

# Visual neuroprostheses

The aim of the review of van Velthoven et al. was to systematically identify the ethical implications of visual neuroprostheses. Approach. A systematic search was performed in both PubMed and Embase using a search string that combined synonyms for visual neuroprostheses, brain-computer interfaces (BCIs), cochlear implants (CIs), and ethics. We chose to include literature on BCIs and CIs, because of their ethically relevant similarities and functional parallels with visual neuroprostheses. Main results. We included 84 articles in total. Six focused specifically on visual prostheses. The other articles focused more broadly on neurotechnologies, on BCIs or CIs. We identified 169 ethical implications that have been categorized under seven main themes: (a) benefits for health and well-being; (b) harm and risk; (c) autonomy; (d) societal effects; (e) clinical research; (f) regulation and governance; and (g) involvement of experts, patients, and the public. Significance. The development and clinical use of visual neuroprostheses are accompanied by ethical issues that should be considered early in the technological development process. Though there is ample literature on the ethical implications of other types of neuroprostheses, such as motor neuroprostheses and CIs, there is a significant gap in the literature regarding the ethical implications of visual neuroprostheses. Our findings can serve as a starting point for further research and normative analysis <sup>1)</sup>.

<sup>1)</sup>

van Velthoven EAM, van Stuijvenberg OC, Haselager DRE, Broekman M, Chen X, Roelfsema P, Bredenoord AL, Jongsma KR. Ethical implications of visual neuroprostheses-a systematic review. J Neural Eng. 2022 Apr 27;19(2). doi: 10.1088/1741-2552/ac65b2. PMID: 35475424.

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