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Impact of artificial intelligent & data analytics in the field of anesthetics

Harry McGrath

University Hospital Limerick, Ireland

Abstract

Artificial Intelligence (AI) and Data Analytics will change our lives beyond recognition, and they will have a far more significant impact than the internet or mobile technology. We are now at the threshold where machine intelligence is comparable with human intelligence, in certain limited aspects, for the first time in history. Enhancements in technology, both software and hardware, have resulted in some human decision-making being inferior to and more erratic than AI in many fields, including medicine. However, it is widely accepted that rather than compete with machines, using AI to support and help make better-informed decisions is the key to future medicine. In areas like anaesthesia, data analytics can be used to develop useful advanced clinical decision support tools based on machine learning.

Keywords: Anaesthesiology, Machine Learning, Big Data, Data analytics, Pain Management,

Data analytics and AI technology have the potential to transform medicine to a level never seen before, in terms of efficiency and accuracy but also creating insecurity and allowing the transfer of expert domain knowledge to machines. However, applying AI to all areas of medicine such as anaesthetics cannot automatically be assumed to achieve improvements beyond human experts. It is often forgotten that it is "Artificial" intelligence that is being considered. Monitoring of depth of anaesthesia during surgery is subjective and depends on the patient's ASA classification and the surgery type to allow accurate drug administration against the measured state of arousal of the patient. The patient's sensitivity may vary throughout the surgical procedure, and the haemodynamic effects of the drugs may limit the amount that can be given safely. Anaesthetics is a complex medical discipline that involves much cognitive and dexterity based work, and assuming AI can easily replace experienced, and knowledgeable medical practitioners is a very unreasonable expectation. Technological advancement has made robots an integral part of several fields, including surgery. Pharmacological robots are closed-loop systems, able to precisely titrate the dose of anaesthetic drugs to a preset value, concerning hypnosis, analgesia and neuromuscular block. Mechanical robots automatically reproduce manual tasks, showing promising performance. Decision support systems can improve clinical practice. The use of robots in anaesthesia shows the advantage of eliminating the repetitive part of the workload, allowing the anaesthesiologist to focus on patient care. A major issue with current deep learning systems is "opacity." Although a machine may be trained to perform a specific input-output mapping, it is often unclear as to which part of the training network is responsible for any specific outcome.

Biography:

Dr. Harry Mc Grath completed his Medical Degree at UCC, in Ireland, and has worked in Melbourne Australia in numerous Hospitals including Monash. He is currently working in University Hospital Limerick in the Anaesthetics Department. He has active research interests with University of Limerick, UESTC China, and Peking University in the field of AI and anaesthestics

Speaker Publications:

1. Future of Artificial Intelligence in Anesthetics and Pain Management

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