

■ Letter to the Editor

## The Potential Role of GPT-4o in Interpreting Chest Computed Tomography for Thoracic Emergencies

### *Torasik Acillerde Toraks Bilgisayarlı Tomografi Yorumlamada GPT-4o'nun Potansiyel Rolü*

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#### Abstract

This study evaluated GPT-4o's performance in interpreting chest CT images for thoracic emergencies. In July 2024, open-access medical images were analyzed by GPT-4o via chatgpt.com with a query to identify and describe abnormalities, specifying the type and plane of imaging. GPT-4o consistently identified the imaging type and plane correctly. For instance, it accurately detected a right-sided pneumothorax with mediastinal shift, and a significant right pleural effusion with a smaller left effusion, although it misidentified minimal bilateral pneumothorax. It correctly identified pericardial effusion in the coronal plane in a cardiac tamponade case but failed to identify a saddle pulmonary embolism. While GPT-4o shows potential for diagnosing chest CT images in thoracic emergencies, it may still miss major abnormalities. Future large-scale studies should evaluate both common and rare pathologies using large language models.

**Keywords:** artificial intelligence; thorax; multidetector computed tomography

#### Öz

Bu çalışmada, torasik aciller için toraks BT görüntülerini yorumlamada GPT-4o'nun performansı değerlendirildi. Temmuz 2024'te, açık erişimli tıbbi görüntüler, chatgpt.com üzerinden GPT-4o'ya analiz ettirildi ve görüntü türü ve düzlemini belirterek anormallikleri tanımlaması istendi. GPT-4o, görüntü türünü ve düzlemini tutarlı bir şekilde doğru belirledi. Örneğin, sağ tarafta pnömotoraks ve mediastinal kaymayı doğru bir şekilde tespit etti ve sağda belirgin, solda daha az belirgin plevral efüzyonu doğru bir şekilde tanımladı, ancak minimal bilateral pnömotoraksı yanlış tespit etti. Kardiyak tamponad vakasında, koronal düzlemde perikardiyal efüzyonu doğru belirledi, ancak aksiyal düzlemde plevral efüzyon olarak yorumladı. Akut pulmoner emboli vakasında, sağ ventrikül ve pulmoner arterleri içeren aksiyal kesitlerde saddle pulmoner emboliyi tespit edemedi. GPT-4o, göğüs BT görüntülerinde önemli tanımlar koyma potansiyeline sahip olsa da, hala büyük anormallikleri kaçırabilir. Gelecekteki büyük ölçekli çalışmalar, yaygın ve nadir patolojileri büyük dil modelleri kullanarak değerlendirmelidir.

**Anahtar kelimeler:** yapay zeka; toraks; çok kesitli bilgisayarlı tomografi

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Dear Editor,

There is an increasing body of research exploring the application of large language models in medical imaging across various modalities [1, 2]. In this context, I would like to share the performance of generative pre-trained transformer (GPT)-4o, the latest version of ChatGPT, in interpreting chest computed tomography (CT) images for common thoracic emergencies.

For common thoracic emergencies, open-access medical images were captured. In July 2024, GPT-4o was prompted via chatgpt.com with the query: "Please evaluate the medical imaging of a patient presenting to the emergency department and describe any abnormalities. Specify the type and plane of the imaging as well." JPEG images were then uploaded. GPT-4o consistently identified the imaging type and plane correctly. The following are some examples:

- Axial CT with pneumothorax: GPT-4o correctly identified a right-sided pneumothorax and mediastinal shift to the left in the parenchymal window (<https://radiopaedia.org/articles/pneumothorax>).
- Axial CT with pleural effusion: GPT-4o accurately described a significant right pleural effusion and a smaller left pleural effusion. Notably, it also detailed the quantity of the effusion. However, it incorrectly identified bilateral minimal pneumothorax, possibly due to the use of the mediastinal window (<https://radiopaedia.org/articles/haemothorax>).
- Cardiac Tamponade: In a case of cardiac tamponade, GPT-4o interpreted the pericardial effusion as a pleural effusion in the axial plane and mediastinal window; however, correctly identified it in the coronal plane (<https://radiopaedia.org/articles/cardiac-tamponade>).

- Acute Pulmonary Embolism: For an acute pulmonary embolism case, axial slices involving the right ventricle and pulmonary arteries were uploaded. GPT-4o failed to identify a saddle pulmonary embolism (<https://radiopaedia.org/articles/saddle-pulmonary-embolism>).

GPT-4o has demonstrated the potential to make significant diagnoses in chest CT imaging for thoracic emergencies. However, it may still miss major abnormalities. Future large-scale studies could evaluate common and rare pathologies in chest CT using large language models.

### Declarations

There was no financial support for the study, and the author has no conflicts of interest to declare.

### Ethics Approval

Since publicly available and anonymized data were used in this study, ethical approval is not required.

### References

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