

## Clinical Background & Need

### Healthcare at the Last Mile

#### RURAL CLINICAL IMPACT

**1:1500**

Ratio of doctors to patients in India  
**1:4** rural to urban doctors

**900 M**  
 People in rural India



Intelehealth bridges the healthcare access gap and bring quality care to patients at the last mile

## Prompt Engineering & Refining Outputs

### ALTERING GPT PROMPT: TESTS AVAILABLE

Prompt: You are a doctor with the following patient rural India. Here is their case: What would be the **top 3 differential diagnosis** for this patient?

Please **rank the differential diagnoses based on the likelihood and provide an explanation** for each one.

The **diagnostic tests that can be run at this clinic include the following:** ...

If additional diagnostic testing is needed beyond the diagnostic tests that can be run at this clinic, **please advise the patient to be referred** to the next highest clinical center

**45**

Case Studies tested with ChatGPT

### NEW PROMPTING WAS MORE CONTEXT SPECIFIC

1. **\*\*Ludwig's Angina\*\***: (additional information)  
 2. **\*\*Deep Neck Infection\*\***: (additional information)  
 3. **\*\*Necrotizing Fasciitis of the Neck\*\***: (additional information)

- \*\*Diagnostic Tests\*\***:  
 1. **\*\*Complete Blood Count (CBC)\*\***  
 2. **\*\*Blood Cultures\*\***  
 3. **\*\*Imaging\*\***  
 4. **\*\*Urea, Creatinine, Electrolytes\*\***  
 5. **\*\*C-Reactive Protein (CRP) or Erythrocyte Sedimentation Rate (ESR)\*\***

**\*\*Management and Referral\*\***:

- **Immediate empirical antibiotic therapy is warranted**, combination such as ampicillin-sulbactam or clindamycin plus a third-generation cephalosporin

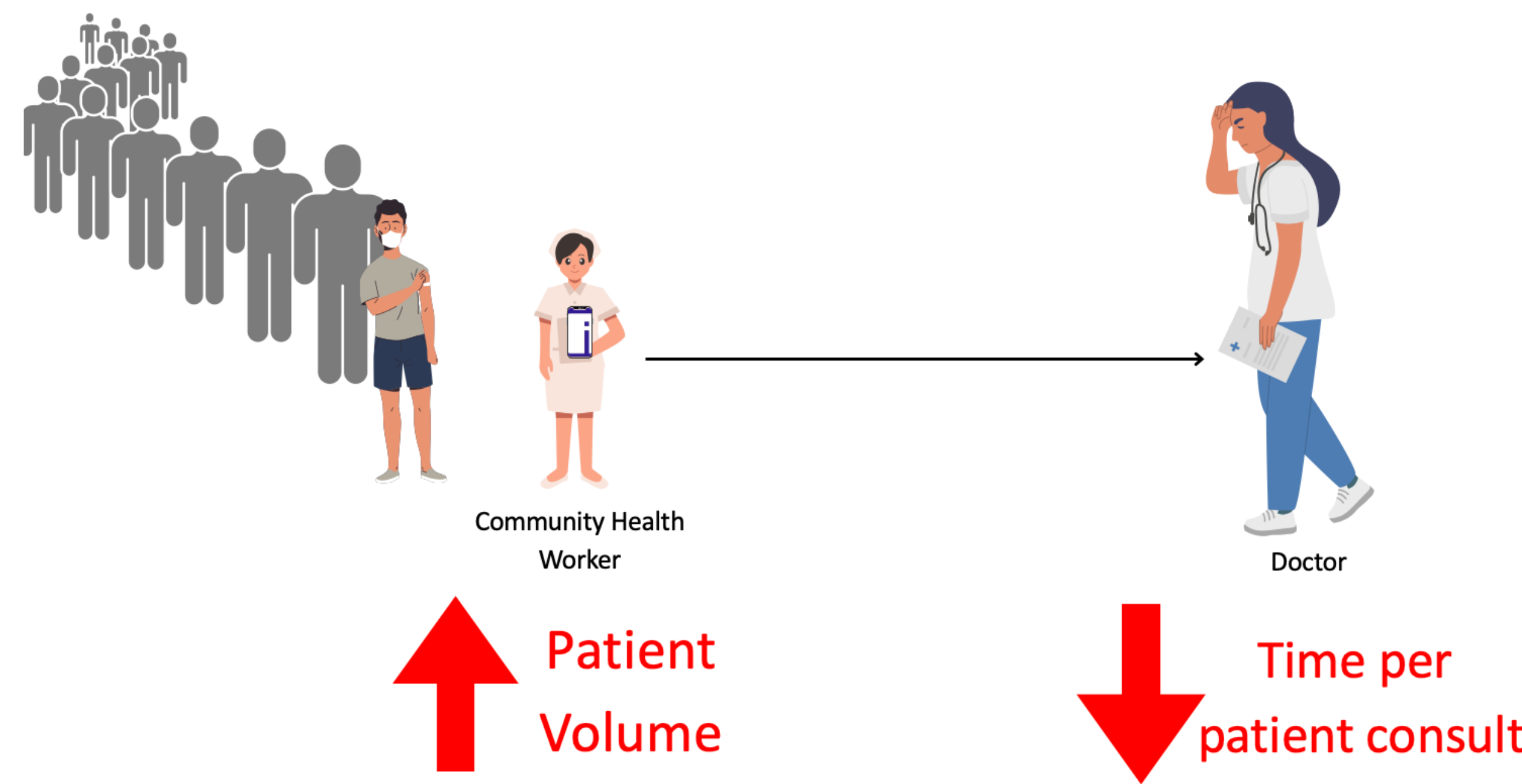
- **Secure the airway. Given the difficulty with breathing and potential for airway compromise, preparation for emergency airway management is critical.**

- **Urgent referral to a higher-level center is necessary for imaging, potential surgical intervention**

Prompt recognition of these conditions and immediate initiation of treatment, along with urgent referral to a specialized center, are crucial steps in managing this patient's condition to prevent potentially life-threatening complications.

## Innovation Opportunity

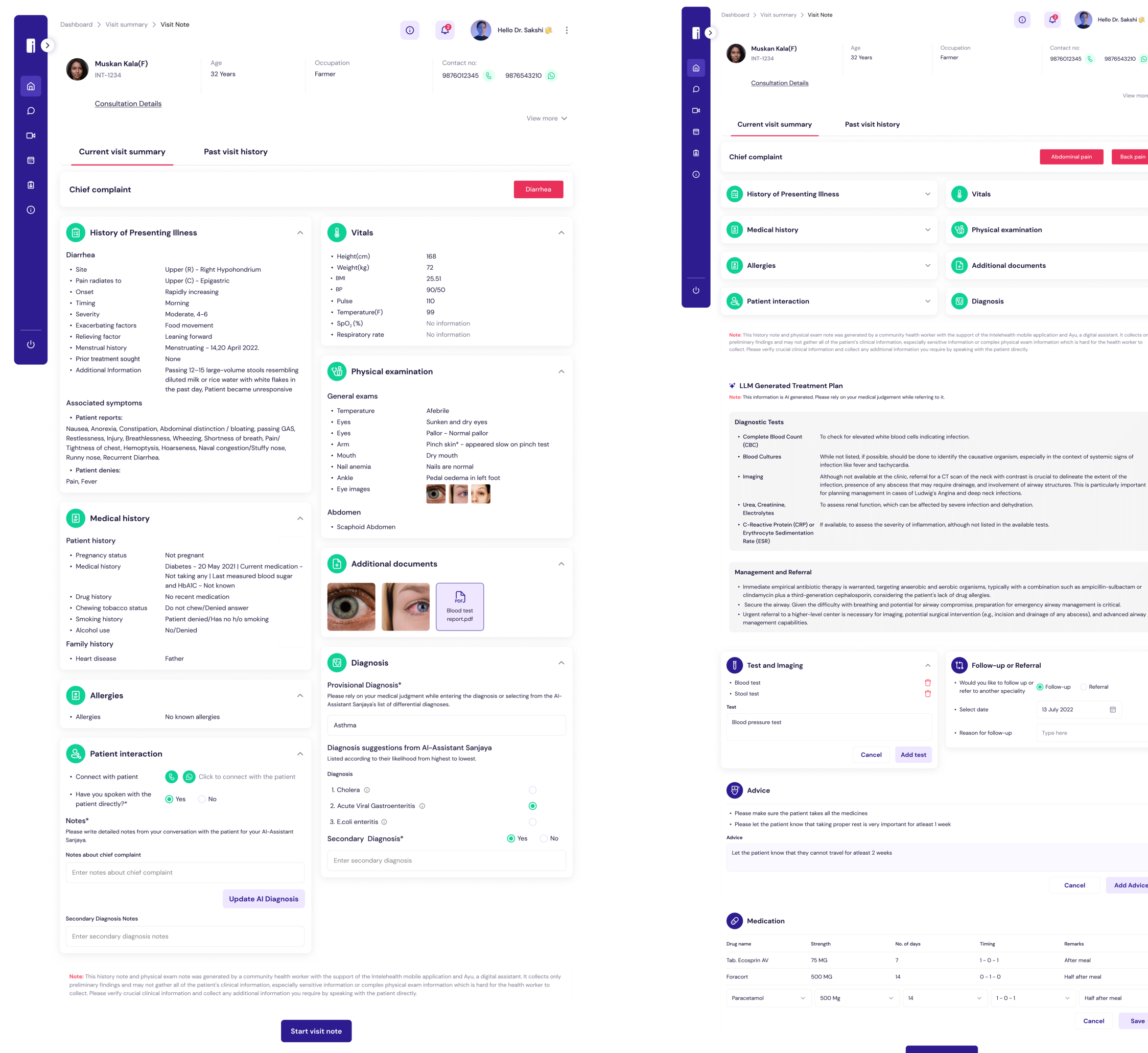
### Shortcomings of Current System



Even with a robust telemedicine system, the system remains overburdened. This leads to issues with lack of time and quality when it comes to patient care.

## Early Prototypes

### UI Interface for AI Clinical Decision Tool



## Bridging AI with Telemedicine

### Choosing & Assessing Clinical Case Studies

#### Case Study Identification

190 → 45

- Represent 12 different subspecialties
- Diagnoses can be made without additional testing or imaging
- Accurate and reproducible ICD-10 diagnosis provided

#### Scoring LLM Outputs

Single physician ranked output with known diagnosis

Likert Score	Quality of LLM Output	Narrative Description
5	Very Good	LLM provided top diagnosis that matched diagnosis of case
4	Good	LLM provided a correct diagnosis in a list of differential diagnosis
3	Neutral	LLM provided a partially-correct diagnosis with low confidence
2	Poor	LLM provided incorrect diagnosis but appropriate next steps
1	Very Poor	LLM provided absolute incorrect diagnosis with incorrect next steps

### Ranking Different LLM Outputs: Medical Terminology vs. Common English

## PROMPT TERMINOLOGY ACCURACY RATES

#### Improvement in Diagnostic Accuracy from MT

**23**

Case Studies tested with ChatGPT

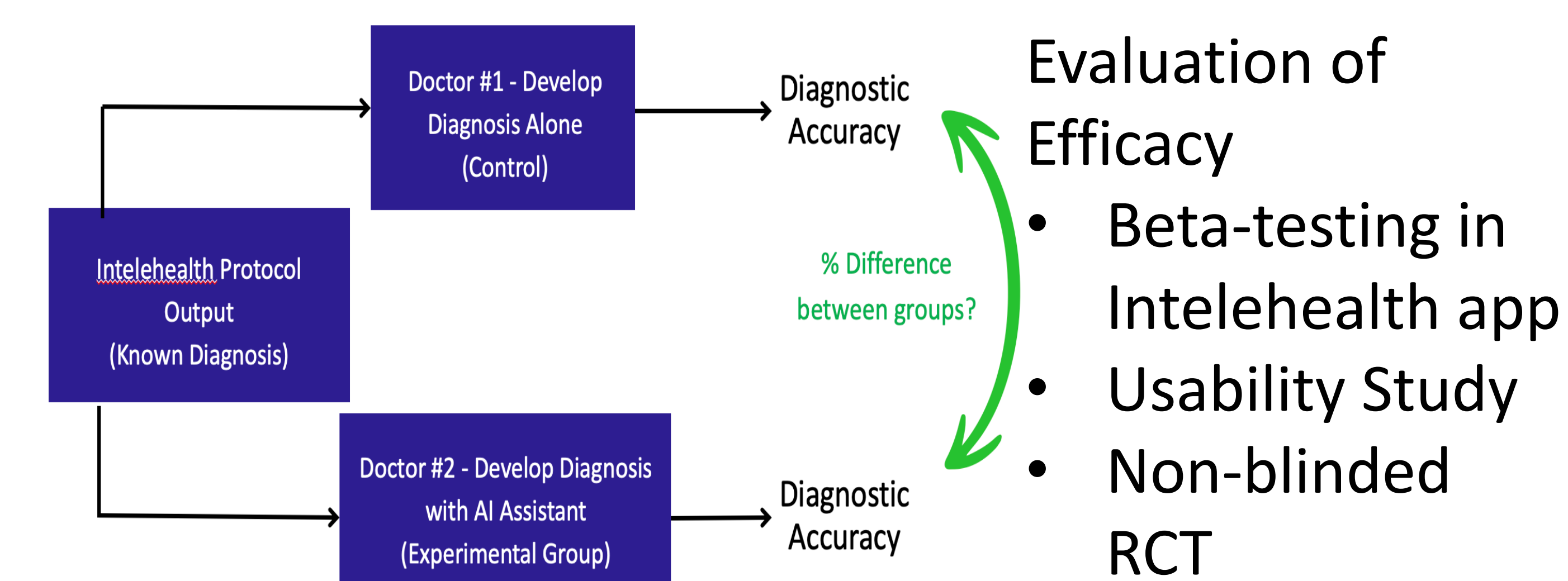
**+0%**  
 GPT 3.5

**+5%**  
 GPT 4.0 Turbo

**+9%**  
 GPT 4.0

## Next Steps

### Usability Study in Early Fall 2024



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