

Leveraging eye-tracking and standardized patients to evaluate usability of Electronic Pharmacy Claims Data (EPCD)

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Background

- Medication non-adherence is critical and costly
- With accurate information, primary care prescribers and pharmacists can address medication non-adherence and engage patients in care
- However, current methods to identify medication adherence, such as patient self-reports and insurance faxes, are suboptimal**
- Novel Health Information Technology (HIT) incorporates prescription dispensing and adherence data into the electronic health record (EHR)
- Electronic Pharmacy Claims Data (EPCD)** integrates information from the patient's pharmacy insurance and includes the date the prescription was filled at the community pharmacy
- Usability and end-user acceptance are critical to the success of HIT**
- Even if HIT is useful, it may not be used in practice**

Objective

- Examine the usability of EPCD in primary care settings

Methods

The Unified Theory of Acceptance and Use of Technology (UTAUT) includes 4 core determinants of HIT intention and use:

- Perceived Usefulness
- Effort Expectancy
- Social Influences
- Facilitating Work-System Conditions

Study Setting

- Primary care prescribers and pharmacists were recruited from a Midwestern Academic Health System
- The health system uses Epic (Epic Systems Inc., Verona, WI) as their EHR vendor and implemented EPCD in February 2023

- Our team built a simulated EHR with EPCD data embedded in 2 locations:
 - Hover-to-Discover functionalities on the main page (Figure 1)
 - Detailed Information available by clicking medication hyperlinks (Figure 2)

Near-Live Usability Testing

- Our team provided participants with brief navigational training
- Participants were asked to review the EHR as they normally would before a patient encounter
- Participants were asked to conduct a medication review encounter with a standardized patient (Figure 3)
- Participants wore eye-tracking glasses (Tobii Pro Glasses 3) to capture where they were looking and focusing their attention
 - Eye-tracking captures participants' gaze patterns as well as how long their eyes fixate on a single location (i.e., fixations)
- Schematic mapping determined the number and duration of EPCD fixations

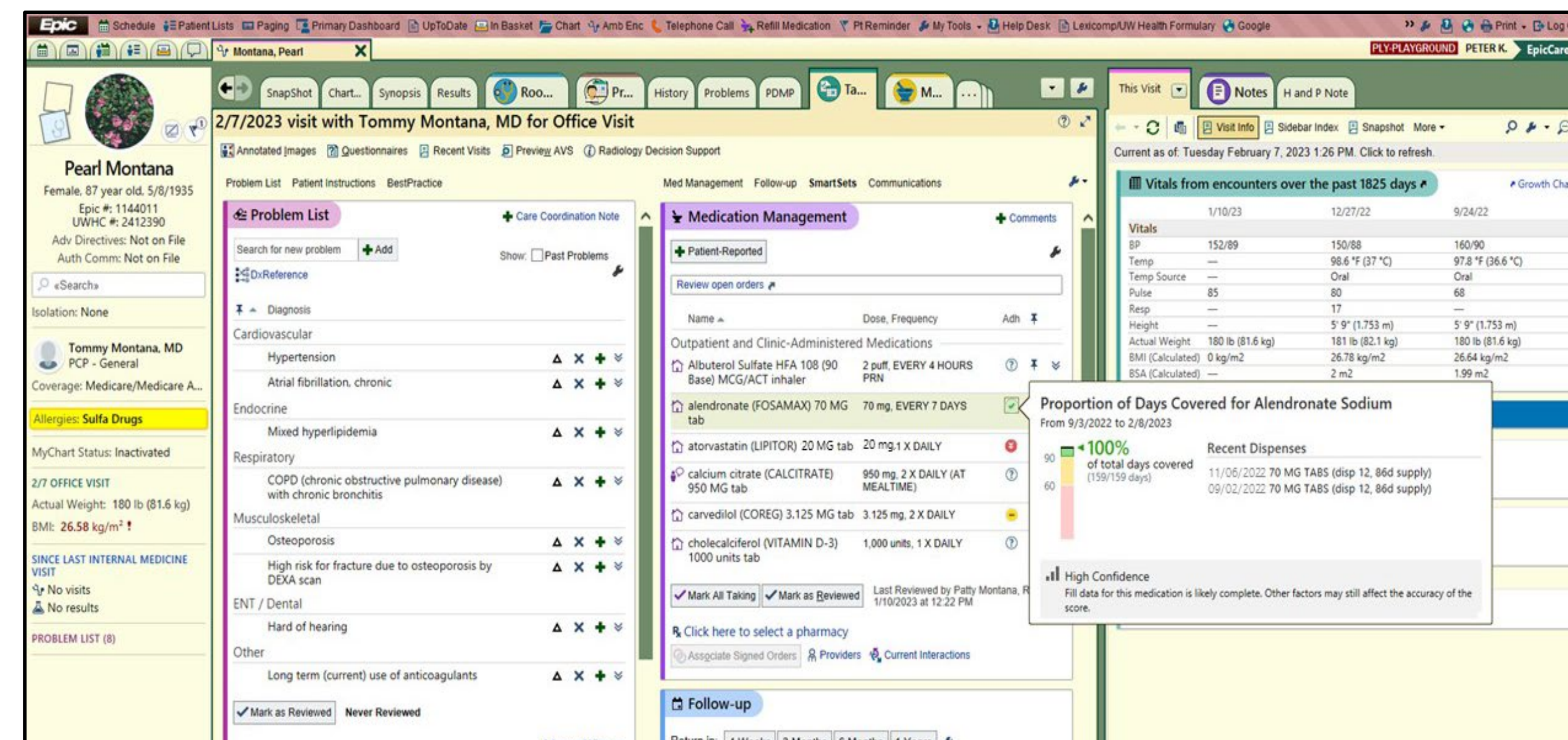


Figure 1. EPCD Information is incorporated into the EHR via **Hover-to-Discover** functionalities. Once prescription fill data is received, the EHR estimates medication adherence.

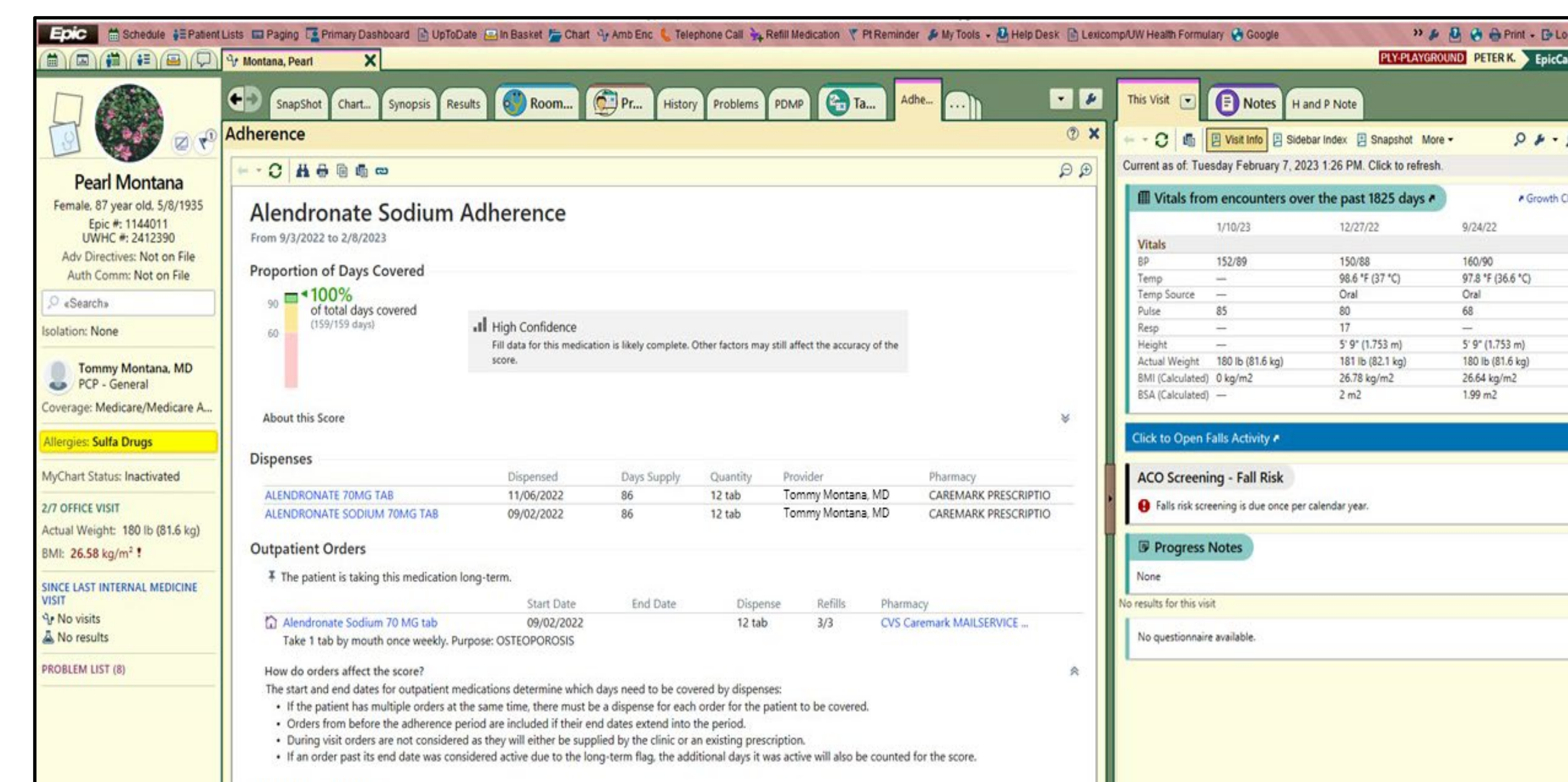


Figure 2. EPCD information is incorporated into the EHR via **Detailed Information** pages accessible by clicking on hyperlinks embedded in the medication names.

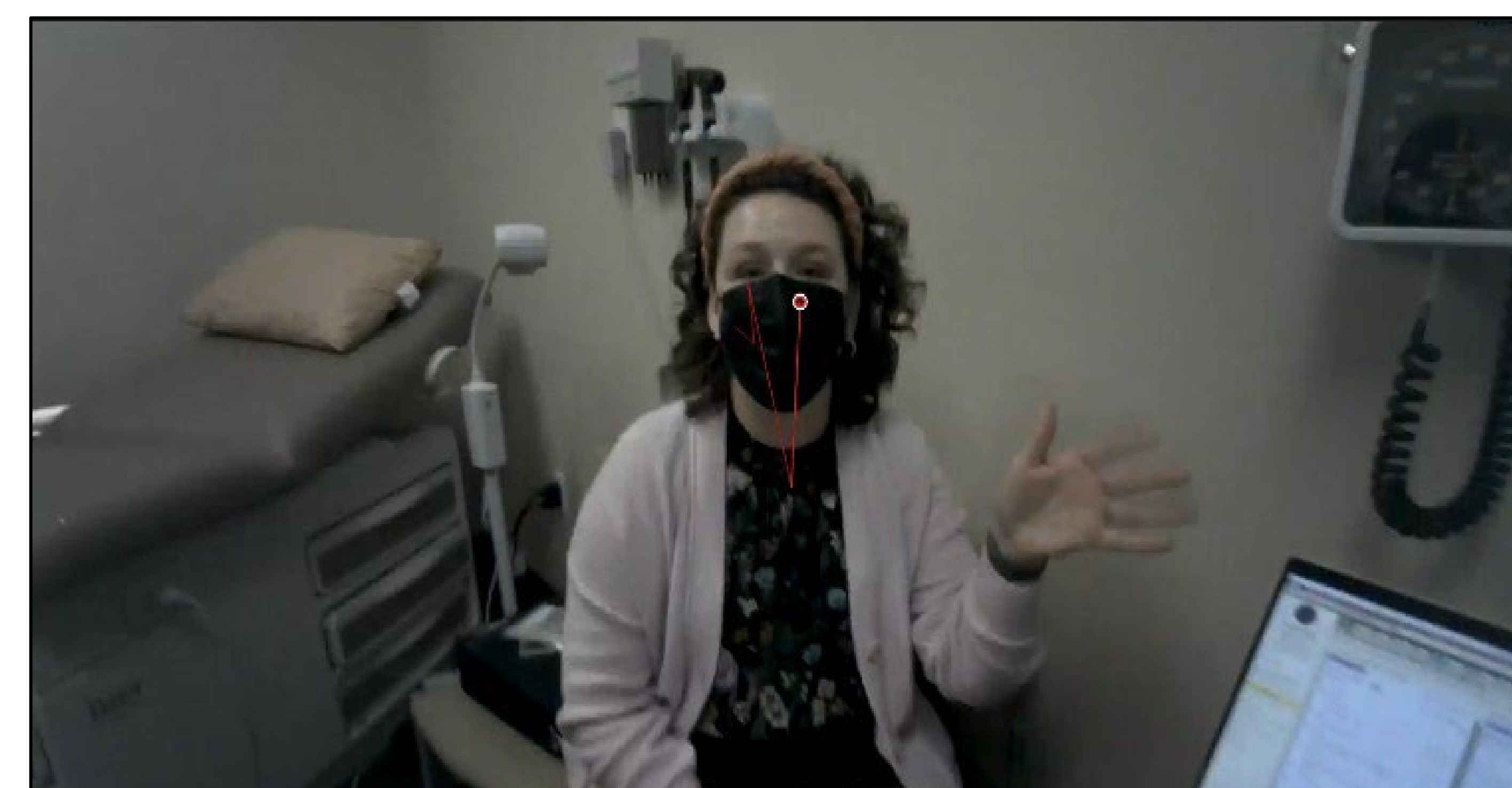


Figure 3. After reviewing the EHR, participants conducted a medication review encounter with a standardized patient. The red circle on the patient's face indicates the participant's gaze (captured by the eye-tracking glasses).

Near-live usability testing is helpful in determining best practices for information location and workflow integration.

Findings

Participant Demographics

- 3 primary care prescribers and 2 primary care pharmacists (n=5)
- Most were male (60%) and white (80%)
- Average of 15 years of healthcare experience

Usability Testing

- Eye-tracking gaze metrics are presented in the table
- Participants used the Hover-to-Discover functionality more than the Detailed Information pages
- Participants used EPCD during the EHR Review preparation before, and during patient encounters

	EHR Review		Patient Encounter		Session Total	
	Number of Fixations	Duration of Fixations	Number of Fixations	Duration of Fixations	Number of Fixations	Duration of Fixations
Hover-to-Discover	782	7 minutes 2 seconds	229	1 minute 53 seconds	1011	8 minutes 55 seconds
Detailed Information	0	0 minutes 0 seconds	25	0 minutes 12 seconds	25	0 minutes 12 seconds
Standardized Patient	N/A	N/A	3393	22 minutes 6 seconds	3393	22 minutes 6 seconds
Other Locations in EHR	1062	7 minutes 42 seconds	1742	12 minutes 7 seconds	2804	19 minutes 49 seconds

Implications for D&I Research

- UTAUT emphasizes the importance of **effort expectancy** (e.g., location of EPCD) and **facilitating conditions** (e.g., workload and time for pre-encounter EHR review)
- Primary care prescribers and pharmacists are experiencing excessive workload, in part due to EHR use
- HIT must consider end-user feedback in its design and implementation
- Future usability research questions include the importance of time-neutral or time-negative HIT as well as the optimal amount of content for rapid consumption

More information on our eye-tracking methods can be found at *Poster C-92 Leveraging eye-tracking to support implementation decision making: Exploring use through three case studies*. Study funded by NCPDP Foundation