# PUZZLE

The topic of technology and war is broad but what is missing is a scientific discussion about how emerging technologies are going to impact the individual soldier. The Centre for International and Defence Policy (CIDP) at Queen's University is leading a project called *The Future Canadian Soldier and Enhancement of Human Performance* to focus on the question of how science and technology can enhance our soldiers, while not losing sight of the ethical, social and policy implications of these enhancements. After co-organizing thematic workshops, both scholars and practitioners realized the urgency of bringing this debate to government and military stakeholders because advances in rehabilitation have a clear dual-use for enhancement.
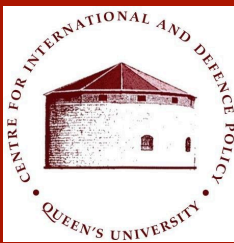
# Policy Brief:
# The Future of the Canadian Soldier and Enhancement of Human Performance

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# BACKGROUND

In September 2015 and June 2016, participants from different professional sectors convened in Kingston to investigate the policy trade-offs linked to human performance enhancement (HPE) in the armed forces. Participants debated the merits and implications of such enhancements on the solider, the mission, and society at large. The birth and development of this project has been made possible through co-sponsorship between the CIDP and the Canadian Institute for Military and Veteran Health Research (CIMVHR), as well as generous grants from the Department of National Defence's (DND) Defence Engagement Program (DEP) and the Social Sciences and Humanities Research Council (SSHRC). This partnership facilitated the creation of a network called the HPE Group, with individuals from academic, government, military, and private sectors from Canada, the United States, Germany, and France.

# KEY FINDINGS

The HPE Group has identified four general findings to date as well as specific policy questions, which deserve further analysis:

1. PANOPTIC: The realm of HPE intersects with a vast array of disciplines and sub-disciplines. There is a need for a holistic assessment that harbors a diverse range of experts and stakeholders. HPE includes invasive forms (such as embedded computing, body modification, and biological engineering) as well as non-invasive forms (such as exoskeletons and wearable computing). To date, the panoptic approach taken by *the HPE Group favours non-invasive forms of HPE to the exclusion of invasive technologies.*

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2. PERSPECTIVE: Gaps in the HPE literature include assessments of society's perspective of soldiers as well as the soldier's own feelings vis-à-vis HPE. While it is important to consider how society might perceive the government's HPE policy, a central concern must also look to how HPE can impact factors such as recruitment, retention, and reintegration. *HPE touches on civil-military and soldier-society relations.*

3. PEOPLE: It is crucial to consider the psychological ramifications of HPE and not just the physical consequences. Attitudes may vary based on position, role, and gender. Relatedly, it is important not to assume that soldiers automatically want access to these enhancement technologies. *How does one gain consent from soldiers in a military context, taking account of the fact that different identity groups within the military may hold different preferences on HPE?*

4. PREDICTIVE: A crucial axis of consideration with regard to HPE relates to the challenge of looking prospectively to anticipate and appreciate the implications of HPE on a whole host of dimensions: from training to fighting. The HPE Group's engaged in exercises but there was a shared sentiment that ultimately future outcomes cannot be prophesized. *How do we account for changes in societal values as well as the contemporary operating environment?*

# RECOMMENDATIONS

We propose three broad policy recommendations:

1. CORE PRINCIPLE: Maintaining the legitimacy of the force is vital in a democracy and this is achieved, in large part, by ensuring that soldiers remains part of the society they are charged with defending. To that end, we favour non-invasive forms of HPE such as exoskeletons and wearable computing devices. Indeed, we applaud the recent announcement of a limited trial of Spring Loaded Technologies *Upshot* knee brace.

2. EASING THE BURDEN: Much of the current focus within Canada is on easing the physical burden of the soldier (indeed, this is what *Upshot* does) and this should continue. Excepting a major shift in technology, current service rifles, ammunition, and communications equipment will continue to be a major component of soldier burden. Easing this burden should remain a near-term focus of HPE. Force protection efforts should follow in priority and only then implementation of non-invasive cognitive enhancements.

3. ITERATIVE ROLL OUT: Given the combination of risk, cost, and benefit associated with HPE, any initiatives should be rolled out incrementally (as with the *Upshot*) however we feel the benefits could be best served if aimed at the special forces community, along the lines of what the US Special Operations Forces Command is working toward with its Tactical Assault Light Operator Suit (TALOS).

We additionally offer three overarching recommendations for future research:

1. DEVELOP: Research on this topic is not complete and the work should not stop here. The CIDP has identified HPE as one of its core research axes and has established the HPE Group as a network on HPE that is an innovative multi-stakeholder initiative.

2. DIFFERENTIATE: Moving forward, HPE research should clarify at the outset the type of enhancement sought. The first type is the invasive realm, which includes discussions relating to automation, robotics, and teleprescence. The second type (which is tied to our core principle recommendation) concerns non-invasive initiatives, where their application or use pivots on burden easing and force protection.

3. DYNAMICS: It is necessary to encourage more conversations that bring together the legal and ethical debates and discussions surrounding HPE. These conversations need to become more frequent but also more integrated. Multi-stakeholder initiatives like the HPE Group are a good model, but similar coordination should occur within government and the armed forces.