

Field Guider

Real-time clinical guidance for mobile health workers

Illustrated Walkthrough, Pregnancy Scenario

Draft v.05

A vision for ARPA-H Paradigm

Technical Area 5: Intelligent Task Guidance

arpahparadigm.org

Kat Labrou, Mandy Liu, Cagri Zaman, Juhan Sonin

Mediate, Massachusetts General Hospital Family Van, Boston Children's Hospital, & GoInvo

29.Apr.24, v.05, feedback@goinvo.com

1. Seeking Guidance



In the living room of her Navajo hogan, Lulu Shebala, 35 and pregnant, is worried about her health. She tells her mother about the headaches and swelling. Listening intently, her mother suggests visiting Doba, a trusted neighbor who works with the Health Service, for help.

2. First Step Towards Care



Lulu meets with Doba outside, with the landscape of the reservation stretching around them. Doba listens to Lulu's health concerns and suggests using her phone to schedule a visit with the Community Health Van. With the ease of technology and community support, Lulu takes a step towards safeguarding her health and that of her baby.

3. Meeting Casey



As she returns home, Lulu connects to the Community Health Van app. On the screen, Casey, a smart health assistant, greets her and asks about her symptoms. As Lulu shares her worries about headaches and swelling, Casey pulls up her health history to provide personal care. Casey books an appointment for Lulu with the Community Health Van for the next morning.

4. Van Setup in Depot



Sara, a community health worker, and Isabella, a registered nurse, get the mobile health van ready at the depot for the day's visits. They check the van's stock, making sure it's equipped with crucial medical tools, like a portable blood pressure monitor, urine test kits, and a small blood analysis machine for immediate blood tests.

5. Van Arrives



Upon arrival, The mobile health van arrives at Lulu's home. Lulu, her family, and Doba walk towards the van. A notification on Lulu's phone tells her the van is there.

6. Setting up the Van



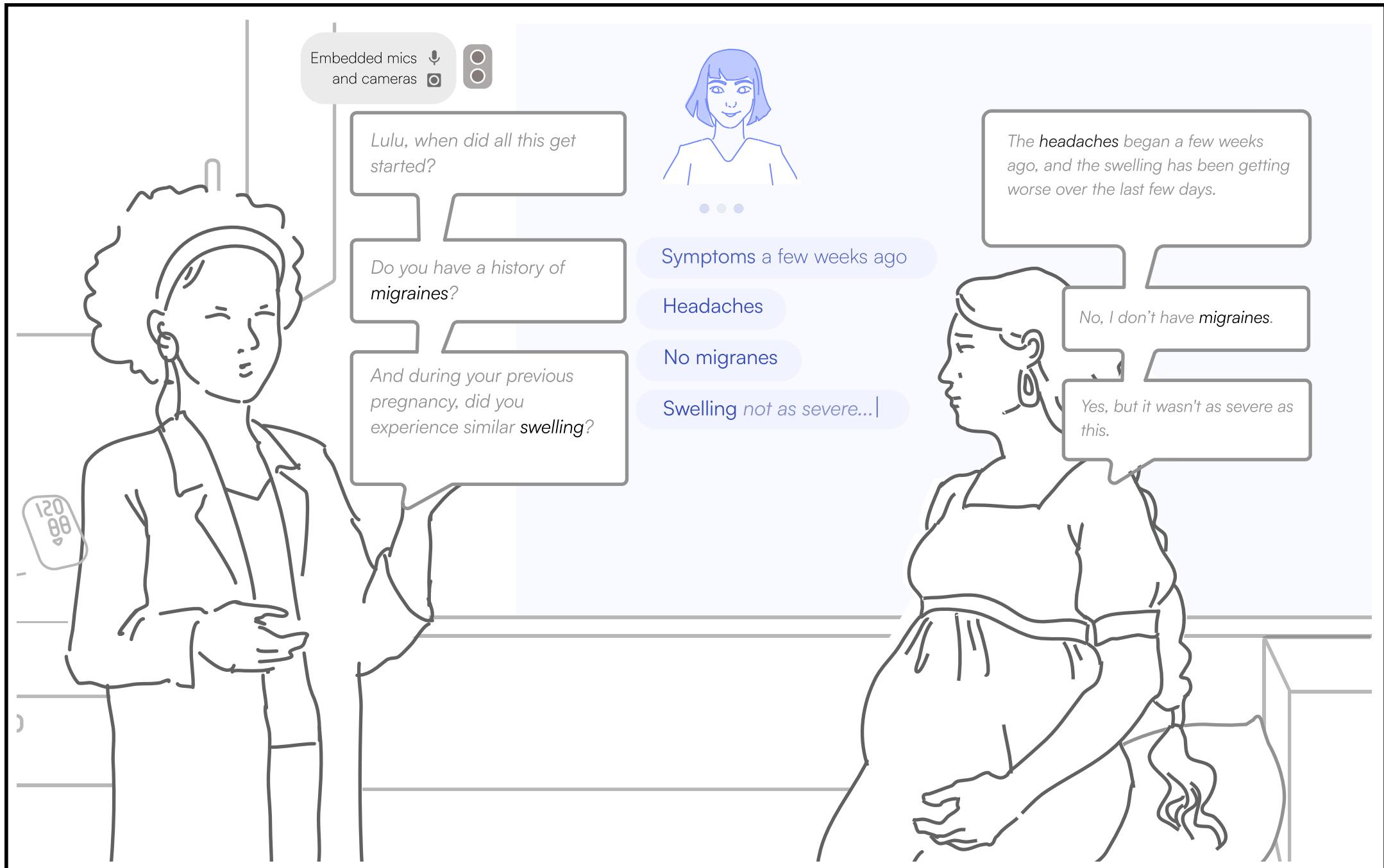
Sara, from the van, greets them and tells them the visit will be recorded on Lulu's Standard Health Record, which they've already seen through the app.

7. Consultation Starts



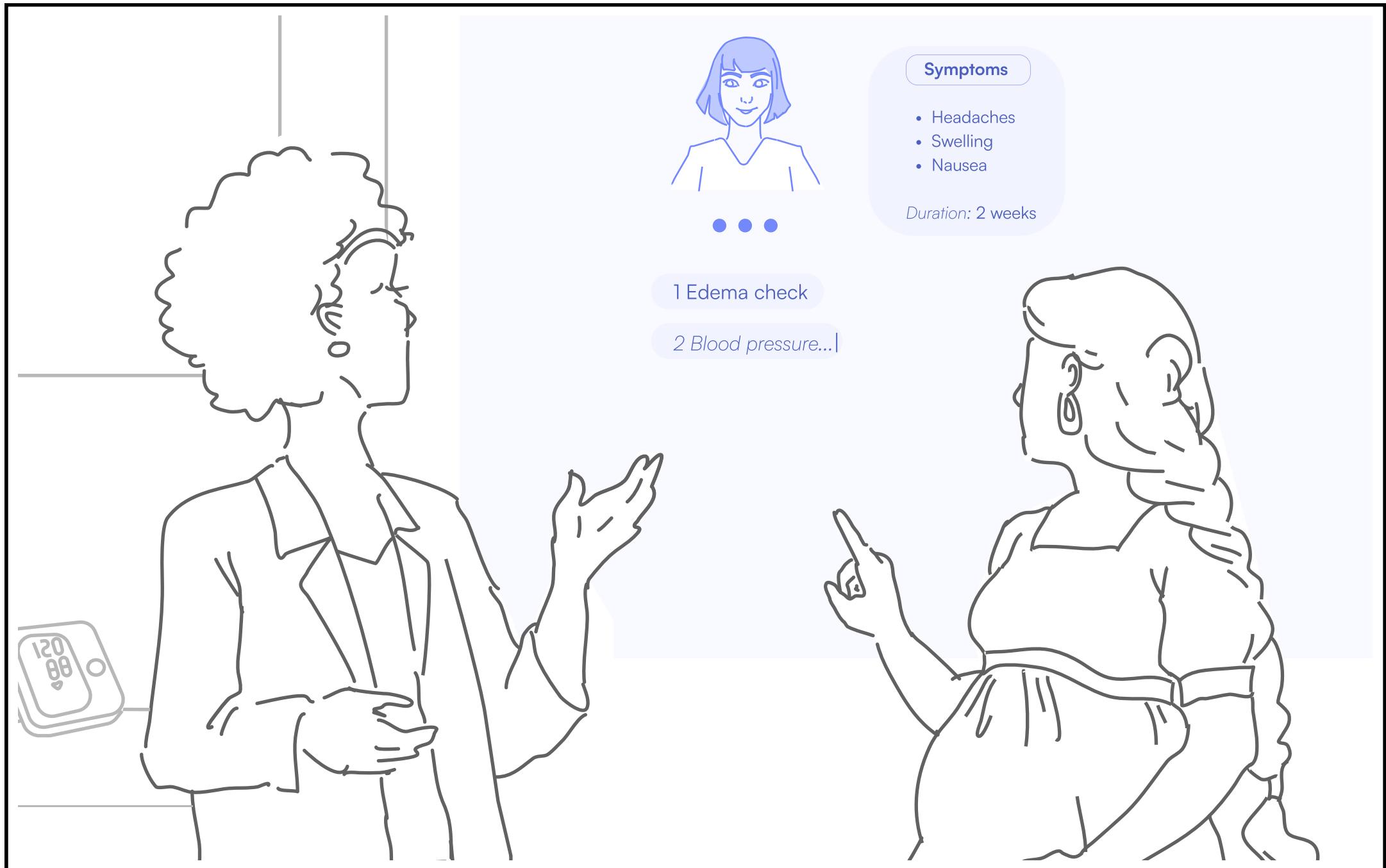
Sara talks with Lulu about her headaches and swelling by the van. After a brief discussion, Isabella, the nurse inside, comes to the door and invites Lulu inside for a closer look at her symptoms.

8. Clinical Interview with CASEY



Isabela conducts a clinical interview with Lulu, asking about her symptoms. Meanwhile, Casey, the virtual health assistant, is active in the background, capturing key information from their conversation. Casey 'listens' for details about the nature of Lulu's headaches, any additional issues like blurry vision or sensitivity to light, the extent of swelling, any sudden weight changes, and changes in urination — all crucial data for a thorough diagnosis.

9. CASEY's Dx



After processing Lulu's medical history and current symptoms, Casey flags the risk of preeclampsia, a serious condition during pregnancy. To clarify Lulu's condition, Casey lists the necessary evaluations: an examination for edema to assess swelling, a blood pressure measurement, a urine test for protein, and a blood draw to check for other indicators.

10. Coordinated Care



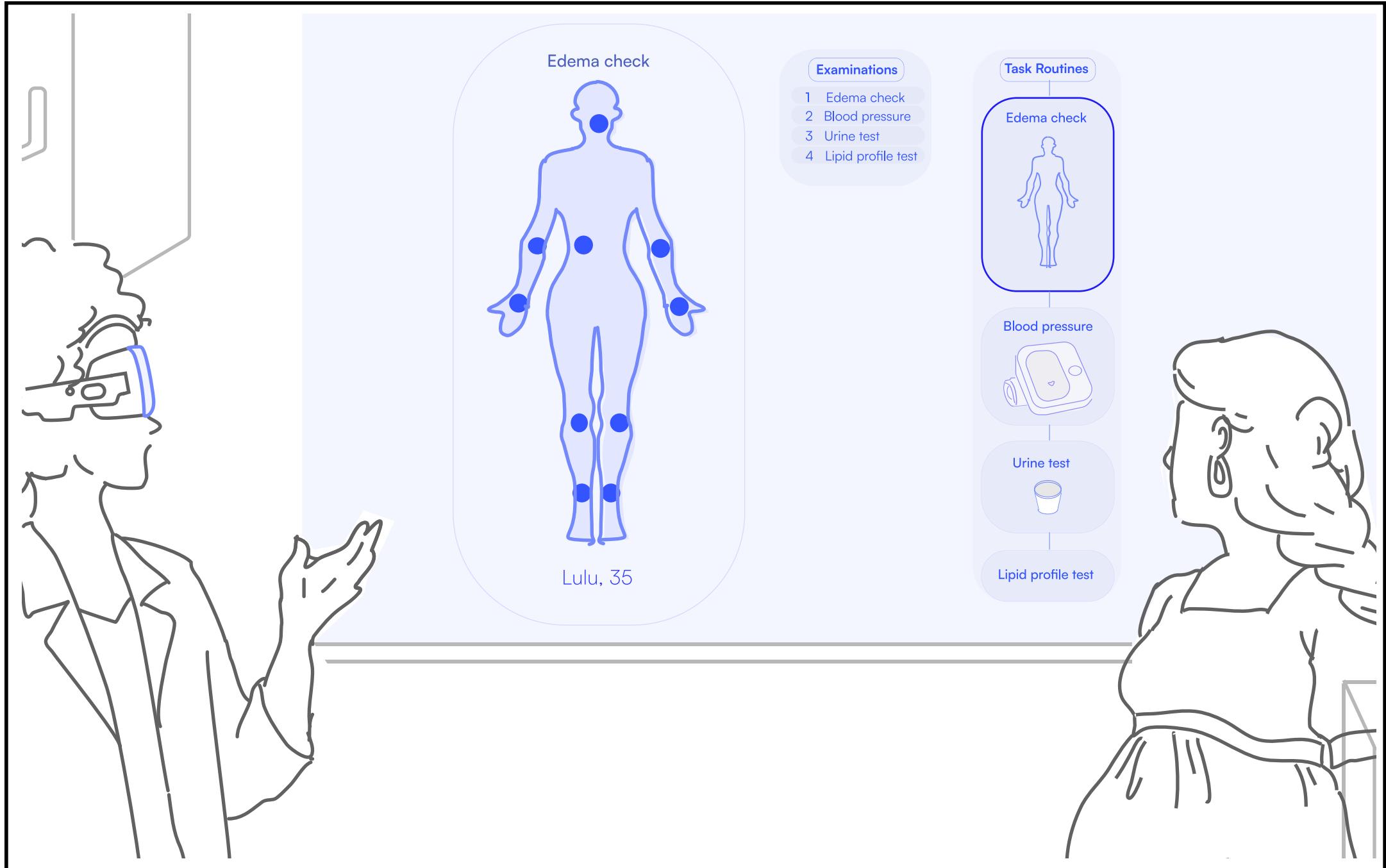
Isabella places a headpiece on, which allows Casey to see through her eyes. This real-time connection enables Casey to assist more directly during the examination. Casey selects the corresponding task routines to provide spatialized clinical guidance for Isabella.

11. CASEY sees Lulu through Isabela's eyes



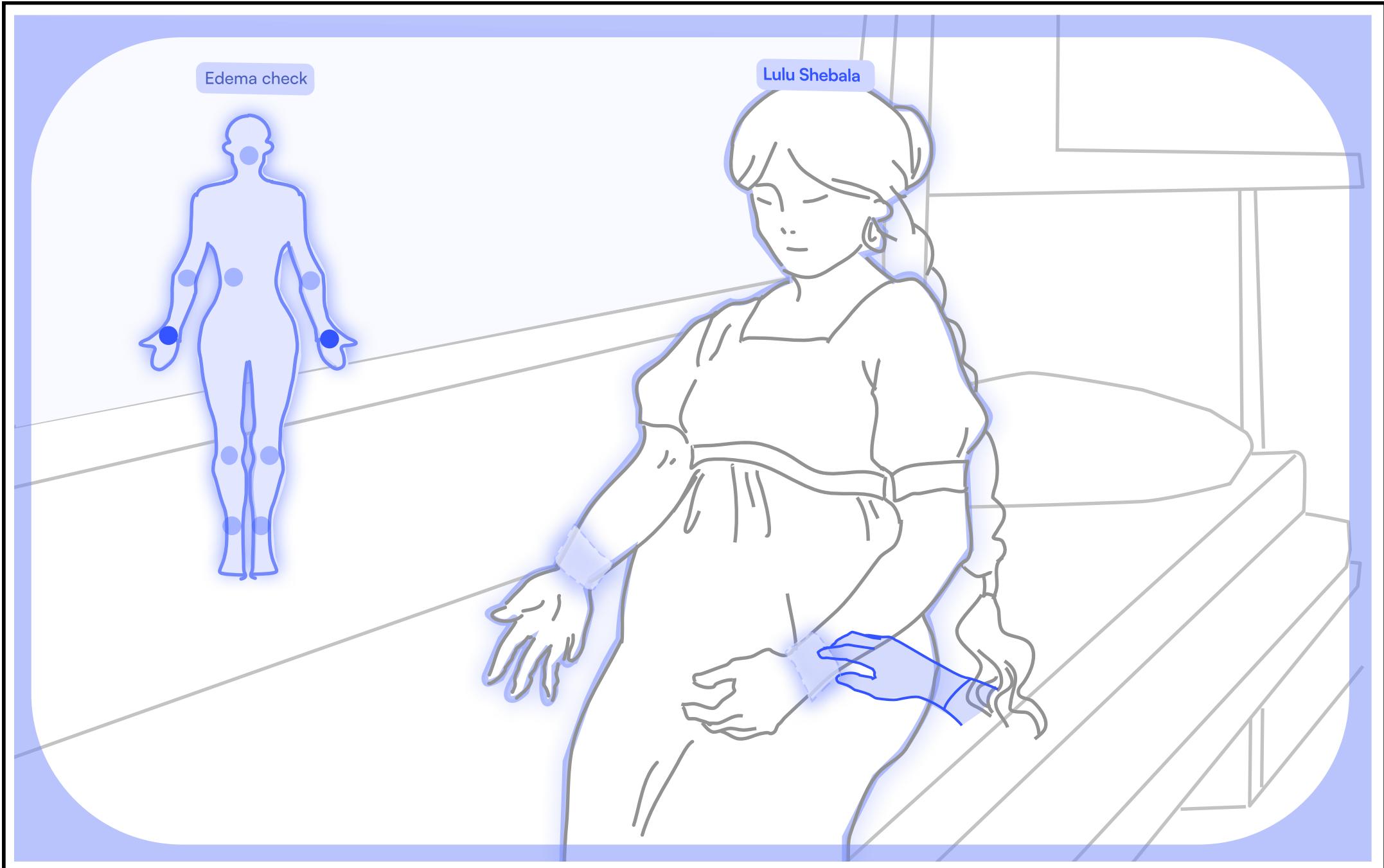
The headset's cameras scan Lulu's body, and a digital twin image materializes on the screen. Lulu can also see this information on a separate display, allowing her to follow along with the examination. This shared visual setup allows both patient and nurse to follow the health assessment in real time.

12. Lulu's Digital Twin



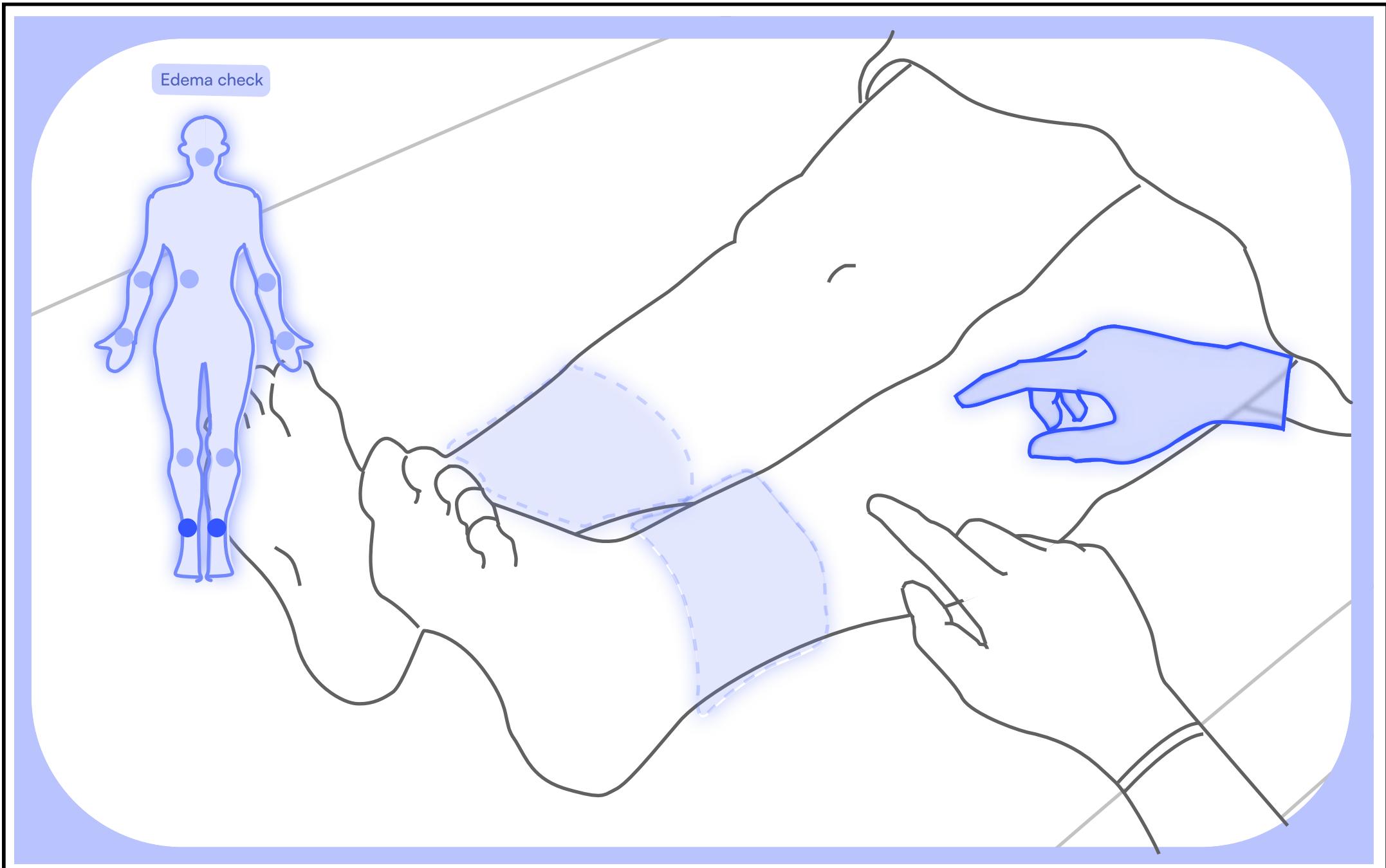
A digital overlay of Lulu's health indicators is shown on screen, guiding Isabella's exam through her headset. This virtual indicators pinpoint areas on Lulu's body where Isabella should check for signs of edema, guiding the physical exam with precision.

13. Physical Exam: Guided Edema Check I



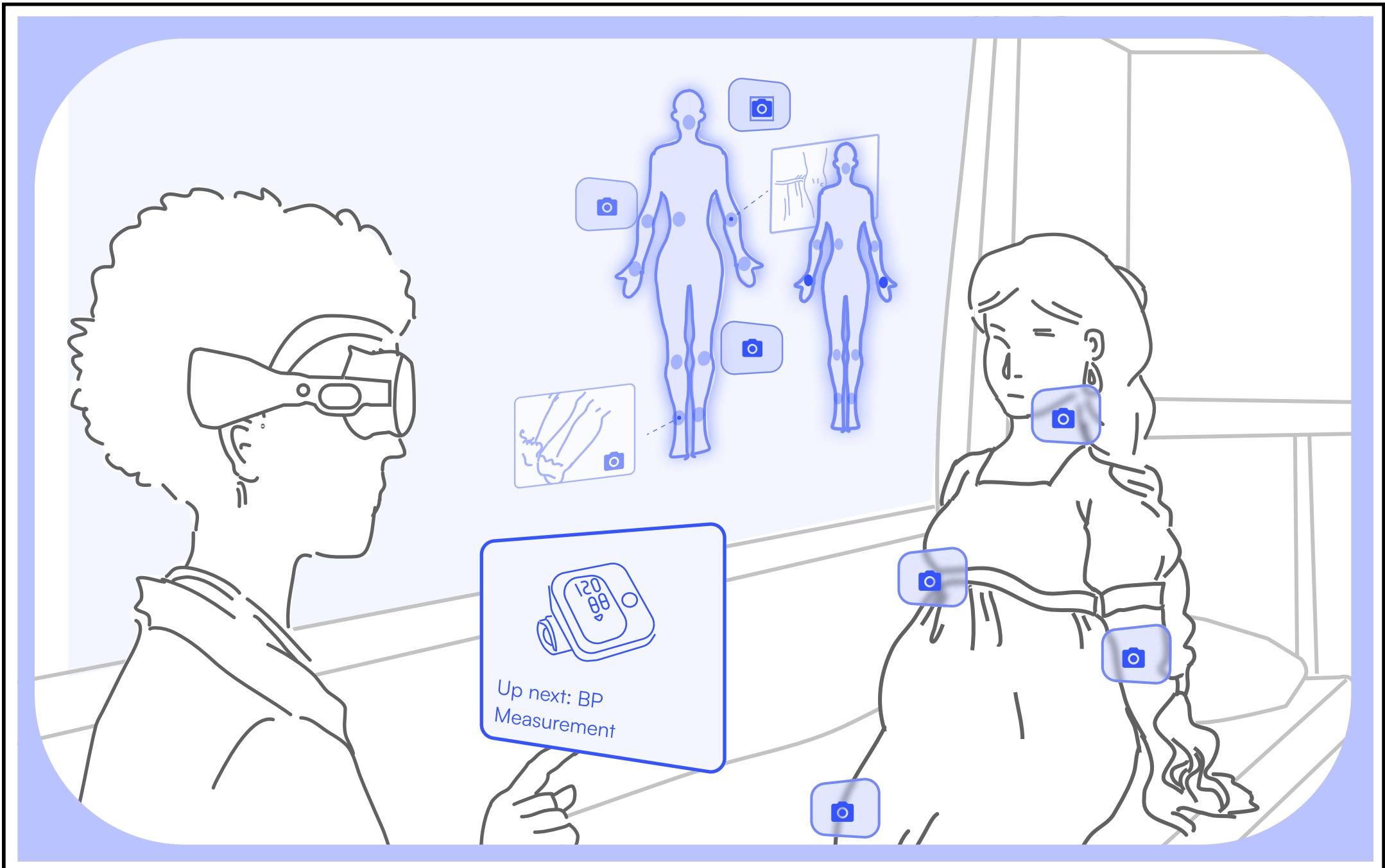
On the AR headset's display, Isabella sees spatialized indicators that precisely mark where she should start the edema examination on Lulu's body. Lulu's wrists are first highlighted in augmented reality, while Lulu can simultaneously observe the process on her digital twin model displayed on the monitor.

14. Physical Exam: Guided Edema Check II



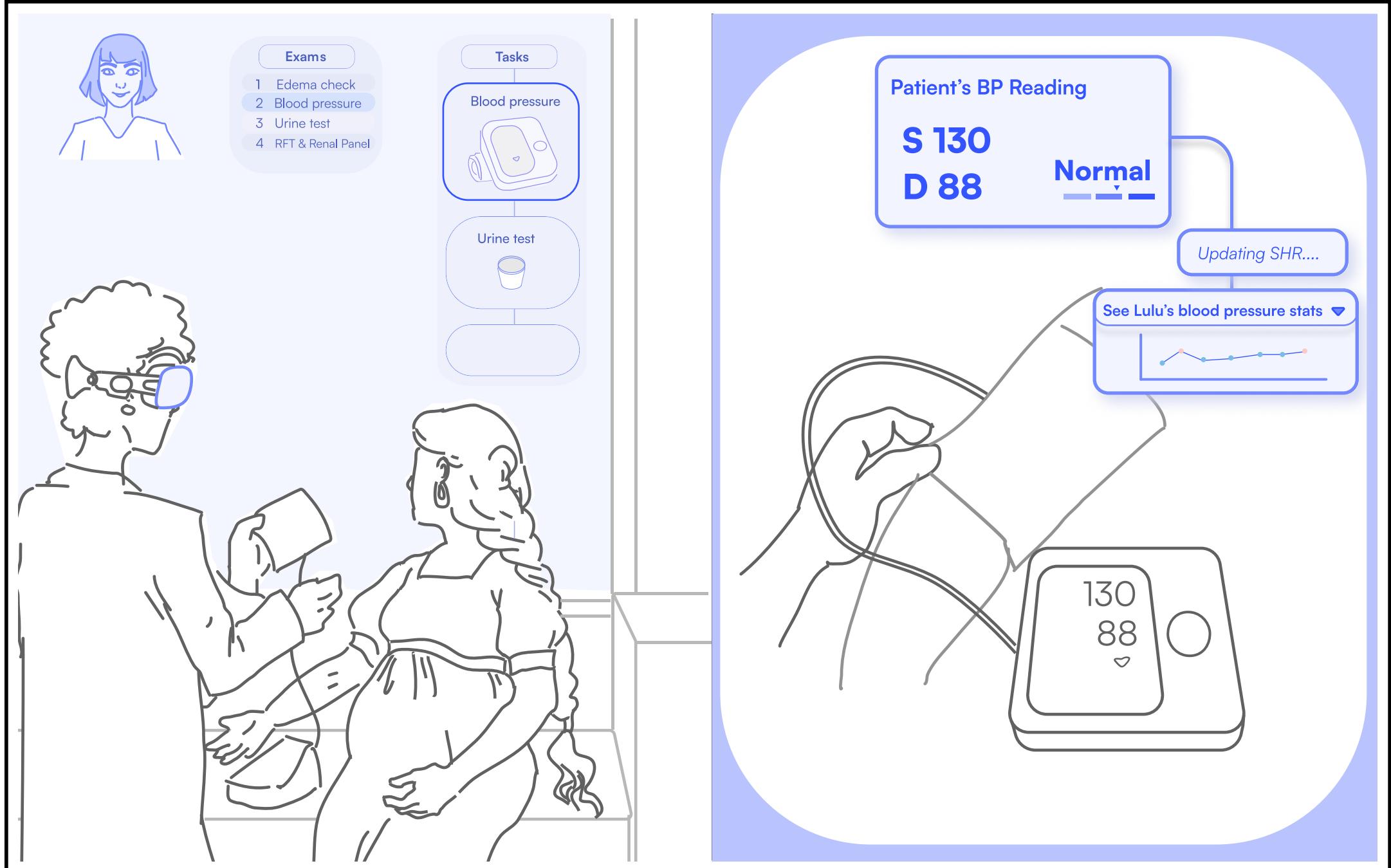
Isabella asks Lulu to lie down and adjust her clothing to reveal her ankles for the exam. Indicators on Lulu's ankles and Casey's ghost hands guide Isabella to the exact spots to check for pitting edema. After pressing, Isabella instructs Casey to take photos of the examined areas. The digital twin on the monitor records the examination process and displays the images as they are taken.

15. Complete and Transition to Next



After finishing the edema assessment and thoroughly documenting the exam findings, Isabella reviews the results and selects to begin the blood pressure measurement on her virtual interface.

16. Guided Blood Pressure Measurement



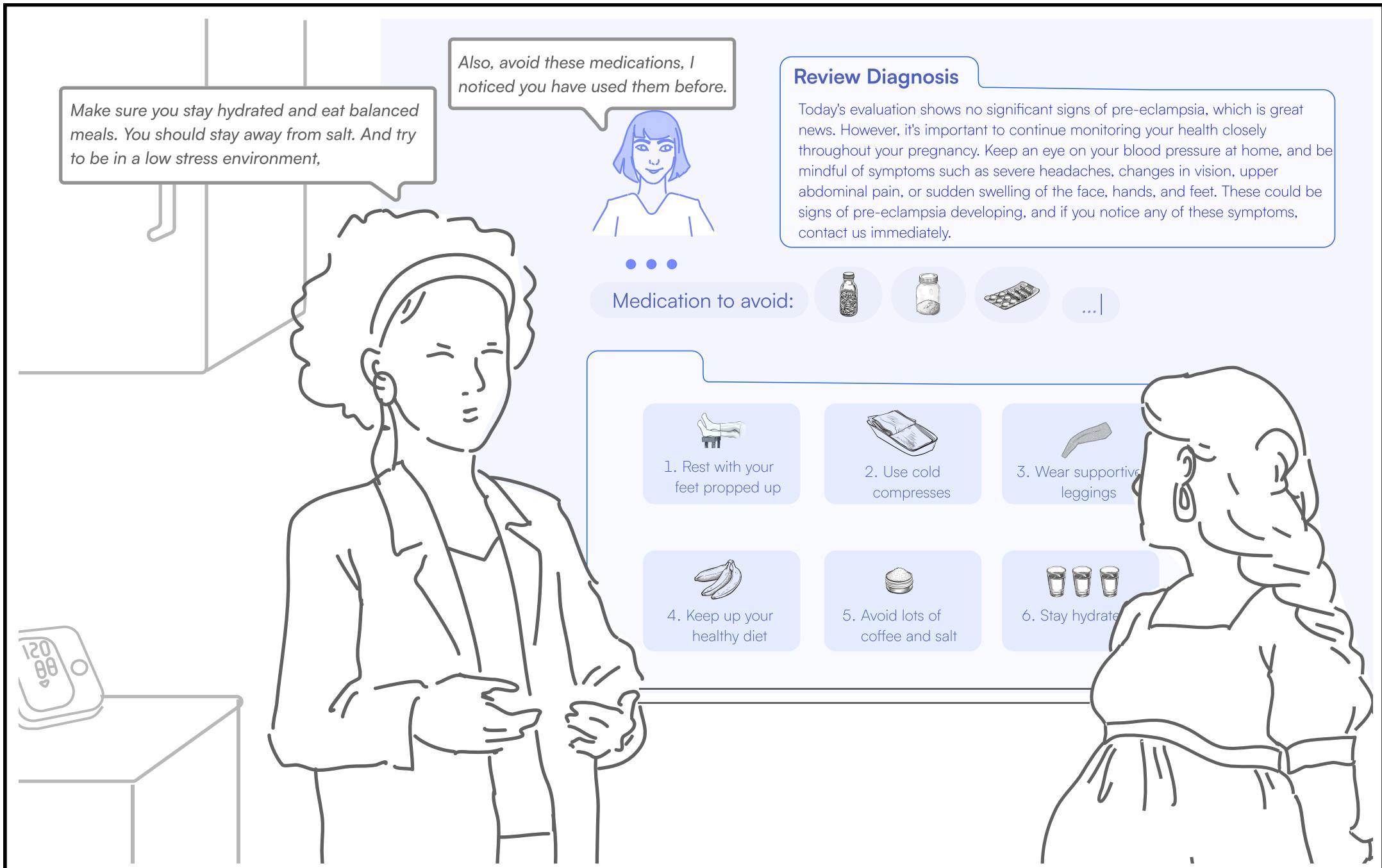
Isabella asks Lulu to relax and take deep breaths. To help keep Lulu calm, Casey displays reminders to breathe slowly. The result is displayed through her headset and automatically recorded in Lulu's Standard Health Record. The measurement shows a slight elevation, but it is within the normal range for Lulu, consistent with her historical data during her previous pregnancy and general health records.

17. Other Exams: Blood Collection and Urine Test



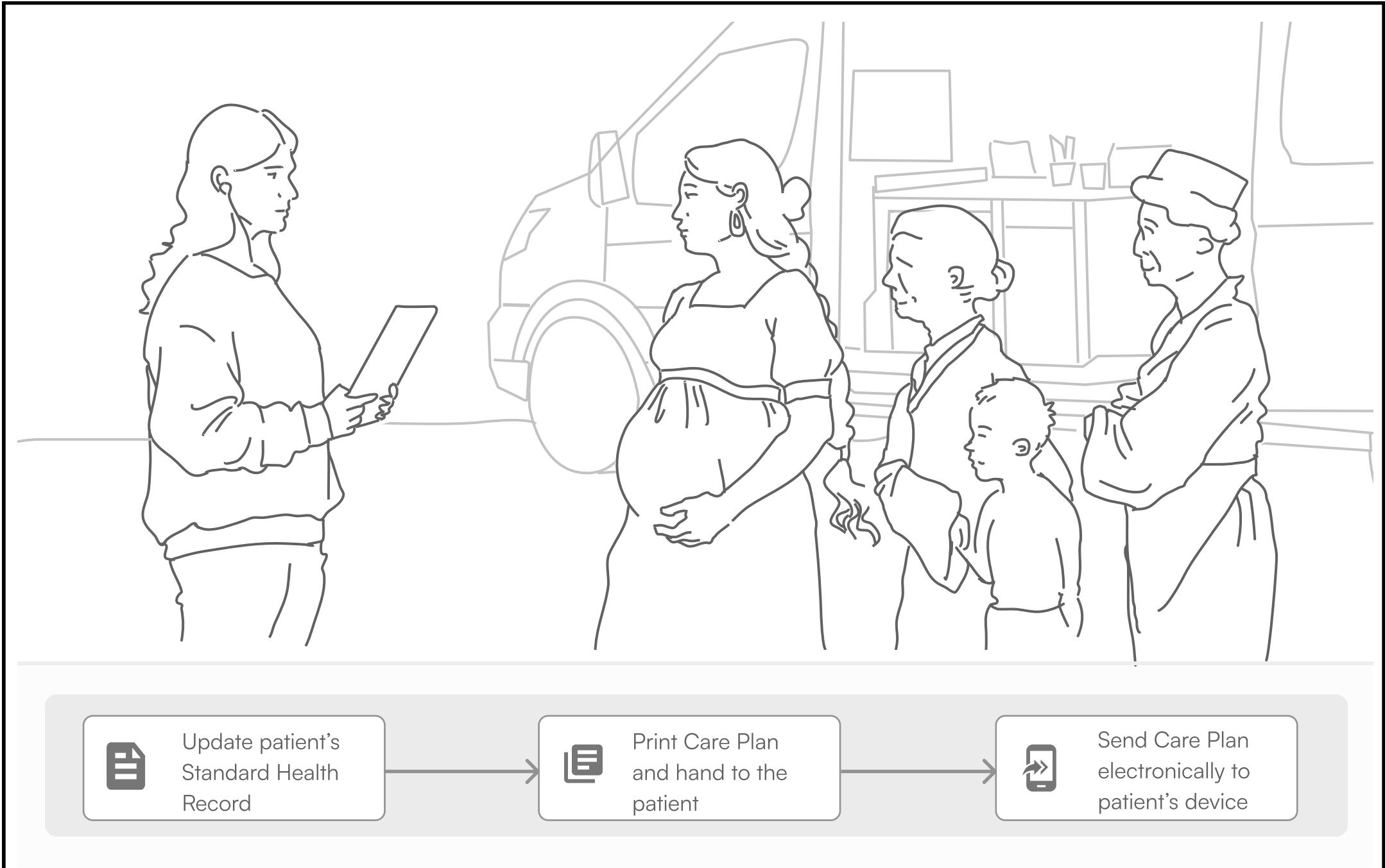
Isabela explains the blood pressure results to Lulu. She mentions that normal results in the upcoming urine test would make preeclampsia less likely, but a blood test is still essential for a full evaluation. They proceed with the urine and blood tests to complete her health assessment.

18. Clinical Advice and Q&A



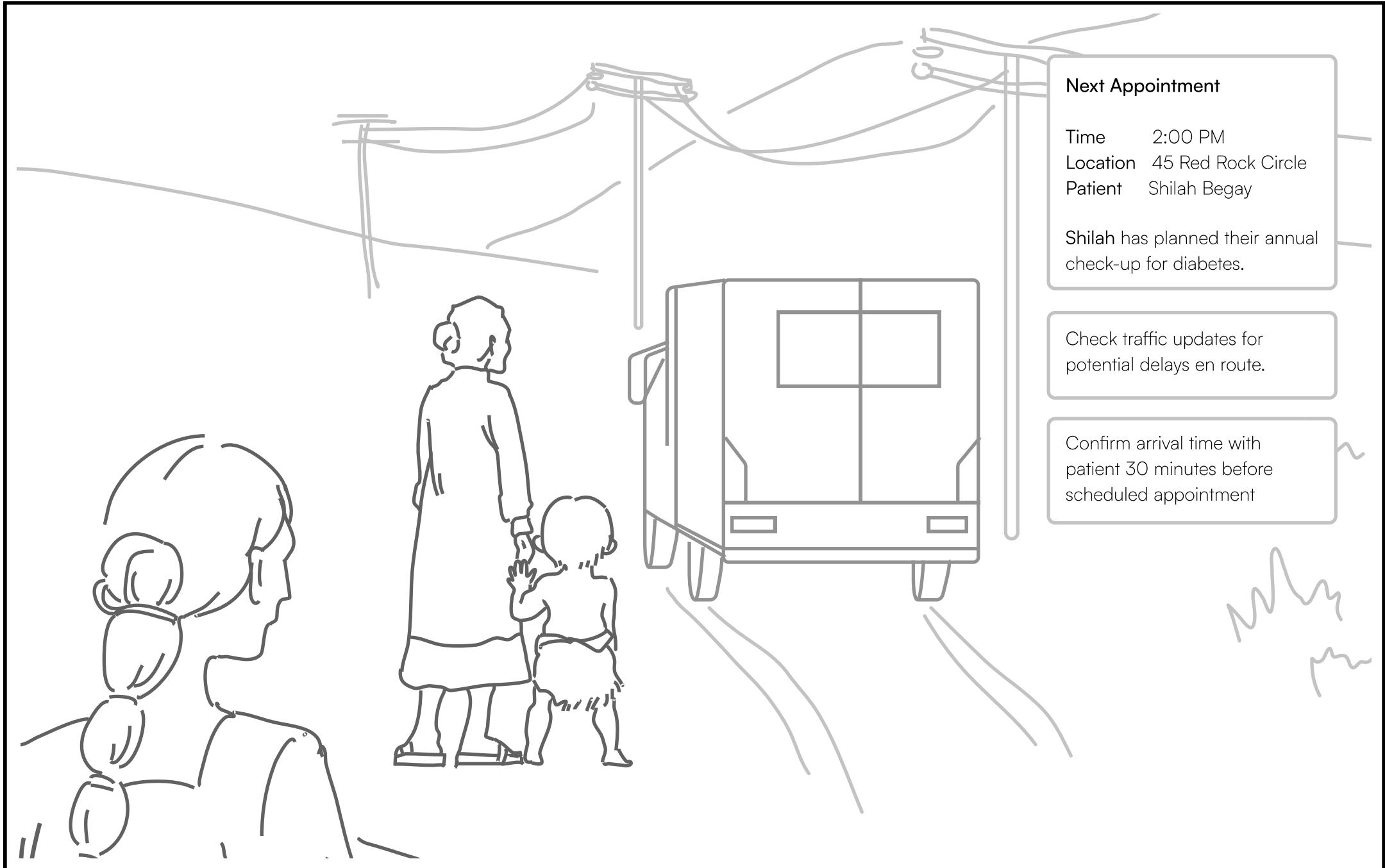
Isabela and Casey provide Lulu with a comprehensive review. Casey presents an illustrated care plan, designed in real-time, to visually guide Lulu through her next steps. They answer Lulu's questions and reassure her that today's results show no significant signs of preeclampsia, which is positive news and emphasize the importance of ongoing monitoring.

19. Consultation Ends



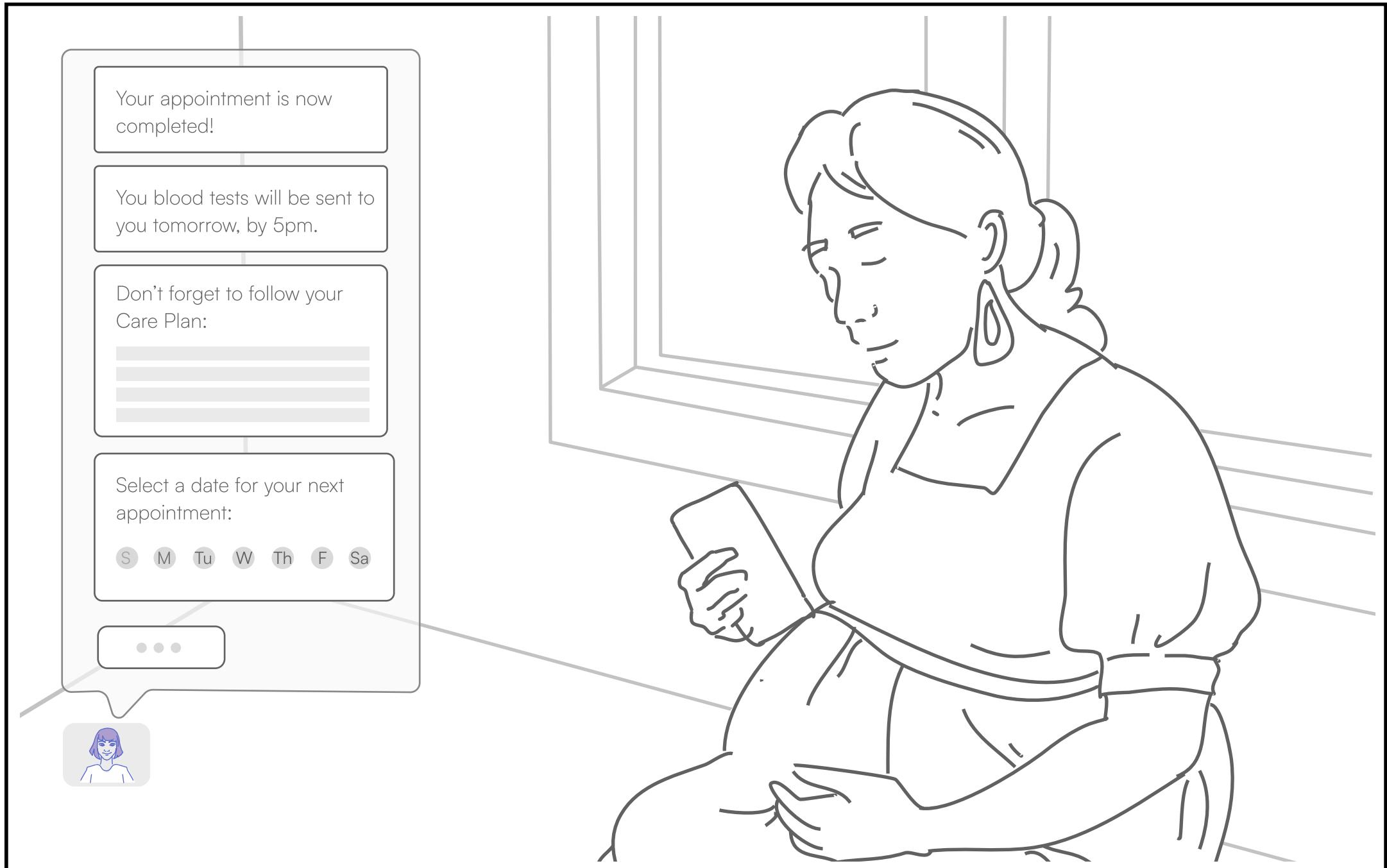
Lulu rejoins her family and Doba outside the van, where Sara gives her the printed care plan and digital documents. Sara informs Lulu that she will receive her blood test results within 24 hours and should book a follow-up appointment next week.

20. Van Sets off to Next Appointment



As the van rolls out from Lulu's location, Sara and Isabella prepare for their next patient visit. A message flashes on the van's dashboard screen, detailing their next stop: the appointment of Shilah at a different location on the reservation.

21. Continued Care and Communication



Back at home, Lulu gets several notifications from Casey on her phone. These include her appointment receipt, updates on her blood tests, her care plan, and a link to schedule a follow-up appointment next week.