



PART 2

Read the text below and answer questions 14–26.

HUMAN ENHANCEMENT: THE ETHICAL FRONTIER OF BIOTECHNOLOGY

A

Biotechnology is increasingly aimed not only at curing disease but also at amplifying human capacities. Alongside pharmaceuticals and medical devices, enhancement now includes neurostimulation, cognitive-training systems, hormonal manipulation, and gene-based interventions that promise sharper attention, greater endurance, or altered mood. Supporters present this as a continuation of self-improvement: humans have long used tools, education, and medicine to expand what bodies and minds can do. Critics, however, argue that enhancement shifts medicine into a broader social project, one that raises questions about identity, power, and what kinds of lives are valued.

B

A recurring ethical difficulty concerns consent and autonomy in contexts where enhancement becomes a competitive expectation. In workplaces, universities, or elite sport, individuals may feel compelled to enhance simply to avoid falling behind, even if the choice is framed as voluntary. Bioethicists describe this as a pressure on cognitive liberty: the freedom to control one's own mental states without coercion. The issue becomes more complex when parents pursue enhancement for children. Advocates may argue that selecting traits is a form of care, while opponents warn that such interventions can restrict a child's right to an open future, locking them into a path they did not choose and cannot easily reverse.

C

Another difficulty is definitional. Many interventions improve function without controversy: vaccines prevent infection, and glasses restore sight. Yet the boundary between therapy and enhancement becomes unclear once technologies push abilities beyond typical ranges. A student using neurotechnology to maintain focus for longer may be seen as redesigning rather than repairing; a soldier receiving pharmaceutical support for wakefulness may be viewed as optimising performance rather than treating illness. The boundary also moves historically: what begins as optional can become socially expected, creating a “therapeutic misconception” in which people interpret enhancement as a medical necessity because social institutions treat non-enhancement as a deficit.

D

Regulation has struggled to keep pace with this shifting landscape. Devices, drugs, and genetic technologies often fall under separate agencies and legal categories, leaving gaps



that innovators can exploit. Some regulators focus on risk profiles, while others attempt to separate therapy from enhancement, even when the same tool can be used for both. This problem is magnified by cross-border markets: consumers may travel or purchase services remotely in jurisdictions with weaker oversight, creating a form of regulatory arbitrage that undermines national rules. As germline editing and advanced neurotechnology develop, the mismatch between rapid innovation and slower governance becomes a central policy concern.

E

Safety and uncertainty sit at the centre of the debate because enhancement often targets complex systems whose long-term dynamics are poorly understood. Gene-based interventions may involve off-target effects, where edits occur at unintended genomic sites, and outcomes can vary across tissues and life stages. Neurotechnologies introduce other risks, from hardware malfunction to subtle psychological changes that appear after prolonged use. Some harms are immediate, but others are delayed risks that surface only years later, after users have already built careers or identities around altered capabilities. Ethical evaluation therefore involves not only known side effects but also the moral question of how much uncertainty is acceptable when interventions are elective.

F

Access and fairness raise a second set of concerns that many writers frame in terms of distributive justice. If enhancements are costly, they may operate as positional goods: advantages that matter primarily because they are scarce and improve one person's standing relative to others. In such cases, even modest improvements can reshape competition for jobs, education, and social status. Over time, differential access may create a biological class divide, in which technological advantages accumulate across generations through inheritance, education, and social networks, rather than only through conventional forms of privilege. Even if prices fall, unequal distribution may persist through geography, institutional gatekeeping, or discrimination in who is offered or encouraged to enhance.

G

Cultural values further complicate claims about what counts as “better.” Traits prized in one society—competitive drive, emotional restraint, height, or particular cognitive styles—may be seen as undesirable elsewhere. Disability scholars also argue that some enhancement narratives imply that certain bodies are unacceptable, reinforcing stigma rather than expanding inclusion. The ethical frontier, on this view, is not simply about safety or efficiency, but about the messages societies send regarding human worth,



normality, and belonging. Enhancement debates therefore intersect with social history, identity politics, and the risk of remaking diversity into a technical problem to be solved.

H

Because fixed lines between therapy and enhancement are unstable, some philosophers propose focusing instead on governance principles. They emphasise transparency about benefits and risks, long-term monitoring, public participation in setting boundaries, and safeguards against coercion in schools, workplaces, or the military. This approach treats morphological freedom as important but not absolute: societies may allow enhancement while still limiting practices that undermine equality or exploit vulnerable groups. The conclusion drawn by many analysts is that outcomes will depend less on the tools themselves than on how societies distribute benefits, manage uncertainty, and protect freedom of choice, so that enhancement does not become a pathway to deeper inequality or diminished autonomy.

Questions 14–18

Choose the correct heading for each paragraph.

List of Headings

- i Why the meaning of “enhancement” is hard to pin down
- ii Managing risk when long-term effects are uncertain
- iii How technology could create a “biological class divide”
- iv Consent problems when enhancement becomes a competitive expectation
- v Why fragmented regulation struggles in a global market
- vi How cultural values influence definitions of “better”
- vii Why ethical questions extend beyond medicine

14 Paragraph B

15 Paragraph C

16 Paragraph D

17 Paragraph E

18 Paragraph F

Questions 19–22



Which paragraph contains the following information?

You may use any letter more than once.

19 The view that enhancement is presented by supporters as part of a long tradition of self-improvement.

20 The warning that advantages could accumulate across generations through technology rather than only social privilege.

21 A proposal to prioritise governance principles such as transparency and public participation instead of fixed lines.

22 The conclusion that outcomes depend on how societies distribute benefits and protect freedom of choice.

Questions 23–26

Complete the sentences below. Choose **NO MORE THAN TWO WORDS** from the text for each answer.

23 Enhancing children could restrict their right to an

24 Interventions can feel less like therapy when they push abilities beyond

25 Regulatory problems are magnified by, which allow consumers to seek services in jurisdictions with weaker oversight.

26 Risks that surface only years after an intervention are described as

Answer Key

14. iv

15. i

16. v

17. ii

18. iii

19. A

20. F

21. H

22. H



23. open future

24. typical ranges

25. cross-border markets

26. delayed risks