Innovations in Military Aeromedicine

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YOU'RE DEFINITELY OFFICER MATERIAL MICHAEL
Scope

Future Operational Health Care

Care for casualties from point of injury to definitive care

Innovative technologies to enhance AME care
Future Operational Health Care

Fewer combat deaths now as proportion of casualties, however, severity of injuries has increased

Those in most need of early surgery need a full hospital capability – especially ICU

New plan devised to address some of these issues
Defence White Paper

Force 2030

Navy
- Six MRH 90 naval combat helicopters

Army
- Seven new CH47F(Chinook) medium lift helicopters.
- 40 MRH 90 Helicopters.

Air Force
- Up to 100 F-35 Lightning II Joint Strike Fighter aircraft.
- Five KC-30A Multi-Role Tanker Transport.
- Six new Wedgetail Airborne Early Warning & Control (AEW&C) aircraft.
- Eight new Maritime Patrol Aircraft.
- Two additional C-130J Hercules.
- 10 new tactical battlefield airlifters.
JP2060
Deployable Health Care Project
ABC?

C: Control hemorrhage

B: Identify and treat tension pneumothorax.

A: Control airway if necessary.

Pre-hospital Care: Noisy, chaotic, dirty
New ‘10-1-2’ Rule

Rapid haemorrhage and airway control

Evacuation assets to casualty within one hour of injury

Casualty to surgical facility within two hours of wounding
UK Medical Emergency Response Team
Acute Lung Rescue Team (ALRT)

Novalung
iLA Membrane Ventilator
Future AME platforms?
Use vehicle of opportunity – no dedicated AME

- Very limited space
- No electrical power or O₂ available
- Route may be diverted
an integrated

*Monitoring, Oxygen, Ventilation, and Suction*

device
Specifications

• Monitor:
  – FiO2 / ETCO2/Capnography / CVP or ICP / NIBP / SpO2 / ECG / Temp
  – Spirometer – insp / exp volume / airway pressures / leak detect

• Oxygen Concentrator:
  – Oxygen concentration (F\textsubscript{1}O\textsubscript{2}): Up to 85% (independent of minute ventilation), permits spontaneous breathing
  – Can also use ultra-low flow external O\textsubscript{2} (as little as 1 L/min = 100% F\textsubscript{1}O\textsubscript{2})

• Ventilator:
  – IMV/ SIMV/ AC / Pressure Support / PEEP / Pressure or Volume control

• Suction:
  – Continuous 100 – 325 mmHg / >20 LPM
Display

Vacuum Fluorescent
Night Vision Compatible
Adjustable brightness
Rotates 180 deg. with screen flip

The display during our initial user evaluation
Display

Waveform and Alarms
ECG / IBP / CO2 / SpO2 / Airway Pressure

Battery
Respiratory Rate
Airway pressure (in)
Airway pressure (out)
Temp
ETCO₂
F₁CO₂
SpO₂

BP
HR
MOVES in MRH-90
Vacuum Assisted Wound Closure (V.A.C.)
Therapy Unit Delivering negative pressure

Foam Dressings Sizes, shapes and formulations to suit all wound types.

Innovative technology monitors and maintains pressure at the wound site.
Innovative Technologies under development

Noise Immune Stethoscope
Dried Plasma
Frozen Platelets
Oxygen Generators
Noise Immune Stethoscope

May be able to listen to heart and breath sounds in challenging environments such as helicopters
Dried Plasma

Life-saving technology for massive blood loss.

Extended shelf-life and temperature stability.

Could be used in far-forward treatment facilities and AME.
Cryo-Preserved Platelets

Clotting similar to native platelets.

Potentially prolonged shelf-life.

Greatly enhanced temperature stability.

Greatly enhanced shelf-life at ambient temperatures.

Could be deployed far forward.
Portable Oxygen Generators

**RVPS**: May replaces the standard “D” cylinder

**Ceramic**: Uses a thin, hot ceramic membrane with a voltage applied.
Summary

New operational health care plan

Larger platforms with retrieval teams

Innovative technologies has benefits for the civilian Aeromedical system
INNOVATION
Finding new, different icebergs to steam into
Thank you