

Decoding Medical Notes with Little Help from Python

AI buddy for simplifying clinical notes.

About me:

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The Problem: Medical Notes Are a Mess

Medical Notes:

HPI: Pt with abdominal pain and N/V
x 2 days

Exam: Afebrile, BP 135/82, HR 78
Distended, absent BS, + diffuse
tenderness

Labs: WBC 15.4, HCO₃ 18, Cr 1.6
Lipase 350

Imaging: CT: pneumoperitoneum, dilated
loops of bowel

Assessment: Small bowel obstruction
secondary to adhesions

Plan: - NPO, NG tube to LWS
- IVF, analgesia
- General surgery consult

Source: ChatGPT

- Doctors are overwhelmed - limited time to explain complex reports
- Patients often receive dense, jargon-filled documentation
- Caregivers struggle to understand or summarize critical info
- Misinterpretation can lead to anxiety, delays, or wrong decisions

Pythonic Attempt to Simplify This

Turning Confusing Medical Notes into Clear Conversations

Patients complain of chest tightness and shortness of breath. Vital signs show elevated BP (140/90) and HR of 98 bpm. ECG reveals sinus tachycardia.
Recommendation: Begin beta-blockers and schedule follow-up in 1 week.

Simplified Summary ↔

Here's a summary of the clinical note in simple terms:

The patient is experiencing chest tightness and difficulty breathing. Their blood pressure is higher than normal (140/90), and their heart is beating faster than usual (98 beats per minute). A heart test called an ECG shows that the heart is beating quickly in a regular pattern, which is known as sinus tachycardia.

What the patient should know:

- These symptoms and test results suggest that the heart is working harder than it should be.
- It's important to start treatment to help manage these symptoms and prevent any further issues.

Treatment and precautions:

- The doctor recommends starting a medication called a beta-blocker, which helps to slow down the heart rate and reduce blood pressure.
- The patient should schedule a follow-up appointment in one week to check how well the treatment is working and to make any necessary adjustments.

Wait... Isn't This Just ChatGPT?

- 🧠 “Sure, you could ask ChatGPT to summarize your medical notes...”
...but you also could text your lab results to a group chat. Please don't.
- 🛑 Privacy Matters:
 - ChatGPT? You're sending your health data to the cloud.
- 🔒 AWS Bedrock = Private & Compliant:
 - Your input is not stored or used for model training
 - IAM roles control access
 - Fully deployable in secure, private environments

Lol

3. “Privacy and Control: ChatGPT can’t give you that.”





 Say this:

“When you paste your medical data into a public AI app, who owns that data? Where does it go? Med-BhAI solves that by using AWS Bedrock — your prompts aren’t used to train models. Your data stays yours.”







This is *key* for the healthcare domain:

- Bedrock = **No training** on your input
- Secure access via IAM roles
- Deployable inside private environments







What Does Med-BhAI Really Do?

-  Input: Raw medical notes with technical jargon and fragmented sentences
-  Processed by: Bedrock-powered LLM (Claude/Nova) via tailored prompts
-  Output: Clear, simple summary - understandable by any family member
-  Bonus: Can adapt tone for different users (e.g., elderly, caregivers)

What's Under the Hood?

-  Backend: Python-based API calls to Amazon Bedrock (Claude & Nova models)
-  Prompt Engineering: Tuned for accuracy, empathy, and medical caution
-  Streamlit Frontend: Interactive UI for input/output without needing code
-  Security Considerations: No PHI stored - input only, inference-only design
-  AWS Integration: IAM roles + Bedrock runtime = scalable and secure
-  No fine-tuning, no pretraining - just smart prompt + smart platform

What I Learned (and Struggled With)

-  Learned how to engineer prompts that sound human but stay medically accurate.
-  Realized the importance of not storing sensitive health info - inference-only design.
-  Understood how to balance creativity with real-world safety constraints
-  Spent hours debugging IAM role permissions and Bedrock invocation errors.
-  Faced WebSocket + CORS issues when deploying with ECS Fargate & Streamlit.
-  Encountered traffic routing issue on AWS – WebApp not accessible to public






💡 Biggest win? Watching a confusing report turn into something my non-tech mom could understand

The Impact & What's Next

- Tools like Med-BhAI can bring clarity, dignity, and empowerment to care
- We're building an email-based delivery system — summaries go straight to your inbox, not our servers
- I'm continuing to improve Med-BhAI with features like speech input and summarization tuning
- 🙏 Huge thanks to Maciej Zukowski, whose guidance helped shape this into more than just an idea



Let's Stay Connected

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-  Whether it's feedback, feature ideas, or collaboration - I'd love to hear from you!

