

## INTRODUCTION

- Opioid Use Disorder (OUD) treatment is intricate
- AI, notably Large Language Models (LLMs), shows promise
- Prompt Engineering: Key to optimizing LLM potential

Investigate	Prompt engineering methods' effectiveness
Evaluate	ChatGPT responses in varied clinical scenarios
Assess	AI-driven decision support feasibility and utility
Present	Comprehensive prompt engineering analysis in OUD treatment
Explore	Different prompting approaches systematically
Elucidate	AI-driven decision support benefits and limitations
Advance	AI understanding in healthcare decision-making
Pave	Way for innovative technology integration in clinical practice
Improve	Outcomes for opioid use disorder patients

## OBJECTIVES & HYPOTHESIS

**Objective: Optimize Opioid Use Disorder Treatment with ChatGPT Prompt Engineering**



**Hypothesis: Leveraging prompt engineering techniques will:**

1. Facilitate generation of contextually relevant insights from ChatGPT
2. Enhance clinical decision-making in OUD management

### Current Clinic Guidelines

**Stabilization:**

- Spacing of visits from weekly to biweekly to monthly, with the option to space.
- Transfers in good standing begin at bi-weekly intervals.
- In-person visits spaced if patient reports no opioid use in the current period, the most recent drug screen is negative for opioids, and most positive for buprenorphine/norbuprenorphine.
- If a slip or return to use of opioids or buprenorphine/norbuprenorphine is absent, step back to the previous visit frequency, consider changing visit format, or consider Sublocade if unable to control medication at home.

**Monthly Maintenance:**

- Every other in-office visit, with a maximum of 2 telemedicine visits in a row.
- Primary care physician assigned from MAT physician list; when PCP not available, utilize MAT physician list as a pool.

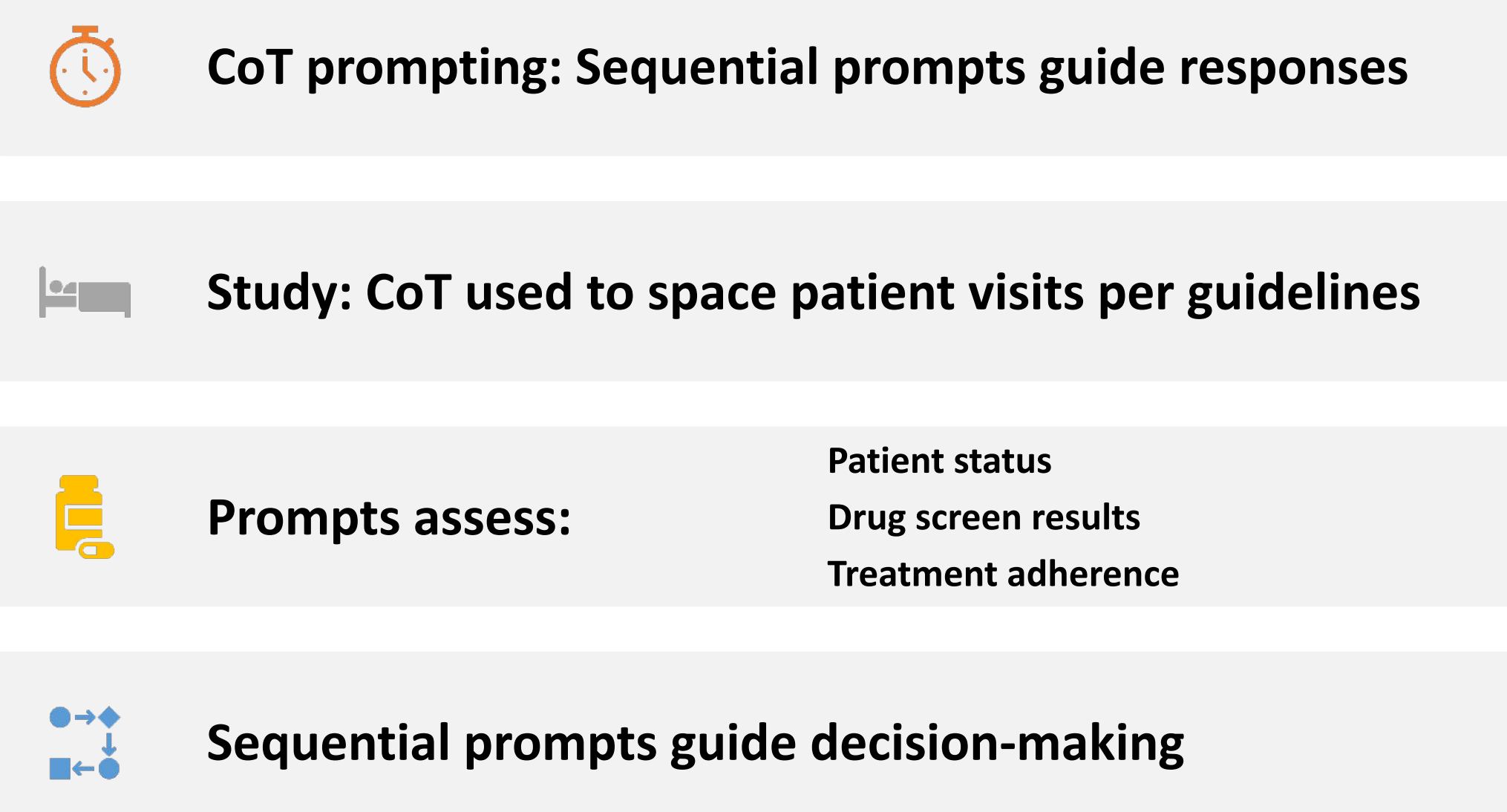
**Q3 Month Maintenance:**

- Every other visit telemedicine OK.
- Offered if all the following are met for more than 1 year: patient reports no substance use (excluding marijuana), drug screen negative for all substances (excluding marijuana), and buprenorphine/norbuprenorphine present.

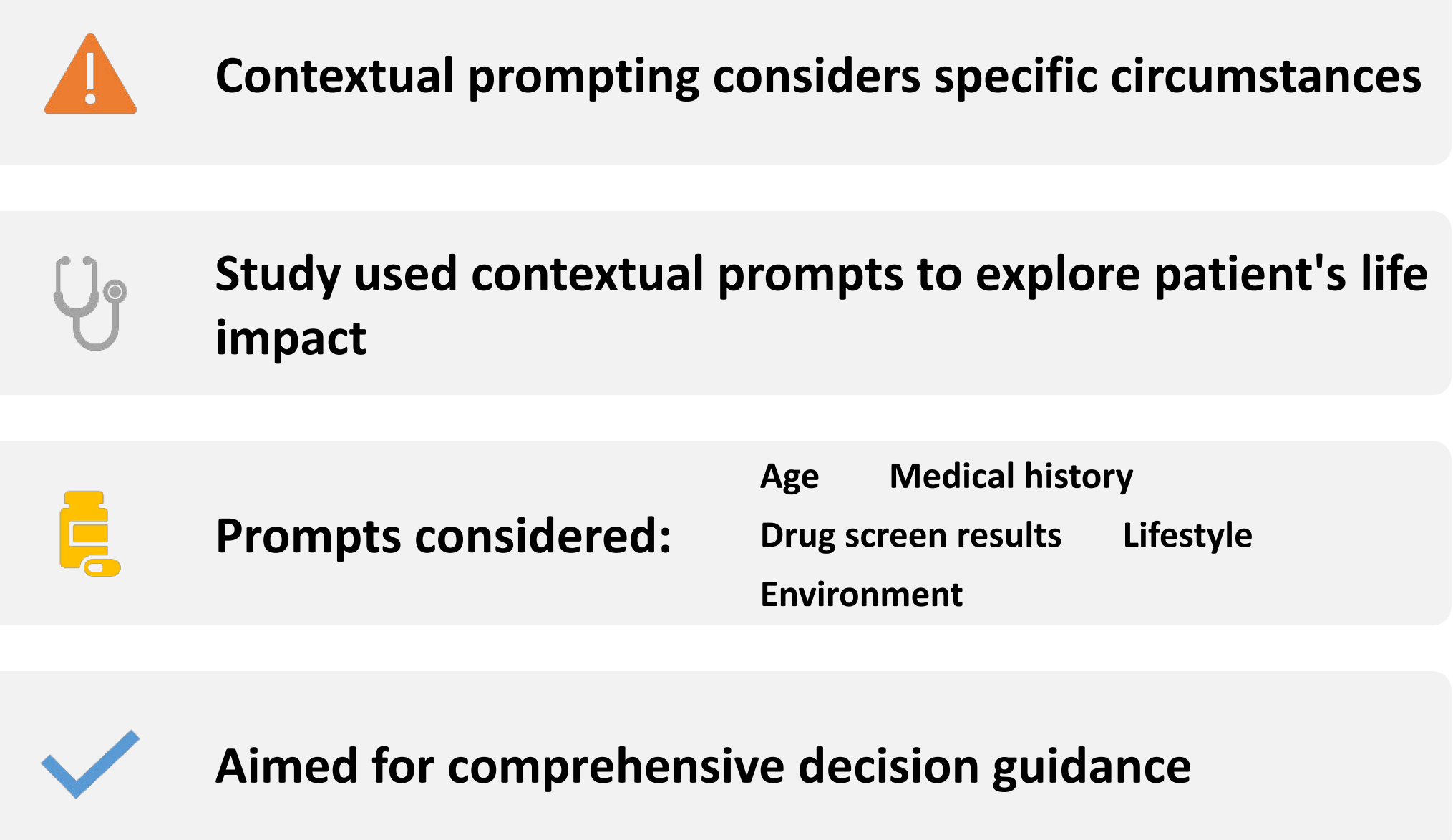
## MATERIALS & METHODS

We used Chain of Thought, contextual, and zero-shot prompting with ChatGPT to evaluate OUD treatment decisions, incorporating clinical guidelines and de-identified patient data. Observations led to refining prompts, enhancing decision-making accuracy and adherence to treatment guidelines.

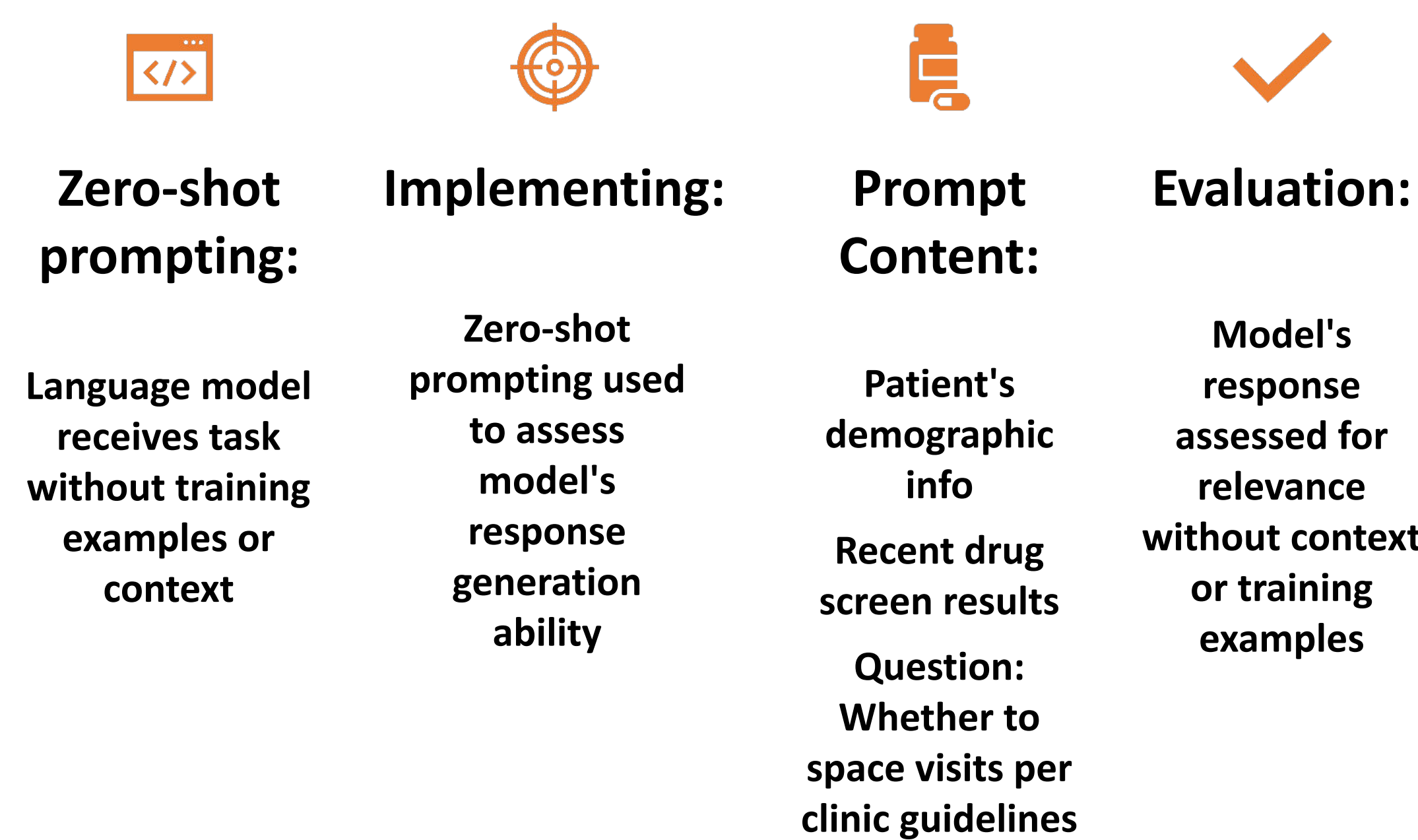
### 1) Chain of Thought (CoT) Prompting:



### 2) Contextual Prompting:



### 3) Zero-shot Prompting:



## RESULTS

Chain of Thought:

*We have a 66-year-old female who presents for follow-up of medications for opioid use disorder. She is currently on monthly treatment visits. However, her last urine drug screen was positive for fentanyl, and it's positive for buprenorphine/norbuprenorphine. Should we consider spacing her visits?*

#### 1. Current Status:

The patient is a 66-year-old female receiving follow-up for medication-assisted treatment for opioid use disorder. She is currently on monthly treatment visits.

#### 2. Recent Drug Screen Results

Her last urine drug screen was positive for fentanyl, but it was positive for buprenorphine/norbuprenorphine as well.

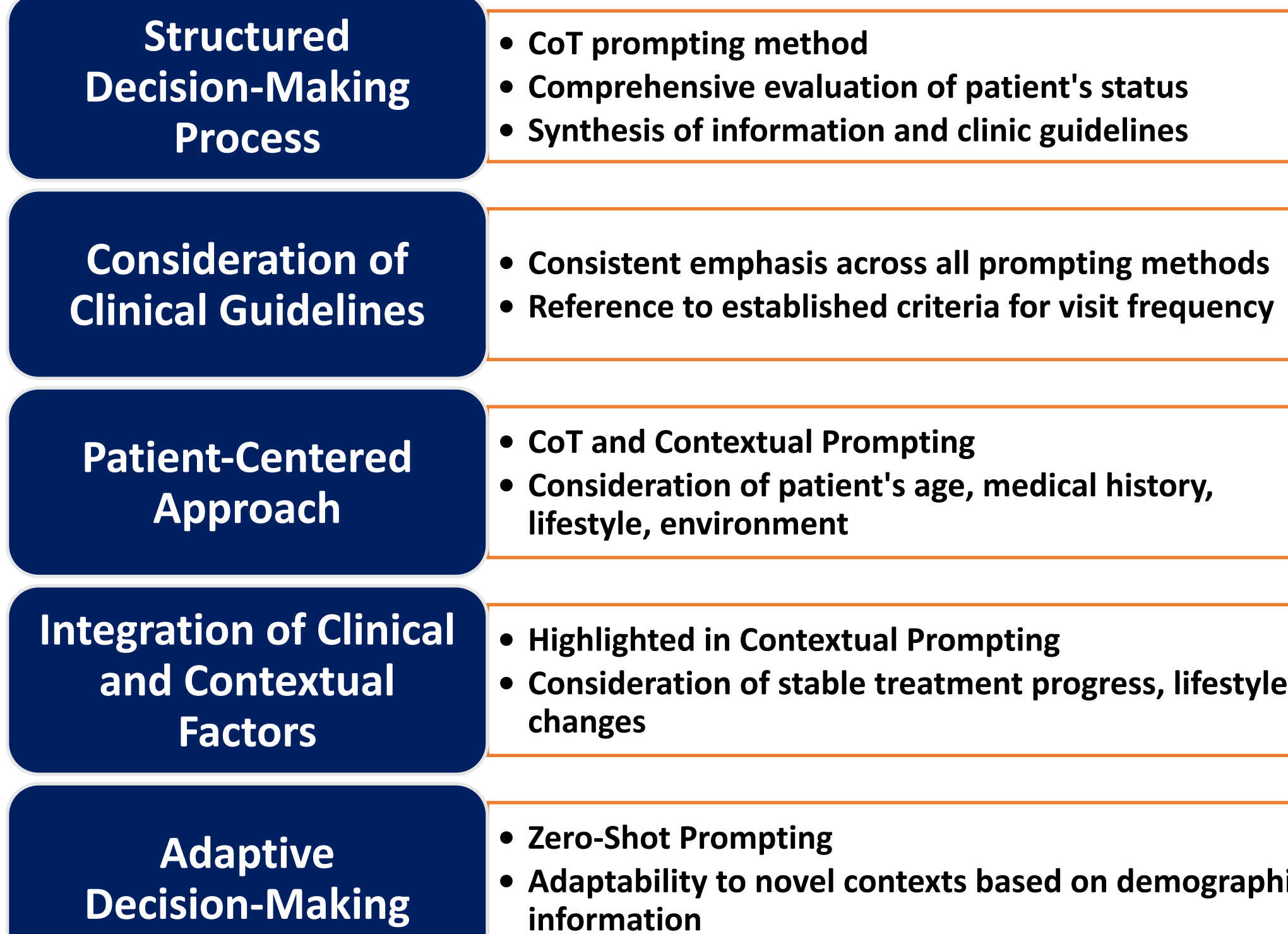
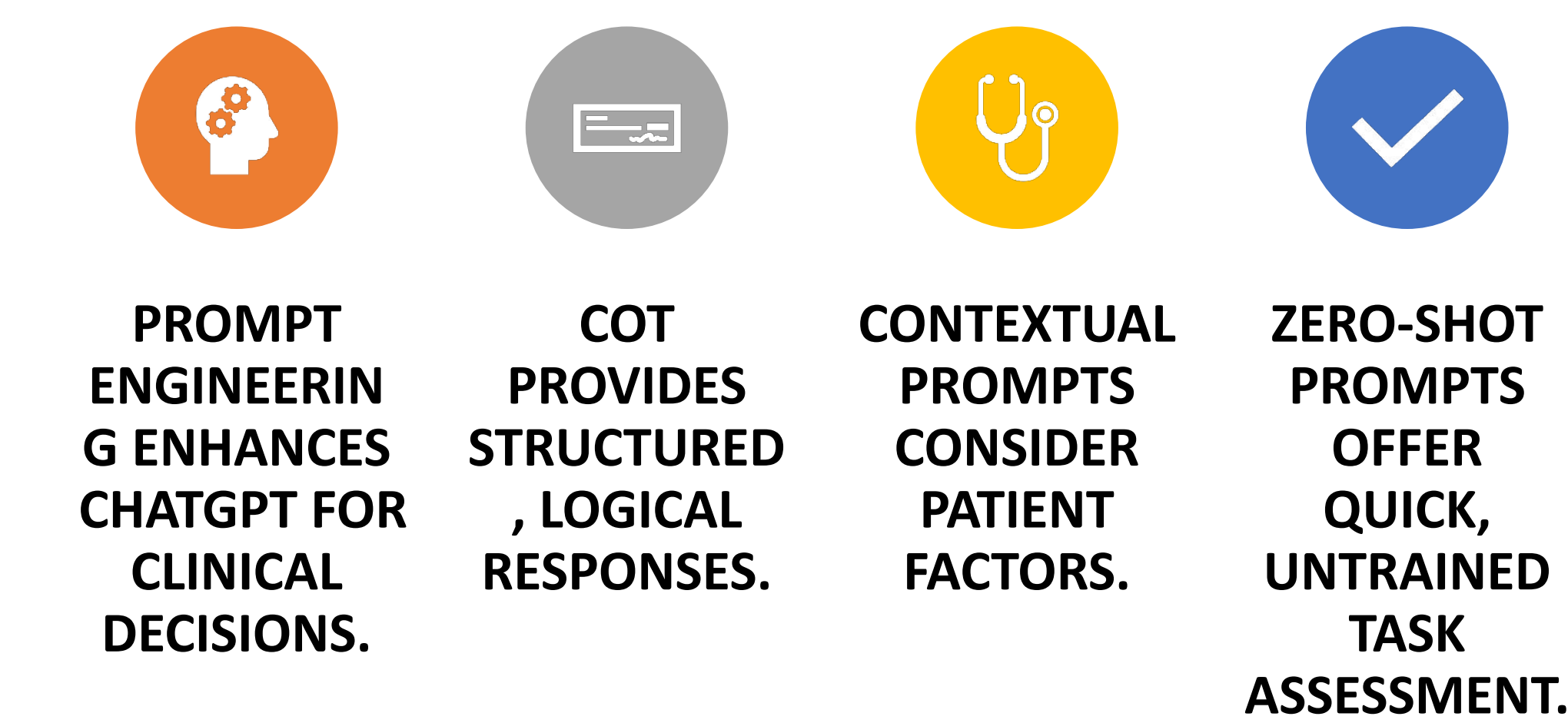
#### 3. Prompting for Clarification

Could the positive fentanyl result be attributed to environmental contamination?

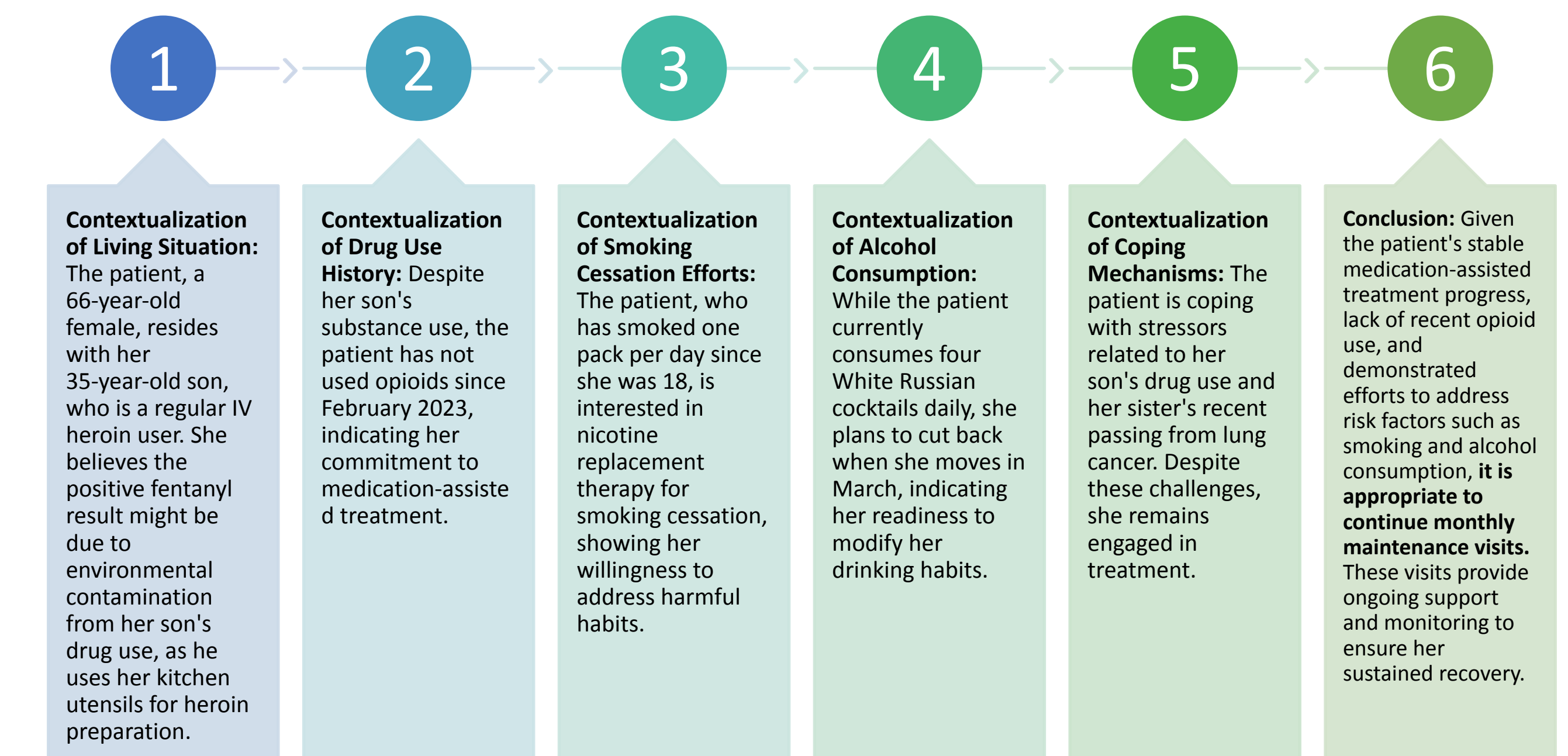
**Decision & Conclusion:** Considering the patient's stable medication-assisted treatment progress, absence of recent opioid use, and adherence to treatment despite challenging circumstances, it appears appropriate to continue with monthly visits.

Given the patient's positive response to treatment and her plans to address alcohol consumption and environmental factors contributing to the positive fentanyl result, it is reasonable to maintain monthly follow-up visits.

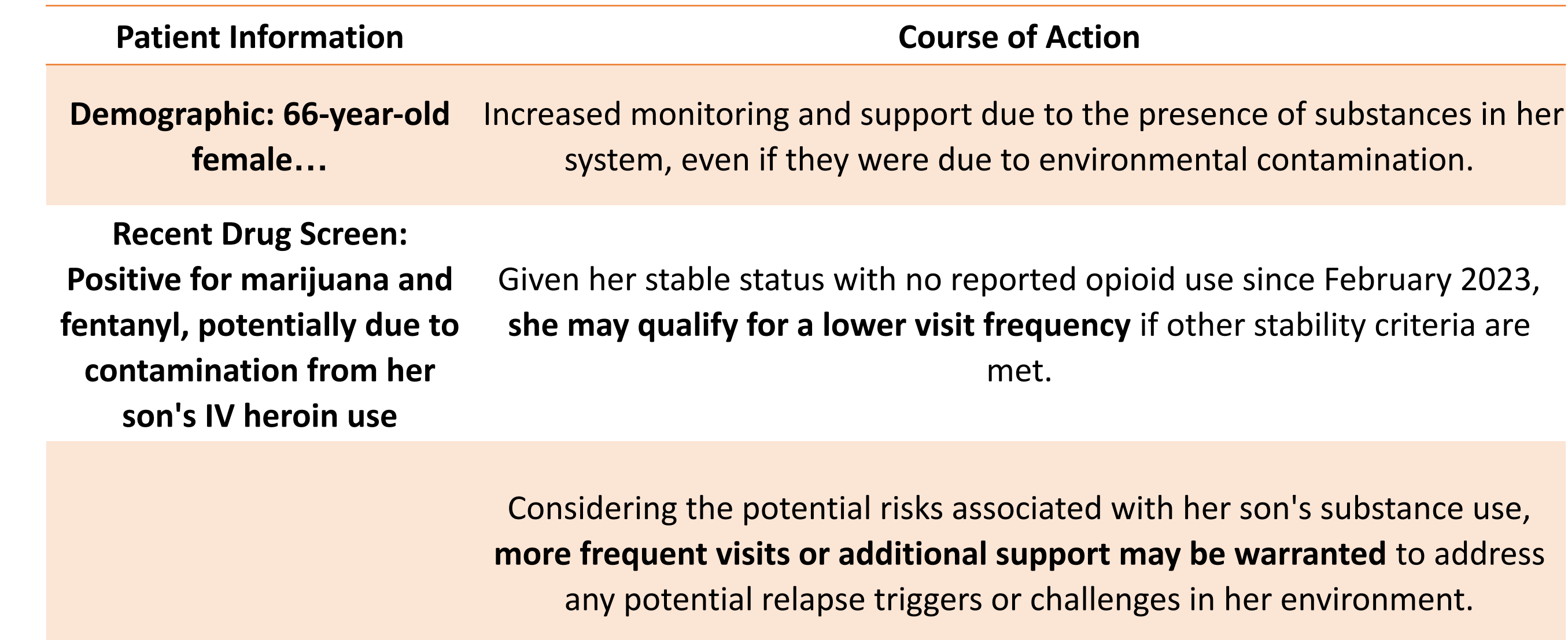
## DISCUSSION



Contextual Prompt Engineering:



Zero-shot Prompting:



## CONCLUSIONS

The study confirmed that tailored prompt engineering with ChatGPT improves clinical decision-making for OUD, highlighting AI's potential to enhance treatment strategies and patient outcomes in real-world healthcare settings.



#### Limitations:

- Language models may not fully capture clinical complexity.
- Individual patient preferences and needs may not always be accounted for.
- Reliance on prompt engineering requires careful formulation and interpretation.

#### Future Directions:

- Refine prompt engineering methodologies.
- Enhance model interpretability.
- Validate clinical utility of AI-driven decision support in healthcare.

## REFERENCES

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