

Paytient – AI Powered Software for Healthcare Professionals and Families

Paytient is a comprehensive, full-stack solution designed to streamline clinical documentation for doctors, nurses, and patients. This repository contains:

- A **React** frontend for user interactions (chatbot and summarizer UI).
- An **Express** backend that interfaces with OpenRouter's Deepseek V3 API to generate chatbot responses and produce medical reports.
- A **Python** script for audio transcription using Deepgram's API.

By automating time-consuming documentation tasks, Paytient empowers healthcare professionals to spend more time providing quality patient care.

AI-Powered Multimodal Processing



Project Structure

```
chAmpIon_NUS_GURU/  
├── chatbot_and_summarizer/  
│   ├── frontend/      # React frontend  
│   └── backend/        # Express backend  
├── transcribe.py       # Deepgram transcription script  
├── record_audio.py     # Audio recording script  
├── .env                # Environment variables  
└── README.md
```

Installation & Setup

Prerequisites

- **Node.js** (with npm)
- **Python 3.x**
- **Deepgram API Key** (for audio transcription)
- **OpenRouter API Key** (for chatbot functionality)

1. Backend Folder Setup

```
bash  
Copy  
cd chatbot_and_summarizer/backend  
npm install  
npm start
```

2. Frontend Folder Setup

```
bash  
Copy  
cd chatbot_and_summarizer/frontend  
npm install  
npm start
```

The frontend will typically run on <http://localhost:3000>.

3. Python Transcription Scripts

Install the required Python packages:

bash

Copy

```
pip install deepgram-sdk pyaudio wave python-dotenv
```

Record Audio

bash

Copy

```
python record_audio.py
```

This script records an audio file locally using your system's microphone.

Transcribe Audio

bash

Copy

```
python transcribe.py
```

This script uploads the recorded audio to Deepgram for transcription and saves the text output locally.

Dependencies

Backend

- **express**
- **cors**
- **multer**
- **fs**
- **node-fetch**
- **dotenv**

Frontend

- **react**
- **react-router-dom**
- **react-markdown**

Python Scripts

- `deepgram-sdk`
 - `pyaudio`
 - `wave`
 - `python-dotenv`
-

Sample Output

Below are example screenshots showcasing the raw output from our backend and frontend interfaces. These images illustrate:

- **Transcription Results** – Text produced by our Deepgram API, play videoplayback file for audio:

“Speaker 0: Perfect. Great. Okay. Excellent. So how can I help you today?

Speaker 1: Well, I've had a cough for a few days. It's just driving me nuts, really.

Speaker 0: Right. How long has the cough been there for?

Speaker 1: I suppose about three or four days now.

Speaker 0: Has it? Mhmm. And have you got any other symptoms with that cough?

Speaker 1: I've got quite a sore throat. That's that's quite bad as well.

Speaker 0: Right. And sore throat, has it been there the same amount of time?

Speaker 1: Yes. Yeah. They're both pretty much the same time.

...

“

- **Medical Summarizer** – Format documents and EHR output generated from transcripts:
 - In creating the standard format to prompt Deepseek AI, we referenced current industry practices on the important information displayed in National Electronic Health Record and through communication with practising medical professionals.

[Chatbot](#) | [Summary](#)

Medical Summarizer

Choose File

No file chosen

Summarize

Summary:

Medical Report
Patient Name: Paul Collins
Date of Consultation: [Insert Date]
Clinician: Gemma Hurley, Nurse Practitioner

Presenting Complaint:

Paul Collins, a 46-year-old male, presented with a cough and sore throat for the past 3-4 days.

History of Presenting Complaint:

- **Cough:** Present for 3-4 days, described as "meaty," productive of green phlegm in moderate amounts. No blood noted. Severity rated 6-7/10, worse in the morning.
- **Sore Throat:** Present for the same duration, constant, and exacerbated by coughing. Relief noted with warm drinks.
- **Associated symptoms:** Initial shakiness on the first day of illness, but no fever, breathlessness, chest tightness, or weight loss reported.
- **No recent travel abroad.**
- **Exacerbating/Relieving Factors:** Cough persists despite over-the-counter cough medicine (Benylin). Sore throat partially relieved by paracetamol and warm drinks.

Past Medical History:

- Type 2 Diabetes Mellitus (diagnosed 3 years ago, managed with metformin and gliclazide).
- Hypertension (diagnosed 2 years ago, managed with ramipril 5 mg daily).
- Previous surgery: Pilonidal cyst excision ~20 years ago, no complications.

Medications:

- Ramipril 5 mg daily (no current side effects, previously caused a cough which has resolved).
- Metformin (dosage unknown, taken three times daily).
- Gliclazide (dosage unknown).
- Occasional paracetamol for headaches or sore throat.

Allergies:

- Suspected allergy to cats (environmental). No known drug or food allergies.

Family History:

- Father: Deceased at age 72 due to stroke.
- No family history of cancer, tuberculosis, or rheumatic fever.

Social History:

- **Occupation:** Builder, currently working on a standard new build with no recent exposure to dust or new substances.
- **Lives with his girlfriend** in a two-bedroom house. Relationship described as happy and stress-free.
- **Smoking:** Smokes low-tar cigarettes, approximately 2 packs every 3 days. Started smoking at age 30. Not currently considering cessation.
- **Alcohol:** Drinks wine, approximately 2 glasses per week.
- **Diet:** Healthy, with homegrown vegetables.
- **Exercise:** Physically active during work but no structured exercise routine.

Review of Systems:

- **Head:** Occasional headaches (~once monthly), managed with over-the-counter painkillers. No head injuries.
- **Eyes:** No visual problems, does not wear glasses.
- **Ears/Nose/Throat:** Nasal congestion triggered by cats. No sinus problems, change in taste, or recurrent sore throats.
- **Respiratory:** No history of asthma or chronic respiratory issues.
- **Cardiovascular:** No chest pain, palpitations, or history of heart disease.
- **Gastrointestinal:** Bowels and urinary habits normal.
- **Musculoskeletal:** Occasional aches and pains related to work, no significant joint problems.
- **Neurological:** No history of stroke, numbness, or weakness.
- **Psychiatric:** Feels "fed up" due to the cough but denies low mood or sleep disturbances.

Summary:

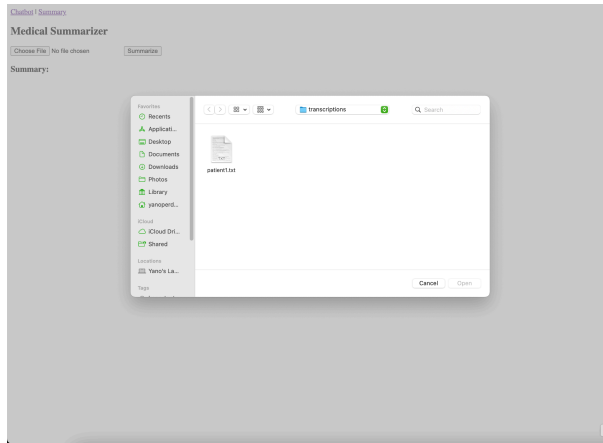
Paul Collins is a 46-year-old male with a 3-4 day history of a productive cough and sore throat. He has a background of well-controlled type 2 diabetes and hypertension. He is a smoker with no recent travel or exposure to new substances. No red flag symptoms such as fever, breathlessness, or weight loss were reported.

Plan:

1. **Physical Examination:** To assess throat, chest, and vital signs.
2. **Investigations:** Consider throat swab, sputum analysis, and chest auscultation.
3. **Management:**
 - Symptomatic relief for cough and sore throat.
 - Reassess need for antibiotics based on examination findings.
 - Smoking cessation counseling offered.
4. **Follow-Up:** Review in 1 week if symptoms persist or worsen.

Clinician's Signature:
Gemma Hurley, Nurse Practitioner
Date: [Insert Date]

- **Chatbot Interaction** – Demonstrates how users can query the system for medical information.



[Chatbot | Summary.](#)

Medical Chatbot

Type your question...

Send

Conversation:

You:

What is a normal blood pressure range?

Bot:

A normal blood pressure range for adults is typically defined as a systolic pressure (the top number) of less than 120 mmHg and a diastolic pressure (the bottom number) of less than 80 mmHg. This is often expressed as **<120/80 mmHg**.

Here's a breakdown of blood pressure categories according to the American Heart Association (AHA):

- **Normal:** Systolic <120 mmHg **and** Diastolic <80 mmHg
- **Elevated:** Systolic 120–129 mmHg **and** Diastolic <80 mmHg
- **Hypertension (Stage 1):** Systolic 130–139 mmHg **or** Diastolic 80–89 mmHg
- **Hypertension (Stage 2):** Systolic ≥140 mmHg **or** Diastolic ≥90 mmHg
- **Hypertensive Crisis:** Systolic >180 mmHg **and/or** Diastolic >120 mmHg (requires immediate medical attention)

It's important to note that blood pressure can vary based on factors such as age, activity level, stress, and underlying health conditions. Regular monitoring and consultation with a healthcare provider are recommended to maintain optimal cardiovascular health.

[Chatbot](#) | [Summary](#)

Medical Chatbot

Type your question...

Send

Conversation:

You:

What are good sources of iron for anemia?

Bot:

Good dietary sources of iron for managing anemia can be categorized into **heme iron** (found in animal products) and **non-heme iron** (found in plant-based foods). Heme iron is more easily absorbed by the body compared to non-heme iron. Here are some excellent sources:

Heme Iron (from Animal Products):

1. **Red Meat:** Beef, lamb, and liver.
2. **Poultry:** Chicken, turkey, and duck (especially dark meat).
3. **Seafood:** Oysters, clams, mussels, sardines, and shrimp.
4. **Fish:** Salmon, tuna, and halibut.
5. **Organ Meats:** Liver, kidney, and heart (high in iron but should be consumed in moderation due to high cholesterol).

Non-Heme Iron (from Plant-Based Foods):

1. **Legumes:** Lentils, chickpeas, kidney beans, black beans, and soybeans.
2. **Whole Grains:** Fortified cereals, quinoa, oats, and brown rice.
3. **Nuts and Seeds:** Pumpkin seeds, sesame seeds, sunflower seeds, and cashews.
4. **Leafy Greens:** Spinach, kale, Swiss chard, and collard greens.
5. **Dried Fruits:** Raisins, apricots, and prunes.
6. **Tofu and Tempeh:** Soy-based products rich in iron.

Tips to Enhance Iron Absorption:

- **Pair with Vitamin C:** Consume iron-rich foods with vitamin C-rich foods (e.g., oranges, strawberries, bell peppers, or broccoli) to improve absorption.
- **Avoid Inhibitors:** Limit foods and beverages that inhibit iron absorption, such as coffee, tea, and calcium-rich foods, during iron-rich meals.
- **Cook in Cast Iron:** Cooking acidic foods (like tomato sauce) in cast iron pots can increase iron content.

If dietary changes are insufficient, consult a healthcare provider, as iron supplements or further evaluation may be necessary.

You:

What should I do if my blood sugar is too high?

Bot:

If your blood sugar is too high, it's important to take immediate steps to manage it and prevent complications. Here's what you should do:

1. **Check Your Blood Sugar:**
Confirm your blood glucose levels using a glucometer. A fasting blood sugar level above 126 mg/dL or a random reading above 200 mg/dL may indicate hyperglycemia.
2. **Hydrate:**
Drink plenty of water to help flush out excess glucose through urine and prevent dehydration, which can worsen hyperglycemia.
3. **Administer Insulin (if prescribed):**
If you use insulin, follow your healthcare provider's instructions for correcting high blood sugar. This may involve taking a correction dose of rapid-acting insulin.
4. **Monitor Ketones (if applicable):**
If you have type 1 diabetes or suspect diabetic ketoacidosis (DKA), check for ketones using a urine or blood ketone test. If ketones are present, seek medical attention immediately.
5. **Avoid High-Carbohydrate Foods:**
Temporarily avoid sugary or starchy foods that can further elevate blood sugar levels. Focus on low-carb, non-starchy vegetables, lean proteins, and healthy fats.
6. **Engage in Light Physical Activity:**
Gentle exercise, such as walking, can help lower blood sugar levels. Avoid intense activity if ketones are present, as it may worsen the condition.
7. **Monitor Symptoms:**
Watch for signs of complications, such as excessive thirst, frequent urination, fatigue, blurred vision, or confusion. If symptoms persist or worsen, seek medical help.
8. **Contact Your Healthcare Provider:**
If your blood sugar remains high despite interventions, or if you're unsure how to proceed, consult your healthcare provider for guidance.
9. **Seek Emergency Care if Necessary:**
If you experience severe symptoms like excessive vomiting, difficulty breathing, or altered consciousness, seek emergency medical attention immediately.

Preventing high blood sugar involves consistent monitoring, adhering to your diabetes management plan, and maintaining a balanced diet and healthy lifestyle. Always follow your healthcare provider's recommendations for managing your condition.

Troubleshooting

- **Frontend Not Starting?**

Make sure **vite** is installed or reinstall dependencies using **npm install**. Check for

any port conflicts.

- **Backend API Errors?**

Confirm your `OPENROUTER_API_KEY` is correctly set in the `.env` file. Verify that the backend server is running without port conflicts.

- **Python Script Issues?**

Ensure that `pyaudio` is correctly installed. If installation fails on certain systems, you may need additional OS-specific dependencies (e.g., `portaudio`).