



Plasma

- Single donor
- Quarantined
- Freeze dried
- Reconstituted



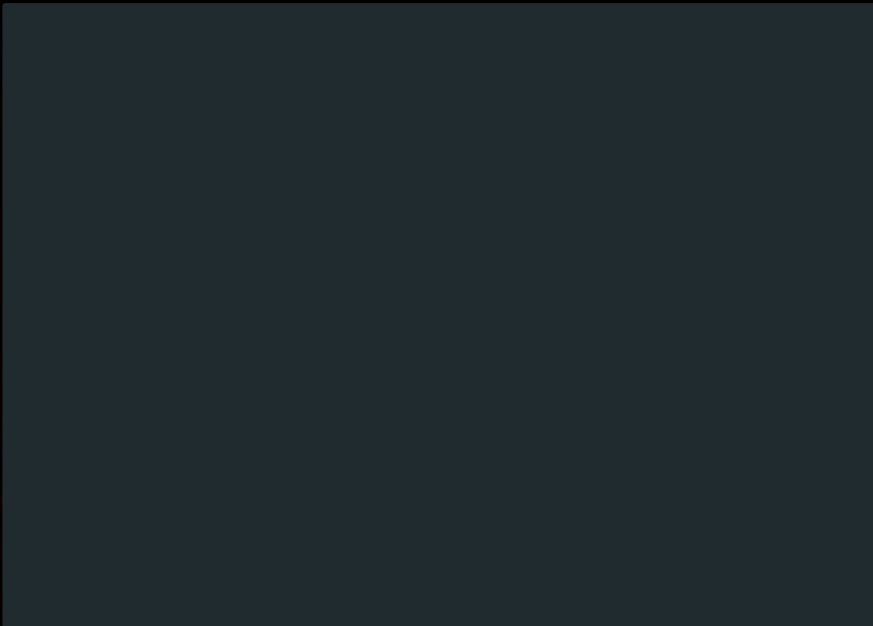
Freeze dried

- Plasma
- Fibrinogen

Whole Blood

Platelets

Whole Blood



Nov 2010. Master Gunnery Sgt. Gary Teicher, G-4, Headquarters and Support Company, 1st Marine Division (Forward), watches as British Army Majs. Rozalind P. Qaranc (center) and Pauline Dorrington (right), nurses with Camp Bastion Hospital, draw blood during the Walking Blood Bank pre-screening at the Combined Aid Station, Camp Leatherneck, Afghanistan.

FWB requires an Emergency Donor Panel (EDP)

- Volunteers
- Pre-screened
 - Donor questionnaire
 - Life-style advice
 - Pre-deployment testing
 - Donor matrix
- Point of care and retrospective testing
- (+/- Platelet sparing leucodepletion)



An example of transfusion support

TXA

Red Cell Concentrate

- Supply and storage

Plasma

- FFP / LP

Fibrinogen

- Cryoprecipitate
- Fibrinogen Concentrate
- Calcium iv

Platelets

- Whole Blood
- Apheresis



Storage and Supply constraints



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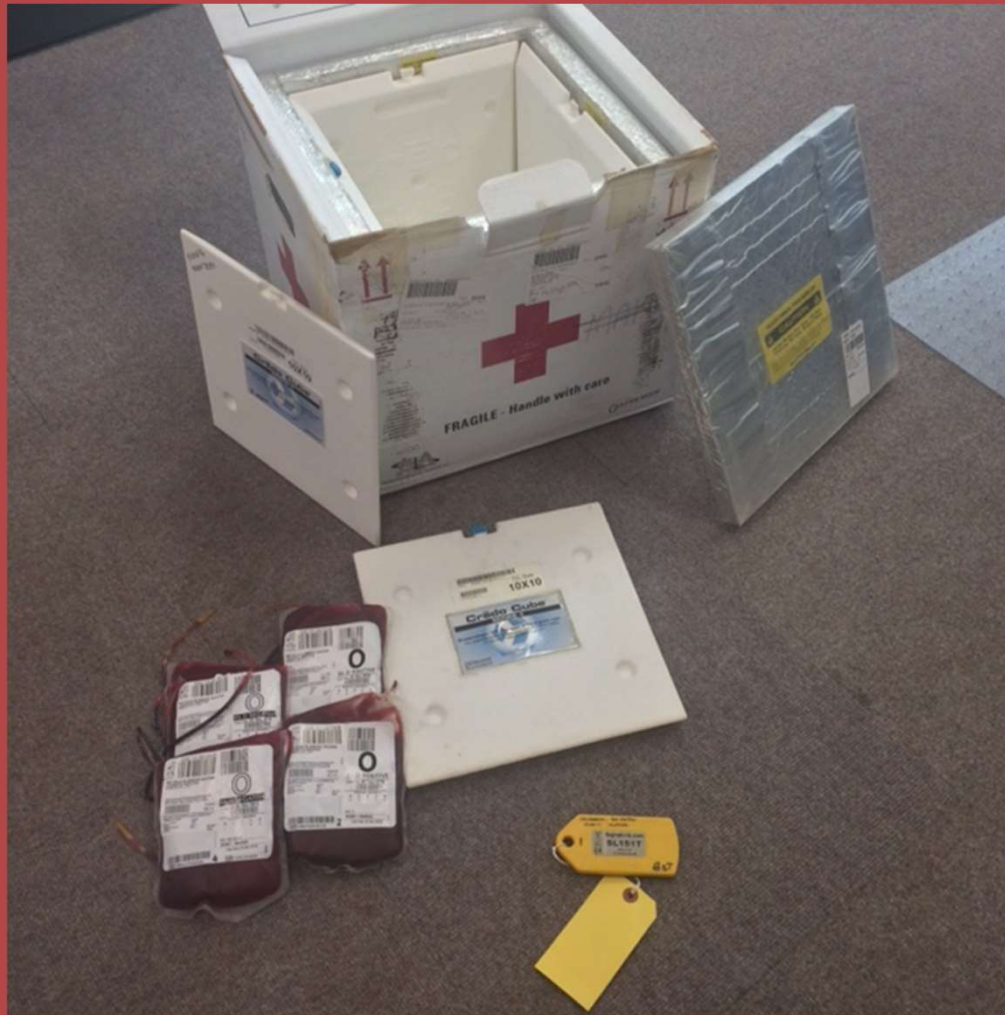
Storage and mobility



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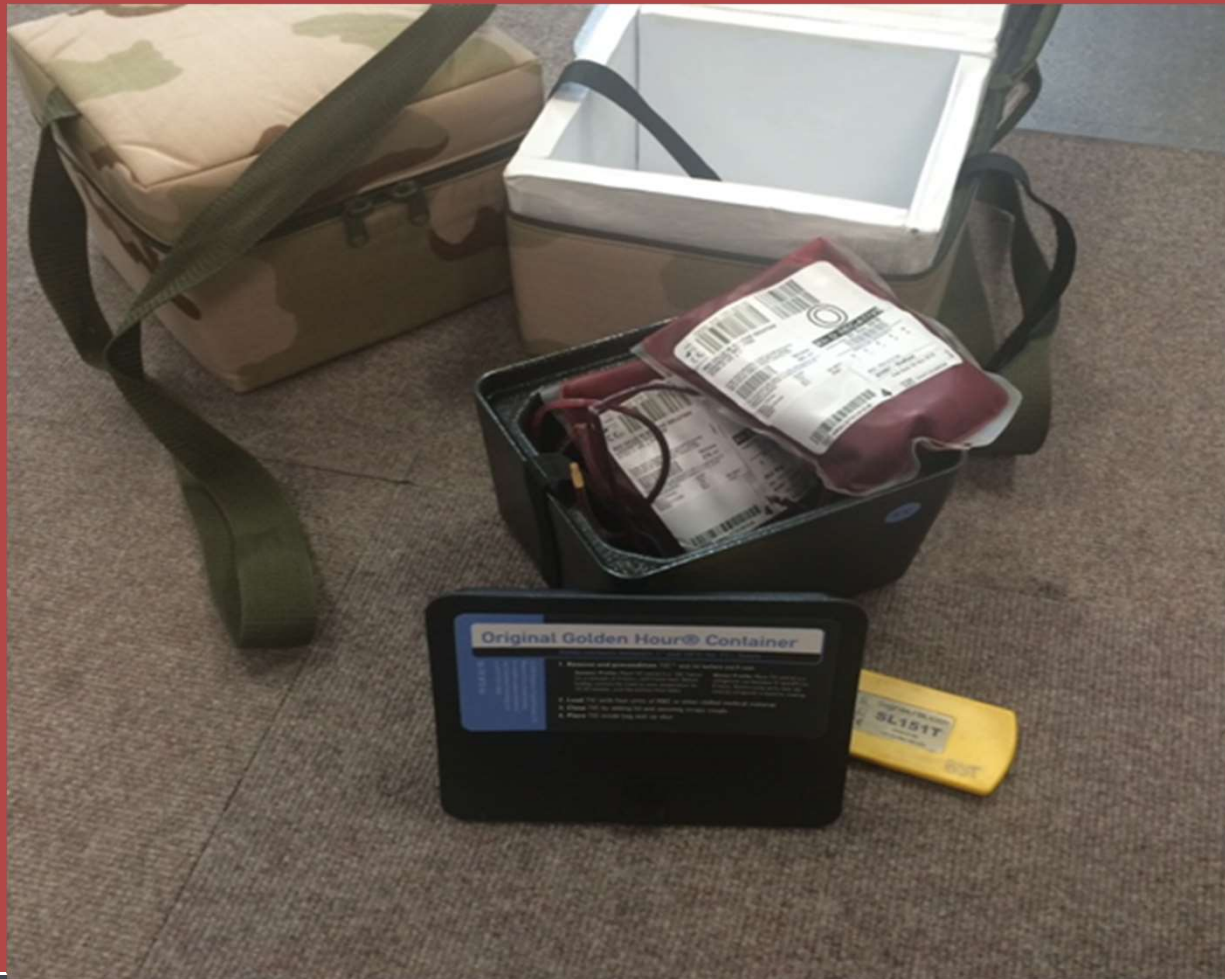
Movement - strategic



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Movement - tactical



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Storage Solutions

Active refrigeration

Any environment

- -10°C
- +40°C

Multiple power supplies

Forward supply

- PHEC
- MERT





Delivery Solutions



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1. CD Path
2. BZZ
3. K+N (LHR)
4. Cape Verde
5. Ascension
6. MPA
7. KEMH



Future blood products

- Cold Platelets
- LD Whole Blood
- Clotting Factor Concentrates
- 'Universal' blood cells
- TXA auto injector





Moving Transfusion Forward





Thank you for listening