



FROM DEEP-SPACE TO BETTER HEALTHCARE: WHAT CANADA'S DUAL-USE ECOSYSTEM CAN TEACH US ABOUT INNOVATION

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Canada has become remarkably good at inventing solutions to some of the world's hardest problems. We're much less successful at putting those solutions to work.

Few sectors illustrate this paradox more clearly than deep-space healthcare. Canada is developing technologies designed to keep astronauts healthy millions of kilometres from Earth, yet many of those same innovations remain unavailable to Canadians living hundreds of kilometres from the nearest hospital.

Recognizing this opportunity, the Canadian Space Agency (CSA) established the Advisory Council on Deep-Space Healthcare, led by former CSA astronaut Robert Thirsk. In its report, [Health Beyond](#), the council argued that technologies developed for the extreme constraints of deep-space exploration could also transform healthcare delivery in Canada's rural, remote, and northern communities.

The CSA subsequently identified health technologies as a strategic priority through its [Health Beyond Initiative](#), including the [Deep Space Healthcare Challenge](#), to support the development of dual-use technologies with applications both in space and on Earth.

Importantly, the *Health Beyond* report identified many of the ingredients needed to move those innovations into practice, including Indigenous partnerships, demonstration sites, research translation, and cross-sector collaboration. Taken together, they reveal something larger: the building blocks of an adoption ecosystem.

Developing breakthrough technologies is only one part of the challenge. The other part is creating the conditions that allow those technologies to be adopted. The organizations making the greatest progress recognize that adoption doesn't begin after innovation. It begins during it.

THE USER BELONGS IN THE DESIGN PROCESS.

Paratus Medical set out to solve one of deep-space medicine's biggest challenges: how can someone make life-saving medical decisions when expert help isn't immediately available? Its emergency decision-support platform guides users through diagnosing and managing medical emergencies, giving astronauts greater medical autonomy during long-duration missions.





Adoption begins by understanding the problem before perfecting the solution. By investing early in trust, local relevance, and shared ownership, innovators are doing more than improving individual technologies. They are creating the conditions that allow those technologies to move beyond pilots and into practice.

INNOVATION NEEDS CONNECTORS.

In healthcare, that means paths to patients. Whether designed for deep-space missions or remote healthcare on Earth, innovations must still navigate the complex path from promising invention to routine healthcare delivery.

Intermediary organizations like the Coordinated Accessible National (CAN) Health Network and the Ontario Bioscience Innovation Organization (OBIO) recognized this challenge, and they are doing something Canada's innovation ecosystem has often overlooked: building adoption pathways.

If community partnerships create the conditions for adoption on the ground, then organizations like CAN Health Network and OBIO create the institutional pathways that allow promising technologies to move through Canada's healthcare system. Rather than simply funding research or commercialization, they help innovators [navigate the relationships](#), [procurement processes](#), and [institutional barriers](#) that determine whether new technologies ever reach patients.

Through CAN Health Network and OBIO, Saskatoon company Luxsonic, a virtual radiology reading platform, secured the partnerships and early adopters it needed to move from invention to implementation, resulting in deployments through [Bayer's clinical trials workflow](#) and [Saskatchewan's Virtual Health Hub](#).

To refine the platform for real-world use, Paratus, the winner of the CSA's first Deep Space Healthcare Challenge, [travelled to northern Quebec](#), where Elders, Cree knowledge holders, physicians, nurses, and members of the Cree Trappers' Association helped test the technology using emergency scenarios based on real experiences on the land. What began as a solution for astronauts became a technology co-developed with the communities facing many of the same challenges here on Earth.

That approach reflects an important pattern among organizations that successfully move beyond pilot projects: they do not treat remote communities as end users. They treat them as partners in the design process.

The [involvement of the Cree Trappers' Association](#) is especially revealing because it recognizes that healthcare in remote northern communities does not always begin with a physician or paramedic. It often begins with whoever is present when an emergency occurs: a hunter, a trapper, a family member, or a neighbour. Rather than asking those communities to adapt to a technology developed elsewhere, Paratus adapted the technology to reflect how healthcare is actually delivered on the land.

IndigenousTech.ai has followed a similar path. The Indigenous-founded and -owned company [partnered with](#) the Westbank First Nation and Osoyoos Indian Band to refine its tele-dermatology platform through local screening clinics and collaboration with community healthcare providers. Once again, the technology evolved alongside the communities it was intended to serve.





Luxsonic's portable imaging environment, which enables specialists to diagnose and collaborate remotely, has clear applications in Canada's remote and northern communities, while also addressing many of the same constraints faced during long-duration space missions.

Canada has spent decades building an innovation ecosystem, but dual-use technologies succeed only when they are matched with equally effective pathways to adoption. Intermediary organizations remind us that innovation alone does not improve healthcare: building the adoption infrastructure does.

THE CHALLENGE ISN'T ONLY INNOVATION. IT'S ALSO COORDINATION.

Taken together, Paratus Medical, IndigenousTech.ai, Luxsonic, CAN Health Network, and OBIO point to a broader lesson. They didn't succeed only by developing better technology. They succeeded because they connected technology to the people, institutions, and processes needed to put it into practice.

Even the strongest innovations struggle when those connections are missing. Viewed this way, Canada's adoption challenge is ultimately a coordination challenge.

Adoption is not the final stage of innovation. It is an outcome of coordination.

While *Health Beyond* challenged Canada to think differently about where deep-space innovation could create value, the next challenge is turning that vision into better healthcare here.

Canada does not need to discover how to build technologies capable of supporting healthcare millions of kilometres from Earth. We are already doing it. Our competitive advantage will come from becoming just as good at ensuring those innovations reach the people who need them here on Earth.

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