



Using Few-shot Prompting of LLMs and icd-10 Codes for More Accurate and Readable Patient Friendly Explanations (pfx) for Incidental Findings on Mri for More Equitable Results Delivery to Patients

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Introduction

Patient friendly explanations (PFx) of radiology findings that are accurate and easily understood may result in better understanding and improved health equity for patients. LLMs can greatly facilitate the generation of these PFx but given their stochastic nature and possibility for hallucination, they require expert review and proofreading for each PFx which is not easily done for every report.

Hypothesis

We used a few-shot prompting LLM workflow to generate PFx, based on examples of manually created PFx using the same style, tone, reading grade level, and also check accuracy by comparing ICD-10 codes of PFx with incidental finding ICD-10 codes. This LLM workflow minimizes the need for editing and proofreading.

Methods

We used the 25 most common incidental findings on MRI (brain, neck, chest, abdomen, pelvis) based on literature review (eg, cavernous hemangioma), to generate PFx using two prompting methods: (1) Zero shot prompting (2) Few shot prompting where we provide 5 examples of manually created and edited PFx and asked the LLM (GPT-4o-2024-05-13) to follow the length, style, and grade-level of those human created PFx. We also prompt the LLM to provide ICD-10 codes for the PFx corresponding to incidental finding as a way to check for accuracy of the PFx.

Results

The PFx examples used in few-shot prompting had 64.6 average number of words and 3.2 average number of sentences. For zero shot prompting vs. few shot prompting, the average number of words per PFx was 10.8 vs. 55.8 and the average number of sentences per PFx was 1.0 vs. 3.0.

Conclusion

Accurate patient friendly explanations (PFx) of incidental findings on MRI studies that can be easily and accurately generated by LLMs using few-shot prompting based on patient needs, may avoid patient confusion and anxiety, and result in better understanding and more equitable health delivery for patients with differing education and backgrounds including for non-English speakers. Future radiology reports will likely contain patient friendly explanations of relevant findings that are customized to each patient, for improved health equity.

Figure(s)



Figure 1. Few Shot Prompting for Generating Patient Friendly Explanations for Incidental Findings

Keywords

Artificial Intelligence/Machine Learning