# ChatGPT for pediatric neurosurgery

- Inherent Bias in Large Language Models: A Random Sampling Analysis
- Evaluating human ability to distinguish between ChatGPT-generated and original scientific abstracts
- Customized GPT model largely increases surgery decision accuracy for pharmaco-resistant epilepsy
- Self-Supervised Data-Driven Approach Defines Pathological High-Frequency Oscillations in Human
- Screening/diagnosis of pediatric endocrine disorders through the artificial intelligence model in different language settings
- A Quantitative Assessment of ChatGPT as a Neurosurgical Triaging Tool
- Deep-learning predicted PET can be subtracted from the true clinical fluorodeoxyglucose PET co-registered to MRI to identify the epileptogenic zone in focal epilepsy
- Personality Changes and Staring Spells in a 12-Year-Old Child: A Case Report Incorporating ChatGPT, a Natural Language Processing Tool Driven by Artificial Intelligence (AI)

### Prompts for pediatric neurosurgery

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"Explore ethical considerations in recommending surgery for a child with a low likelihood of long-term benefit."

"Discuss the potential impact of artificial intelligence on improving outcomes in pediatric neurosurgery."

See artificial intelligence for epilepsy diagnosis.

## **Comparative observational studies**

A study aimed at examining the impact of ChatGPT on pediatric endocrine and metabolic conditions, particularly in the areas of screening and diagnosis, in both Chinese and English modes. A 40-question questionnaire covering the four most common pediatric endocrine and metabolic conditions was posed to ChatGPT in both Chinese and English three times each. Six pediatric endocrinologists evaluated the responses. ChatGPT performed better when responding to questions in English, with an unreliable rate of 7.5% compared to 27.5% for Chinese questions, indicating a more consistent response pattern in English. Among the reliable questions, the answers were more comprehensive and satisfactory in the English mode. We also found disparities in ChatGPT's performance when interacting with different target groups and diseases, with improved performance for questions posed by clinicians in English and better performance for questions related to diabetes and overweight/obesity in Chinese for both clinicians and patients. Language comprehension, providing incomprehensive answers, and errors in key data were the main contributors to the low scores, according to reviewer feedback.

Conclusion: Despite these limitations, as ChatGPT continues to evolve and expand its network, it has

significant potential as a practical and effective tool for clinical diagnosis and treatment.

What is known: • The deep learning-based large-language model ChatGPT holds great promise for improving clinical practice for both physicians and patients and has the potential to increase the speed and accuracy of disease screening and diagnosis, as well as enhance the overall efficiency of the medical process. However, the reliability and appropriateness of AI model responses in specific field remains unclear. • This study focused on the reliability and appropriateness of AI model responses to straightforward and fundamental questions related to the four most prevalent pediatric endocrine and metabolic disorders, for both healthcare providers and patients, in different language scenarios.

What is new: • The AI model performed better when responding to questions in English, with more consistent, as well as more comprehensive and satisfactory responses. In addition, we also found disparities in ChatGPT's performance when interacting with different target groups and different diseases. • Despite these limitations, as ChatGPT continues to evolve and expand its network, it has significant potential as a practical and effective tool for clinical diagnosis and treatment <sup>1)</sup>

This study provides a foundational analysis of ChatGPT's potential in pediatric endocrinology, particularly in screening and diagnosis. The findings underscore the model's promise, particularly in English, while highlighting significant limitations in non-English contexts and complex scenarios. Addressing language disparities, expanding question complexity, and conducting detailed error analyses are crucial next steps. Despite its limitations, ChatGPT demonstrates significant potential to enhance clinical efficiency and decision-making as it continues to evolve.

### **Case reports**

#### see ChatGPT prompts for case reports

Low-grade gliomas (LGGs) are the most common type of pediatric brain tumors The presentation of pediatric intracranial tumors is varied and diverse. The early identification and low-grade glioma treatment are important to achieve favorable outcomes. Although personality changes can be a symptom of intracranial tumors, they are rarely the only main presenting of the clinical features. In addition to central nervous system (CNS) tumors, personality changes can be associated with psychological and endocrine conditions, contributing to a broad differential diagnosis. Because symptoms such as personality changes have the potential to be missed, communication between family members and clinicians is imperative to identify these symptoms early. Puthenpura et al. report the case of a 12-year-old child who presented with personality changes as her main symptom and was found to have an intracranial neoplasm. This case report integrates original author writing with output from ChatGPT, a natural language processing tool driven by artificial intelligence (AI). In addition to the case itself, this report will explore the benefits and drawbacks of using natural language Al in this context <sup>2</sup>

#### 1)

Ying L, Li S, Chen C, Yang F, Li X, Chen Y, Ding Y, Chang G, Li J, Wang X. Screening/diagnosis of pediatric endocrine disorders through the artificial intelligence model in different language settings. Eur J Pediatr. 2024 Jun;183(6):2655-2661. doi: 10.1007/s00431-024-05527-1. Epub 2024 Mar 19. PMID: 38502320; PMCID: PMC11098926.

2)

Puthenpura V, Nadkarni S, DiLuna M, Hieftje K, Marks A. Personality Changes and Staring Spells in a 12-Year-Old Child: A Case Report Incorporating ChatGPT, a Natural Language Processing Tool Driven by Artificial Intelligence (AI). Cureus. 2023 Mar 20;15(3):e36408. doi: 10.7759/cureus.36408. PMID: 37090271; PMCID: PMC10115215.

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