SABRN's 'System-of-Systems' Approach to Health Support for Underserved Communities

Jan 2026

Contents

Glossary

Term	Definition
AUSA 23	Association of the US Army 2023
BAMC	Brooke Army Medical Centre
BSX	Bengaluru Space Expo
DG(I)AFMS	Director General of the Indian Armed Forces Medical Services
DIU	Defense Innovation Unit
E-LifePod	'Emergency-Surgical-Critical Care' LifePods (for managing battle injuries)
EM	Electromagnetic (signature)
G4 Alliance	Global Alliance for Surgery, Obstetrics, Trauma & Anaesthesia
G-LifePods	'General Population' LifePods (non-militarized LifePods for civilian health support)
HL7-FHIR	Health Level 7 - Fast Healthcare Interoperability Resources
IAV 25	International Armed Vehicles 2025
ISC	India Space Congress 2023 & 2024
Chief of JTS	Chief of the Joint Trauma System
MedCDID	Medical Capabilities Development & Integration Directorate
MDM 24	Modern Day Marines 2024
MOSA	Modular Open Systems Architecture
N-LifePod	'Non-Emergency' LifePods (for managing non-battle injuries)

Term	Definition
NORSOCOM	Norwegian Special Operations Command
NSWC	Navy Special Warfare Command
PAAS	Platform-as-a-Service
PC-Pods	'Patient-Clearance' Pods (for casualty evacuation)
PODs	Prehospital Operating-Theatre Detachments
RACS	Royal Australasian College of Surgeons
RAP	Regimental Aid Post
RFID	Radio-Frequency Identification
RHU	Radioisotope Heating Unit
S-LifePods	'Support' LifePods (for providing logistic support necessary to enable function of E-LifePods & N-LifePods)
SAS 23	Sea Air Space 2023
SME	Small & Medium Enterprise
SOF Week 24	Special Operations Forces Week 2024
SXSW 25	South by South West 2025
TAMU	Texas Agricultural & Manufacturing University
TLR	Technology Readiness Levels
USASOC	US Army Special Operations Command

A. Background

The SABRN Group are operational subsidiaries of SABRN Tech, an Australian veteran-founded company developing solutions for healthcare and planetary health. These SABRN subsidiaries have a focus on providing health support for our civilian and uniformed populations.

Founded by Prof. Abhilash Chandra (a General & Vascular surgeon, soldier [26-years in the Australian Army and counting], and academic), SABRN leverages advanced technologies and international collaborations to address pressing global challenges.

SABRN's mission is to make healthcare available, accessible, and affordable to all underserved people around the world, especially those in remote, austere, hostile, overwhelmed and combat environments.

SABRN has a strong commitment in developing healthcare resilience between civilian and Defense organisations, especially with respect to interoperability and interchangeability during natural and man-made disasters (including conflict and terrorism).

SABRN's flagship initiatives, the patented medical and surgical PODs, are compact and modular systems designed to enhance casualty evacuation and stabilization. They are domain-agnostic, vehicle-agnostic and scalable, making them more effective in disasters.

From the PC-Pods (for patient clearance to-and-from various rendezvous points, including the point-of-injury) to the LifePods (that enables pre-hospital, surgical and post-operative critical care provision), these PODs represent a shift from traditional healthcare delivery to a patient-centric, mobile 'Platform-as-a-Service' approach.

SABRN is integrating technologies from many international Micro, Small & Medium Enterprises (mSMEs) to achieve enhanced medical and non-medical capabilities.

Additionally, SABRN has a focus on aligning with global environmental goals by creating circular economies. By integrating healthcare, sustainability, and innovation, SABRN is working on solutions to complex challenges, fostering impact in underserved communities worldwide.

B 1. Problem #1: Climate

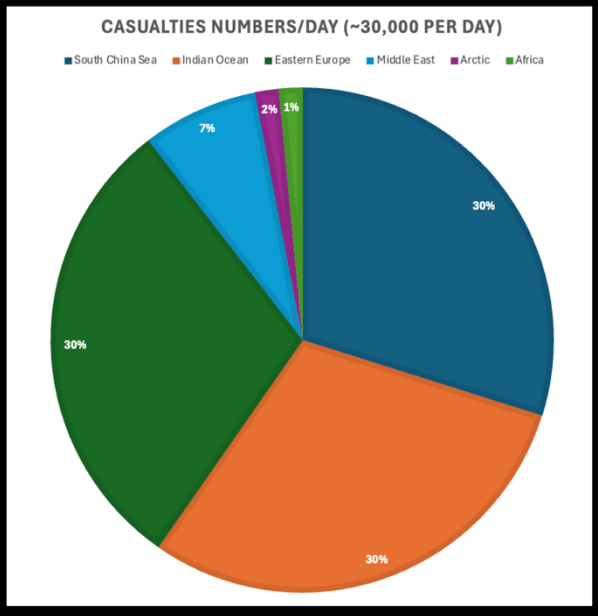
- Progression of global warming (now earth is 1.5ºC above pre-industrial levels)
- ↑ Natural & Man-made Disasters
- Isolated Rural & Remote Communities
- Hazardous Occupations
- Overwhelmed Environments
- Food & water shortages → ↑ conflicts
- New diseases

- Climate changes will impact both civilian and Defense populations.
- Consequently, demands on civilian & combat health support will increase significantly.
- Better coordination between civilian & combat health support systems is critical

B 2. Problem #2: War

Significant risk of CBRN conflict

Estimated regional casualty if WW III occurs



In a World War III scenario:

If conventional warfare:
1,500–11,000 casualties daily.

If limited nuclear warfare:
50,000–500,000 casualties daily.

If full-scale nuclear warfare:
Millions of casualties in the first few days, with long-term devastation.

*Extrapolated from WW II numbers

B 3. Problem #3: MIL-CIV Coop

Need For Military-Civilian Cooperation, Coordination And Coexistence In Healthcare Delivery During Conflict & Peace

- Current Concerns
  - Insufficient surge capacity & capability Lack of integrated planning
  - No unified incident command structures
  - Legal, ethical & policy barriers
  - Logistics limitations
  - Medical evacuation bottlenecks
  - Personnel shortages
  - Training gaps
  - Supply chain fragility
  - Public perception
  - Political hesitation
  - Inadequate use of innovation & technology

C 1. SABRN: Purpose

SABRN Goal:
Make healthcare accessible & affordable for all underserved communities & people

Multiple capability gaps identified in both Civilian & Defense Healthcare Systems

A. Insufficient healthcare infrastructure

B. Insufficient frontline health workers

C. Insufficient healthcare specialists

SABRN Approach

A. Alter paradigm (adapt 'hospital-to-patient' model instead of traditional 'patient-to-hospital' approach with the SABRN PODs)
B. **Integrate** modern technologies to create a system-of-systems effect within new model, and
C. Use updated model to complement existing systems

C 2. SABRN: UVP

SABRN's Unique Value Proposition:

SABRN aims to improve Patient Survival and accelerate Patient Recovery by:

1. Closing the gap between injury and intervention for stabilisation and life-saving interventions as close to the point-of-presentation,

&

2. Incorporating preventative health protocols for chronic disease and non-communicable disease management

C 2. SABRN: Process

SABRN aims to meet these objectives by taking a 'system-of-systems' approach:

1. Scaling Number of Healthcare Infrastructure (with SABRN PODs)

2. Scaling Impact of Healthcare Specialists (with merged-reality telementoring)

3. Scaling Efficiency of Frontline Workers (with immersive technologies)

D. SABRN PODs

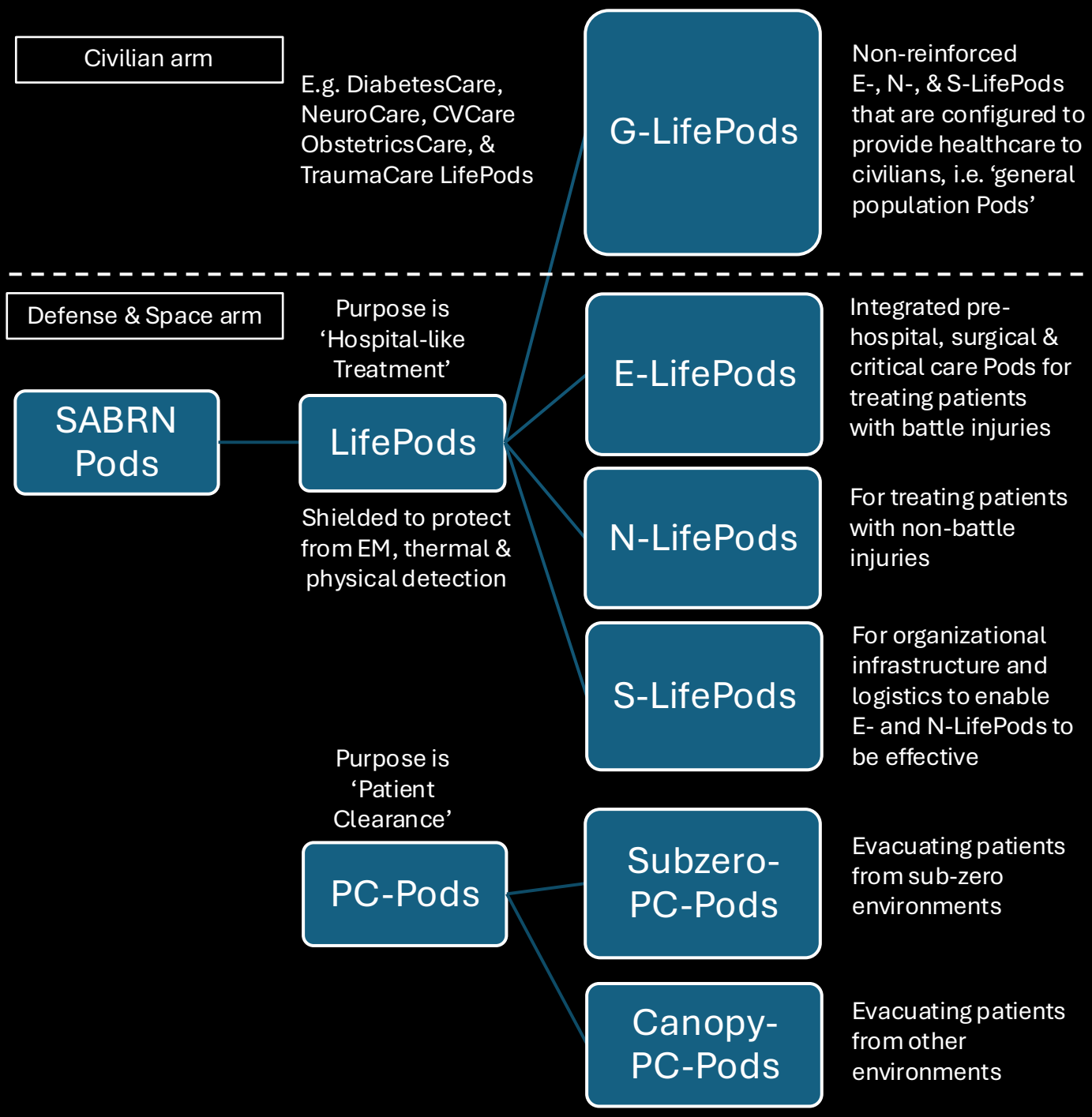
SABRN Pods will help scale healthcare infrastructure because they are:

- Compact & Containerized
- Expeditionary Medical & Surgical Capabilities
- That are integrated with medical and non-medical technologies,
- Are de-centralized & geographically unconstrained
- And can act as “Mini-Mobile Field Hospitals”

SABRN is building a digitally inter-connected transportable ‘hospital’ with no geographic constraints that can complement current civilian and combat health support capabilities

D. SABRN POD Categories

There are two main categories of SABRN PODs: 1) 'Infirmary' LifePods; & 2) 'Patient Clearance' PC-Pods
Each category has several sub-categories

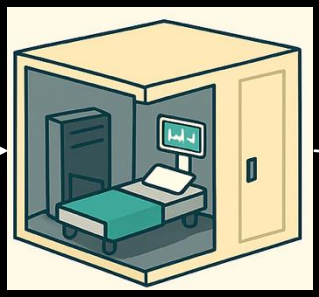


D. SABRN POD Modularity

International Patent
WO 2023/178388 A1

‘Cube-in-a-Cube’ Pods
have multiple levels of modularity

Micro-modularity: Physical modularity (panels)

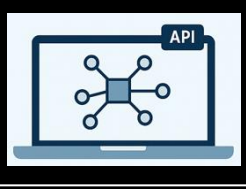


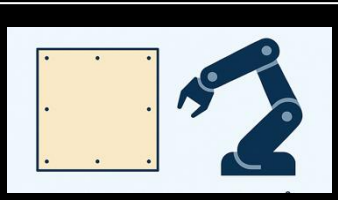
Mini-modularity: Functional modularity (interchangeable interior systems)

Macro-modularity: Systemic modularity (Multi-Pod networking for field hospitals)

Midi-modularity: Mission modularity (Pod level mission reconfiguration)

Digital-modularity: APR-driven platforms; Modular software layers (EMR, asset tracking); Secure, upgradable & connected





Manufacturing-modularity: Panelized construction (1.0m x 1.2m); Robotics-enabled assembly; Local sourcing & circularity; Sovereign production; Dual-use; Field repair

D 1. PC-Pods

‘Patient Clearance’ PC-Pods enable casualty evacuation from point-of-injury or from one rendezvous point to the next

PC-Pods:

Can be transported by →	1. Uncrewed vehicles (e.g. UGV, UAV, USV, UUV) &/or 2. Crewed vehicles (e.g. snow mobiles, trailers, pickup trucks etc.)
Will have on-board →	oxygen, monitoring, heat, blood products & communications
Can be sealed & pressurized	
Two variants: 1) Subzero-PC-Pods; & 2) Canopy-PC-Pods	

D 1a. Subzero-PC-Pods

International Patent
WO 2023/178388 A1

Pre-α prototype developed in Canberra, α-prototype being developed in India

Heavy insulation within walls to ensure ~50°C temperature differential

Radioisotope heating unit (RHU) incorporated to maintain battery at operational temperature

Future testing planned in India (Himalayas), and possibly in US, Canada, and Europe

Concept outlined in Arctic Challenge at Camp Rødsmoen, Norway with USSOCOM & NORSOCOM in Jan 25

Prototype in development

D 1b. Canopy-PC-Pods

International Patent
WO 2023/178388 A1

Pre-α-prototype currently being built in Australia (Brisbane, Canberra, and Adelaide)

Every Canopy-PC-Pod is a "CASEVAC evacuation system" that complements traditional ambulances

Design:

- Modular Open Systems Architecture (MOSA)
- 2.1 m (H) x 0.9m (W) x 0.9m (H)
- Evac by crewed or uncrewed systems
- Land: Pickup truck, trailer, train, UGV
- Maritime: Boat, USV
- Air: Planes, helicopter, UAV
- Littoral: Amphibious vehicles, hovercrafts

Compatible with civilian and military vehicles

D 2. ‘Infirmary’ LifePods

International Patent
WO 2023/178388 A1

Based around the ‘SABRN Cube-in-a-Cube’ MOSA design

Cuboid shape:
3.0m (L) x 2.4m (W) x 2.4m (H)

- Modular @ macro-, midi-, mini- and micro-levels
- Exoskeleton = Constant size
- Endoskeleton = Changeable
- Customizable & Configurable
- Reinforced = Bunkerable

Three ‘Defense’ LifePods based on SABRN Cube:

- Small physical footprint
- Thermal cloaking
- EM shielded

1. E-LifePods (E=Emergency)
2. N-LifePods (N=Non-Emergency)
3. S-LifePods (S=Support)

One ‘Civilian’ LifePod based on SABRN Cube:

- Can be militarized if needed

1. G-LifePods (G=General Population)

D 2a. E-LifePods

"~25% of KIA in Middle-East conflicts were potentially preventable" Eastridge *et al*. (2012). *J Trauma Acute Care Surg*: 73(6). S5. 431-7

International Patent
WO 2023/178388 A1

Image is of pre-alpha prototype – scale 1:1

Integrated ED, OT, & ICU

- Pre-hospital capability +
- Surgical capability +
  - ➢ Damage Control Surgery (Including Neuro, Vascular & Ophthalmic)
- Critical care capability +
  - ➢ For prolonged casualty care
- Bunker-able & transportable

Human & K9 treatment capability

D 2b. N-LifePods

"~25% of active-duty service members have signs of a mental health condition" Kessler *et al*. (2014). *JAMA Psychiatry*. 2014;71(5): 504-513.

International Patent
WO 2023/178388 A1

Image is of pre-alpha prototype – scale 1:1

For Disease & Non-Battle Injuries (to maximize Return-To-Duty & War-Fighting Capability)

Multiple variants:

Medical	Dental	Allied Health	Mental Health
• RAP, Consulting room, Isolation for infectious agents, Ward capacity		• Physiotherapy, Rehabilitation, Occupational therapy	• Psychological therapy

D 2c. S-LifePods

International Patent
WO 2023/178388 A1

Enables E-LifePods and N-LifePods by providing the logistics infrastructure

Integrates with military logistics

Multiple variants:

- C5
- Supply chain management
- Waste management
- Auxillary power
- Water purification
- 3D printing

D 3. G-LifePods

International Patent
WO 2023/178388 A1

Non-militarized ‘General Population’ LifePods

Healthcare components same

Based on configurations of SABRN Cubes (one, two, three, four or more Cubes to make G-LifePods)

Supports people from remote, austere, hostile, and overwhelmed environments

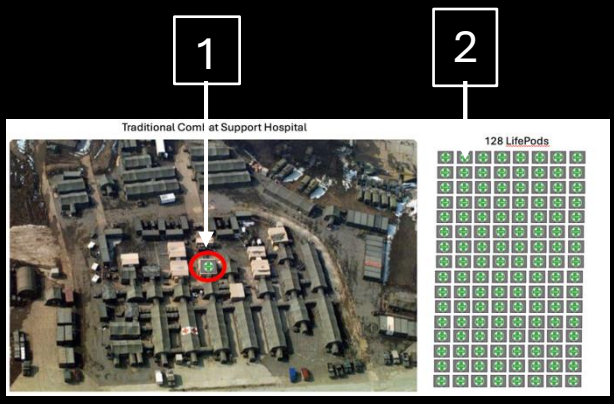
Multiple variants of G-LifePods (pilots planned for 2026-27):

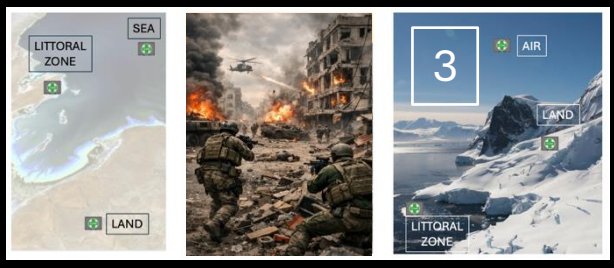
- DiabetesCare (pilots in Australia/Fiji)
- CardiovascularCare (pilot in Sri Lanka)
- ObsCare (pilot in Ghana/Kenya)
- TraumaCare (pilot in India)
- NeurocCare (pilot in Indonesia)

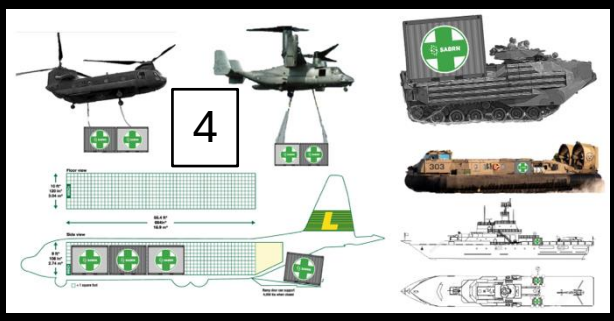
Other future variants:
- Rehabilitation
- Dental
- Chemotherapy
- Dialysis

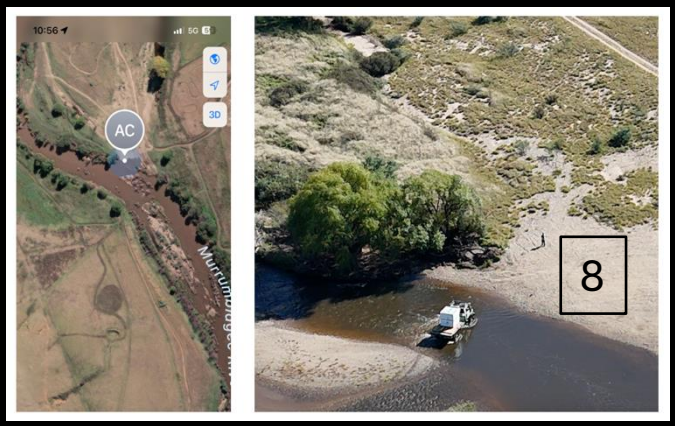
D 4. Objectives: Non-Clinical

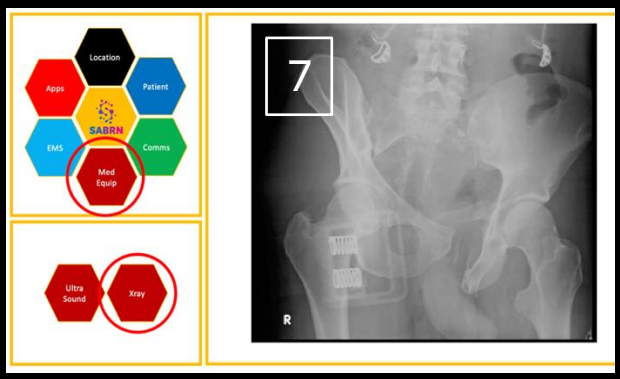
1. Compact
2. Scalable
3. Domain-agnostic
4. Vehicle-agnostic
5. Geographically unconstrained
6. Bunkered/Bermed
7. Language-agnostic dashboard & OS
8. Enhanced logistics with QR Code, RFID & GeoJSON mapping











Enables ‘just-in-time’ delivery of resources to remote & austere locations using RFID/Bar coding/QR Coding and GeoJSON format for mapping Geospatial data

D 5. Objectives: Clinical

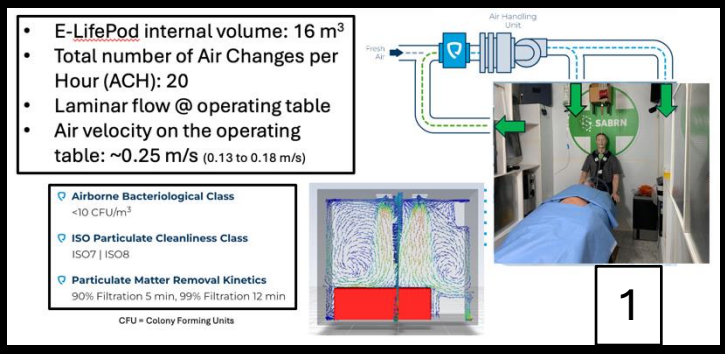
1. Air decontamination (surgical sterility)

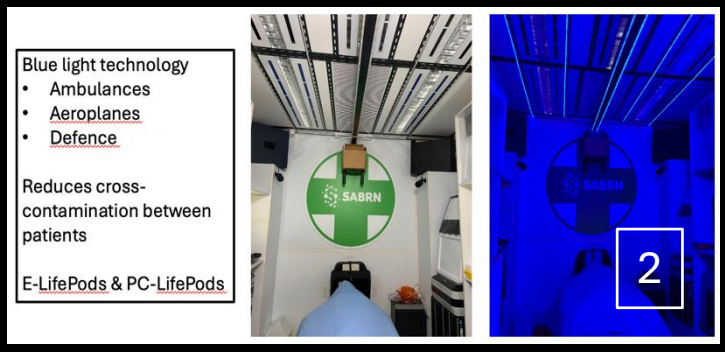
2. Surface decontamination

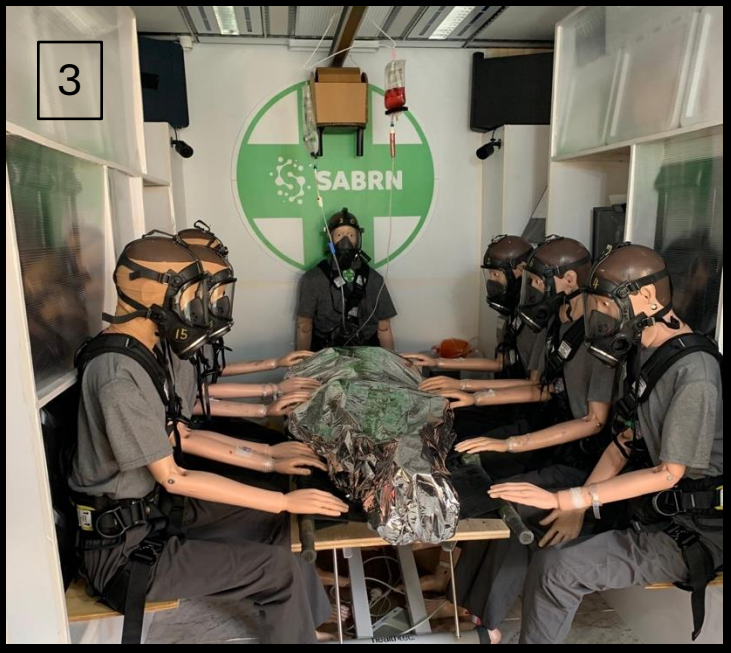
3. Counter-biological, chemical, nuclear & radiological threats

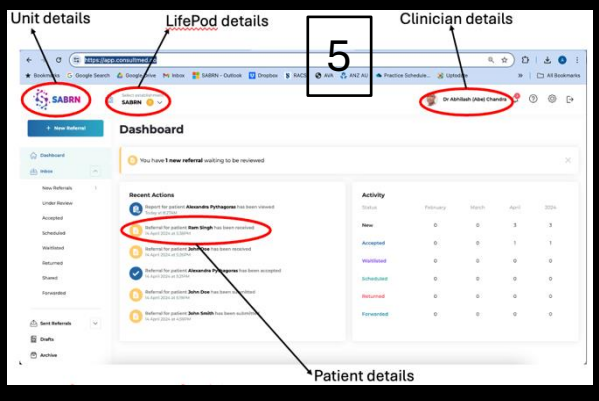
4. Enhanced diagnostics (XR, CT)

5. HL7-FHIR compliant Electronic Medical Records







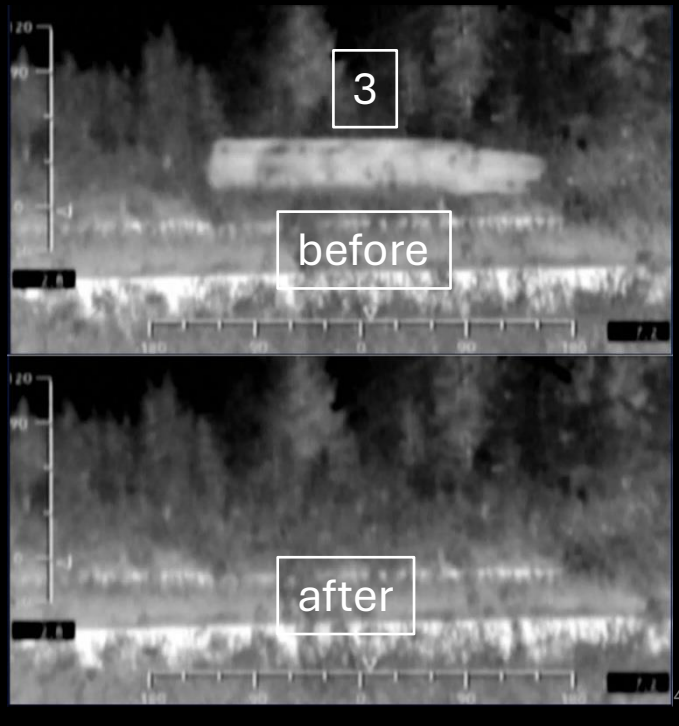


D 6. Objectives: Defense

1. Electro-magnetic signature cloaking (hard-wall +/- soft-wall Faraday cage)

2. Electro-magnetic signature deception (spoofing devices)

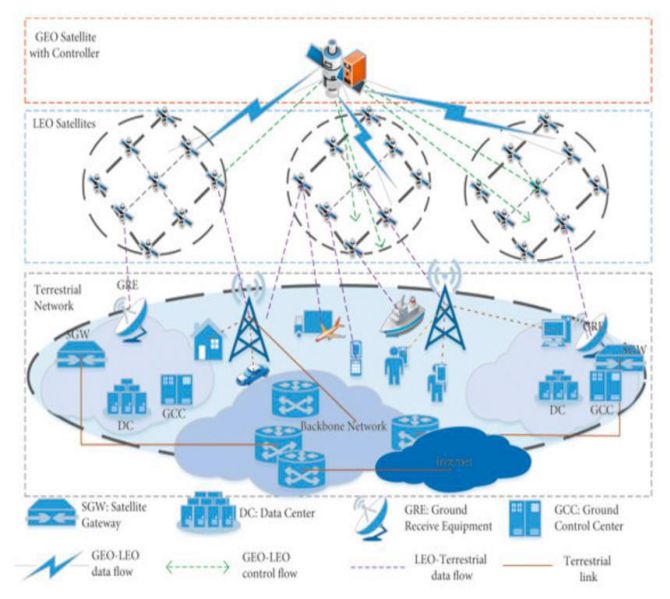
3. Thermal signature cloaking (NB: images **NOT** of SABRN Pods)



4. Ballistics-proof +/- radiation/nuclear resilient replacable panels

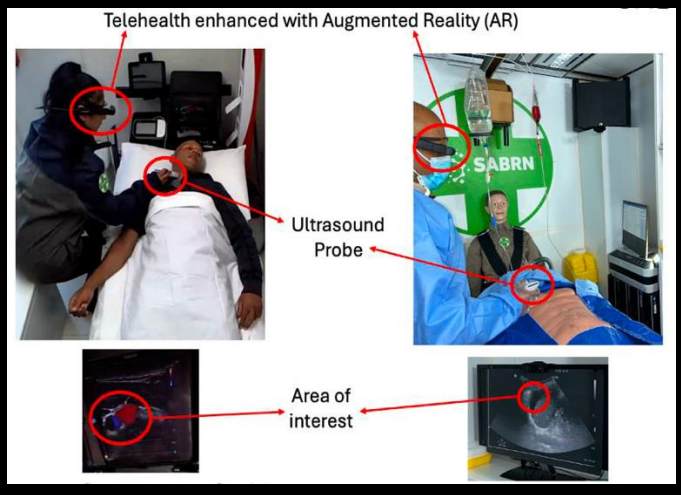
E. Scaling Specialists

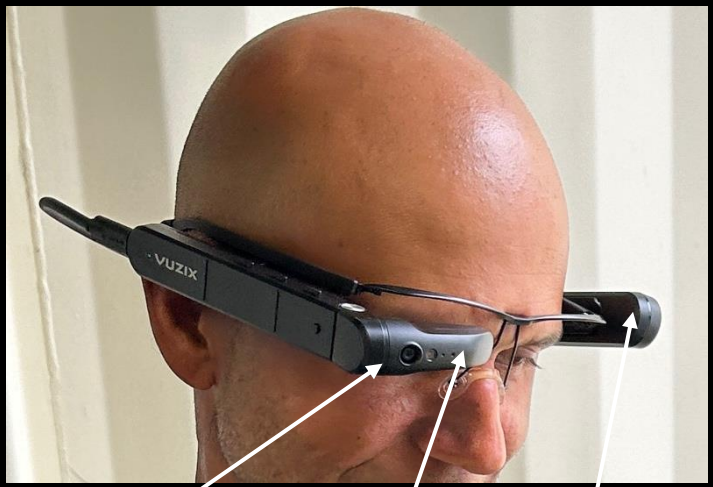
Communication Resilience (LEO, MEO, GEO satellites)



Two-way telementoring in a graded system:

1. Low-power two-way messaging (9-liners)
2. Audio-only
3. Audio & Video
4. Merged-reality enhanced audio-video

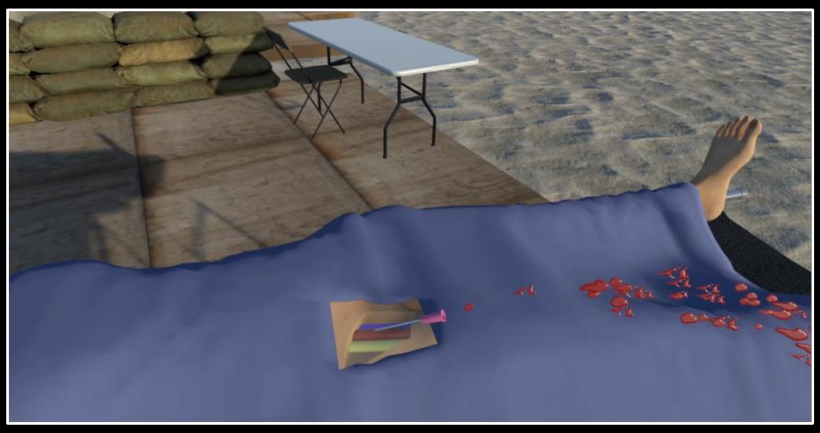




camera screen battery

F. Scaling Frontline Workers

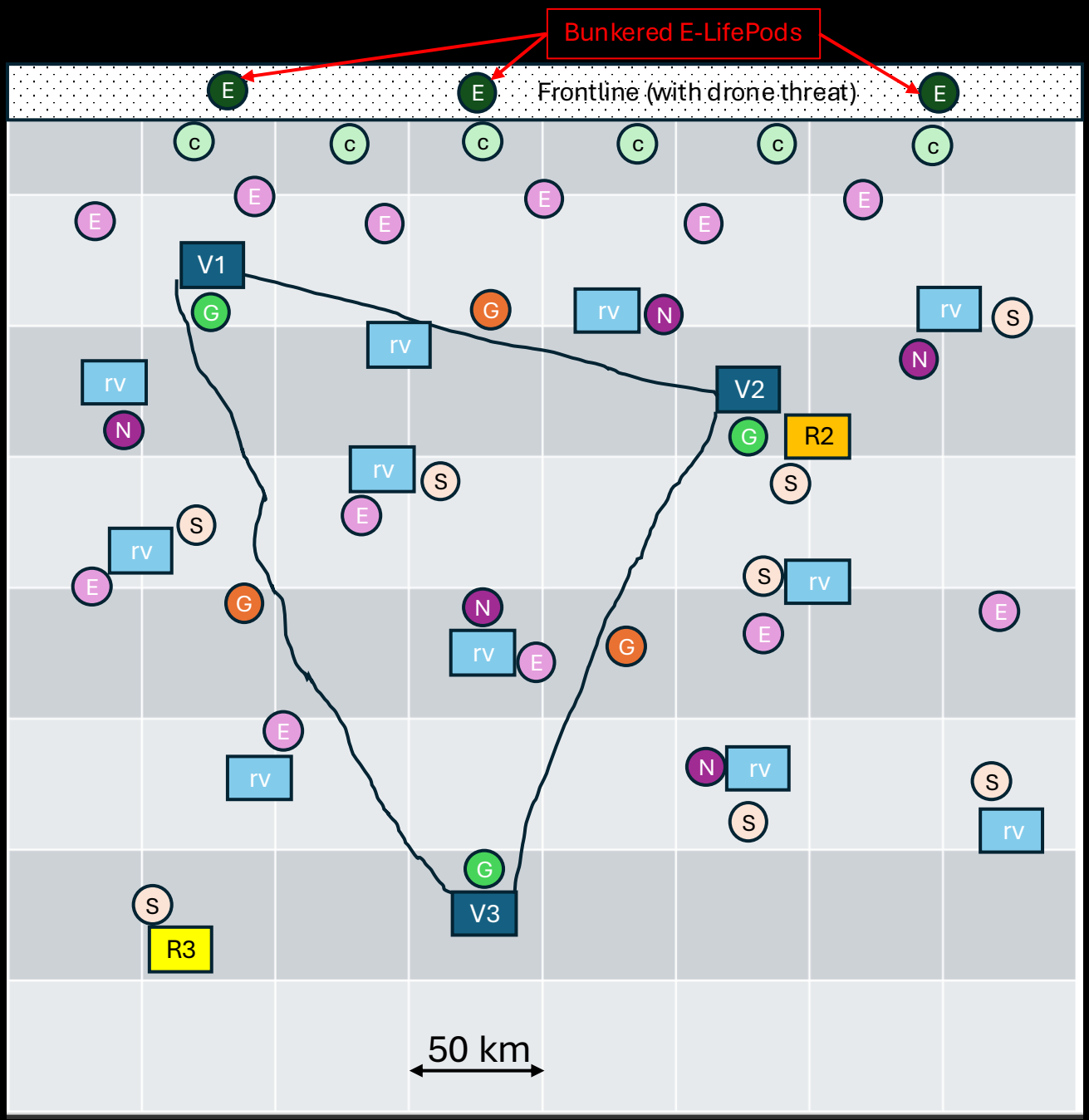
‘Just-in-time’ & ‘just-in-case’ training with Virtual Reality, Augmented Reality, and 3D-printed surgical mannequins



VR headset

- Cheap & accessible
- Training under stress
- Deep Reinforcement Learning principles
- Use of ‘cartridges’
- Rehearsals & tactile/ haptic feedback
- Formative-summative assessments

G. CIV-MIL CONOPS



V	Village	rv	Rendezvous points
G	G-LifePod (chronic health focus)	N	Transportable N-LifePods
G	G-LifePods (road-trauma focus)	S	Transportable S-LifePods
c	Canopy-PC-Pods (on UGVs)	R2	Role 2 facility
E	Transportable E-LifePods	R3	Role 3 facility

H. Progress To Date

In Australia:
- 26+ years with Army
- Part of Defense Trailblazer
- Recipient-Spitfire Association Australia Memorial Defense Fellowship 2025
- Canopy PC-Pod pre-α–prototype build in Brisbane/Canberra (25)
- PC-Pod prototype build in Adelaide (25)
- LifePod prototype (Ade - 25)
- Demo to 1-CHC medics (25)
- AsiaLink Business Prog (26)

In UK & Europe:
- Established SABRN UK at Uni of Warwick Innovation Centre
- Association with Uni of Birmingham and Warwick
- Subzero E-LifePod α–prototype build to be in WMG
- At Eurosartory 24 & IAV 25
- Attended Deployed Medical & Healthcare Delivery Conf 25
- USSOCOM Tech Exp 25-1 in Norway (Jan 25)
- DSEI London (Sep 25)

In Japan:
- Presented at Osaka World Expo 25 for Austrade/DFAT
- Associated with Uni of Osaka Disaster Management Unit

In India:
- Presented at BSX 22 & 24, ISC 23 & 24, G20 Space Economy Leaders Forum 23
- Attended Def-Sat 24 & 25
- Engagements with DG(I)AFMS
- Subzero-PC-Pod α–prototype build in Delhi
- Associations with T-Hub & T-Works for manufacturing, and IIT-Madras
- LifePod α–prototype to be built in Hyderabad
- Formed SABRN Health India
- Community Disaster Management Conference & Workshop (Jun 25)

In US:
- Austrade delegate to SAS23, AUSA23, MDM24, SOF Week 24
- Several engagements with JTS & MedCDID
- Associations with BAMC/TAMU
- CBRN-resilient E-LifePod α–prototype build to be at TAMU
- SABRN USA Inc established
- Attended SXSW DIU Capital Factory (Mar 25), NDMA Pilot Consortium (Jun 25)
- Finalist @ MOSA Summit Innovation Challenge (25)
- Babson College Global Surgery Slingshot Program 2026

I 1. Traction

Feedback from USSOCOM Technical Experimentation 25-1 Arctic Experimentation for SABRN (by 4 assessors; Jan 2025):

- [Navy Special Warfare Command (NSWC)]: The **LifePods by SABRN … could represent a significant leap forward** in personal shelter and **life support technology**, offering **unmatched versatility and durability for use in extreme and high-risk environments**. With applications spanning military and disaster relief these pods could provide comprehensive support systems that ensure the safety and comfort of users in some of the most challenging conditions. While the technology is early TRL 3, ongoing innovation in energy efficiency, portability, and sustainability could further enhance the performance and long-term applicability of the Life Pods.

- [US Army Special Operations Command (USASOC)]: System appears tailored to military use. However, possible value in civil/natural disaster response. **Recommend further discussion with DoD experts**.

- [US Army Special Operations Command (USASOC)]: The developer is not currently working with the US DoD on the technology. Due to its ability to support partner forces and soldiers in austere environments I believe **USSOCOM should take a deeper look at the technology's applicability to the modern battlefield**.

- [US Army Special Operations Command (USASOC)]: **This product would be useful to a forward surgical team**.

I 2. Traction

‘Case-studies’ planned in 2026:

- Regional & Remote South Australia (SA)
  - ‘Surrogate’ DiabetesCare LifePod Pilot in Eyre Peninsula with Adelaide University and DiabetesSA (2026) for remote and indigenous SA populations.
- Western Pacific Islands
  - DiabetesCare LifePods Pilots in Fiji, Samoa & Tonga with RACS & DFAT (late 2026-2027) to address at risk isolated resource-poor populations.
- Ghana & Kenya
  - ObsCare LifePods Pilot (late 2026) with Babson College Global Surgery Slingshot Program 2026 to address high maternal mortality rates in Africa secondary to post partum haemorrhage.
- Sri Lanka
  - CVCare LifePods Pilot in Kandy (late 2026-2027) to address high cardiovascular-related morbidity and mortality in South Indians.
- India
  - TraumaCare LifePod Pilot in Tamil Nadu (late 2026-2027) to address high road-traffic accident-related mortality in India.
- Indonesia
  - NeuroCare LifePods Pilot in Jakarta (late 2026-2027) to address high ischaemic stroke and traumatic brain injury rates in in Indonesia.
- Northern Australia
  - E-LifePod & PC-Pod demonstration for EX PITCH BLACK 2026 in Darwin (mid 2026)

J. Development Roadmap

Pre-2024

- Trademark approved
- Patent filed
- Pre-alpha prototypes

2025

- Alpha-prototypes test & adjust
  - 3-HB Dec 2025 (Australia)
  - Texas A&M University for US DoD (USA)
  - T-Works for IAFMS (India)
  - University of Warwick for UK MOD (UK)
- Regulatory Requirements

2026

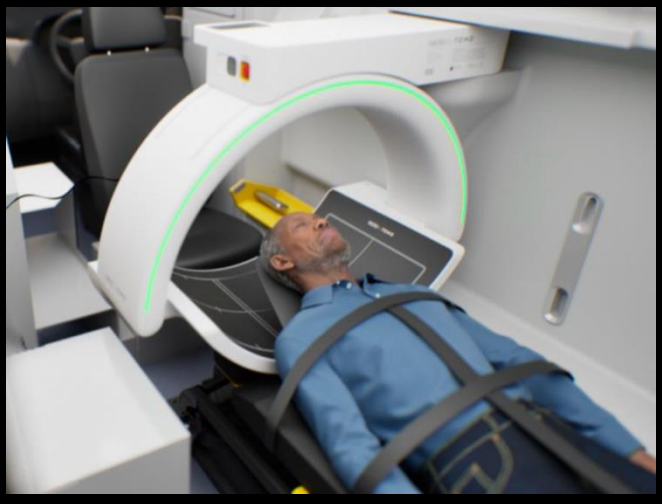
- IP-licensing
- ISO Certification
- Pilots & Case Studies

2027+

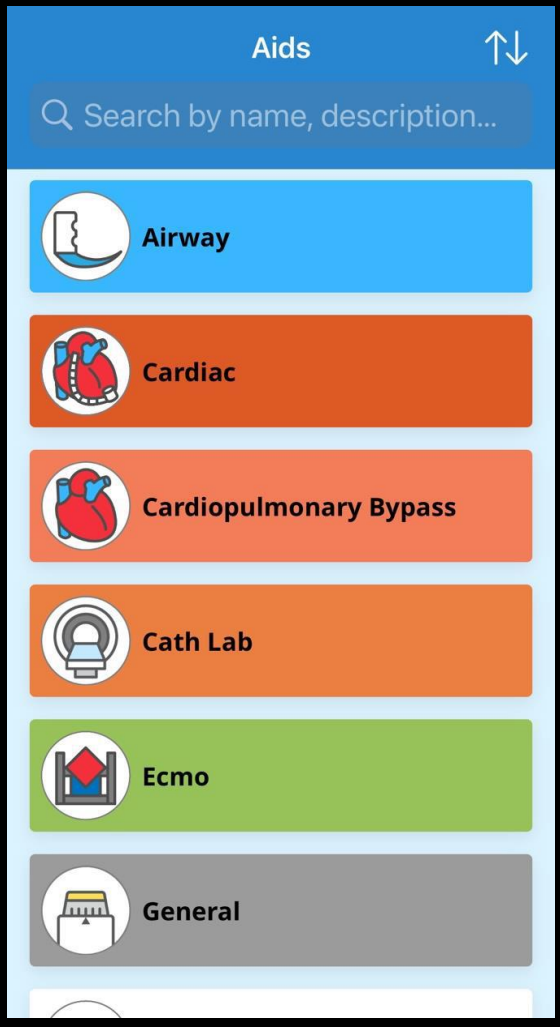
- Commercialization
- Indigenize and scale in multiple countries

K. Future R&D

Advanced diagnostics



Offline AI assistance for frontline health workers

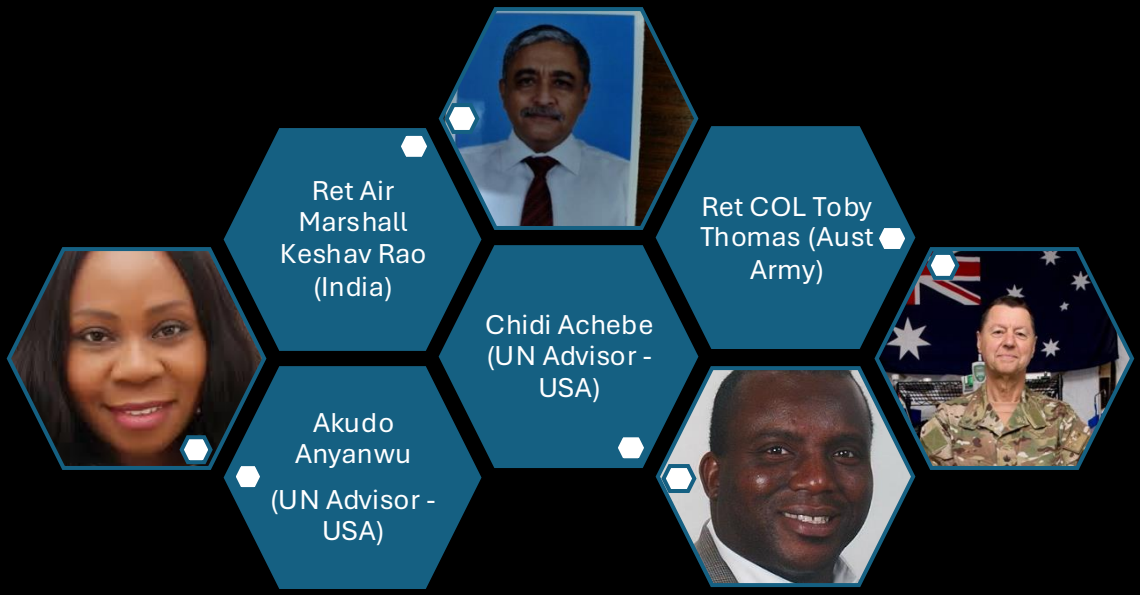


Incorporating robotics (including human-dependent & possibly human-independent robotic surgery

'Space' Healthcare provision for humans on extra-terrestrial environments

L. Executive Team

M. Advisory Team



N. Collaborators

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