

Alejandro Medina, MD

Full-Stack Software Engineer | Healthcare Technology | U.S. Citizen
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SUMMARY

Full-Stack Software Engineer with an MD background, specializing in clinical-grade web applications. Combines clinical domain expertise with production-ready engineering to build secure, role-aware, full-stack systems — from database design and REST APIs to validated, responsive frontends.

SKILLS

Languages & Frameworks: TypeScript, React, Next.js (App Router), Node.js, Python (FastAPI), TailwindCSS

Data & Infrastructure: PostgreSQL, SQLAlchemy, Alembic, Pydantic v2, Zod, RESTful APIs, JWT / RBAC

Frontend Tooling: TanStack Query v5, React Hook Form, Zod, Axios, Git/GitHub

Clinical Domain: EMR workflows, HIPAA Compliance, Clinical Decision Support (CDS), Patient Safety

EXPERIENCE

Full-Stack Developer / AI Engineer (Freelance) — Remote 2024 – Present

- Architected secure workflows with Role-Based Access Control (RBAC) for sensitive medical data, ensuring full traceability aligned with HIPAA-compliant design patterns.
- Developed high-performance RESTful APIs to transform complex JSON clinical payloads into structured data for clinical decision support systems.
- Applied AI-assisted development to accelerate engineering velocity — generating complex business logic and validation schemas while maintaining full code ownership and understanding.

Medical Intern, Clinical Safety & Operations — Hospital Aranda de la Parra 2022 – 2023

- Managed patient care and clinical documentation in a high-pressure environment, gaining deep insight into clinician workflow pain points and operational frictions.
- Collaborated with multidisciplinary teams to ensure patient safety protocols and data accuracy, directly informing a code-first approach to medical software architecture.

PROJECTS

MediDash — Full-Stack Clinical Dashboard

[Live Demo](#) | [GitHub \(Frontend\)](#) | [GitHub \(Backend\)](#)

Next.js 16 · TypeScript · React 19 · TailwindCSS v4 · TanStack Query · FastAPI · SQLAlchemy · Alembic · PostgreSQL · JWT

- Built a production-deployed clinical dashboard enforcing RBAC down to individual form fields — doctors manage full patient data and consultations; nurses are limited to vitals only.
- Designed a full consultation system with versioned diagnoses, treatments, and prescriptions — every edit creates an immutable new version (original_id, superseded_at, superseded_by_id) with dedicated history endpoints.
- Engineered a pairwise drug interaction checker with symmetric deduplication across a seeded catalog, returning severity-graded clinical alerts to flag dangerous drug combinations.
- Implemented WHO surgical safety checklists with 10 pre-populated steps per patient, item-level completion tracking with timestamps, and per-user attribution on every action.
- Two-layer validation: Pydantic v2 field constraints + SQLAlchemy CheckConstraints enforce clinical data ranges (age 0–120, weight 0–500 kg, GCS 3–15) at both API and database levels.
- Frontend: React Hook Form + Zod, TanStack Query v5 server state, Axios 401 interceptor, and a Next.js middleware route guard (proxy.ts) — deployed on Vercel + Render.

EDUCATION

Doctor of Medicine (MD) — Universidad Autónoma de Guadalajara 2023

Full-Stack Web Development (React, Next.js, Node.js) — Udemy 2025

100 Days of Code: Python Pro Bootcamp — Udemy 2025