

# WellnessGrid

## Overview

**Summary:** **WellnessGrid** is an AI-powered health coach designed to help teens manage chronic conditions with confidence and independence. It combines daily symptom tracking, medication reminders, and personalized protocol guidance into a friendly chat interface. Built with safety in mind, it detects risky patterns and shares smart reports with caregivers or clinicians. While especially tailored for teens, Vitalfinity adapts to support anyone managing long-term health conditions.

### Key Features:

- **Pediatric Compatability:** Designed to be used by kids, although usable by all. Follows guidelines.
- **Doctor/Patient Configurable Protocols:** Families and clinicians can tailor guidance based on known treatments and research-backed standards.
- **LLM Chat:** Provides safe, age-appropriate, and customizable health support.
  - Medical LLM
    - MedGemma
    - ...
  - Access to:
    - Information
      - Preset information (for each disease)
      - Doctor configuration
      - Protocols / guidelines - heavily weighed
    - Tool action recommendations
    - Medical Data - Compatible with patient notes, EHR, or genetics if available—used to personalize insights.
- **Tracking/Reporting/Logging**

- **Daily Reports & Logs:** Tracks symptoms, medications, mood, nutrition, and more—auto-generates weekly and monthly summaries for parents or doctors.
  - **Smart Escalation Engine:** Detects risky patterns and alerts parents or clinicians when action is needed.
  - **Customizable Tools:** Smart medication reminders, glucose tracking, and disease-specific tools driven by patient protocols and AI suggestions.
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# Implementation

## MVP

**Goal:** Launch a focused, testable LLM-powered AI health coach MVP that provides personalized guidance, basic logging, and medically-informed responses for 1–2 chronic conditions (e.g. asthma, Type 1 diabetes).

Component	Description	Tools/Stack
LLM Chat Interface	A basic AI chat coach trained or prompted to support chronic disease management. Give access to information	LLM: potentially use MedGemma or other options like Meditron. RAG with GPT-4.
Preset Medical Knowledge	Curated static content (protocols, FAQs, summaries, research information, etc.) per condition. Start with around 5 conditions.	Disease-specific markdowns, PDFs, JSONs, etc. stored in database (Supabase) or locally.

## LLM Capabilities

- Answer condition-specific questions (pulled from a verified knowledge base)
- Provide **encouraging, age-appropriate** responses (using tone control or fine-tuning)
- Provide first-line symptom advice (e.g. “Mild headache — let’s monitor it today.”)

## Tech Stack

Component	Tool	Notes
Frontend	Next.js 15 TypeScript Tailwind CSS Radix UI Shadcn/ui Recharts	React framework w/ App Router Type-safe development Utility-first styling Accessible component primitive Modern UI component library Data visualization
Backend & Database	Supabase Row Level Security (RLS) Supabase Auth	PostgreSQL database with real-time capabilities User data isolation User authentication and management
Dev Tools	pnpm ESLint Prettier	package manager code linting code formatting
AI Integration	Flask + Ngrok (Colab)	Running models (BioGPT, BioBERT)

## Phase 2

### AI Layer

#### Chat + Reasoning

Handles all convo, user queries, summaries, task planning, analytics, etc.

Component	Role	Tech
General LLM	Natural chat, task routing, personalization	Gemini API + OpenRouter Fallback
Message Router	Decide what model / tools to trigger	Custom logic or LLM function-calling

#### Medical Intelligence

Processes medically relevant queries safely.

Component	Role	Tech
Medical LLM	Domain expertise in medicine	BioGPT, Med42, etc. Colab, HF API, or other.

MedBERT	Entity extraction, symptom/disease mapping	Hugging Face model (e.g., ClinicalBERT or MedBERT)
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## RAG (Retrieval-Augmented Generation)

Pull info from curated health documents to reduce hallucination.

Component	Role
Vector DB	Chroma or Qdrant
Embeddings	PubMedBERT
Framework	LangChain
LLM (Medical)	BioGPT, Med42, etc.
LLM (General)	Gemini API or OpenRouter
Hosting (temp)	Colab
Deployment Later	CloudRun / Vercel

## Tool/Tracking Layer

Tracks health inputs, connects to the database, and feeds structured data into the AI.

**Database:** Supabase

**Insights:**

- Use cron jobs or Supabase Edge Functions to trigger insight generation
- Each time period:
  - Fetch all logs from that period
  - Organize data by type
  - Convert to structured prompt
- Pass logs into the LLM with a template
- Save to Supabase and display.
- Optional: fine-tune over time, scoring models; auto-triggers / smart notifications.

## Data Store & Backend

<b>Component</b>	<b>Purpose</b>	<b>Tool</b>
Supabase (PostgreSQL)	Structured data: users, logs, tools	In place
Vector Store (RAG)	Store docs like CDC, Mayo, etc.	Supabase pgvector
Edge Functions	Logic, API endpoints	Supabase Edge Functions

## Frontend (Already Built)

- Next.Js 15