The Military Medical Innovation Paradox: Why Rapid Battlefield Solutions Struggle to Become Lasting Capabilities

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The "Iron Swords" war has demonstrated that in modern high-intensity conflict, military medical innovation is an essential operational necessity. As the Israel Defense Forces Medical Corps (IDF MC) adapts to unprecedented battlefield challenges, it has profoundly transformed how it conceptualizes and deploys medical technology. This evolution has transitioned the IDF MC from a predominantly research-oriented organization into a proactive leader in technological development. By actively identifying operational requirements at the point of injury and mobilizing strategic partners to co-create medical solutions, the IDF MC has established a model of applied innovation. Across all professional disciplines, from those facing complex battlefield constraints at the point of injury to those addressing the evolving challenges of mental health and operational medical services, now serve as key partners in characterizing needs and conceptualizing solutions, driven by an entrepreneurial spirit and a commitment to operational impact. This "Open Innovation" approach is best illustrated by two distinct examples of the transition from "spark" to capability: (a) the digital casualty documentation (the 'Digital 101'), which has evolved into a comprehensive Casualty Command and Control (C2) system, successfully transitioning from an innovative pilot to a broadening operational capability despite ongoing integration challenges; and (b) the unmanned aerial delivery of blood products, which remains at the stage of a successful operational pilot and has yet to be institutionalized as a broad, systemic capability across the IDF.

However, these achievements reveal a persistent structural tension termed the "Innovation Paradox": the coexistence of a high capacity for rapid solution generation alongside a limited institutional ability to absorb and scale them. While operational urgency can catalyze significant technical progress, transitioning from a "minimal viable product" (MVP) to a fully institutionalized military capability remains a substantial challenge. Effective innovations often remain localized because they lack integration into formal frameworks such as doctrine, training, and long-

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term strategic planning. To resolve this paradox, military medical services must establish "organizational rails" during peacetime. This requires a clear institutional framework that coordinates the operational requester, the requirements authority, and the development body. Ultimately, the lesson for military medical systems is structural rather than technological; sustainable capability does not emerge from creativity or rapid experimentation alone, but from delivering relevant, scalable care. While innovation may ignite initial capability, the impact of these efforts will be defined by institutional structures' capacity to sustain and scale solutions effectively beyond the constraints of conflict.

Conflict of interest

The authors declare no conflicts of interest.

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