Review Lancet Oncol. 2024 Nov;25(11):e589-e601. doi: 10.1016/S1470-2045(24)00315-2.

Artificial Intelligence for Response Assessment in Neuro Oncology (AI-RANO), part 2: recommendations for standardisation, validation, and good clinical practice

Spyridon Bakas [1], Philipp Vollmuth [2], Norbert Galldiks [3], Thomas C Booth [4], Hugo J W L Aerts [5], Wenya Linda Bi [6], Benedikt Wiestler [7], Pallavi Tiwari [8], Sarthak Pati [9], Ujjwal Baid [10], Evan Calabrese [11], Philipp Lohmann [12], Martha Nowosielski [13], Rajan Jain [14], Rivka Colen [15], Marwa Ismail [8], Ghulam Rasool [16], Janine M Lupo [17], Hamed Akbari [18], Joerg C Tonn [19], David Macdonald [20], Michael Vogelbaum [21], Susan M Chang [22], Christos Davatzikos [23], Javier E Villanueva-Meyer [17], Raymond Y Huang [24];
Response Assessment in Neuro Oncology (RANO) group

Affiliations
PMID: 39481415 DOI: 10.1016/S1470-2045(24)00315-2

Abstract

Technological advancements have enabled the extended investigation, development, and application of computational approaches in various domains, including health care. A burgeoning number of diagnostic, predictive, prognostic, and monitoring biomarkers are continuously being explored to improve clinical decision making in neuro-oncology. These advancements describe the increasing incorporation of artificial intelligence (AI) algorithms, including the use of radiomics. However, the broad applicability and clinical translation of AI are restricted by concerns about generalisability, reproducibility, scalability, and validation. This Policy Review intends to serve as the leading resource of recommendations for the standardisation and good clinical practice of AI approaches in health care, particularly in neuro-oncology. To this end, we investigate the repeatability, reproducibility, and stability of AI in response assessment in neuro-oncology in studies on factors affecting such computational approaches, and in publicly available open-source data and computational software tools facilitating these goals. The pathway for standardisation and validation of these approaches is discussed with the view of trustworthy AI enabling the next generation of clinical trials. We conclude with an outlook on the future of AI-enabled neuro-oncology.