

The Next Evolution or Ethical Dilemma? Generative AI in Prosthetics and Orthotics

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Introduction

Generative AI (GenAI) is a rapidly evolving form of artificial intelligence capable of creating new content by analysing patterns in existing data and responding to user prompts. Driven by large language models (LLMs), it can transform Prosthetics and Orthotics through enhanced education, research, and administrative efficiency. However, there is limited literature on its direct application to P&O, and ethical considerations. Insights from other AHPs, regulatory bodies, and grey literature provide a foundation for developing P&O-specific guidance.

Key Questions:

- What are the ethical implications of generative AI in P&O?
- How ready is the profession to adopt it?
- Do we need guidance for safe adoption of generative AI tools?



Method

Design: Mixed-methods approach

Desk Review (2020–2025)

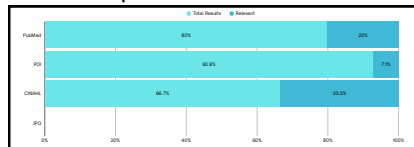
- Databases: PubMed, CINAHL, Prosthetics and Orthotics International (POI), Journal of Prosthetics and Orthotics (JPO).
- Grey literature: HCPC, AHPF, CSP, SoR, NICE, NHS England, UK Government.
- Tools used: Mendeley, NotebookLM, ChatGPT (for data synthesis).
- Explored 3 Keywords: Ethical Implication, Generative AI and Prosthetics and Orthotics
- Focus: "What are the ethical implications of generative artificial intelligence in P&O"

Ongoing BAPO Member Survey (2025)

- Participants: ~600 members (clinicians, technicians, support staff, apprentices).
- Sections:
 - a. Demographics
 - b. Current AI use
 - c. Ethical priorities (based on six key literature themes)
- Includes optional sign-up for follow-up focus groups.

Results - Themes from Literature

Database searches using key terms related to Prosthetics and Orthotics, Generative Artificial Intelligence, and Ethics yielded 38 total records, of which 9 were relevant. No studies specifically addressed generative AI ethics within Prosthetics and Orthotics practice.



In contrast, 12 UK policy and regulatory documents from HCPC, AHPF, CSP, SoR, NHS England, NICE, and the UK Government demonstrate growing ethical guidance across other health professions regulatory bodies.

Key Ethical Challenges



Ethical Priorities

01 Data quality and Integrity

02 Security and Privacy

03 Ethical and trust concerns

04 Implementation Barrier

05 Workforce impact & AI literacy

06 Environmental sustainability

Key Areas of Guidance for Safe AI Adoption

Governance & Law:

AI in healthcare must comply with UK GDPR, the Data Protection Act, and DHAC safety standards. Oversight is led by the DHSC, ICO, and MHRA, with required impact assessments to manage privacy, equality, and ethical risk.

Ethical Design:

AI systems must be transparent, fair, and accountable, maintaining human oversight and explainability. Sustainability is encouraged to align with NHS carbon goals.

Procurement:

Public bodies are advised to procure AI ethically — ensuring transparency, bias mitigation, and continuous monitoring of system performance.

Professional Standards:

Safe use depends on AI literacy, training, and accountability. The HCPC and other regulators emphasise ongoing education and professional responsibility when using AI in practice.

Discussion

Why should we care about these priorities as a profession adopting AI?

- Protects Patient Trust** – Ensuring data privacy and security safeguards sensitive information and maintains confidence in our clinical practice.
- Supports Accountability** – Transparency and explainability allow clinicians to justify decisions and integrate AI safely into patient care.
- Promotes Equity** – Addressing bias prevents unequal treatment and ensures fair access to high-quality orthotic and prosthetic care.
- Safeguards Safety** – Reliable, validated AI tools reduce errors and uphold professional standards in assessment and prescription.
- Prepares the Workforce** – Embedding AI literacy into CPD equips clinicians to use technology responsibly and adapt to digital transformation.
- Protects the Planet** – Considering environmental sustainability ensures innovation aligns with NHS net-zero goals and responsible healthcare delivery.

Why does the lack of P&O-specific AI guidance risk unsafe adoption?

The absence of Prosthetics and Orthotics (P&O)-specific literature on generative AI ethics presents a significant risk to safe adoption because it leaves the profession without tailored guidance on accountability, bias, and data governance.

While other UK Allied Health Professions, such as physiotherapy and radiography, have established ethical principles and AI readiness frameworks, P&O lacks clear standards to evaluate tools, manage data, or define clinician oversight. Without field-specific frameworks, practitioners risk relying on unvalidated AI outputs, potentially compromising patient safety, privacy, and professional accountability.

Furthermore, the absence of structured training in AI literacy widens the gap between innovation and ethical use. Drawing from broader UK and international frameworks (HCPC, NICE, AHPF, CSP), P&O urgently requires its own governance model to ensure generative AI enhances rather than undermines professional integrity and patient-centred care.

Help shape the adoption of AI in P&O by filling out this survey and joining the focus group



Conclusion

Generative AI holds great promise for advancing Prosthetics and Orthotics through personalised device design, rehabilitation planning, and education. However, the absence of P&O-specific ethical frameworks raises concerns around data integrity, intellectual property, and accountability. "Hallucinations" in AI outputs highlight the risk of misinformation without proper human oversight. Ownership and copyright restrictions, such as Prosthetics and Orthotics International's prohibition on AI-based text and data mining, further underscore the need for clear governance.

References

1. Allied Health Professions Federation (AHPF) Principles for AI and education. In: 1.
2. Artificial intelligence (AI) in education. (2024). <https://www.unesco.org/en/artificial-intelligence-in-education>
3. Artificial intelligence (AI) in education. (2024). <https://www.unesco.org/en/artificial-intelligence-in-education>
4. Artificial intelligence (AI) in education. (2024). <https://www.unesco.org/en/artificial-intelligence-in-education>
5. British Society of Artificial Intelligence (BSAI) (2024). <https://www.bsaionline.org/>
6. Castagnoli, E. & Health, M. (2023). <https://www.bsaionline.org/>
7. Castagnoli, E. & Health, M. (2023). <https://www.bsaionline.org/>
8. Castagnoli, E. & Health, M. (2023). <https://www.bsaionline.org/>
9. Castagnoli, E. & Health, M. (2023). <https://www.bsaionline.org/>
10. Castagnoli, E. & Health, M. (2023). <https://www.bsaionline.org/>
11. Castagnoli, E. & Health, M. (2023). <https://www.bsaionline.org/>
12. Castagnoli, E. & Health, M. (2023). <https://www.bsaionline.org/>
13. Castagnoli, E. & Health, M. (2023). <https://www.bsaionline.org/>
14. Castagnoli, E. & Health, M. (2023). <https://www.bsaionline.org/>
15. Castagnoli, E. & Health, M. (2023). <https://www.bsaionline.org/>
16. Castagnoli, E. & Health, M. (2023). <https://www.bsaionline.org/>
17. Castagnoli, E. & Health, M. (2023). <https://www.bsaionline.org/>
18. Castagnoli, E. & Health, M. (2023). <https://www.bsaionline.org/>
19. Castagnoli, E. & Health, M. (2023). <https://www.bsaionline.org/>
20. Castagnoli, E. & Health, M. (2023). <https://www.bsaionline.org/>

Disclosure: Elements of this poster were created using generative AI tools (ChatGPT and NotebookLM) and designed in Canva