



— CASE STUDY · REVISED OCTOBER 2026

How Agnos helped a hospital-at-home provider cut referral-to-treatment from two weeks to two days

A FHIR-native EMR, built from the ground up, that brings the clinic to the patient: referral intake, eligibility, scheduling, home-visit documentation, e-prescribing and claims in one system. Updated with what AI now adds at every step.

Client

Distributed medical practice delivering specialized care in patients' homes, United States

Engagement

Product definition, FHIR architecture, EMR build, integrations, QA, DevOps, cloud

Platform

FHIR-native EMR on AWS, OpenSearch, e-prescribing, eligibility, SSO

"The idea of starting treatment two days after receiving a referral seemed like a fantasy. Together with our client, we accomplished what seemed impossible."

FROM THE ORIGINAL 2022 CASE STUDY. THE OUTCOME STANDS; THE TOOLS HAVE MOVED ON.

THE CLIENT

Bringing the clinic to the patient

Chronic conditions are among the leading causes of death and disability in the United States. Many of them, especially when mismanaged, lead to painful symptoms, emergency room visits and hospital admissions that drive up the cost of care. Left untreated, conditions that are treatable can be fatal.

The biggest challenge doctors face is often getting patients with chronic conditions to come to the office at all, both for the disease itself and for the related conditions that follow it. When a condition requires daily or weekly care, each visit is another trip the patient may not be able to make.

What if the clinic came to the patient instead? Our client is a distributed medical practice that delivers specialized healthcare services to patients in their own homes, improving quality of life and removing barriers to the best medical care. It uses an evidence-based strategy and customized treatment regimens to address inequities in access and inefficiencies in cost.

The practice receives referrals from healthcare providers (doctors and hospitals) and from payers (health insurance companies) through many channels: faxes, phone calls to call centers in the United States and India, and third-party portals. It coordinates appointments so that every patient receives high-quality care and handles the administrative needs and questions that come with it. Its system serves patients, clinicians, practitioners, primary care physicians, patient care coordinators and referring providers.

Problem statement

Providers, especially primary care physicians, struggle to bring care to the patients who need it most, on time, wherever those patients live. The client had built a system to address the obstacles its clinical and administrative staff faced, but the system itself had become part of the problem.

- The legacy EMR was a third-party SaaS product that was not aligned with the practice's people, processes or technology, and so could not deliver operational excellence or patient satisfaction.
- Integration with other platforms was difficult, and maintaining data in the legacy system was a constant effort.
- Most work required manual processing; the outdated system could not automate it.
- Because of those manual processes and the lack of integration, the time between the start of a referral and the start of actual care was far longer than necessary, and patient outcomes suffered for it.
- The engineering team was deploying a commercial off-the-shelf (COTS) EMR, but enhancing existing features or adding new ones was slow and difficult.

PROPOSED SOLUTION

One system for every step from referral to recovery

Agnos applied its expertise in healthcare technology and business process optimization to help the client bring together providers, patients and insurance companies around the patient at home. The system Agnos helped build manages every element of that journey: patient intake, insurance eligibility checks, authorization for treatment, appointment setting, patient care coordination, caregiver training and deployment for home visits, telehealth and caregiver visits, encounter notes, patient experience feedback, claims submission, remote monitoring, patient self-service and portal, and automated follow-up until the health outcome is achieved.

**2 weeks →
2 days**

from physician referral
to first treatment

91%

of patients heal within
the authorized duration
of treatment

15–20 min

less patient intake and
check-in time per
patient

10–15 min

of staff time saved per
patient through
reduced paperwork

Solution definition

- **Consolidated referral intake.** Faxes, call-center phone calls and the practice's own and third-party portals, from insurance companies and referring providers, flow into one queue.
- **Task management.** A tasking and inbox solution that assigns, tracks and escalates every item of work.
- **Patient registration.** Demographic and insurance capture, with batch validation of coverage for active patients.
- **Eligibility checks.** Current coverage, coverage phase, patient responsibility and the contractual constraints that care delivery must respect, through integration with Availity.
- **Intake forms and consent.** Non-clinical questionnaires, patient authorization and consent captured digitally.
- **Document management.** Archiving of faxes and generation of Continuity of Care Documents (CCDs).
- **Reporting.** Process status and performance reporting on efficiency and effectiveness.
- **Configurable workflows.** A workflow management system the practice can adapt as its business changes.
- **Permissions and access management.** Role-based access across every user group.
- **Migration and integration.** Existing data and users migrated; integration with multiple external systems.

Before this partnership, it took about two weeks to begin treating a referred patient with a potentially lethal condition related to a chronic disease such as cancer or diabetes. While the patient waited, care coordinators, clinicians and doctors wrestled with legacy systems and manual processes to expedite the start of care. **Together, Agnos and the client reduced the start of care from two weeks to two days.**

HOW WE DID IT

A green-field, FHIR-native architecture, delivered with discipline

Agnos provided the client with a global team of software engineers and technology consultants who combined strong technical skills with deep domain knowledge in healthcare. The team wrote user and technical stories to capture every functional and non-functional requirement. Agnos quality assurance engineers applied Test-Driven Development (TDD), wrote the test cases, completed all types of functional testing, including smoke and black-box testing, and automated regression testing.

Agnos also applied its expertise in software-defined infrastructure and DevOps to address all of the client's cloud and IT infrastructure needs, which shortened the time to go-live and simplified maintenance and support afterwards. Enterprise architecture decisions were aligned with the client's current state of technology and with future considerations, above all the adoption of the FHIR standard across all software development.

STANDARD

FHIR from the ground up

A green-field architecture based on Fast Healthcare Interoperability Resources (FHIR), the HL7 standard that defines an API for exchanging electronic health records together with its data formats and elements. Every record in the EMR is a FHIR resource, which is what makes the integrations below straightforward.

MOBILE

Intake and documentation on the move

To streamline patient intake and documentation and maintain patient history in a mobile-friendly application, Agnos integrated with the client's legacy system, selected the right technology components and provided architectural guidance and setup.

PRESCRIBING

A new e-prescription service

Bulk export of prescriptions; an incremental export job every two minutes that synchronizes only the delta from the EMR; and an import job that synchronizes resources from DrFirst back into the EMR.

SEARCH AND IDENTITY

OpenSearch and single sign-on

AWS OpenSearch provides fuzzy and complex search across patients and records and doubles as the de-duplication engine. Single sign-on authentication was established for all users.

INTEGRATION	PURPOSE
Availity	Real-time eligibility, coverage phase and patient responsibility, with batch validation for active patients.
DrFirst	Electronic prescribing; medications e-prescribed through the EMR are visible in the portal and the generated resources can be adjusted.
Legacy EMR and referral channels	Data and user migration; fax, call-center and portal referrals consolidated into one intake queue.
Payer and provider systems	Coverage validity and authorization checked and synchronized between the patient, the doctor and the insurer and their respective record systems.

BUSINESS OUTCOME

Technology is only a means to the end

At Agnos we are obsessed with the business outcomes our clients define, not with the technology for its own sake. This is what the client gained.

Operational efficiency the practice had never seen. Missed patient appointments fell sharply and revenue rose meaningfully. Patient intake and check-in time dropped by 15 to 20 minutes, and reduced paperwork saved staff 10 to 15 minutes per patient.

Care coordination without spreadsheets. Patient care coordinators can see weekly schedules for doctors and clinicians and reschedule or cancel appointments as needed. Previously they searched spreadsheets by hand. Delays in scheduling the start of care were reduced.

Electronic prescriptions. Patients receive e-prescriptions; clinicians view the medications prescribed through the EMR portal and adjust the resources the prescription application generates.

Faster, cleaner data. Search built on a search engine is fast and is also used for de-duplication. Patients complete every required form on their mobile device, and the forms upload directly to the EHR systems that need them.

An agile, adaptive business. Configurable workflows let the practice adapt quickly as its business needs change. Guided treatment paths keep the quality of physician care consistently high.

Interoperability by design. Because the whole system is built on FHIR, it integrates and interoperates with many different healthcare systems. Coverage validity and authorization are checked and synchronized automatically between the patient, the doctor and the insurer.

From two weeks to two days. The practice went from providing specialized care typically within two weeks of a physician referral to within two days. As a result, 91% of patients heal within the authorized duration of treatment. The system also advances the Quadruple Aim: it reduces manual tasks, scans and adds referrals automatically, and keeps patient records up to date without human rekeying.

Customized views, value-based insight

The client can now build customized patient data views and deliver timely, efficient, value-based and insight-driven care. The same data that runs the practice day to day is the data that proves its outcomes to payers and referring providers.

2026 ADDENDUM · PART ONE

What has changed since this work: hospital at home grew up, and AI arrived

When this EMR was built, care at home was still an exception that had to justify itself. In 2026 it is a reimbursed, measured model of care with a five-year runway, and the same workflows this system automated are now the ones AI is transforming.

2030

Medicare's Acute Hospital Care at Home waiver extended for five years in the February 2026 spending package

Chartis, February 2026

366

hospitals across 139 health systems in 37 states approved by CMS to deliver hospital care at home

CMS via AHA, February 2026

7% vs 23%

30-day readmissions for Mass General Brigham's home hospital patients against facility-based care

Annals of Internal Medicine, via AHA

~500M

health records exchanged over TEFCA, the national interoperability network, up from about 10 million in January 2025

HHS, February 2026

The model has proof. A 2024 CMS report found that Medicare beneficiaries treated under the waiver had a lower 30-day mortality rate than comparable inpatients. Ohio State's program reports a 9.2% 30-day readmission rate against 16% for traditional inpatient care, with 95% of patients rating it 9 or 10 out of 10. Every one of these programs runs on the workflow this case study describes: referral, eligibility, scheduling, home visits, monitoring and follow-up.

The records now arrive. National exchange has made retrieving a patient's history a solved problem for a growing share of encounters. The bottleneck has moved from finding the record to reading it, and that is a job models now do well.

The industry has moved from pilots to production. Half of US healthcare organizations have implemented generative AI and more than 80% have put first use cases in front of end users (McKinsey, April 2026). Bain and Bessemer's October 2026 scorecard reports average returns of 3.5 times with payback in about twelve months, led by administrative work and revenue cycle, where 67% of provider AI already runs as semi- or fully autonomous agents. Ambient documentation is the most widely adopted clinical use: Kaiser Permanente's medical group reports its AI scribe gives 3,400 physicians about an hour a day back at the keyboard, and a six-system study in JAMA Network Open found clinician burnout fell from 52% to 39%.

The deadlines are real. CMS now requires standard prior-authorization decisions within seven days and expedited ones within 72 hours (from January 2026), and electronic prior-authorization, provider-access and payer-to-payer APIs by January 2027. For a practice whose start of care depends on authorization, that is a patient-experience deadline as much as a compliance one.

2026 ADDENDUM · PART TWO

If we built it today: AI at every step from referral to recovery

Everything in the original architecture still stands; a FHIR-native EMR is exactly the foundation agentic AI needs. What changes is what each step can do. The table pairs each capability we delivered with the AI that now sits on top of it.

STEP WE BUILT	THEN (2022)	NOW, WITH AI
Referral intake	Faxes, calls and portal referrals consolidated into one queue, then read and keyed by staff	Document intelligence: OCR plus large language models turn a faxed referral into structured FHIR resources (Patient, Condition, ServiceRequest, Coverage) with confidence scores and a citation back to the page. Staff confirm, they no longer retype.
Eligibility and authorization	Availity checks, batch validation, authorization tracked by hand	Authorization agents: an agent assembles the authorization packet from the record, submits it through the payer's prior-authorization API and follows up against the new CMS clocks. MUSC Health reports agents completing 40% of prior authorizations without human involvement (Deloitte).
Scheduling and care coordination	Task management, weekly schedules, coordinators reschedule by hand	Agentic triage: an agent reads each new referral, ranks it by clinical urgency and authorization status, proposes the caregiver and the visit slot, and drafts the outreach. A coordinator approves anything that reaches a patient.
Home visit and encounter notes	Mobile intake forms and documentation entered by the caregiver	Ambient documentation in the home: the visit is captured on the caregiver's phone, the note is drafted into the FHIR encounter and the clinician signs it. The same capture produces the patient's plain-language after-visit plan.
Remote monitoring	Device data collected and reviewed	Models watch, nurses decide: monitoring streams are summarized and triaged so a nurse sees the five patients who need a call today, not five hundred data streams. Alerts are decision support, never the decision.
E-prescribing	DrFirst synchronization every two minutes	Reconciliation assist: a model reconciles the medication list across referral, record and prescription feed and flags interactions for the prescriber.
Claims and follow-up	Claims submitted; follow-up automated by rules	Revenue-cycle agents: agents work denials, chase missing documentation and time patient follow-up to the care plan, inside the practice's existing workflow. This is where Bain finds providers' fastest returns.
Search and QA	OpenSearch; TDD and automated regression	Conversational record, evaluated models: clinicians ask questions of the longitudinal record; evaluation suites in CI score every model release for accuracy and omissions.

The one thing that does not change. Every row above ends in a person who is accountable. AI reads, drafts, ranks and proposes; a clinician or a coordinator decides. Because every record in this EMR is a FHIR resource and every action is logged, each agent step can be traced, replayed and audited. That is what responsible AI means in practice on this platform.

2026 ADDENDUM · PART THREE

What can go wrong, the guardrails, and where this leads

What can go wrong

- **Confident wrong answers.** Epic's sepsis prediction model, used by hundreds of hospitals, caught only 33% of sepsis cases across 38,455 Michigan Medicine admissions (JAMA Internal Medicine, 2021). A summary that omits an allergy is worse than no summary; every omission must be measurable.
- **Transcription that invents.** OpenAI's Whisper, used to transcribe visits for 30,000 clinicians, was found to insert sentences no one said (AP, 2024). Ambient notes need a clinician's signature and an accuracy review before go-live.
- **Harm by omission.** Stanford and Harvard's NOHARM study of 24 AI systems across 1,100 real cases found severe-harm error rates from 3% to 25%, mostly from omitting a needed test or treatment (2026).
- **Protected data in the wrong place.** Models, prompts and logs are all PHI surfaces. Business associate agreements must cover every model endpoint; no patient data in consumer AI tools.
- **Algorithms deciding coverage.** CMS told Medicare Advantage insurers in 2024 that an algorithm alone may not deny coverage; a clinician must decide. The same principle applies to every agent on this platform.

Guardrails Agnos puts in place

- Build inside the client's existing cloud and BAA (AWS Bedrock or Azure OpenAI), with no PHI leaving the tenant.
- Retrieval-grounded generation only: the model answers from the record and shows where.
- Human in the loop on every action that touches a patient, a payer or a prescription.
- Shadow mode first: the agent drafts, staff send, every difference is logged and measured against a hand-built baseline.
- Evaluation suites in CI: accuracy, omission and hallucination rates on every release.
- A named model owner, a drift alarm and a kill switch, written into the runbook on day one.

How to start. Pick the single highest-volume referral channel. Measure today's time from referral to first visit and today's rekeying error rate by hand on a sample. Run document intelligence on the same sample inside the practice's cloud BAA, with a coordinator scoring the output blind. Ship only when it beats the baseline on omissions, not just on speed. Agnos has run this sequence; it takes weeks, not quarters.

2026 ADDENDUM · PART FOUR

The future state we are building toward

A FHIR-native EMR with every action logged is exactly the foundation agentic AI needs. Here is where that foundation leads over the next three to four years.

Future state, 2027 to 2030

- **Referral to first visit in hours, not days.**
Document intelligence at intake, authorization agents working the payer APIs and agentic scheduling compress the two days this system achieved into the same day for routine referrals.
- **The home becomes the ward.**
With the waiver secured through 2030, continuous monitoring, in-home diagnostics and virtual rounds run on the same FHIR backbone; nurses supervise exceptions surfaced by models.
- **The patient and caregiver take part.**
The original future scope, a patient app with education, checklists, rescheduling and surveys, becomes a conversation in the patient's language, grounded in their own plan of care.

WHY AGNOS

Healthcare depth, engineering discipline, and now an AI-first delivery model

Contributions in the healthcare field. Patient-facing and provider-facing applications for single- and multi-specialty hospitals, applications for SaaS vendors, enterprise solutions for medical practices, and the payer version of a patient app built with a partner.

Interoperability expertise. Extensive experience with FHIR and HL7 v2, integration with Epic, Cerner and CMS Blue Button 2.0; FHIR implemented with GraphQL, HAPI, and on Azure, Google Cloud and AWS. We started implementing FHIR for clients before it was commonly used; we have built FHIR-based accelerators and our internal data models are FHIR-based. Our interoperability implementations at CareCloud have been referenced by Google Cloud's Healthcare API teams, and our products are honored by the CARIN Alliance for meeting CMS interoperability guidelines.

Business and engineering, together. Our founders bring expertise in both business consulting and engineering. Global turn-key teams of product and project managers, business analysts, UX designers, DevOps, QA and software engineers provide around-the-clock coverage.

Independent and transparent. We are fiercely independent and give back to customers in the form of service credits and any compensation we receive from strategic alliance partners. Under our Gain Share model, we do not make money unless you realize the business outcomes we define together. We maintain HIPAA compliance.

AI-first since 2026. Agnos now delivers software through an AI-driven SDLC: specifications become pull requests through coding agents, CI is the gate, and senior engineers review and merge. The same approach is available for your AI initiatives, built inside your cloud and your BAA.

ABOUT THIS PAPER

The AI Sherpa, prepared by, about Agnos, and the sources



THE AI SHERPA

AI for Good and AI for Evil are the same technology. The doctor who treats himself has a fool for a patient, and the health system that takes on AI alone is in the same position. The AI Sherpa is the Agnos promise: a guide who knows the mountain, builds inside your cloud and your business associate agreements, measures every step against a baseline, and climbs with you.

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Tomorrow starts today. If you would like the referral-to-first-visit baseline on page 8 measured on one of your own intake channels, write to info@agnos.io. The first conversation is a working session, not a sales call.

About Agnos. Agnos was established in 2012 with a mission to empower businesses with next-generation, end-to-end agile software development services. We combine human creativity with cutting-edge technologies to benefit society and shape accountable business. Our hand-picked global team of technologists and consultants, with partner capacity of more than 20,000 worldwide, offers a follow-the-sun delivery platform. Core values: agility, trust and quality. As an AI-first services company focused on the intersection of healthcare and artificial intelligence, Agnos guides healthcare organizations through responsible, secure AI, from strategy to production.

Sources for the 2026 addendum. Chartis, "10 years of continuous hospital at home funding: Congress extends waiver," February 9, 2026. American Hospital Association, "4 providers turning hospital-at-home into a care delivery transformation juggernaut," March 10, 2026, citing CMS approvals, a 2024 CMS report to Congress, Mass General Brigham (Annals of Internal Medicine) and The Ohio State University Wexner Medical Center. HHS, "TEFCA reaches nearly 500 million health records exchanged," February 11, 2026. McKinsey, "Generative AI in healthcare: current trends and future outlook," April 16, 2026. Bain & Company with Bessemer Venture Partners, "The 2026 Healthcare AI ROI Scorecard," October 14, 2026. Deloitte Center for Health Solutions, "2026 US Health Care Outlook," December 11, 2025. American Medical Association on The Permanente Medical Group's ambient AI scribe, 2024. JAMA Network Open, ambient AI scribes and clinician burnout, 2025. CMS Interoperability and Prior Authorization Final Rule (CMS-0057-F), January 2024. JAMA Internal Medicine, external validation of the Epic Sepsis Model, 2021. Associated Press on Whisper transcription, October 2024. NOHARM benchmark, Stanford and Harvard, 2026. CMS memo to Medicare Advantage organizations on the use of algorithms in coverage decisions, February 2024.

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