Artificial Intelligence in Medicine

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Artificial intelligence (AI) has gained recent public prominence with the release of deep-learning models that can generate anything from art to term papers with minimal human intervention. This development has reinvigorated discussion of the existing and potential roles of AI in all aspects of life. Among the wide range of fields with possible applications of AI, however, medicine stands out as one in which there is tremendous potential along with equally substantial challenges. At the Journal, we are seeing a rapidly increasing number of manuscript submissions that consider some aspect of AI applied to medicine. Given this enormous interest, we have now published in this issue of the Journal the first articles in a new series, AI in Medicine, that will consider both the reasonably established and the growing possible roles of AI and machine learning technologies in all aspects of health and health care. Moreover, to further our commitment to this area, we are also announcing the 2024 launch of a new journal, NEJM AI (ai.nejm.org), which aims to provide a forum for high-quality evidence and resource sharing for medical AI along with informed discussions of its potential and limitations.

As a medical journal, we face two new publishing challenges for NEJM AI. The first is the breadth of potential AI applications. There is virtually no area in medicine and care delivery that is not already being touched by AI. For example, AI-driven applications are available to capture the dictation of medical notes; many such applications are attempting to synthesize patient interviews and laboratory test results to write notes directly, without clinician intervention. AI is playing an increasing role in health insurance coverage, assisting caregivers in making claims and payors in adjudicating them. We have already seen many published reports that use AI to interpret images — radiographs, histology, and optic fundi. Tools that utilize AI have come into increasing use in analyzing and interpreting large research databases containing information ranging from laboratory findings to clinical data. All these tools offer the potential for increased efficiency and may, perhaps, render insights that are difficult to attain with more traditional data-analysis methods. However, new AI methods are not necessarily a panacea; they can be brittle, they may work only in a narrow domain, and they can have built-in biases that disproportionally affect marginalized groups. This range of AI applications requires a diverse group of authors, editors, and reviewers, even though the pool of individuals with appropriate knowledge is still relatively small.

Second, expertise in the field of AI and machine learning is closely linked to commercial applications. The underlying technology is rapidly changing and, in many cases, is being produced by companies and academic investigators with financial interests in their products. For a growing class of large-scale AI models, companies that have the necessary resources may be the only ones able to push the frontier of AI systems. Since many such models are not widely available yet, hands-on experience and a detailed understanding of a model’s operating characteristics often rest with only a small handful of model developers. Despite the potential for financial incentives that could create conflicts of interest,
a deep understanding of AI and machine learning and their uses in medicine requires the participation of people involved in their development. Thus, in the series of AI articles we are publishing in the Journal and in *NEJM AI*, we will not restrict authorship and editorial control to persons without relevant financial ties but will follow a policy of transparency and disclosure.

Medicine is much different from other areas where AI is being applied. AI enables new discoveries and improved processes in the entire health care continuum; ethical, governance, and regulatory considerations are critical in the design, implementation, and integration of every component of the AI applications and systems. Because of concerns about both utility and safety, new applications will generally have to adhere to the same standards applied to other medical technologies. This will require a level of rigor in testing similar to that used in other areas of medicine, but it also can present challenges, such as the “dataset shift” that can result when there is a mismatch between the data set with which an AI system was developed and the data on which it is being deployed. This summer, we hope to begin evaluating research studies for *NEJM AI* that bring careful methodology to understanding how to use AI and machine learning approaches in medicine. And as always, we welcome such studies at the Journal. We are excited to use our resources to encourage high-quality work in AI and to disseminate it with the same standards that we apply to everything we publish.

Disclosure forms provided by the authors are available with the full text of this editorial at NEJM.org.

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**Prophylactic Antibiotics for Vaginal Delivery — Benefits and Possible Harms**

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Ignaz Semmelweis, a Hungarian physician often labeled the “Savior of Women,” pioneered the use of antiseptic techniques to decrease puerperal fever. Although his seminal 1861 publication, *The Etiology, Concept and Prophylaxis of Childbed Fever*, was poorly received at the time, it is now the foundation for contemporary preventative obstetric practices, including routine hand washing. Despite this progress, maternal infection remains one of the top causes of maternal death worldwide and is currently ranked third behind hypertension and hemorrhage. The World Health Organization (WHO) has reported that as of 2017, approximately 810 women died each day from preventable causes related to pregnancy and childbirth. Of these deaths, 94% occurred in low- and middle-income countries, and 10.7% were directly caused by infection or sepsis.1 The majority of these deaths were in sub-Saharan Africa and South Asia.

The WHO lists the improvement of maternal health as one of its key priorities and, along with the United Nations, has called for a 70% decrease in maternal mortality by 2030.2 Because sepsis is one of the leading causes of maternal complications and death, the WHO convened an international panel of experts to specifically address this condition. The resultant 2017 WHO Statement on Maternal Sepsis established criteria for the diagnosis of maternal sepsis and detailed the Global Maternal and Neonatal Sepsis Initiative and its vision of reducing maternal and neonatal deaths related to sepsis. This effort included the development and testing of strategies to prevent, detect, and successfully manage maternal and neonatal sepsis.3