



MHSRS 2026

Autonomous CASEVAC and Resupply Using UGVs



INNOVATIVE SOLUTIONS
TO COMPLEX PROBLEMS

Greg Rule, P.E.



Disclaimer

- ▶ The views presented here are the private views of the author(s) and are not to be construed as the official views or policies of the U.S. Department of Defense or Applied Research Associates, Inc.
- ▶ This material is based on research sponsored by ARA, Inc under an Internal Research and Development project. The U.S. Government is authorized to reproduce and distribute reprints for Governmental purposes notwithstanding any copyright notation thereon
- ▶ Opinions, interpretations, conclusions and recommendations are those of the authors and are not necessarily endorsed by the Department of Defense
- ▶ We report no conflicts of interest

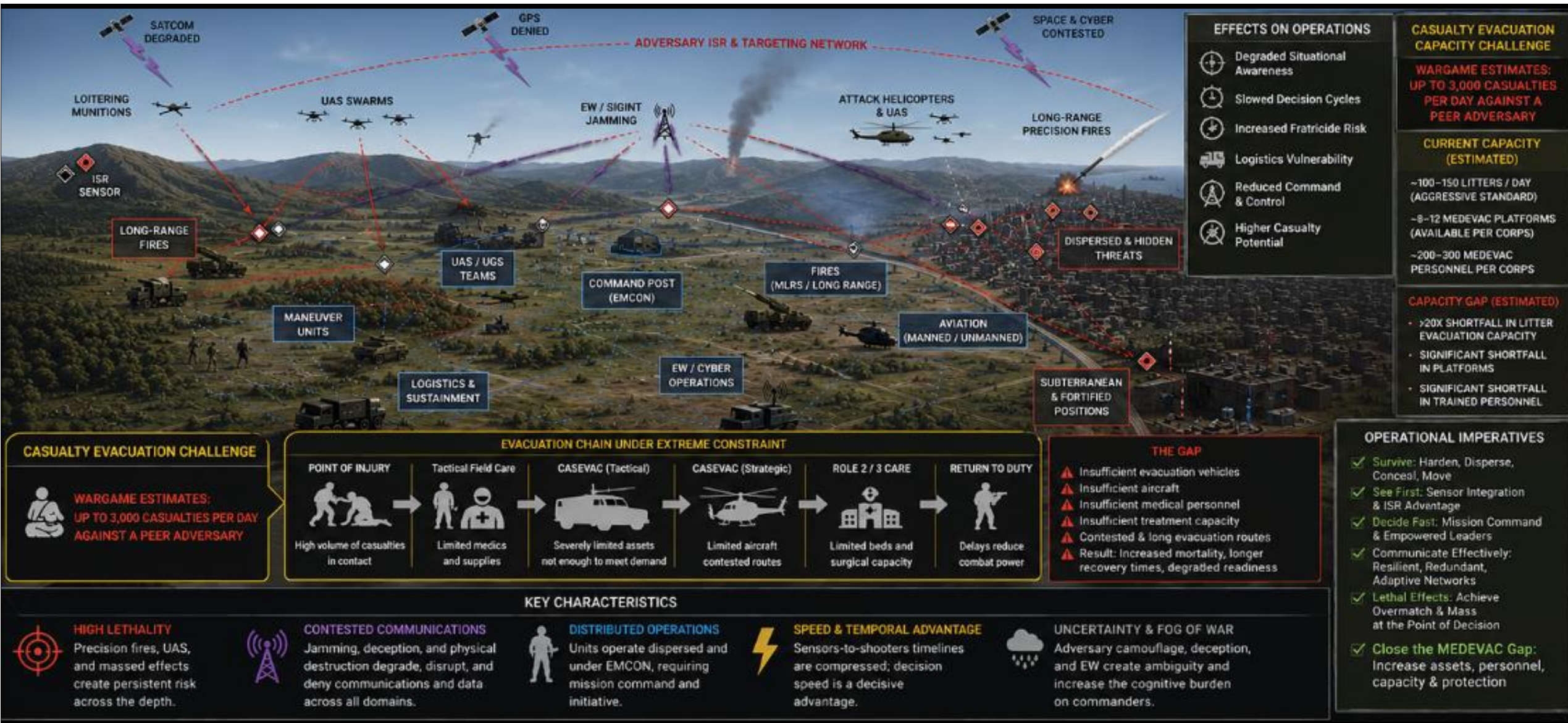
Agenda

- ▶ The Modern Battlefield
- ▶ CASEVAC Requirements
- ▶ Autonomous CASEVAC CONOPS
- ▶ ARA's Autonomous CASEVAC Solution
- ▶ Conclusion



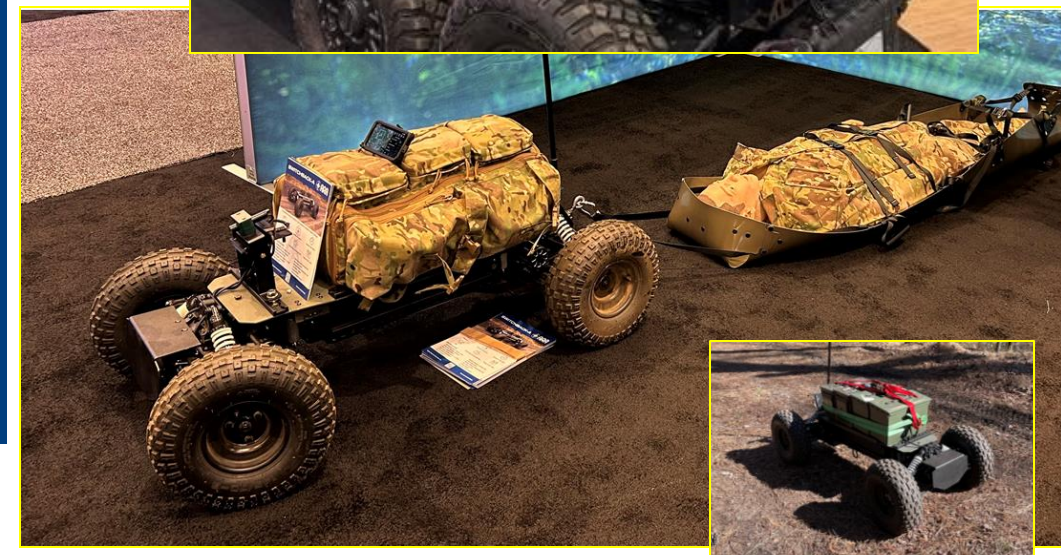


The Modern Battlefield – Transparent and Lethal

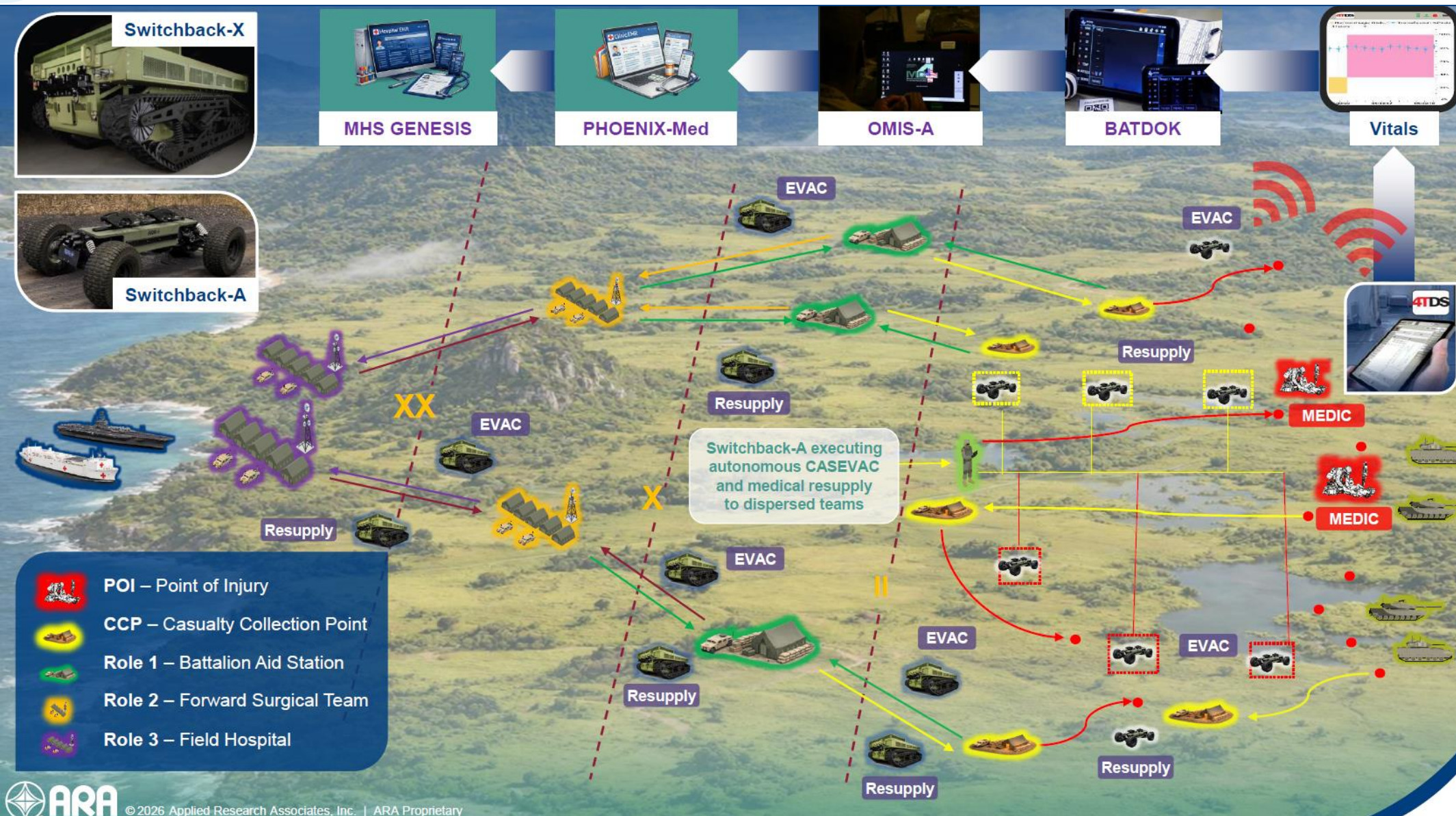


CASEVAC Requirements

- ▶ Tow >300lbs for casualty and gear
- ▶ Patient stabilization and monitoring
- ▶ Environmental monitoring and protection
- ▶ Integrated with NGC2 & TAK/Nett Warrior for communications
- ▶ Limited autonomy when communications are lost
- ▶ Medical data management



Autonomous CASEVAC CONOPS



- ▶ Multipurpose systems are key
- ▶ Cost is a real constraint
- ▶ Enabling one person to manage multiple extractions is a force multiplier
- ▶ Many smaller units reduces risk compared to a few larger platforms
- ▶ Capacity and need grow from POI to Role 3



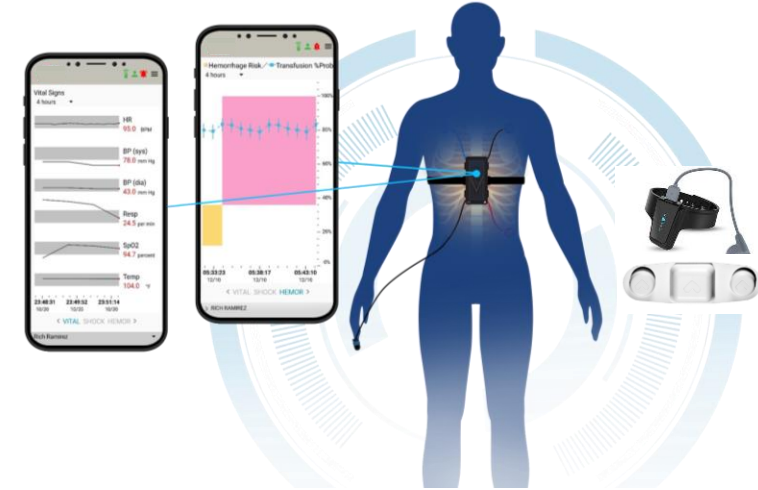
ARA's Autonomous CASEVAC Solution

- ▶ Lightweight (2-man portable)
- ▶ Teleop perception to full autonomy
- ▶ Low profile to avoid detection
- ▶ Multi-terrain capability
- ▶ Real time monitoring reported to operator
- ▶ En route care in development for future fielding

SWITCHBACK-A 2.0 PLATFORM – CORE MOBILITY LAYER
Scalable, Rugged, Survivable



4TDS – Trauma, Treatment, Triage, & Training Decision Support
Casualty Monitoring, CDS



Open Architecture
Standards-based interfaces for maximum flexibility



Payload Agnostic
Supports a wide range of mission configurations



Drive-by-Wire Teleoperation
Precision control with low latency and high situational awareness



Autonomy Ready
Integrates with leading autonomy software and perception suites



Modular Interfaces
Quick swap payloads and mission kits



Scalable Power & Payload
Optimized power distribution and payload capacity



Rugged & Survivable
Built for austere, contested environments



Mobility / Terrain Advantage
High durability, extreme terrain performance & stability



Real-Time Decision Support
Support with 90-min shock prediction



Evaluated with >100 Army, Navy, Air Force medics



Detect Shock and Internal Hemorrhage
Using Only Vitals



Flexible Platforms
4TDS operates on Android Nett Warrior and ATAK



Sensor Agnostic
4TDS connects to multiple COTS vital signs sensors



Refresher Training
4TDS provides quick refresher training options



Conclusion

We're ready

- ▶ Autonomous ground CASEVAC can be done now
- ▶ Cost effective solutions deployed at the battalion level increase survivability
- ▶ 10 systems in rotation for a company can move hundreds of casualties a day from POI to CCPs with a single operator



Questions

Gregory Rule, P.E.

grule@ara.com

210-344-7644

March Callis, COL(ret)

jcallis@ara.com

405-315-5947