Perception of Artificial Intelligence (AI) among radiologists

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Introduction
Radiology is a relatively new specialty among the other specialties in medicine; it has experienced evolutionary changes in its journey in the last century and in this current millennium and seems to be very much prone to further innovations.

Artificial Intelligence (AI) in radiology is a very hot, exciting, irresistible, innovative, and evolutionary topic, perhaps the biggest milestone in its journey after the invention of the X-ray by William Conrad Roentgen in 1895 (1).

AI, without doubt, will become part of radiologists’ daily practice, helping clinicians improve efficiency and diagnostic capability. It has the potential to shift through a large quantity of imaging data in seconds, assisting radiologists by helping to prioritize worklists and diagnoses (2).

AI perception among radiologists and radiology trainees
The perception of AI among clinicians and radiologists varies across a spectrum ranging from total acceptance and great enthusiasm (3) to big skepticism, anxiety, fear of job cuts, denialism, and apprehensiveness. In a survey conducted among radiology trainees, this anxiety reflected in their results as follows: “Trainees were more likely to express doubts on whether they would have pursued diagnostic radiology as a career had they known of the potential impact artificial intelligence is predicted to have on the specialty, \( P = 0.0254 \) and were also more likely to plan to learn about the topic, \( P = 0.0401 \)” (4).

Wherever you see yourself in the spectrum, nobody can stop the advancement, innovations, and implantation of AI in radiology. Since 2015, there have been several peer-reviewed articles and conferences (3) where AI has shown the greatest spike in its journey in this millennium.

Evolution of convolutional neural networks and quality issues
Convolutional neural networks (CNN) have had revolutionary advancement since the very first implementation starting a few layers in between the input and outputs. Nowadays, it can be up to 150 layers. The interactions among the “artificial neurons” seem to remain a mystery—like a black box—for a while; however, data scientists/engineers seem to have a cutting-edge solution for this, such as inventing another clever CNN to be able to understand and analyze the interactions among these neuronal cells. This would also be helpful to understand and solve the quality assurance (QA) issues of the CNNs.

Is AI friend or a foe?
AI is a friend rather than a foe (3) and would gain a very valuable and priceless place in radiology, not only for the diagnostic challenges but also for triaging. This would create “quality time” for radiologists with their patients and prime time for teaching and research. This would render more focusing on diseases and enable a “theranostic” tailored approach for the diseases. What would happen precisely in the near future would remain a bit of a dilemma but radiology undoubtedly will see abundant changes in the next decade or so. The radiology curriculum will include basic AI, likewise in radiology physics (3,5). Radiologists with AI interest would be a preferable skill in radiology job interviews in the near future. The private sector will be actively seeking radiologists with a specific interest in AI.

We, as doctors, have enjoyed an unwarranted sense of job security through centuries. White-collar labor is far from sheltered against the new AI storm. Although a number of medical fields may be poised for automation, radiology seems to be one of the first in the pipeline.
The rollout of AI technology is likely to be incremental, even hideous. Patients and their loved ones will benefit as will the macroeconomy. Radiologists, however, both actual and aspiring, should anticipate potential job losses and plan accordingly (6).

**Future directions**

We would even see AI software in subspecialties, not only in general medicine but also in radiology, pathology, oncology, ophthalmology, and so on. It is strongly believed that AI will have a pivotal impact on medicine and radiology. The radiology horizon will see lots of spectrums from triaging to diagnostic and theranostic approaches. Radiologists will be promoted and will have more quality time for their patients, research, and teaching. In this challenging and knowledge-enhanced millennium, the skepticism and alien feelings and thoughts around AI will gradually fade away.

In conclusion, despite some angst about AI in radiology, the near future seems to be very bright with the conception of many promising innovations. Radiologists and radiology trainees will gain more trust in AI and AI-enhanced procedures and will be happy to use it in their day-to-day work in the future.

**Declaration of conflicting interests**

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

**Funding**

The authors received no financial support for the research, authorship, and/or publication of this article.

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