unthinkable

SUCCESS STORY

Developing An AI-Driven Patient Intake Platform For Rare Disease Care

Customer: TeleRare Health

Country: United States

Industry: Healthcare

ABOUT THE CLIENT

TeleRare Health®

TECH STACK

Retell AI | metriport | Azure

TeleRare Health is developing a new care platform for patients with rare diseases, one that addresses a long-standing structural issue in healthcare. TeleRare's approach is to operate as a white-label, virtual genetics department for partner healthcare systems. The organization provides licensed genetic counselors and clinical geneticists, purpose-built clinical workflows, and a platform designed specifically for genetic medicine.

BUSINESS SITUATION

While more than 10,000 rare diseases are known today, most physicians are trained to recognize only a fraction of them. As a result, patients often spend years navigating fragmented systems, explaining their condition across providers.

Additionally, rare disease intake is deceptively complex. Before a patient ever meets a genetic counselor or clinical geneticist, a significant amount of work happens behind the scenes. Much of it is manual, repetitive, and difficult to scale. Firstly, medical assistants and clinicians spent around 60 minutes per patient assembling histories, pulling records from multiple systems, printing pedigrees, and reconciling missing information. This work happened before the actual clinical encounter and did not scale with patient volume.

Moreover, new patients routinely waited 2—3 months for an initial visit. Patients are also asked to interact with multiple portals, forms, phone calls, and follow-ups.

The existing EHRs handle billing and other operations profoundly; however, genetics-specific workflows, longitudinal family history, rare disease narratives, and genetic testing are bolted on at best.

Phase 1 of this project was intentionally designed to integrate with multiple healthcare systems while preserving their existing billing and EHR workflows.

The client had a very clear goal: remove the operational bottleneck at intake and pre-test evaluation without disrupting existing billing/EHR workflows at healthcare organizations.

KEY REQUIREMENTS OF THE CLIENT WERE TO:

1. Design and build the entire platform from scratch, starting with an MVP
2. Automate >80% of the pre-test intake workflow
3. Introduce AI for patient intake without compromising clinical trust or compliance
4. Integrate deeply with HIEs and partner EHRs using FHIR standards
5. Ensure HIPAA compliance and auditability from day one
6. Deliver Phase 1 within a tight, fixed timeline, with future phases already in scope

THE SOLUTION

We envisioned TeleRare Health as a foundation for a multi-phase clinical platform. From the start, our design decisions were guided by the thought of removing any friction before patient encounters.

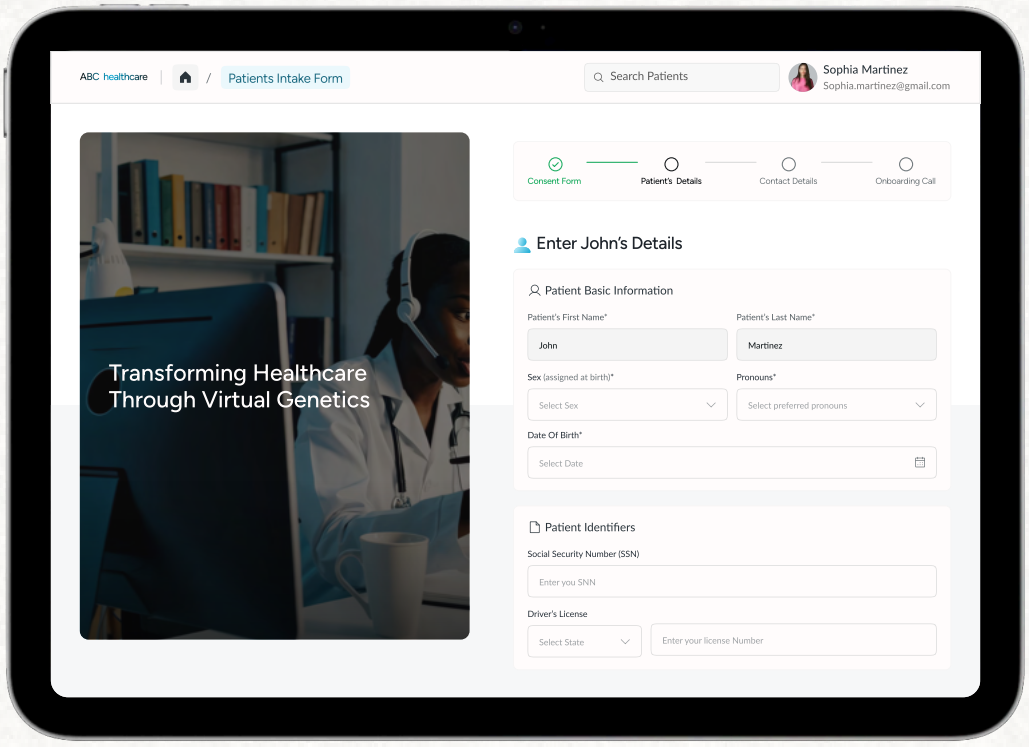
Phase 1 deliberately avoided replacing the partner healthcare system's EHR. Instead, we focused on everything that happens before the clinician opens the chart: intake, history collection, summarization, and preparation. This allowed TeleRare to deliver immediate value while minimizing organizational risk for partner institutions.

Some of the modules that we developed include:

A Simplified Patient Onboarding Flow

The patient journey starts with a secure link sent via SMS or email. We implemented magic-link authentication using Azure Entra External ID to eliminate password friction while maintaining strong identity controls.

Patients fill in their e-Consent forms, demographics, and identifiers needed to locate their records and authorization for data use and secondary purposes. All data is stored as FHIR Patient and Consent resources in Azure Health Data Services (AHDS), ensuring interoperability. This design choice mattered. A two-minute onboarding flow significantly increased completion rates and reduced support overhead.

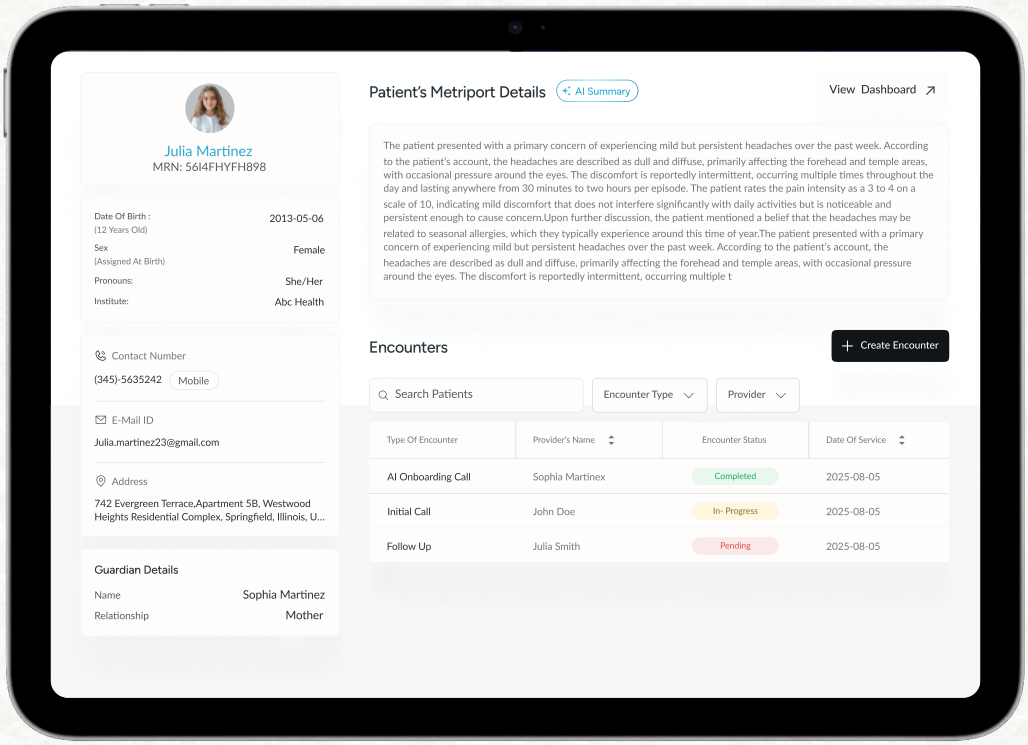


AI-Based Pre-Visit Interviews

We chose an AI voice agent for TeleRare. We integrated Retell AI to conduct structured intake calls that feel conversational rather than interrogative. The key design considerations were that patients can make multiple AI calls if they need breaks, and each call generates a transcript and a call summary. AI calls were informed by the Comprehensive Patient Overview and Retry logic, and alerts ensured no silent failures.

At the back end, Retell webhooks delivered transcripts to Azure Functions. Transcripts were stored as FHIR resources, and each interaction was linked to a clinical encounter. If a call failed after retries, Medical Assistants were alerted automatically via Microsoft Teams.

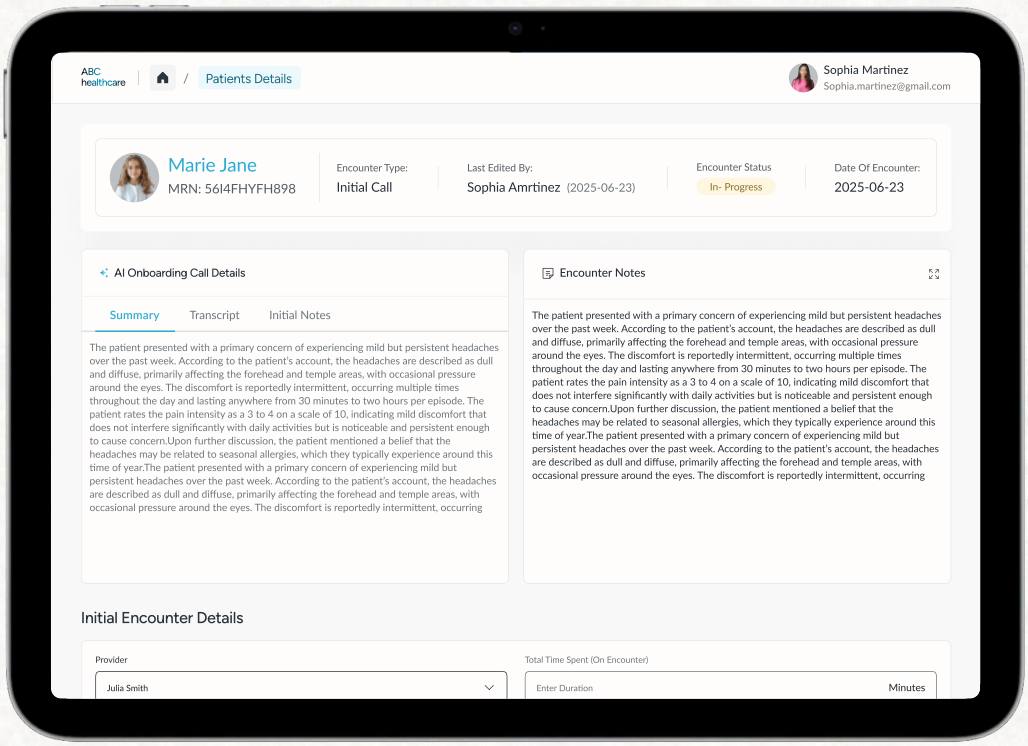
Once a patient record is created, the platform automatically triggers a Metriport HIE pull via Azure Logic Apps. Metriport aggregates basic demographics, diagnoses, encounter history, and any relevant clinical records.

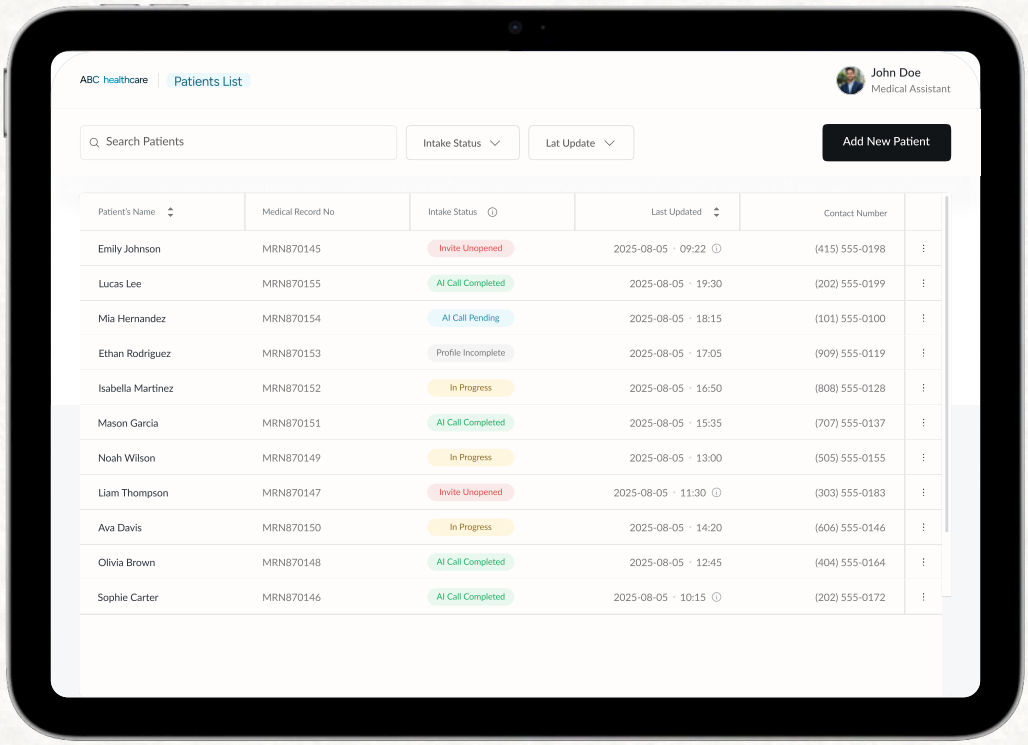


Drafting Clinical Notes With LLMs

After intake calls are complete, the system merged the structured HIE data, AI call transcripts, and encounter metadata. This combined context was passed to a custom prompt pipeline using Azure OpenAI. The output included a high-level clinical note, CPT codes for billing context, and MDM justification explaining how conclusions were reached.

We were intentional about transparency. Clinicians could see the transcript, the AI-generated note, and the reasoning behind the note. At this stage, TeleRare clinicians could copy/paste the drafted note into the partner EHR. This preserved existing billing workflows while saving substantial preparation time.





IMPACT

Phase 1 delivered measurable results within weeks of go-live. Clinicians began visits with complete histories already assembled, and waitlists were reduced without adding staff. More importantly, the platform shifted how genetics teams spend their time. They could now focus on clinical judgment rather than admin tasks. With Phase 1 in production, TeleRare is now positioned to:

1. **Automate genetic test ordering**
2. **Move charting and billing into the platform**
3. **Launch a national rare disease expert network**

Our plan is to extend the platform to support automated genetic test ordering, including pedigree generation and push-button submissions to laboratories. We also plan to enable in-platform charting, transcription, and billing support, reducing dependence on partner EHRs for routine genetics workflows. The foundation we built supports all of it, without asking healthcare systems to change how they operate overnight.

NUMBERS THAT SHOWCASE THE IMPACT

80%

Pre-Test Encounters Completed Within 15 Minutes

95%

Intakes Handled By AI Agents, Reducing Manual Workload

95%

Referred Patients Completed Onboarding Without Support