Development & Deployment of the Canadian Forward Aeromedical Evacuation Capability

NATO RAMS & STO Technical Course 2019

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Outline

- Background
- Development of new CAF FAE capability
- CMERT Design
- Operation PRESENCE Roto 0
- The future of FAE in the CAF

- Acknowledgements
  - LCol Hannah
  - NATO Colleagues!

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Background

- Traditionally Canada has relied on **partnership with Allies** for FAE in deployed operational settings
- In 2006 the Canadian Forces Health Services was directed to develop a program and train Medical Technicians (Paramedics) for employment in the deployed FAE environment
- This capability has only been used in a limited way in humanitarian operations

FAES Course on the CH-146 Griffon

Background

- Canada's capability has been limited due to the size of the CH-146 Griffon / Bell 412
- FAE was never incorporated into RCAF/CFHS doctrine
- **Canada has recently (re)acquired the CH-147F** Chinook which now gives us the capability of providing larger teams to care for/move larger numbers of patients

A golden opportunity

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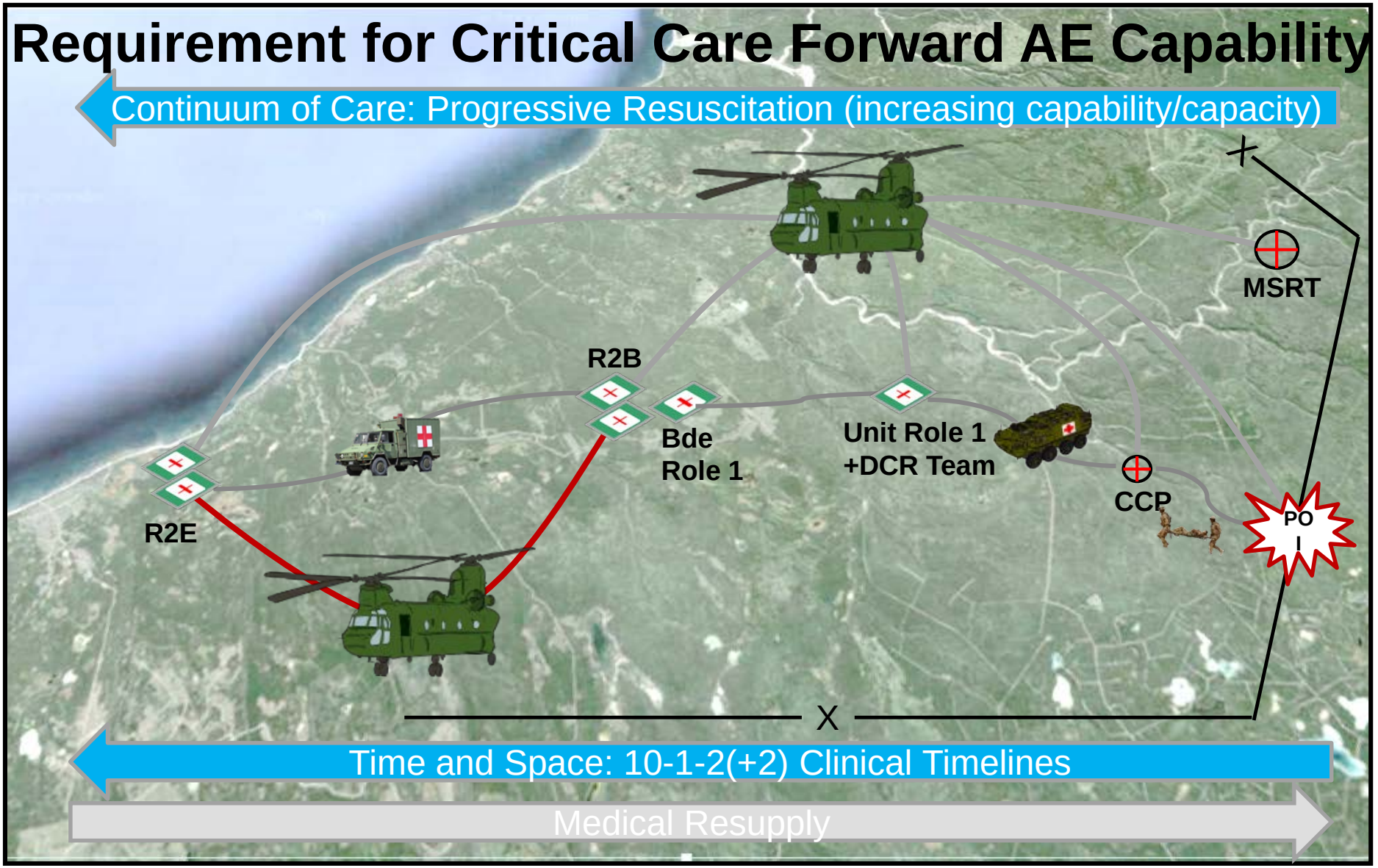
FAE Program Development

- On 10 July 17 the Chief of Defence Staff, General Vance directed that “the RCAF, with the support of Health Services, would **Force Develop and Force Generate a Forward AE structure that is capable, and scalable to meet National, Allied, Coalition, UN and NATO requirements**. This capability must be operationally ready by 1 August 2018.”

FAE Program Development

- CDS directive included:
  - **Phase 1** – develop initial capability, based on the CH147F platform
  - **Phase 2** - develop an enduring capability compatible with **all Tactical RW platforms**
  - Capability must be interoperable with NATO Allies

Requirement for Critical Care Forward AE Capability



CCP	Casualty Collection Point
MSRT	Mobile Surgical Resuscitation Team
DCR	Damage Control Resuscitation
POI	Point of Injury
R2B	Role 2 Basic
R2E	Role 2 Enhanced

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Role 1 MTF

Role 2 MTF

Forward Aeromedical Evacuation

Tactical Aeromedical Evacuation (short range)

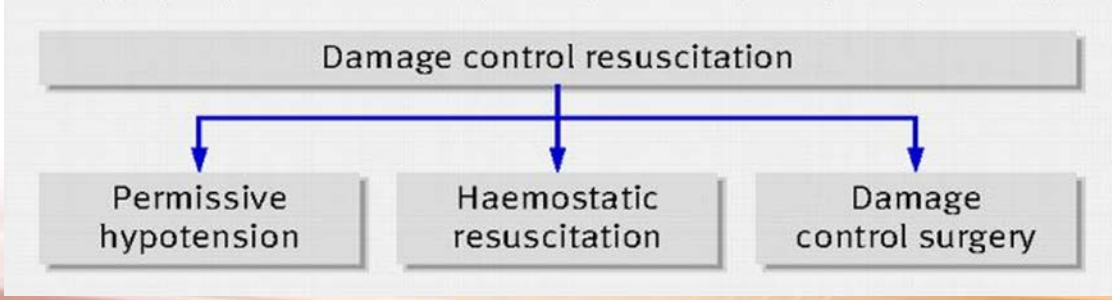
Ground Evacuation

FAE Program Development

- Capability Requirements
  - Must fulfil NATO Mandated 10:1:2 timelines for evacuation of casualties
  - Force protection assets will also be required
  - Chinook will also be expected to do other tasks in addition to FAE, including utility taskings and support to other operations
  - FAE capability development includes development of doctrine TTPs for RCAF

FAE Capability

- FAE medical capability must meet the goal of increased survival rates
- Must be scalable to meet the needs of the mission, from one Med Tech acting alone to a full Critical Care Air Transport Team
- Must be able to support MSRT and principle of provide progressively increasing levels of care
- Consider accepted Critical Care Practices
  - DCR
  - DCS



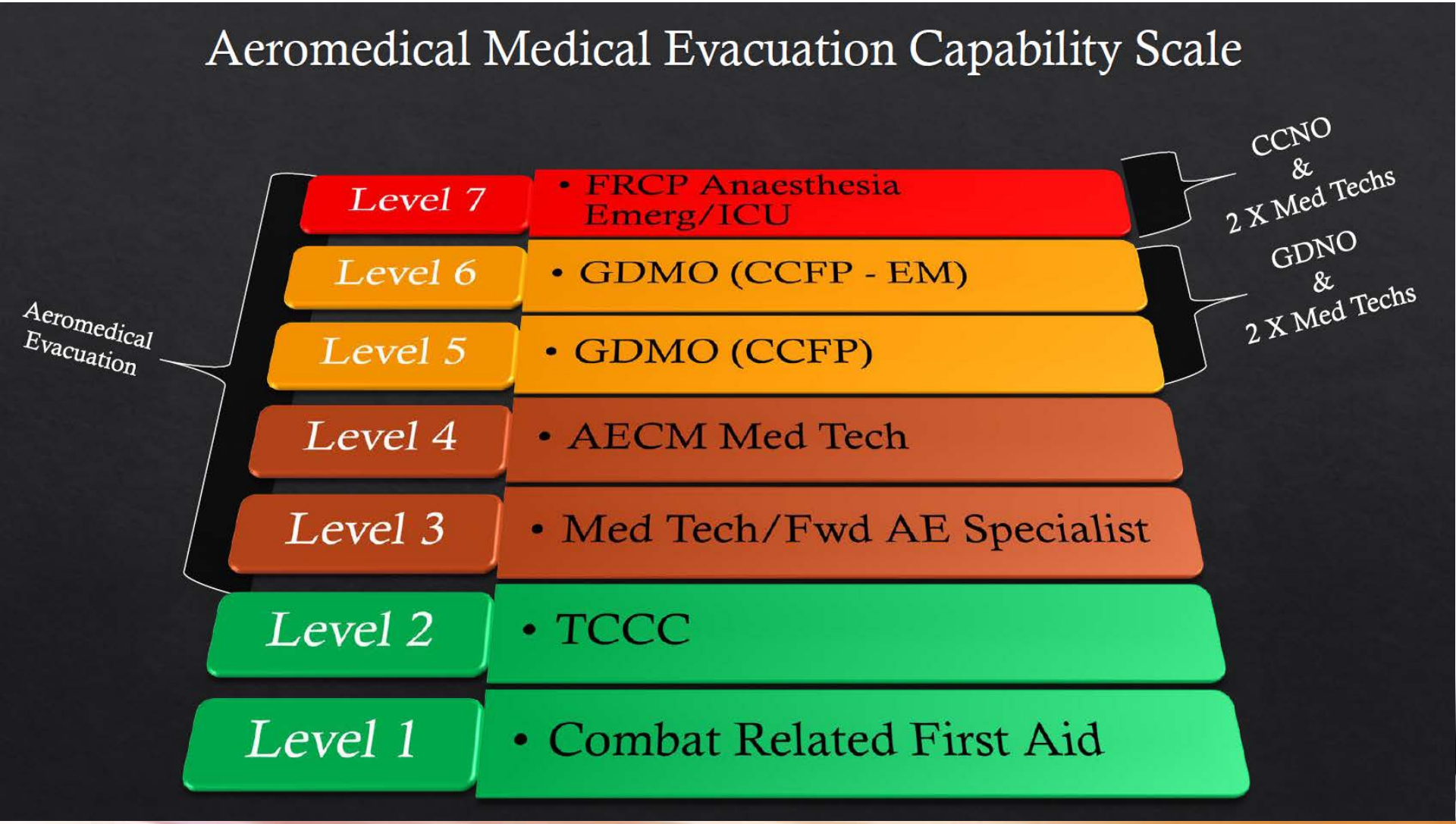
Medical Personnel and Skills

- Studies have suggested **improved mortality outcomes** in severely injured patients in combat settings **when evacuated by medics with ALS skills vs. medics with only BLS** training. (4, 5)
- A 2016 study showed **no difference in mortality when AE was staffed with EMT-P or physician vs. EMT-B** for the evacuation of casualties from the POI during Afghanistan Operations (6)
- A systematic review of controlled civilian studies published in 2009 suggested that the **addition of a physician to the PH team did improve outcomes**.(7)
- Two military specific, retrospective studies published since also **suggest improved outcomes with physicians** in a military setting. (8,9)
- Unfortunately, all studies are of lower quality, owing to their retrospective nature.

FAE Capability Assessment

- A Critical Care physician is required to move patients from MSRT
- A physician is a requirement of some of our NATO allies
- Capability will be scalable
- Type of physicians and nurses will be based on mission type and location

FAE Capability



CMERT Crew Composition

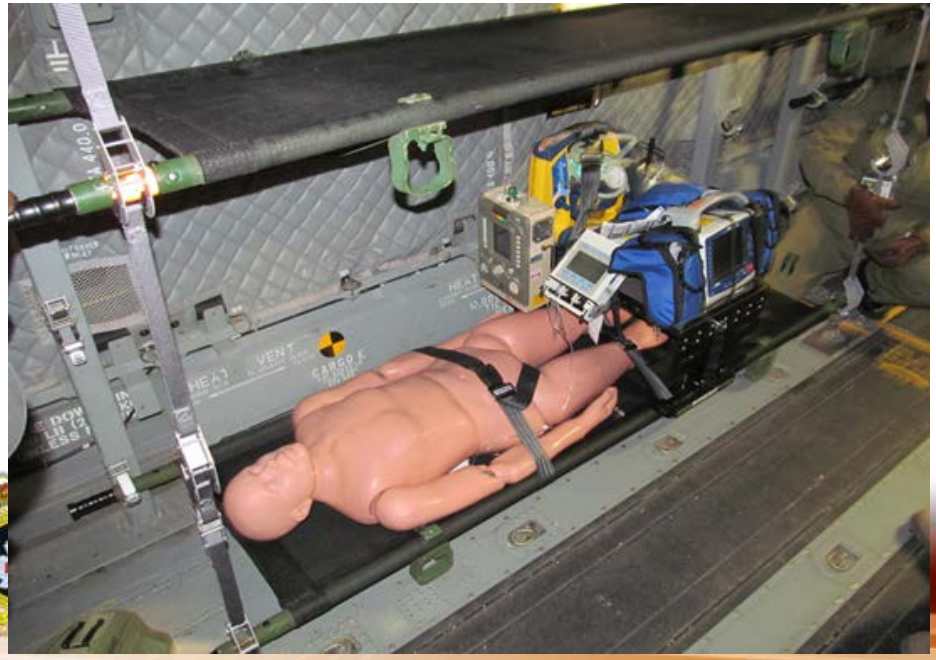
- Assuming a semi-permissive environment:
  - **2 for 1** CH-147F
    - Crew includes 2 x Plt, 1 x FE, 1 x LM, 1 x DG
  - **4 for 2** CH-146
    - Crew includes 2 x Plt, 1 x FE, 1 x DG
  - **Medical Crew includes**
    - 1 x Physician, 1 x Nurse, 2 x Med Techs

CMERT Force Employment CONOP

- Single MOB, 1st + 2nd line support in situ, 2nd line maintenance in Canada
- Standard combat radius limited to 100nm (CH146 limit) – May be mitigated through tactics
- ½ cabin available for patient care/movement
- ½ cabin available for utility tasks
- Ground force support required; LZ (CCP) must be secure

Medical Equipment Requirements

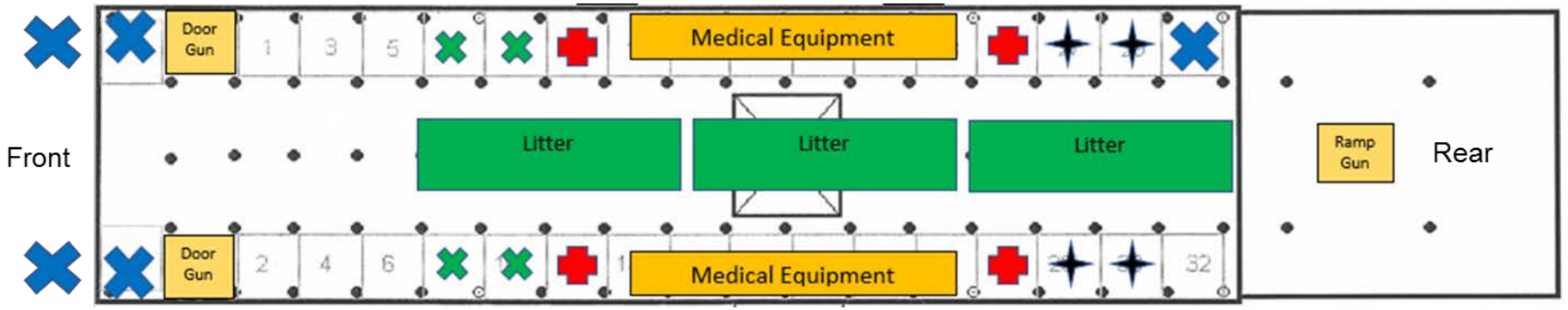
- Portable Patient Treatment Area (PPTA)
- Fluid containment floor system
- Wireless communications
- Advanced airway devices/support
- Ultrasound
- Blood fridge / cooler
- REBOA



Medical Equipment Challenges

- All equipment requires airworthiness certification
- ‘Wet floor’ design/installation
- Storage / maintenance / upgrading of equipment is logistically challenging and expensive
- Objective is international interoperability
- Blood products – complicated logistic tail
  - Fibrinogen concentrate
  - Freeze dried plasma
  - PRBC
- Oxygen – dangerous cargo, subject to several restrictions for flight

CMERT CONFIGURATION

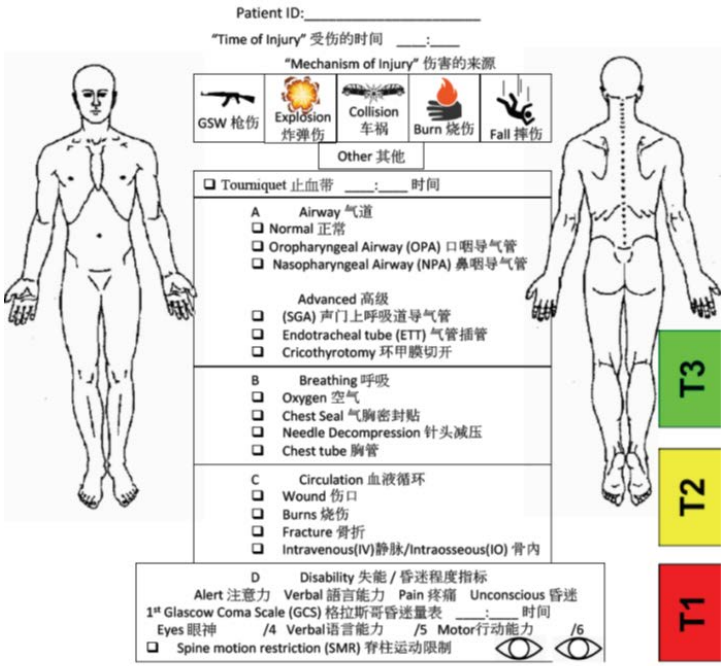


- Team Composition
  - – 5 x CH147F Aircrew
    - 2 x Pilot; 1 x FE; 1 x LM; 1 x DG
  - – 4 x Medical Crewmember
    - 1 x MO; 1 x CCNO; 2 x Med Tech
  - – 4 x Force Protection (TCCC)

- Patient Capacity
  - – 3 x Litter
  - – 4 x Ambulatory
  - – 7 x Escorts / Other Passengers

Tactics & Procedures

- C2
  - Connectivity To/From Avn Bn
  - Medical SME to facilitate: int assessment, mission acceptance, launch authority
- Documentation
  - 9-line, MIST & Handover
- SOP development
- Tactical environment ops
- Tac Avn
  - Flying tactics are best left to Tac Avn
  - Medical care is part of the mission set
  - AE crew must also participate in the operation of the aircraft



Operation PRESENCE

- The Canadian Armed Forces (CAF) is currently supporting the United Nations Multidimensional Integrated Stabilization Mission in Mali (MINUSMA)
- **The core mission is to provide MINUSMA with the 24/7 capability to medically evacuate UN forces by air**
- Approximately 250 CAF personnel in Gao
- 3 x CH-147F + 5 x CH-146
- When possible, the CAF provides other services:
  - transport troops, equipment, and supplies
  - logistics support

Roto 0 - Mission Statistics

- 01 Aug 18 – 31 Jan 19
- 8 missions flown
- 25 patients moved
  - Pri A x 6
  - Pri B x 8
  - Pri C x 11
- 23 military; 2 civilian
- Destination MTFs
  - CHN R2
  - FRA R2
  - NGA R2
  - DEU R1
  - NLD R1
- https://www.facebook.com/watch/?v=789179431435176

Roto 0 - Mission Statistics

Mechanism of Injury	Injuries Sustained	Interventions Provided
IED	Femur #	IV/IO
Small arms fire	Phalynx #	PRBC/FDP
Non-battle (hand)	Soft tissue lacerations	Crystalloid
Non-battle (eye)	Visceral lacerations	Pain control
Non-battle (back)	? Blast lung	Splinting
Environmental (heat)	Airway obstruction	
	Burns	
	Globe/orbit contusion	
	TBI	

- MOI and injuries sustained listed here do not correspond to any specific patient
- 10 expired after reaching DMTF

Lessons Learned

- Physician qualification (GDMO, EM +1, Critical Care)
- Nurse qualification (GDNO, CCNO)
- IV pumps may not be necessary
- Blood products have been valuable
- Intubation vs supraglotic airway
- Integration training important - minimum 7 days
- Communication challenges (3 different networks)
- ALSE requirements (helmets, vests)
- Physical Training / Strength
- Utilization of Force Pro for TCCC

Outstanding challenges

- Enduring concept design
- Force generation
- Selection process
- Maintenance of clinical skills
- Maintenance of air-specific qualifications and currencies

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Questions?

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