# **Healthcare Analysis Project**

## **Introduction**

This project analyzes healthcare data to uncover trends and insights regarding patient demographics, visit frequencies, and health metrics. By using SQL, the project demonstrates skills in joins, window functions, common table expressions (CTEs), and aggregations. The primary goal is to provide actionable insights that support resource planning, chronic care management, and preventive healthcare strategies.

## **Key Insights**

1. **Patient Details with Their Visits**:
   * Combined patient details and visit records:
     + Example: Patient 1 (John Smith) has had 5 visits.
     + Common diagnoses include hypertension and cold.
   * **What It Means**:
     + Provides a complete view of patient visits, useful for tracking healthcare engagement and identifying frequent visitors.
2. **Patient Summary Report (Visits and Health Metrics Combined)**:
   * Combined patient demographics, visit details, and health metrics:
     + **Total Visits**: Range from 1 to 13 visits per patient.
     + **Average Visit Duration**: Varies from 1 to 12 days.
     + **BMI**: Ranges from 18.9 (underweight) to 34.7 (obese).
     + **Blood Pressure**: Elevated readings (140+/90+) are common.
   * **What It Means**:
     + High-frequency visitors and longer durations highlight the need for chronic care management.
     + Elevated BMI and blood pressure levels necessitate preventive health programs.
3. **Patients with More Than 3 Visits**:
   * Filtered patients with more than 3 visits:
     + Example: Patient 30 (Kevin Riggs) had 6 visits.
   * **What It Means**:
     + Highlights frequent visitors who may need specialized attention or chronic care plans.
4. **Patients by the Number of Visits**:
   * Counted and ranked patients by their total visits:
     + Patient 21 had the highest number of visits (13).
     + Most patients had between 1-5 visits.
   * **What It Means**:
     + Identifies high-utilization patients for chronic care management.
5. **Most Recent Checkups**:
   * Retrieved the 10 most recent patient checkups, all from 2024.
     + Example: Patient 50 (Jill Bryant) had their last checkup on December 12, 2024.
   * **What It Means**:
     + Indicates active healthcare monitoring and highlights patients who may require reminders for follow-ups.
6. **Average Visit Duration by Diagnosis**:
   * Diagnoses and their average visit durations:
     + **Injury**: 7 days (longest).
     + **Hypertension**: 5 days.
     + **Cold**: 2 days (shortest).
   * **What It Means**:
     + Longer durations for injuries highlight the need for efficient resource allocation for critical conditions.
7. **Average BMI and Blood Pressure by Age Group**:
   * Grouped patients by age:
     + **18-30**: Avg. BMI = 25.15, Avg. BP = 120/80.
     + **31-50**: Avg. BMI = 26.95, Avg. BP = 130/85.
     + **51+**: Avg. BMI = 26.72, Avg. BP = 135/90.
   * **What It Means**:
     + Older patients (51+) have higher BMI and blood pressure levels, necessitating focused health programs.
8. **BMI Category Analysis**:
   * Categorized patients by BMI:
     + **Underweight**: 5 patients.
     + **Normal Weight**: 83 patients.
     + **Overweight**: 62 patients.
     + **Obese**: 55 patients.
   * **What It Means**:
     + Identifies groups at risk of chronic health conditions and supports targeted wellness programs.
9. **Running Averages for BMI**:
   * Calculated running averages for BMI over time:
     + Stabilizes between **26 and 28**.
   * **What It Means**:
     + Highlights consistent BMI trends, though high averages suggest a prevalence of overweight or obese patients.
10. **Patient Demographics with Health Metrics**:
    * Combined patient demographics with health metrics:
      + BMI and blood pressure levels are documented alongside patient information.
      + Example: Patient 5 (Lauren Jones) has a BMI of 24.5 and a blood pressure of 120/80.
    * **What It Means**:
      + Enables holistic understanding of patient health, supporting targeted healthcare interventions.

## **Conclusion**

This project demonstrates the application of advanced SQL skills to analyze patient data and derive actionable insights. Key findings highlight the need for chronic care management, preventive health programs, and efficient resource allocation. The analysis underscores the value of data-driven decision-making in optimizing healthcare outcomes and enhancing patient care. This project serves as a testament to SQL proficiency and its potential to drive impactful results in healthcare analytics.