ADAMS

ADVANCED ASTRONAUT MEDICAL SUPPORT

CREE BUSH KIT ADAPTATION

version 20250326

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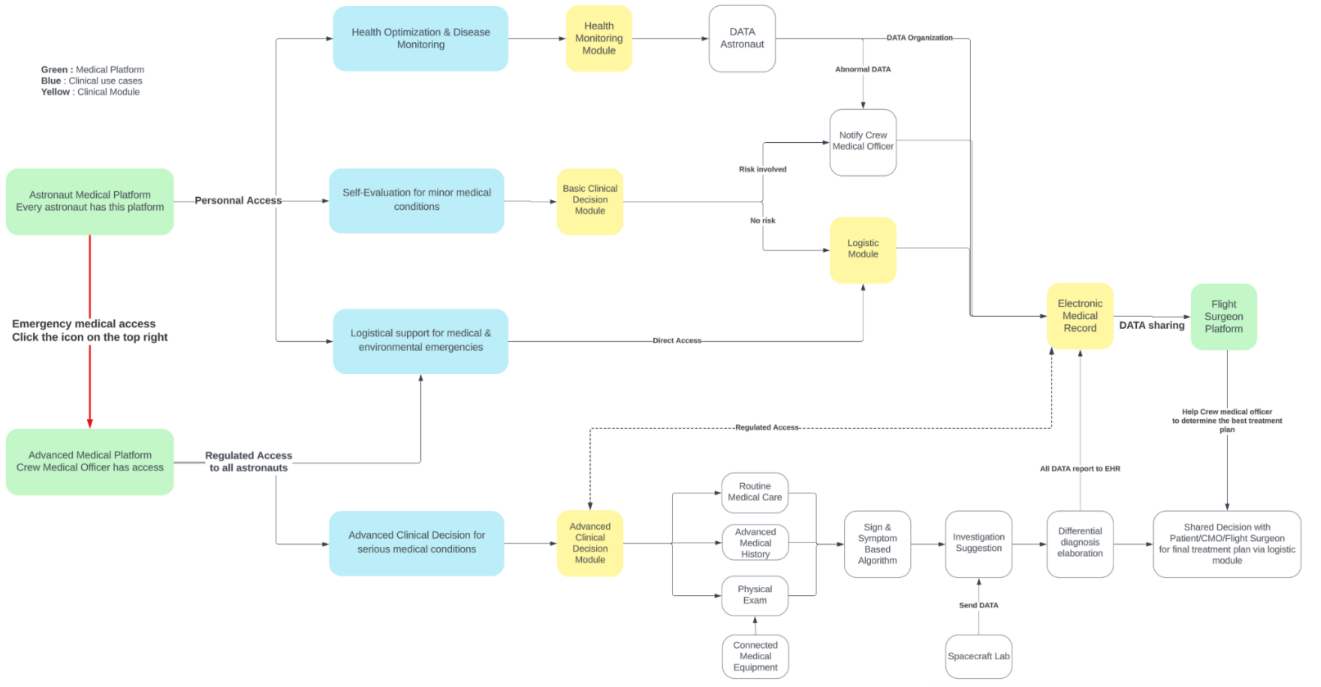
Table of content

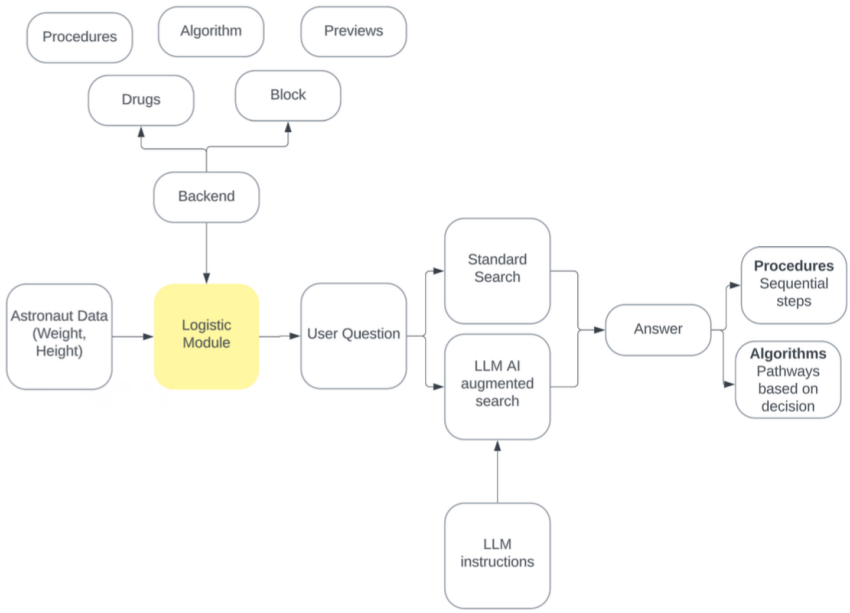
Design of the adapted C2M2 system

Current C2M2 Design

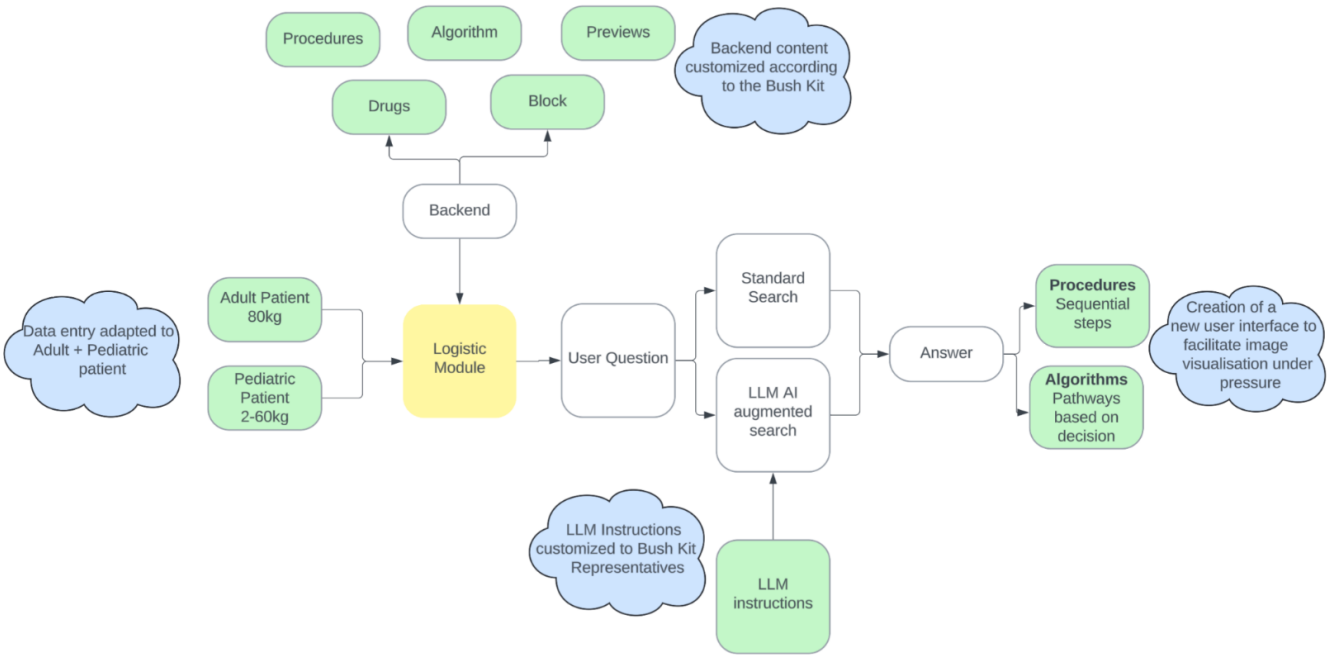
Our Connected Care Medical Module (C2M2) was originally designed as an advanced medical support system for astronauts, featuring a comprehensive suite of medical protocols, procedures, and decision support tools. The system's architecture was built to accommodate the specialized needs of space missions, with modules specifically tailored to the skills, training, and operational constraints faced by astronauts in orbit or on planetary missions.



Current C2M2 Logistical module design



Design of the adapted C2M2 system



Data entry adaptation

After reviewing the Bush Kit content, we discovered that all of the drugs available are fixed doses that don't need to be adjusted according to weight. To simplify the interface, we created two straightforward entry points:

- Adult : Default 80kg weight
- Pediatric : A slider from neonate to 14 y/o to estimate weight

This streamlined approach eliminated unnecessary complexity and made the system more accessible to users with varying levels of medical training.

Backend content adaptation

Our scientific illustrator and medical team worked extensively on integrating a significant portion of the Bush Kit scientific content. To better illustrate certain concepts, we created new medical illustrations and content. The comprehensive work included:

- 80 medical illustrations
- 50 pieces of equipment
- 38 drugs
- 2 previews
- 1 algorithm

This extensive content adaptation ensures that the A.D.A.M.S. system provides comprehensive coverage of the Bush Kit materials while enhancing understanding through visual elements.

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Custom LLM instructions

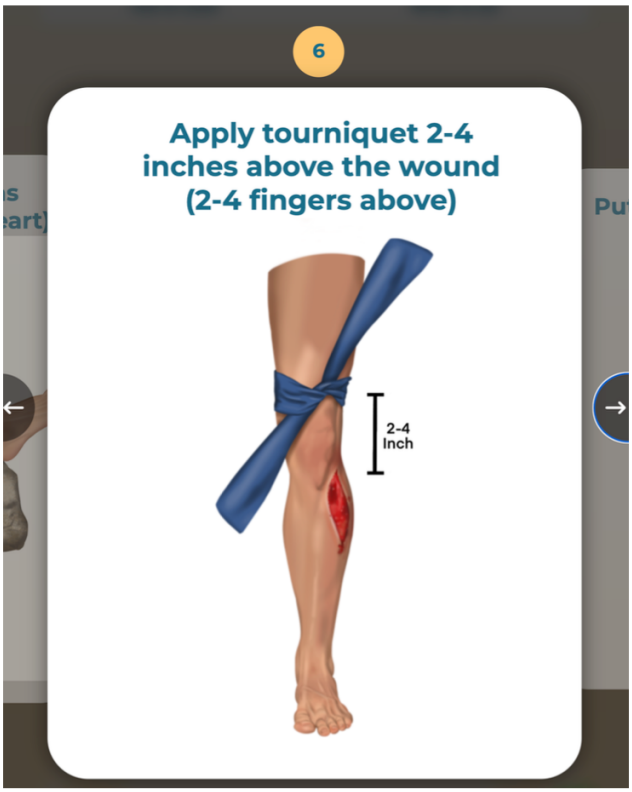
We wrote custom Large Language Model (LLM) instructions to provide answers in simple terms that can be understood by non-medical professionals. These instructions were specifically designed to:

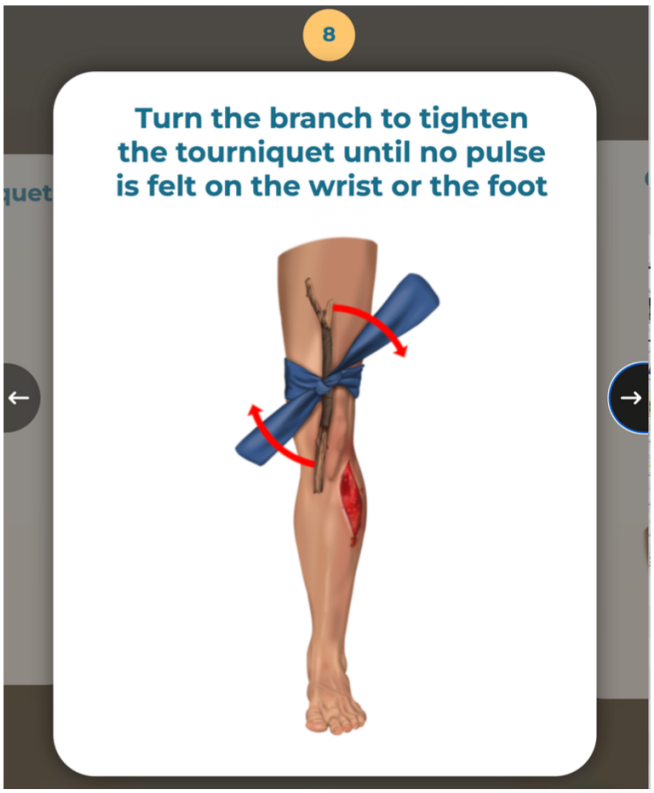
- Simplify complex medical terminology
- Prioritize critical information during emergencies
- Provide clear, action-oriented guidance
- Account for limited medical expertise
- Support users under stress conditions

New user interface to facilitate image visualization under pressure

For the Cree adaptation, we created a new user interface to facilitate image visualization on an iPad mini. We developed an interface where minimal text is displayed with a heavy focus on clear sequential images and simple buttons. Our goal was to simplify the interface so it could be accessible under pressure, using only "next & back" buttons or a swipe to change steps.
This design philosophy acknowledges the cognitive limitations that affect all users during emergency situations and particularly addresses the visual learning preferences expressed by the Cree community.

The proposed improvements will optimize security and system stability, ensuring reliable communication between the medical device and applications used in critical environments.





Final plan and guide for deployment

The deployment of the A.D.A.M.S. Cree Bush Kit Adaptation took place in Whapmagoostui, following a carefully structured approach to maximize effectiveness and gather comprehensive feedback. This plan evolved through extensive collaboration between all stakeholders and incorporated flexibility to address the unique challenges of remote deployment.

Timeline

The deployment followed a progressive timeline that allowed for proper preparation, execution, and evaluation:

- **Pre-deployment coordination (November-December 2024):** Extensive collaboration with Cree Board of Health and Social Services, Canadian Red Cross, and Canadian Space Agency to align objectives and expectations. This phase included multiple planning sessions to define scenarios, identify participants, and establish evaluation protocols.
- **Preparation phase (December 2024-February 2025):** Adaptation of the A.D.A.M.S. system to accommodate the Bush Kit content, including technical development, content creation, and user interface design. This intensive period involved translating paper-based protocols into dynamic digital formats and creating new medical illustrations to support key procedures.
- **Advance team deployment (March 2025):** Key team members arrived 48 hours before the main deployment to establish logistics, test communication systems, and prepare the physical environment. This early arrival proved crucial for addressing unforeseen challenges.
- **Training session (March 8, 2025):** Comprehensive introduction of A.D.A.M.S. functionality to local healthcare providers and CTA members prior to simulation exercises. This orientation provided essential context and baseline familiarity with the system.
- **Simulation exercises (March 9, 2025):** Execution of two primary scenarios (bleeding patient and unconscious patient) tested by multiple participants with varying levels of medical expertise. Each scenario was performed multiple times, allowing comparison between the paper Bush Kit and digital A.D.A.M.S. system.
- **Feedback collection (March 9-10, 2025):** Structured debrief sessions and informal discussions to gather insights from all participants. This phase emphasized culturally appropriate methods for eliciting authentic feedback.

Resource Allocation

Successful deployment required careful allocation of diverse resources:

- **Personnel:** ResusMind team members (technical and medical specialists), Cree Trappers Association (CTA) representatives with intimate knowledge of bush activities and challenges, local healthcare providers from the community clinic, and translators to bridge language barriers.
- **Technology:** iPad mini devices loaded with the A.D.A.M.S. software, Starlink internet connection for backup communications, power supplies and charging equipment, and audio recording equipment for feedback sessions.
- **Medical supplies:** Complete Bush Kit components for simulation exercises, supplementary medical supplies for demonstrations, and simulated wounds and blood for realistic scenarios.
- **Documentation:** Initial evaluation forms, NASA Task Load Index assessments (adapted based on cultural considerations), debrief protocols, and observation guides for recording participant interactions.

Communication Strategy

Effective communication across cultural and professional boundaries was essential:

- **Multi-level engagement:** Deliberate involvement of local medical professionals, CTA members, and community representatives to ensure diverse perspectives. This approach fostered a sense of collective ownership and respect for varying expertise.
- **Translation support:** Cree language translators facilitated communication during simulations, highlighting real-world challenges in emergency communication across dialects and languages.
- **Structured feedback sessions:** Formal and informal opportunities for participants to provide insights, with emphasis on creating comfortable environments for honest evaluation.
- **Regular stakeholder updates:** Continuous information sharing between ResusMind, CSA, CRC, and the Cree Board of Health to ensure alignment throughout the deployment process.

Risk Mitigation

Anticipating and addressing potential challenges was a primary focus:

- **Communication contingencies:** Multiple backup systems (primary radio, secondary radio, and Starlink satellite connection) to ensure uninterrupted connectivity even in adverse conditions.
- **Local coordination:** Early arrival of team members to address logistical challenges, establish relationships, and adapt to local conditions and customs.
- **Flexible scheduling:** Built-in flexibility to adapt to changing circumstances, participant availability, and unexpected community events.
- **Cultural sensitivity training:** Preparation of the deployment team to respect and work effectively within Cree cultural contexts and communication styles.
- **Technical redundancy:** Multiple device options and power sources to ensure continuous operation regardless of technical difficulties.

Deployment descriptions

The A.D.A.M.S. Cree Bush Kit Adaptation deployment was a collaborative effort between Resus-Mind, Canadian Space Agency, Canadian Red Cross, and the Cree Board of Health and Social Services. The deployment focused on testing the adapted A.D.A.M.S. system in simulated emergency scenarios relevant to the Cree community, with emphasis on authentic conditions and diverse user perspectives.

Setting and Environment

The deployment was conducted at the cultural camp in Whapmagoostui, providing an authentic environment that reflected real-world conditions. This setting offered a balance between accessibility and the remote conditions often encountered in emergency situations within Cree territories. The cultural camp setting provided:

- A realistic backdrop that simulated the isolation of bush emergencies
- Natural challenges related to communication and resource limitations
- Culturally significant context that enhanced participant engagement
- Sufficient space for multiple simultaneous simulation activities
- A meaningful connection to traditional Cree land-based activities
- This environment created authentic testing conditions that would have been impossible to replicate in a clinical or laboratory setting.

Participant Profile

The deployment engaged a diverse group of participants to ensure comprehensive evaluation:

- **CTA members:** Trappers and hunters with varying levels of medical knowledge, representing the primary potential users of the Bush Kit in remote settings. These individuals brought invaluable perspective on practical application in real wilderness conditions.
- **Local healthcare providers:** Nurses and community health workers from the Whapmagoostui clinic, offering professional medical perspective and insights into integration with existing healthcare infrastructure.
- **Translators:** Community members fluent in both English and Cree (with various dialects) who facilitated communication between participants and simulated the real-world language challenges that occur during emergencies.
- **Observers:** Representatives from the Canadian Space Agency and Canadian Red Cross who provided additional perspective and documented the deployment process for their respective organizations.

This diverse participant group ensured that the A.D.A.M.S. system was evaluated from multiple perspectives, reflecting the varied backgrounds of potential users.

Simulation Structure

Two primary scenarios were carefully developed to test the most critical emergency situations encountered in remote settings:

1. **Bleeding patient scenario:** Participants were required to manage a simulated severe bleeding from a leg wound, demonstrating critical actions including direct pressure, wound assessment, and tourniquet application. This scenario tested the system's ability to guide users through time-critical interventions where delays could be life-threatening.
2. **Unconscious patient scenario:** Participants were tasked with assessing an unconscious patient, checking vital signs, measuring blood glucose levels, and placing the patient in the recovery position. This scenario evaluated the system's effectiveness in guiding systematic assessment and intervention for a complex but less visibly urgent situation.

Each scenario was conducted multiple times with different participants using both the traditional paper Bush Kit and the A.D.A.M.S. digital application, allowing direct comparison between the tools. The scenarios were carefully designed to:

- Represent common and high-stakes emergency situations in remote settings
- Test critical decision points and procedural knowledge
- Evaluate both the speed and accuracy of information retrieval
- Simulate realistic pressure and stress conditions
- Accommodate participants with varying levels of medical expertise

Following each simulation, participants engaged in immediate debrief discussions to capture their experiences and insights while the impressions were fresh.

Technical Implementation

The A.D.A.M.S. system was deployed on iPad mini devices, selected for their portability, battery life, and screen quality. The system was configured with several key features:

- **Stress-optimized interface:** The user experience was designed specifically for high-pressure situations, with simplified navigation and visual clarity as primary objectives.
- **Visual-centric approach:** Information presentation prioritized clear illustrations and minimal essential text, recognizing both cultural preferences for visual learning and the cognitive limitations that affect all users during emergencies.
- **Intuitive navigation:** The system employed "next & back" buttons and swipe gestures that required minimal training to master, allowing users to focus on the patient rather than the technology.
- **AI-powered assistance:** An artificial intelligence component provided conversational support, answering questions in simple, accessible language and helping users locate specific information quickly.
- **Offline functionality:** The system was designed to function without continuous internet connectivity, essential for remote wilderness use.

This implementation represented a significant departure from traditional medical applications, prioritizing simplicity and effectiveness under stress over comprehensive feature sets.

Data Collection

Throughout the deployment, multiple data collection methods were employed, with an emphasis on culturally responsive approaches. Early in the process, we transitioned from structured NASA Task Load Index assessments to informal feedback discussions and group conversations. This adjustment reflected our commitment to cultural sensitivity and Indigenous communication preferences, removing potential barriers related to written evaluations and academic frameworks. By recording these discussions and observing participants' interactions with the tools, we were able to gather authentic and comprehensive feedback while respecting traditional Cree knowledge-sharing practices.

The data collection methodology evolved during the deployment to better align with community preferences and cultural contexts:

- **Observational documentation:** Team members carefully recorded participants' interactions with both the paper Bush Kit and digital system, noting points of confusion, success, and comparative performance.
- **Group discussions:** Facilitated conversations allowed participants to build on each other's observations in a format that aligned with traditional Cree knowledge-sharing practices.
- **Individual interview**s: Brief conversations with participants immediately after simulations captured personal experiences and perceptions.
- **Technical metrics:** System-based tracking of user pathways, time spent on different screens, and interaction patterns provided objective data on usage.
- **Photography and video:** Visual documentation of the deployment process captured contextual factors and non-verbal indicators of participant experience.

This multi-faceted approach to data collection ensured that both quantitative and qualitative aspects of the system's performance were thoroughly evaluated.

Deployment outcomes

Encountered challenges

The deployment revealed several significant challenges that provide valuable guidance for future implementations.

Communication infrastructure limitations

Initial plans to use radios for communication encountered significant technical difficulties, which would have substantially delayed the testing process. Despite advance testing, the radios failed to maintain reliable connections between simulation areas, creating authentic communication challenges that mirror real emergency scenarios in remote areas. This experience highlighted the critical importance of reliable communication infrastructure in remote settings and reinforced the value of redundant systems.

Logistical coordination

Despite advance planning, there were some logistical challenges related to transportation availability and scheduling. The limited availability of vehicles for transporting participants and equipment between locations affected the number of iterations possible during the testing period. These challenges emphasized the need for flexible planning approaches.

Integration with local medical teams

Early coordination with the clinic staff was limited, resulting in initial uncertainty about the project's purpose and objectives. As one participant noted, "At first, the clinic staff didn't know what was happening, but by the end of the morning, they were excited about the possibilities." This observation underscored the importance of comprehensive stakeholder engagement well in advance of deployment, with particular attention to local healthcare providers who will be essential partners in any implementation.

Language barriers

Communication challenges emerged during the demonstrations, particularly with varying Cree dialects between participants. This created authentic translation challenges that would likely occur in real emergency situations. The translators occasionally needed to repeat instructions multiple times or find alternative expressions to convey medical concepts across dialect differences, highlighting the importance of visual communication in bridging language gaps.

Data collection

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User interface navigation

Some participants struggled to identify interactive elements within the app. As noted in feedback, "People didn't always realize they could click on certain elements. We need to improve the UI to guide them better." This challenge was particularly evident during initial interactions with the system, though users typically became more comfortable with continued use. The observations highlighted specific opportunities to enhance visual cues and interactive elements to improve intuitiveness.

Bush Kit organization

Locating specific items within the physical Bush Kit proved challenging under simulated stress conditions, suggesting a need for improved organization and visual identification of critical supplies. Multiple participants spent considerable time searching for specific items within the kit, particularly during the bleeding scenario where rapid access to tourniquets and dressings was critical. This experience indicated that digital improvements should be accompanied by parallel enhancements to the physical components of the emergency response system.

Successes achieved

The deployment demonstrated numerous significant successes that validate the potential of A.D.A.M.S.

Technology reliability in remote settings

The A.D.A.M.S. system functioned effectively despite the challenging environment, demonstrating its potential for deployment in remote locations. The backup communication systems, particularly Starlink, proved crucial to this success, ensuring continuous connectivity throughout the testing process. The iPad devices maintained battery life throughout the day and performed reliably in varying light conditions and handling situations.

Superior information access

Participants consistently reported faster access to critical information using the app compared to the paper guide. As one participant noted, "It was almost impossible to find the recovery position in the book. The app was much faster." This observation was particularly significant during the unconscious patient scenario, where locating specific assessment procedures and intervention steps in the paper manual proved time-consuming compared to the digital system's direct access.

User-friendly interface

Once participants understood the carousel navigation system, they were able to follow the visual guidance effectively. The emphasis on illustrations over text proved particularly valuable under stress conditions. Users frequently commented on the clarity of the visual instructions and the intuitive flow between steps. The swipe navigation was especially well-received, with users quickly adopting this interaction method after minimal introduction.

Authentic testing conditions

The cultural camp setting provided a realistic environment that closely resembled actual field conditions, enhancing the validity of the testing process. The natural challenges of the setting—including communication difficulties, language differences, and environmental factors—created an authentic context that would have been impossible to replicate in a controlled laboratory environment. This authenticity significantly increased confidence in the applicability of the findings to real-world scenarios.

Collaborative engagement

The deployment successfully engaged multiple stakeholders, including CTA members, healthcare providers, and community representatives, fostering a sense of ownership and investment in the technology. The inclusive approach led to enthusiastic participation and rich feedback from diverse perspectives. Several participants expressed interest in continued involvement with the project, suggesting potential champions for broader implementation.

Cross-cultural integration

The A.D.A.M.S. system demonstrated potential for bridging cultural and linguistic gaps by providing clear visual guidance that reduced reliance on text-heavy instructions. This visual approach resonated strongly with CTA members who emphasized the importance of visual learning in their cultural context. As Joshua from the community noted, "The Cree are very visual in their learning and interaction," an observation that validated our design approach.

Comprehensive content integration

The team successfully incorporated a significant portion of the Bush Kit content into the digital format, including 88 procedures, 80 medical illustrations, 50 equipment items, 38 drugs, 2 previews, and 1 algorithm. This comprehensive integration proved that complex medical content could be effectively translated into a digital format while enhancing clarity through multimedia approaches. The depth and breadth of content available impressed many participants, who noted the system felt complete rather than a limited prototype.

Lessons learned

Advanced preparation is crucial

Having team members on-site 24-48 hours before deployment proved essential for addressing logistical challenges. As one participant stated, "If it was not for having someone troubleshooting beforehand, things would have been very tough." This advanced presence allowed the team to establish relationships, test communication systems, and adapt to unexpected circumstances without compromising the core objectives of the deployment.

Redundant communication systems are essential

The availability of Starlink as a backup communication system prevented significant delays and should be considered mandatory for future deployments. One participant emphasized: "I would insist on Starlink as an absolute must for any future deployment." The experience demonstrated that even well-tested primary communication systems can fail in remote environments, making redundancy not just desirable but essential for operational success.

Visual learning predominates under stress

Participants strongly preferred image-based guidance over text, particularly in stressful scenarios. This reinforced the value of the A.D.A.M.S. approach focusing on clear visual instructions over text. The observation that "under stress, even doctors need pictures" highlighted the universal nature of this preference, which extends beyond cultural preferences to reflect fundamental cognitive processes under pressure.

Color-coding improves efficiency

The need for intuitive color-coding emerged as a key improvement area for both the digital application and physical Bush Kit, with suggestions for using red for emergency items, yellow for assessment tools, and blue for airway-related supplies. This color-coding approach could significantly reduce cognitive load during emergencies and speed access to critical equipment. One participant noted, "The idea of quick, color-coded emergency protocols with images is a no-brainer. This could save lives."

Early stakeholder engagement

Establishing relationships with all stakeholders, especially local medical teams, well in advance of deployment is critical for success. This includes providing clear communication about project objectives and expected outcomes. The experience in Whapmagoostui demonstrated that even brief delays in engagement could create initial uncertainty, though this was quickly overcome through open communication during the deployment.

Animations enhance understanding

Short animations or GIFs demonstrating procedures proved more effective than static images or text descriptions, especially for complex procedures. One participant suggested that "small animations could be game-changers" for teaching critical procedures under stress. This insight has significant implications for future content development, suggesting that investing in dynamic visual elements could substantially improve effectiveness.

Flexibility enables discovery:

The agile approach to testing allowed for responsive adaptation during the deployment, leading to valuable insights that might have been missed with a more rigid testing protocol. As one participant reflected, "This whole thing reinforced why we need to keep it agile. If we had tried to overplan this, we wouldn't have learned as much." This flexibility enabled the team to pursue unexpected lines of inquiry and adapt to participant feedback in real-time.

User backgrounds influence interaction

There were notable differences in how participants with different backgrounds (medical professionals versus non-medical users) interacted with the application, highlighting the need for an interface that accommodates varying levels of expertise. One observer noted, "You could see the difference between someone with medical training and someone without—but both could still follow the app and make the right decisions." This observation validates the system's ability to support users with diverse training backgrounds, a critical feature for bush deployment.

Next steps

Based on the deployment outcomes, we have identified several high-priority actions to advance the A.D.A.M.S. Cree Bush Kit Adaptation.

Phase 1: System Refinement (2-3 months)

1 - Commplete A.D.A.M.S. interface improvements based on field feedback:
- Enhance visual cues for interactive elements to address the observation that "people didn't always realize they could click on certain elements"
- Implement the "Visual Bridge" concept for intuitive entry points into the system
- Incorporate animated GIFs for critical procedures like tourniquet application and recovery position
- Develop improved color-coding system throughout the interface (red for emergency items, yellow for assessment tools, blue for airway-related components)

2 - Expand content integration:
- Complete integration of all remaining Bush Kit procedures into the A.D.A.M.S. architecture
- Create additional medical illustrations for procedures identified as needing visual enhancement
- Develop short instructional animations for complex procedures based on user feedback

3 - Conduct formal scientific verification:
- Establish a scientific committee of wilderness medicine experts to review all integrated protocols
- Validate all medical procedures against current best practices and guidelines
- Ensure all medication dosages and emergency protocols comply with appropriate standards
- Document verification process for regulatory compliance

Phase 2: Bush Kit 2.0 Development (3-4 months)

1 - Redesign physical Bush Kit to align with digital interface:
- Replace ziplock bags with durable, color-coded containers
- Implement consistent color-coding between physical supplies and digital guidance
- Improve labeling with visual markers that match digital illustrations
- Reorganize kit contents to prioritize emergency items for quick access

2 - Create smartphone-compatible version:
- Optimize interface for smaller screens while maintaining visual clarity
- Ensure functionality with limited connectivity typical in remote regions
- Test with various mobile device types common in the community

3 - Develop comprehensive training program:
- Create training materials for CTA members, healthcare providers, and other potential users
- Design training sessions that accommodate varying levels of technical and medical expertise
- Produce instructional videos demonstrating system use in realistic scenarios

Phase 3: Controlled Field Testing (3 months)

1- Deploy Bush Kit 2.0 with selected hunters for real-world testing:
- Equip 10-15 experienced hunters with the complete system (digital + physical kit)
- Establish structured feedback mechanisms including regular check-ins
- Document any real emergency situations where the system is utilized
- Collect and analyze usage patterns to identify improvement opportunities

2 - Refine system based on field testing results:
- Implement necessary adjustments to interface, content, or physical organization
- Address any reliability or usability issues identified during extended use
- Enhance features that demonstrate particular value in real-world conditions

Phase 4: Full Implementation (6-12 months)

1- Formal deployment across Cree communities:
- Distribute Bush Kit 2.0 and A.D.A.M.S. system to all CTA members
- Implement training program through established community channels
- Establish ongoing technical support structure

2- Integration with regional healthcare infrastructure:
- Develop protocols for communication between bush users and clinic staff
- Create standardized documentation systems for emergency care provided in the field
- Establish referral pathways for patients requiring higher levels of care

3- Ongoing evaluation and improvement:
- Implement continuous quality improvement process
- Collect data on system usage, effectiveness, and patient outcomes
- Regularly update content based on user feedback and evolving medical standards

This phased approach ensures systematic progress from the prototype tested in Whapmagoostui to a comprehensive emergency medical support system serving the entire Cree community. Each phase builds on the successes and lessons of the deployment while addressing identified challenges to create a solution that truly meets the needs of the community.

Conclusion

The A.D.A.M.S. Cree Bush Kit Adaptation deployment demonstrated the significant potential of adapted space medical technology to address healthcare challenges in remote terrestrial environments. The successful integration of advanced digital tools with established wilderness medicine protocols created a synergy that impressed participants from diverse backgrounds and perspectives.

The deployment revealed that visual-centric, stress-optimized interfaces can effectively bridge gaps in medical knowledge, language differences, and cultural contexts, providing critical support during emergency situations in isolated settings. The enthusiastic response from CTA members and local healthcare providers suggests strong potential for adoption if the identified refinements are implemented.

Perhaps most importantly, this project exemplifies how collaboration between space agencies, humanitarian organizations, and Indigenous communities can yield innovations that benefit all parties. The parallels between remote wilderness healthcare and space medicine create a fertile ground for mutual learning and advancement, with each domain informing and enhancing the other.
As one participant reflected, "I don't think I'll sleep tonight—this has so much potential for impact." This sentiment captures the excitement and promise of the A.D.A.M.S. Cree Bush Kit Adaptation, which represents not just a technological advancement but a new model for collaborative innovation across geographical, cultural, and institutional boundaries.

Appendix

Integral quotes from feedback sessions

The feedback session on the adaptation of A.D.A.M.S. to the Bush Kit highlighted both logistical challenges and the overall success of the testing process. Participants agreed that the event achieved its objectives, with valuable insights gained on communication, team coordination, and the usability of the technology in real-world conditions.

Logistics and planning

- "I would insist on Starlink as an absolute must for any future deployment."
- "If it was not for having someone troubleshooting beforehand, things would have been very tough."

Usability & Performance Over Traditional Methods

- "It was almost impossible to find the recovery position in the book. The app was much faster."
- "The app, once it's tuned, absolutely outperformed the paper guide."
- "Just the fact that you prompted us to try and find something in the book—it was critical. The book wasn't even referring to the right page, but in the app, it was instant."
- "People under stress need pictures—even doctors. The small animations could be game-changers."
- "As soon as people were on the carousel, I knew they were okay. They just clicked, followed, and got it."
- "We saw people go, 'Oh, there!' That's the moment when you know it works."

Real-World Impact & Practicality

- "If we had something like this during evacuations, screening medications for people fleeing floods or fires would be so much easier."
- "It's incredible to think about how many lives this could save—especially for infectious diseases, high-risk pregnancies, or even guiding a non-clinical person through basic care."
- "Wouldn't it have been great if responders in Libya had access to this? They're not clinical people, but they still need guidance."
- "When the hunters were using it, we saw them realize how valuable this tool could be for them."

Training & Accessibility

- "It was great to involve every CTA member—they all got hands-on experience with the app, and their feedback was invaluable."
- "You could see the difference between someone with medical training and someone without—but both could still follow the app and make the right decisions."
- "I was afraid of coming in and looking like 'the doctor from Montreal with a solution to a problem we don't have,' but it was clear that people saw value in this."

Future Potential & Innovation

- I don't think I'll sleep tonight—this has so much potential for impact."
- "This is the beginning of something huge. The integration of visuals, intuitive navigation, and real-time assistance could revolutionize remote medical care."
- "It's not just collecting data—it's actually helping make decisions that improve care quality in real-time."
- "If we get this right, we could put this directly in the hands of hunters, first responders, and nurses—it could be transformative."
- "The idea of quick, color-coded emergency protocols with images is a no-brainer. This could save lives."
- "This project shows how space medicine research and remote healthcare can push each other forward."

Endorsement of the Approach & Collaboration

- This was not just a demo; it was proof of concept. We didn't fake anything—we tested it in real conditions, and it worked."
- "We started with an idea, and now we're seeing it turn into something real that people actually want to use."
- "This was a true collaboration. The best ideas came from seeing real users interact with the app and give feedback."
- "This whole thing reinforced why we need to keep it agile. If we had tried to over-plan this, we wouldn't have learned as much."