# Harnessing AI for Medical Informatics: A Comparative Study of GPT and Traditional Methods in Expanding Medical Acronyms and Shorthands

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## Introduction

Medical acronyms and shorthand are widely used in healthcare to shorten word count and alleviate reading burden. However, varying interpretations across clinical contexts pose challenges, potentially disrupting workflows and paradoxically increasing the time required to understand the intended communication. Traditional methods of acronym and shorthand expansion, such as looking up medical dictionaries or conducting internet searches, often fail to account for contextual nuances, leading to further inefficiencies and misinterpretation.

## Hypothesis

Large language models, such as ChatGPT 4.0, will outperform traditional lookup methods of medical acronyms and shorthand expansion (Taber's Dictionary, OpenMD, and Google Search) in terms of accuracy.

## Methods

Fifty de-identified History of Present Illness (HPI) statements between August and October 2024 containing >2 acronyms from a cross-sectional procedures workup database were selected. Acronym and shorthand expansions were generated using ChatGPT-4.0 by feeding in the HPI statement and comparing to three traditional lookup methods: Taber's Dictionary, OpenMD, and Google Search. Accuracy was calculated as the proportion of correct expansions relative to the total acronyms analyzed. The phrase was marked "N/A" if it did not exist in the lookup method. Two physicians independently evaluated expansions for accuracy. A paired two-sample t-test was used to compare the performance of ChatGPT with each traditional method with statistical significance set at p < 0.05.

## Results

A total of 498 acronyms/shorthands were identified from the 50 HPI statements by ChatGPT-4.0. After excluding 21 entries, which were either brand names or mislabeled, 489 (160 unique) acronyms/shorthands remained. On average, each HPI statement contained $9.5 \pm 4.0$ acronyms or shorthands, with a range of 4 to 26 per statement. ChatGPT-4.0 was correct on 160/160 (100.0%) compared to 47/160 (29.4%, $p < 0.05$) for Taber's Dictionary, 87/160 (54.4%, $p < 0.05$) for OpenMD, and 127/160 (79.4%, $p < 0.05$) for Google Search (Figure 1). One such example (Table 1) of a less commonly used acronym in which ChatGPT outperformed traditional methods given the context of the HPI statement is the expansion of

"SS." ChatGPT correctly identified it as surgical scar, Google expanded it as sliding scale, Taber's expanded it as a half, and OpenMD offered multiple incorrect expansions, including one-half, sliding scale, and Sjogren's syndrome.

## Conclusion

Context-aware capabilities of ChatGPT-4.0 in expanding medical acronyms and shorthands highlights its superiority in addressing inefficiencies inherent in traditional lookup methods. By incorporating AI-powered tools, healthcare systems may streamline communication, minimize errors, and boost clinical efficiency. Further studies should explore real-world implementation and evaluate their influence on clinical outcomes.

## Figure(s)

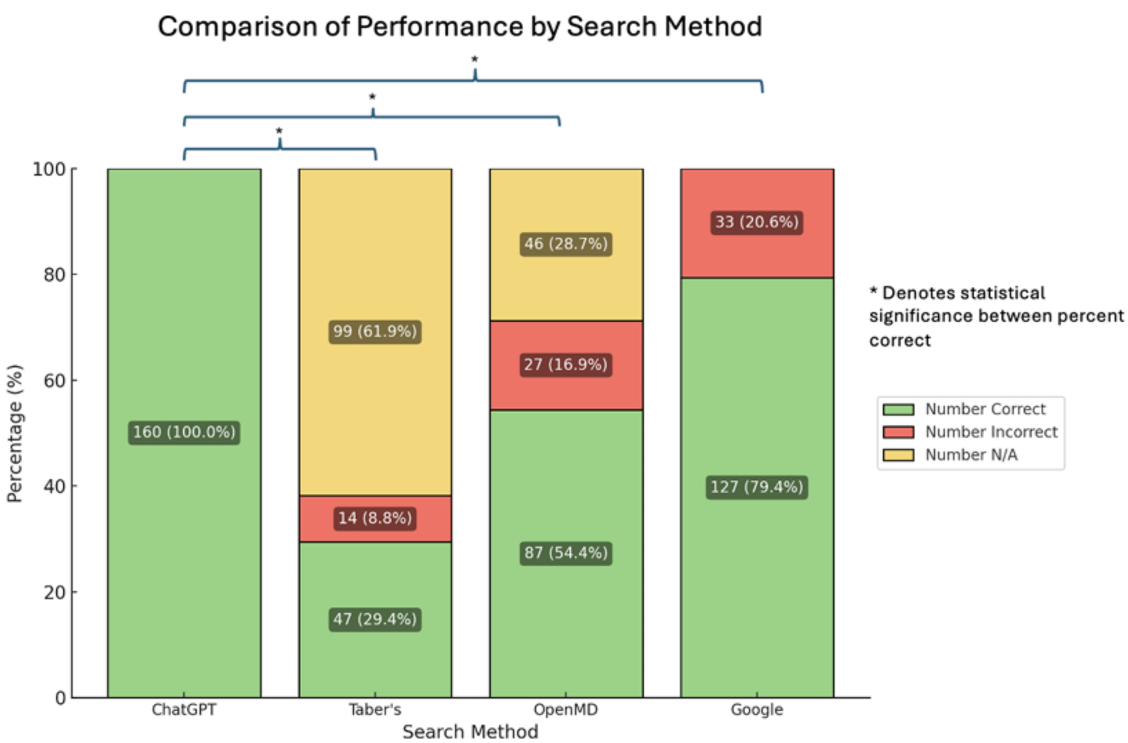


**Figure 1.** Comparison of performance as characterized by percentage of correct, incorrect, and N/A (not found) expansions for each search method (ChatGPT, Taber's, OpenMD, and Google).

| Statement Number | Acronym | GPT Expansion | Taber's Expansion | OpenMD Expansion | Google Expansion |
|---|---|---|---|---|---|
| 1 | **PICC** | peripherally inserted central catheter | peripherally inserted central catheter | peripherally inserted central catheter | peripherally inserted central catheter |
| 2 | **Pt** | patient | platinum; patient | Pt: platinum [element]<br>PT: part time; physical therapy; prothrombin time<br>pt: patient; pint | physical therapy |
| 3 | **NAT** | nucleic acid test | N/A | non-accidental trauma; nucleic acid-based tests | non-accidental trauma |
| 34 | **MET** | metastasis | N/A | metabolic equivalent task (ratio) | medical emergency team |
| 35 | **HD** | hemodialysis | hearing distance | health department; hearing distance; hemodialysis; herniated disk; Hodgkin's disease; Huntington's disease | hemodialysis |

**Table 1.** Five sample acronyms selected from five different HPI statements. The corresponding rows reveal the acronym/shorthand expansion provided by each search method. Green answers were counted as correct and orange/red as incorrect. N/A responses were those not found in the lookup method.


# Keywords

Applications; Artificial Intelligence/Machine Learning; Clinical Workflow & Productivity; Patient/Family Experience; Quality Improvement & Quality Assurance