



Ethical issues in military bioscience

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1 Introduction

Armed forces have a long and complicated relationship with bioscientific innovation. It may well be the case that military-sponsored research and development in the life sciences have yielded important benefits for the society at large, for example when it comes to public health (e.g. Dasey 1990). At the same time, the militaries' penchant for secrecy and occasionally cavalier attitude towards risk (e.g. Moreno 2001) have made the notion of military bioscience rather eerie in the public imagination. So much so that botched military biomedical experiments have become a favoured trope of screenwriters looking for unnerving material.

Bioscientific knowledge and biotechnology have, of course, a wide range of military uses. They map onto an equally broad spectrum on ethical and legal implications. At one end are applications that are so clearly objectionable as to give rise to minimal ethical or legal debate. For example, the aversion to the use of biological warfare agents to harm the adversary has become entrenched. Interestingly, biological warfare has drawn more moral scorn than chemical warfare (e.g. Krickus 1965). Along with the practical difficulties of using biological warfare agents, this may have helped pave the way for the blanket ban on biological warfare in the 1972 Biological Weapons Convention (BWC), whereas the comprehensive prohibition of chemical weapons took another twenty years to achieve. Also, aside from the industrial scale violation of the BWC by the Soviet Union (and possibly Russia) (e.g. Leitenberg, Zilinskas, and Kuhn 2012), the prohibition of biological warfare agents has been rather well adhered to.

At the other end of the spectrum of military biotechnology and bioscience one finds some relatively uncontroversial practices, such as the use of biomaterials in mil-

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itary medicine. Similarly, attempting to improve the nutrition or training programs of military personnel by drawing on latest bioscientific insight does not appear to be problematic. This seems to be the case, at least, if service members are not subjected to experimental practices involuntarily or given an unfair advantage compared to the rest of the population.

In the middle of the spectrum, however, lie interventions that are not objectionable on their face but nevertheless create significant ethical conundrums. Some of these are precisely the focus of this symposium.

2 Human enhancement

Most of the following papers address, in one way or another, human enhancement in the military. Human enhancement broadly refers to biomedical interventions undertaken to make a person “better than well”, that is, to improve some aspect of their performance beyond what is regarded as “normal” (see generally Juengst and Moseley 2019). But matters quickly become contested: in particular, it is by no means obvious what “well” or “normal” mean. Also, the ability to distinguish in a principled manner between enhancement and treatment remains debatable (e.g. Erler 2017),

As Adam Henschke (2023, Sect. 1) demonstrates, the matter is further complicated by enhancement and disenchantment being context-dependent notions. Thus, a particular change in a person’s cognitive or physical functioning may be unequivocally beneficial at a certain point in time or in some context but just as unequivocally detrimental at another time or in another context. Accordingly, what might amount to a desirable enhancement during military service could become an undesirable disenchantment in civilian life (ibid., Sect. 1), or otherwise complicate demobilisation and reintegration (Walsh and Van de Ven 2023, Sect. 3).

Even though distinguishing between enhancement and therapy seems to be fraught with difficulty, the distinction does have significant practical implications for law and policy (e.g. McGee 2020). Adrian Walsh and Katina van de Ven (2023) suggest, however, that the ethical evaluation of enhancement depends on the context, and thus applying the enhancement-therapy distinction does not always have similar law and policy implications. In particular, they argue that the considerations that support prohibiting enhancement (“doping”) in professional sport are inapplicable to the conduct of warfare, such that the adoption by the Australian Defence Force of parts of the World Anti-Doping Code becomes difficult to defend on ethical grounds (ibid., Sects. 2–3).

3 Duty of care

Aside from problems with conceptual delimitation and overall acceptability, human enhancement in the military also raises questions about the associated duty of care. Clearly, military personnel have some rights vis-à-vis the armed forces, and/or the military has certain obligations towards the service members; some of these are rel-

evant to enhancement (Henschke 2023, Sect. 2; Walsh and Van de Ven 2023, Sect. 4; see also Dobos 2023).

What complicates the exercise of the duty of care in this context is that it may pull in different directions. Henschke (2023, Sect. 2) shows that an enhancement (*in casu*, increased vigilance as a result of brain stimulation) may benefit the service member while on active duty, but amount to a debilitating anxiety disorder in civilian life. Likewise, Walsh and Van de Ven (2023, Sect. 5) point out that service members who becomes accustomed to an enhancement (in their example, the use of anabolic-androgenic steroids to increase muscle mass and strength, and improve endurance) may find it difficult to reintegrate into civilian society where the use of this enhancement is illegal or frowned upon. Ned Dobos (2023, Sect. 3) notes a risk related to moral injury: a pharmacological intervention that protects the service member against a debilitating sense of wrongdoing or guilt (i.e. moral trauma) may expose them to a corrosion of moral emotions and induce a sense of indifference (i.e. moral degradation).

As a consequence, a complicated balancing of the short- and long-term interests of service members must take place, all against the background of the broader military benefit arising from the use of the enhancement. Thus, even if we accept that the armed forces or the government owe a duty of care to military personnel, it is far from obvious what exactly that requires in practice when it comes to enhancements.

4 Accountability

Human enhancement may also make it more difficult to establish accountability for undesirable actions. Walsh and Van de Ven (2023, Sect. 3) give the example of fighter pilots who, having ingested amphetamines as an approved fatigue countermeasure on a long mission, mistakenly fire on friendly forces. They query whether the use of such drugs might lessen the responsibility of the individuals involved, and thereby also cast doubt on the acceptability of the intervention in question from the perspective of the just war theory (*ibid.*). The same questions also arise under the rules and principles of international law that apply in armed conflicts (Liivoja 2022, sec. IV(A); Harrison Dinniss and Kleffner 2016, sec. VI(B)).

Sahar Latheef (2023) considers individual responsibility in the context of brain-to-brain interfaces (BBIs), which would allow direct communication between two or more human brains. She argues that an individual connected to a BBI ought not be held fully responsible for their actions due to the adverse impact this technology can have on their ability to act freely, coupled with a diminished sense of self-agency, and a lack of authenticity of thoughts and memories (*ibid.*). She notes, among other things, that the absence of language in communication erodes a sense of agency—a problem that also manifests itself in the legal context (e.g. Noll 2014).

5 Dual loyalties

Finally, human enhancement may increase the tension between military ethics and medical ethics, and exacerbate the problem of dual loyalties of persons who are simultaneously members of the medical profession and the profession of arms.

Michael Reade (2023) considers in detail how conflicting duties may arise out of these loyalties, and how a balance between the requirements of military and medical ethics could be maintained in practice. He explains how armed conflict accentuates the problem of dual loyalties, noting that the military medical practitioner may face a dilemma when, for example, asked to prescribe medications to enhance combat ability, in the knowledge that this might have an adverse effect on the individuals (*ibid.*, Sect. 6). In this context, questions can also arise about the bounds of the activities that military medical personnel can carry out while retaining their special protection under international law (see Liivoja 2018).

6 By way of a conclusion

The papers in this special issue take distinctly different approaches to ethical issues in military bioscience. But, when read together, several common themes emerge. First, the papers highlight the ambiguities in the concept of human enhancement, and perhaps give us reason to be wary of that concept. Second, they implicitly suggest that biomedical interventions in the military cannot be evaluated based on purely civilian conceptions of bioethics or medical ethics but require an approach that factors in uniquely military considerations (cf. Mehlman and Corley 2014). Third, the papers identify challenges for accountability—both in terms of the way in which the service member’s individual responsibility may be eroded as a result of human enhancement, as well as the additional demands placed on the ethical compass of the military medical professional.

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References

- Dasey, Charles F. 1990. ‘Medical Benefits of the Biological Defense Research Program’. *Politics and the Life Sciences* 9 (1): 77–84.
- Dobos, Ned. 2023. ‘Pharmacological Prophylaxes against Moral Injury’. *Monash Bioethics Review* 41 (1). <https://doi.org/10.1007/s40592-022-00167-3>.
- Erler, Alexandre. 2017. ‘The Limits of the Treatment-Enhancement Distinction as a Guide to Public Policy’. *Bioethics* 31 (8): 608–615. <https://doi.org/10.1111/bioe.12377>.
- Harrison Dinniss, Heather A., and K. Jann, and Kleffner. 2016. ‘Soldier 2.0: Military Human Enhancement and International Law’. *International Law Studies* 92 (1): 432–482.
- Henschke, Adam. 2023. ‘When Enhancements Need Therapy: Disenhancements, Iatrogenesis, and the Responsibility of Military Institutions’. *Monash Bioethics Review* 41 (1). <https://doi.org/10.1007/s40592-022-00169-1>.

- Juengst, Eric, and Daniel Moseley. 2019. 'Human Enhancement'. In *The Stanford Encyclopedia of Philosophy*, edited by Edward N. Zalta. <https://plato.stanford.edu/archives/sum2019/entries/enhancement/>.
- Krickus, Richard J. 1965. 'On the Morality of Chemical/Biological War'. *Journal of Conflict Resolution* 9 (2): 200–210.
- Latheef, Sahar. 2023. 'Brain to Brain Interfaces (BBIs) in Future Military Operations: Blurring the Boundaries of Individual Responsibility'. *Monash Bioethics Review* 41 (1). <https://doi.org/10.1007/s40592-022-00171-7>.
- Leitenberg, Milton, Raymond A. Zilinskas, and H. Kuhn Jens. 2012. *The Soviet Biological Weapons Program: A History*. Cambridge, MA: Harvard University Press.
- Liivoja, Rain. 2018. 'Biomedical Enhancement of Warfighters and the Legal Protection of Military Medical Personnel in Armed Conflict'. *Medical Law Review* 26 (3): 421–448. <https://doi.org/10.1093/medlaw/fwx046>.
- Liivoja, Rain. 2022. 'Being More than You Can Be: Enhancement of Warfighters and the Law of Armed Conflict'. In *The Future Law of Armed Conflict*, edited by Matthew C. Waxman, and Thomas W. Oakley, 83–102. New York, NY: Oxford University Press. <https://doi.org/10.1093/oso/9780197626054.003.0006>.
- McGee, Andrew. 2020. 'Using the Therapy and Enhancement Distinction in Law and Policy'. *Bioethics* 34 (1): 70–80. <https://doi.org/10.1111/bioe.12662>.
- Mehlman, Maxwell J., and Stephanie Corley. 2014. 'A Framework for Military Bioethics'. *Journal of Military Ethics* 13 (4): 331–349. <https://doi.org/10.1080/15027570.2014.992214>.
- Moreno, Jonathan D. 2001. *Undue Risk: Secret State Experiments on Humans*. New York, NY: Routledge.
- Noll, Gregor. 2014. 'Weaponising Neurotechnology: International Humanitarian Law and the Loss of Language'. *London Review of International Law* 2 (2): 201–231. <https://doi.org/10.1093/lril/lru009>.
- Reade, Michael C. 2023. 'Whose Side Are You on? Complexities Arising from the Non-Combatant Status of Military Medical Personnel'. *Monash Bioethics Review* 41 (1). <https://doi.org/10.1007/s40592-022-00168-2>.
- Walsh, Adrian, and Katinka van de Ven. 2023. 'Human Enhancement Drugs and Armed Forces: An Overview of Some Key Ethical Considerations of Creating "Super-Soldiers"'. *Monash Bioethics Review* 41 (1). <https://doi.org/10.1007/s40592-022-00170-8>.

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