



# *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



**STOP** **+** **+**  
THE  
**BLEEDING** **+** **+**



Rapid haemorrhage and  
airway control

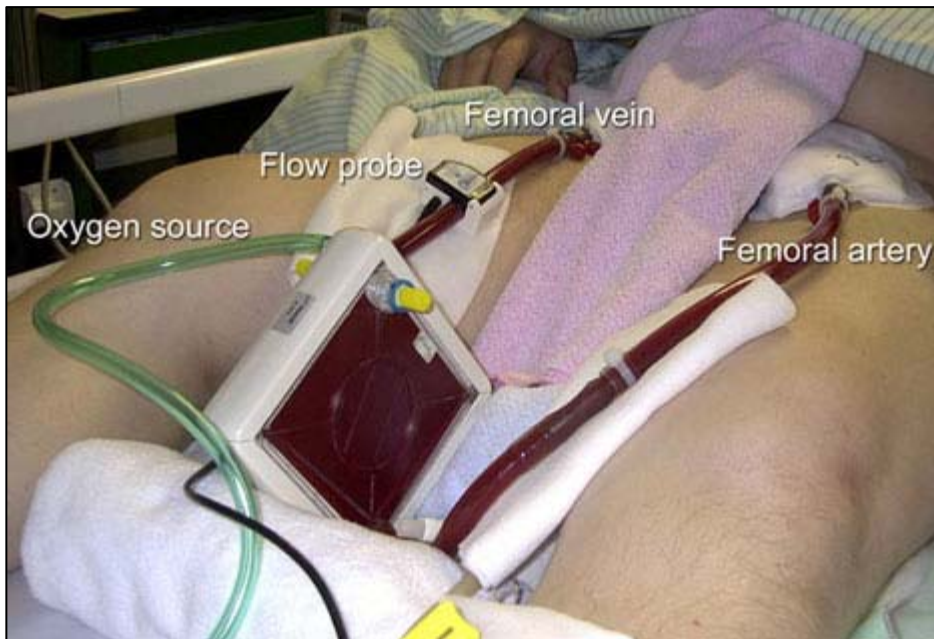
Evacuation assets to  
casualty within one hour of  
injury

Casualty to surgical facility  
within two hours of  
wounding

# UK Medical Emergency Response Team

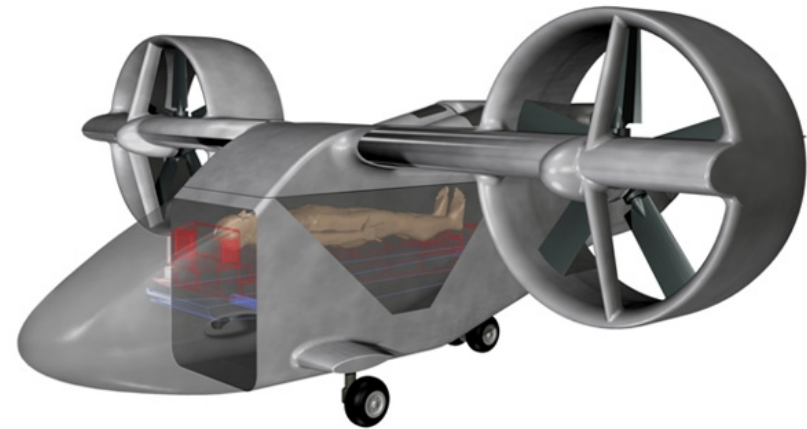


# Acute Lung Rescue Team (ALRT)



Novalung  
iLA Membrane Ventilator

# Future AME platforms?



# US Marine Corps



Use vehicle of opportunity – no dedicated AME

- Very limited space
- No electrical power or O<sub>2</sub> available
- Route may be diverted





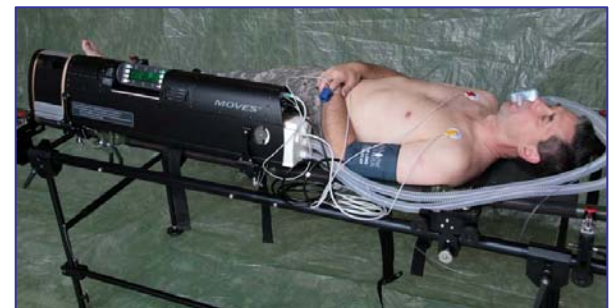
an integrated  
**Monitoring, Oxygen, Ventilation, and  
Suction**  
device



# Specifications



- **Monitor:**
  - FiO<sub>2</sub> / ETCO<sub>2</sub>/Capnography / CVP or ICP / NIBP / SpO<sub>2</sub> / ECG / Temp
  - Spirometer – insp / exp volume / airway pressures / leak detect
- **Oxygen Concentrator:**
  - Oxygen concentration (F<sub>I</sub>O<sub>2</sub>): Up to 85% (independent of minute ventilation), permits spontaneous breathing
  - Can also use ultra-low flow external O<sub>2</sub> (as little as 1 L/min = 100% F<sub>I</sub>O<sub>2</sub>)
- **Ventilator:**
  - IMV/ SIMV/ AC / Pressure Support / PEEP / Pressure or Volume control
- **Suction:**
  - Continuous 100 – 325 mmHg / >20 LPM



# Display

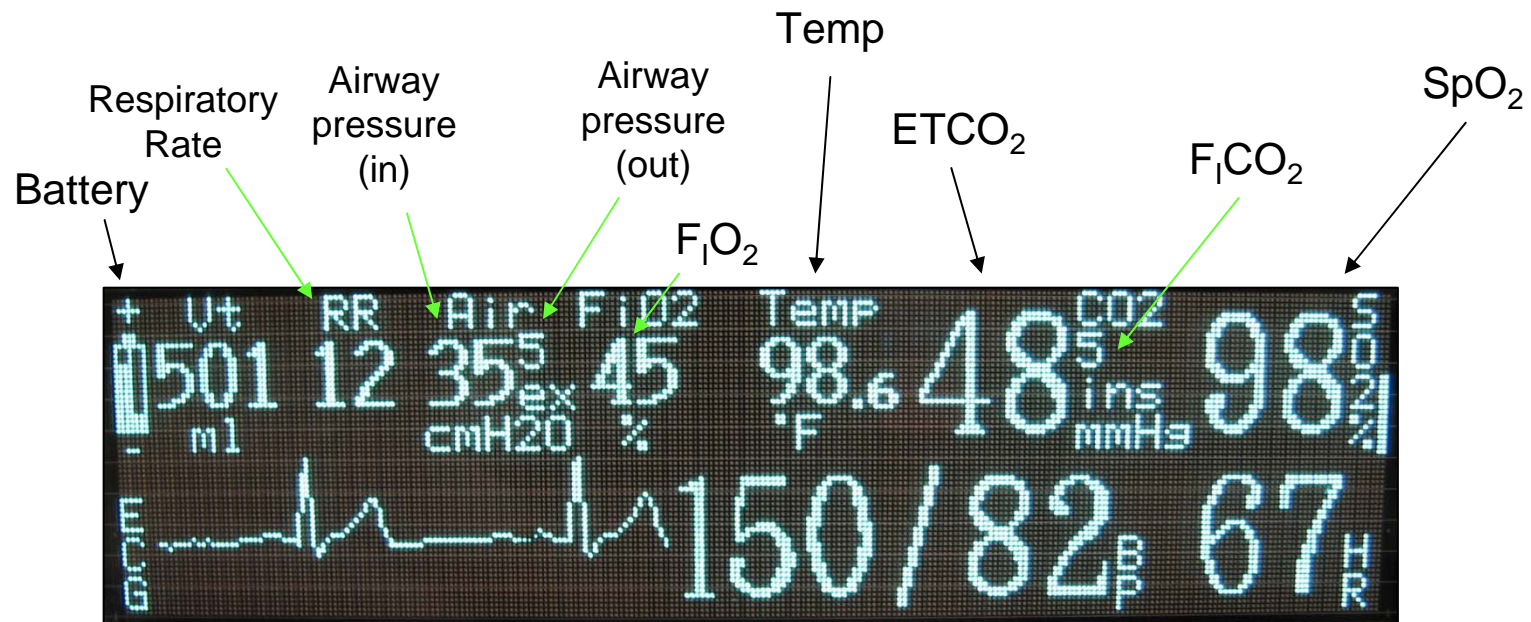


Vacuum Fluorescent  
Night Vision Compatible  
Adjustable brightness  
Rotates 180 deg. with screen flip

The display during our initial  
user evaluation



# Display



Waveform and Alarms

ECG / IBP / CO<sub>2</sub> /  
SpO<sub>2</sub> / Airway  
Pressure

BP

HR

# MOVES in MRH-90



# Vacuum Assisted Wound Closure (V.A.C.)

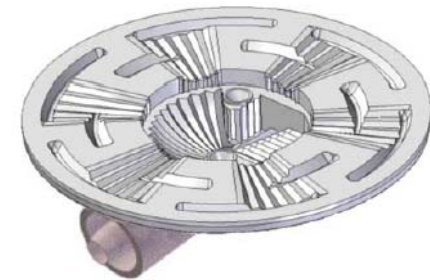




**Therapy Unit**  
Delivering negative  
pressure



**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



Rotary Valve Pressure Swing (RVPS) Oxygen Generator

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



Ceramic Oxygen Generator

**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

