

Role of chat-generative pre-trained transformer (ChatGPT) in anaesthesia: Merits and pitfalls

Dear Editor,

Large language models (LLM) are artificial intelligence intended to imitate human language processing

abilities. Generative pre-training transformer (GPT) is a form of LLM generated by OpenAI (San Francisco, CA, USA). A massive dataset of text (570 GB with 175 B parameters) was used to train the latest model (GPT-3) released in 2020, allowing it to create realistic and coherent text.^[1,2]

The potential use of this technology in the field of anaesthesia is far-reaching [Table 1]. It could be used to educate patients, provide perioperative instructions and aid the anaesthesiologist in clinical

Table 1: Potential applications and major pitfalls of ChatGPT**Potential applications of ChatGPT^[3,4]**

Preoperative period

- Patient education and counselling regarding anaesthetic drugs, techniques and risks involved
- Assistance during preoperative evaluation: history taking, data collection, ordering relevant investigations and providing diagnosis
- Provision of preoperative instructions to the patient depending on the type of surgery and plan of anaesthesia
- Assisting the anaesthesiologist in clinical decision-making based on evidence-based recommendations

Intraoperative period

- Monitoring vitals (heart rate, blood pressure) and determining deviation from the standard range
- Maintenance of records of drugs administered, vitals and complications, if any

Postoperative period

- Provision of analgesia, diet and activity recommendations
- Maintenance of record of patient's experiences and hospital stay

Role in scientific research

- Overcoming language barriers and increasing research equality
- Performing dataset analysis
- Performing a literature review
- Hypothesis generation
- Conduct surveys and data collection

Resident education

- Provision of evidence-based recommendations
- Personalised learning
- Case-based critical thinking

Major pitfalls of ChatGPT^[3,5]

- Risk of bias
- Lack of transparency of datasets used in ChatGPT training
- Risk of factually incorrect information
- Potential for research fraud
- Security and privacy concerns regarding sensitive patient data
- Copyright and authorship hassles
- Lack of empathy and emotional perspective needed in healthcare

decision-making, such as selecting the type and dose of an anaesthetic agent based on the patient data and surgical procedure.^[3,4] It could reduce the documentation load, allowing anaesthesiologists to focus on critical clinical matters.^[3,4] ChatGPT can also potentially be used in the emergency area to triage patients, leading to faster delivery of healthcare and efficient use of manpower and resources. It could also enable communication, allowing patients to receive care/conduct pre-anaesthetic evaluation remotely, reducing the need for in-person visits.^[4]

ChatGPT may also help non-native English speakers overcome language barriers, thus enhancing research

equity and versatility.^[5,6] ChatGPT also has the potential to conduct surveys and track outcomes over more extended periods.^[4] It also has the potential to write entire manuscripts [Supplementary File 1]. It may also facilitate the spread of scientific research by converting complex findings into a more comprehensible language for the general community.^[1,2]

There are myriad concerns and challenges regarding integrating this technology into routine anaesthesia practice [Table 1].^[3,5,6] There is a potential for ChatGPT-3 to generate inaccurate content with a risk of hallucination (factually incorrect information which appears scientifically credible), leading to untoward consequences.^[4,6] Chat-GPT needs more medical proficiency and background to fully understand the complex causal relationships between different diseases and treatments.^[1] ChatGPT training is based on datasets generated before 2021, so it cannot be used presently as an updated source of literature review. There is also a potential for research fraud and copyright hassles as ChatGPT is not an acceptable author based on the existing Committee on Publication Ethics and the International Committee of Medical Journal Editors authorship guidelines.^[5]

Artificial intelligence can only assist and complement an experienced anaesthesiologist, and thorough human supervision of Chat-GPT is a must.

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Conflicts of interest

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SUPPLEMENTARY FILE 1

Letter to editor generated by ChatGPT on the “Role of ChatGPT-3 in anaesthesia”

As an AI language model, ChatGPT can potentially play several roles in the field of anaesthesia, primarily by providing information, assisting with decision-making, and supporting education and research. Here are a few examples:

1. **Information retrieval:** ChatGPT can help anesthesiologists access up-to-date information on anaesthesia techniques, drug interactions, guidelines, and protocols. It can provide quick answers to specific questions related to anaesthesia, helping practitioners stay informed.
2. **Decision support:** Anaesthesia involves complex decision-making, and ChatGPT can assist in this process. It can help anesthesiologists evaluate patient data, such as medical history, preoperative assessments, and lab results, to suggest appropriate anaesthesia plans or identify potential risks.
3. **Education and training:** ChatGPT can serve as a virtual instructor, providing educational resources to trainee anesthesiologists and medical students. It can explain anaesthesia concepts, procedures, and best practices, and even simulate interactive case scenarios to enhance learning.
4. **Research assistance:** Researchers in the field of anaesthesia can benefit from ChatGPT by using it as a tool to gather and analyze data. It can assist in literature reviews, summarizing research papers, and identifying relevant studies, thus saving time and providing insights for further investigations.
5. **Patient education:** ChatGPT can contribute to patient education by offering clear and concise explanations about anaesthesia-related topics. It can help alleviate anxiety and answer common questions regarding the anaesthesia process, potential risks, and post-operative care.

It's important to note that while ChatGPT can provide valuable information and support, it should not replace the expertise and judgment of a qualified anesthesiologist. Anesthesiology is a specialized medical field that requires extensive training and experience, and ChatGPT should be used as a complementary tool to assist healthcare professionals in their decision-making process.