AI-assisted Clinical Trial Matching for Patients with Cholangiocarcinoma

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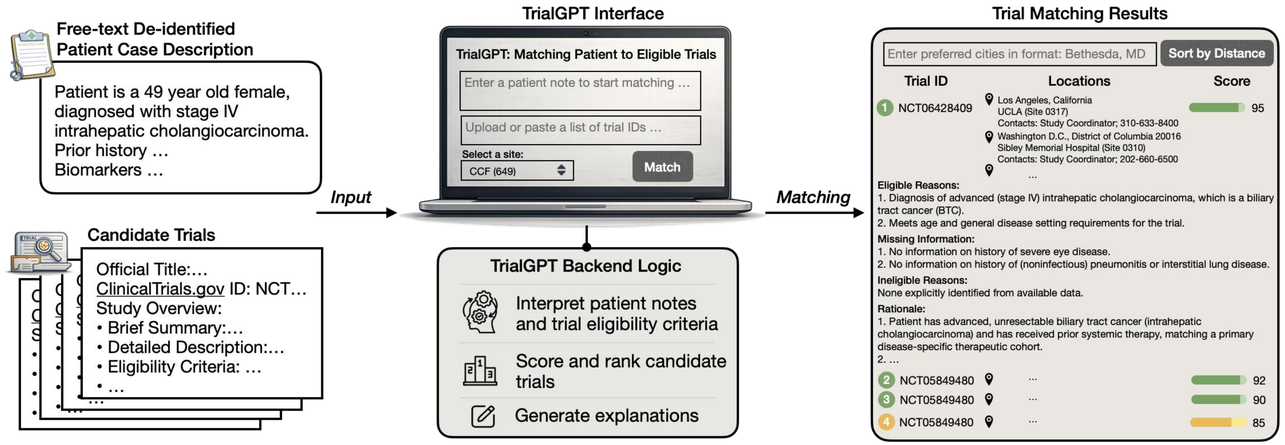
Background

- Clinical trial participation can expand access to investigational therapies and help advance cancer care [1].
- For cholangiocarcinoma (CCA), identifying the right trial at the right time is challenging because eligibility depends on clinical context, prior treatment, and biomarker status.
- Biomarker-driven disease-agnostic trials may be overlooked when embedded within broader solid-tumor protocols.
- Practical factors such as travel distance may also affect trial accessibility.
- We extended our previously developed AI-assisted trial matching system, TrialGPT [2], to support more efficient clinical trial matching for cholangiocarcinoma.

TrialGPT: AI-assisted Clinical Trial Matching System

- Supports both structured EHR-style data and unstructured clinical narratives.
- Compares patient information against CCA-related and biomarker-driven disease-agnostic trials.
- Returns ranked candidate trials with explanations, including:
  - Eligible evidence: patient information that supports trial eligibility
  - Missing information: information needed to determine eligibility more confidently
  - Ineligible reasons: trial criteria that the patient does not meet
  - Overall rationale: a concise summary of why the trial was ranked as a candidate or not
- Enables sorting of prioritized trials by distance.

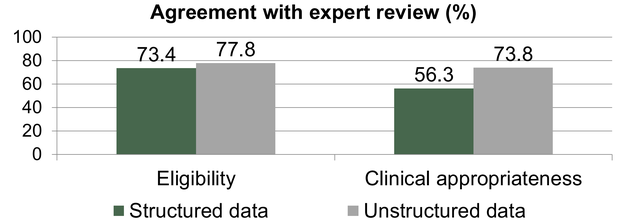


Methods

- We evaluated TrialGPT on 19 cholangiocarcinoma patient cases using both structured and unstructured patient information.
- TrialGPT compared each case against 649 candidate trials and generated ranked recommendations with explanations.
- CCF staff reviewed the outputs for eligibility agreement, clinical appropriateness, and usefulness.

Results

73-78% Eligibility agreement | **1-2** Minutes per trial review



Cholangiocarcinoma Foundation User Feedback

- Helpful for finding biomarker-specific trials within broad solid-tumor protocols
- Missing information is valuable for guiding follow-up questions.
- Explanations enable faster review.
- Unstructured narrative input improved convenience while still supporting good performance.

Conclusions

- TrialGPT demonstrated real-world usability for CCA trial screening.
- TrialGPT is freely accessible to CCF clinicians, scientists, and patient advocates.

Acknowledgements
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TrialGPT

NIH National Library of Medicine

[1] National Cancer Institute. *Why Participate in a Clinical Trial?* Updated Nov 18, 2024.
[2] Jin Q, …, Lu Z. *Matching patients to clinical trials with large language models. Nature Commun.* 2024;15:9074.

What problem are we solving?
Finding a clinical trial for patients with CCA can be hard because every trial has detailed rules about who can join. We adapted and extended TrialGPT [1], our previously developed AI-assisted trial matching system, to help Cholangiocarcinoma Foundation (CCF) staff support patients by quickly identifying trials that may be a good match.

What did we do?
TrialGPT reads both structured medical data and doctor-written summaries. It compares a patient's information with many relevant trials and ranks the most promising options for clinician review.

What did we find?
In 19 real-world cases, TrialGPT's eligibility decisions matched expert review about 73% to 78% of the time. Many suggested trials were considered appropriate to recommend, and the explanations helped clinicians review each trial more quickly.

What does this mean?
AI-assisted trial matching may speed up trial screening and reduce missed opportunities. TrialGPT is designed to support, not replace, clinical judgment.