

Oversight of artificial intelligence in medicine: A review and content analysis of frameworks

Abstract: Introduction: Artificial intelligence (AI) is rapidly expanding in medicine even while lacking formal oversight. We sought to identify and describe topics on the oversight of AI in medicine. We also explored where along the translational process (i.e., AI development, reporting, evaluation, implementation, and surveillance) these topics were targeted. Methods: We conducted a literature review of frameworks regarding the oversight of AI in medicine. The search included key topics such as ‘artificial intelligence,’ ‘machine learning,’ ‘guidance as topic,’ and ‘translational science,’ and spanned the time period 2014-2021. Frameworks were included if they described translational considerations for AI. The included frameworks were summarized descriptively. Qualitative content analysis was used to identify topics in the oversight of AI in medicine, and quantitative content analysis was used to evaluate their coverage of the topics. An evaluation matrix methodology was used to visualize how topics were described across the different translational stages for each framework. Results: Six frameworks were identified for inclusion. Content analysis of the frameworks revealed five overarching topics related to the oversight of AI in medicine, including: transparency, reproducibility, ethics, effectiveness, and engagement. All frameworks included discussions regarding transparency, reproducibility, ethics, and effectiveness, while only half of frameworks discussed engagement. The evaluation matrix revealed that frameworks were most likely to report AI considerations for the translational stage of development, and least likely to report considerations for the translational stage of surveillance. Discussion: Frameworks provided broad guidance for the oversight of AI in medicine, but notably offered less input on the role engagement approaches for oversight, and regarding the translational stage of surveillance. Identifying and optimizing strategies for engagement is essential to ensure that AI can meaningfully benefit patients and other end-users.

About the Speaker: Norah L Crossnohere, PhD, is a Research Scientist in the Dept. of Biomedical Informatics at the Ohio State University College of Medicine. Norah’s training is in public health and social and behavioral sciences, and she received her PhD from the Johns Hopkins Bloomberg School of Public Health in 2020. Norah is a social scientist whose research applies and advances mixed-methods approaches to measure patient preferences, and other patient-centered outcomes. She has experience in quantitative choice modeling, qualitative interviewing, and patient engagement for use informing regulatory and clinical decision-making, and has applied these methods in pediatrics, cancer, and rare diseases.

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