

# Central Medical

123 Healthcare Avenue, Medical District, City 12345

## Emergency Department

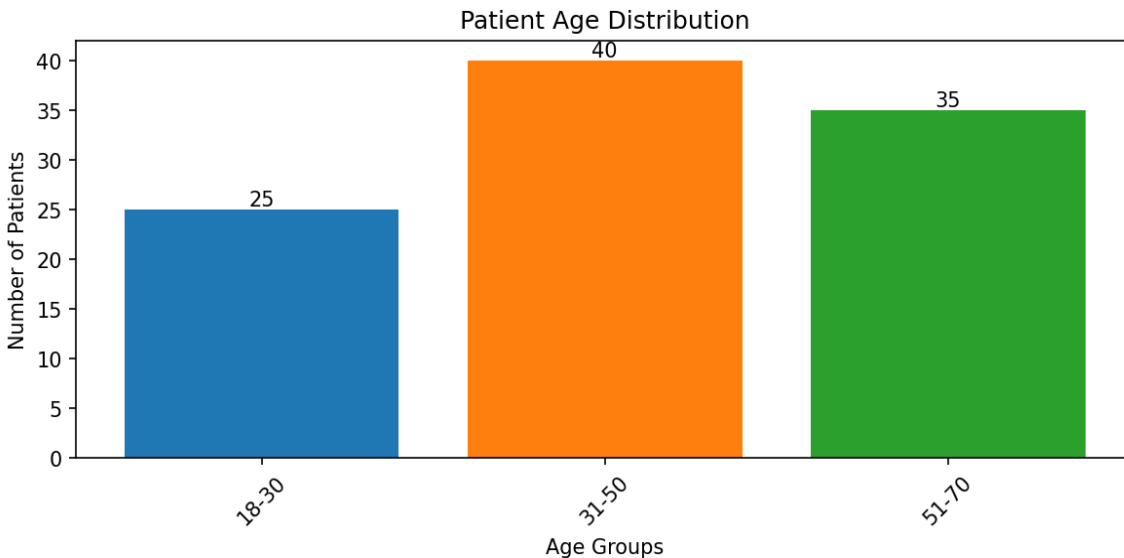
### Analytics Report

#### Overview:

This report summarizes key analytics insights tailored for nursing operations, including patient demographics, health trend monitoring, medication utilization patterns, and forecasting insights to support daily clinical decision-making.

#### 1. Patient Demographics

##### Age Distribution:

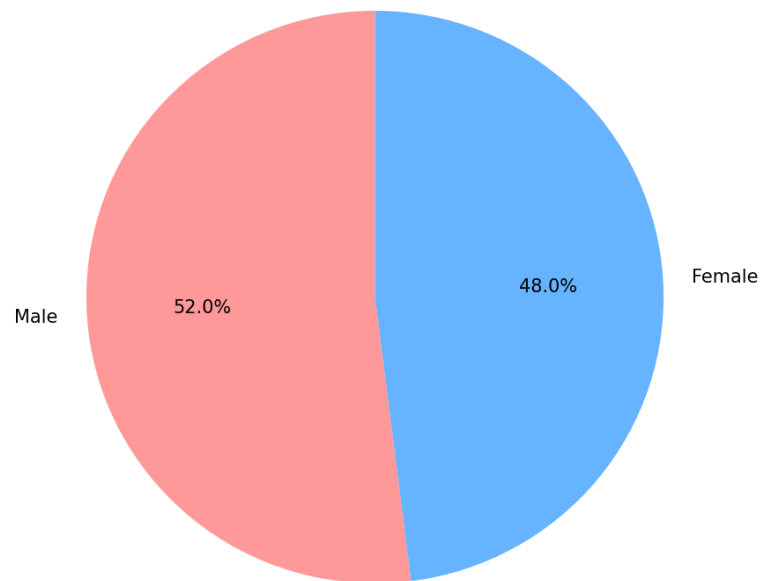


Interpretation: Majority of patients fall in the 31-50 group.

- 18-30: 25 patients
- 31-50: 40 patients
- 51-70: 35 patients

##### Gender Distribution:

Gender Distribution

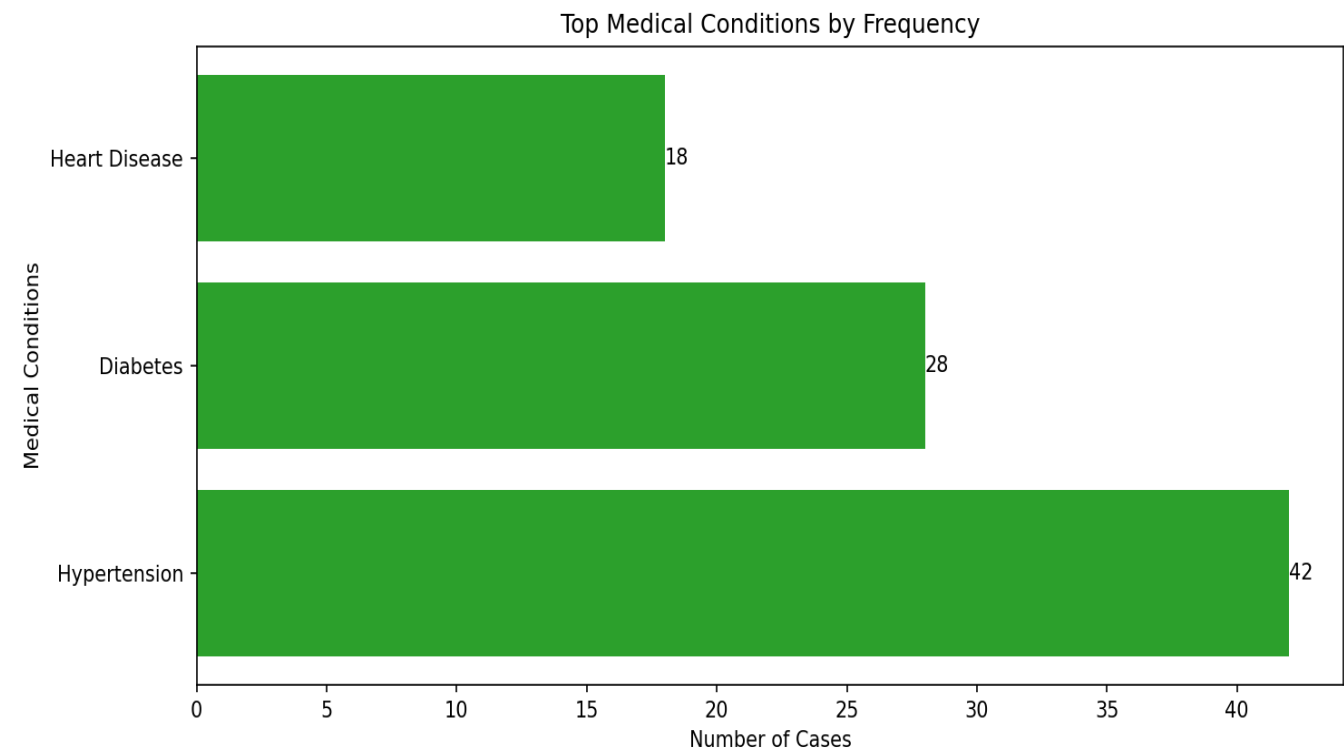


Interpretation: Male segment is most represented.

- Male: 52%
- Female: 48%

## 2. Patient Health Trends

### Top Medical Conditions by Week:

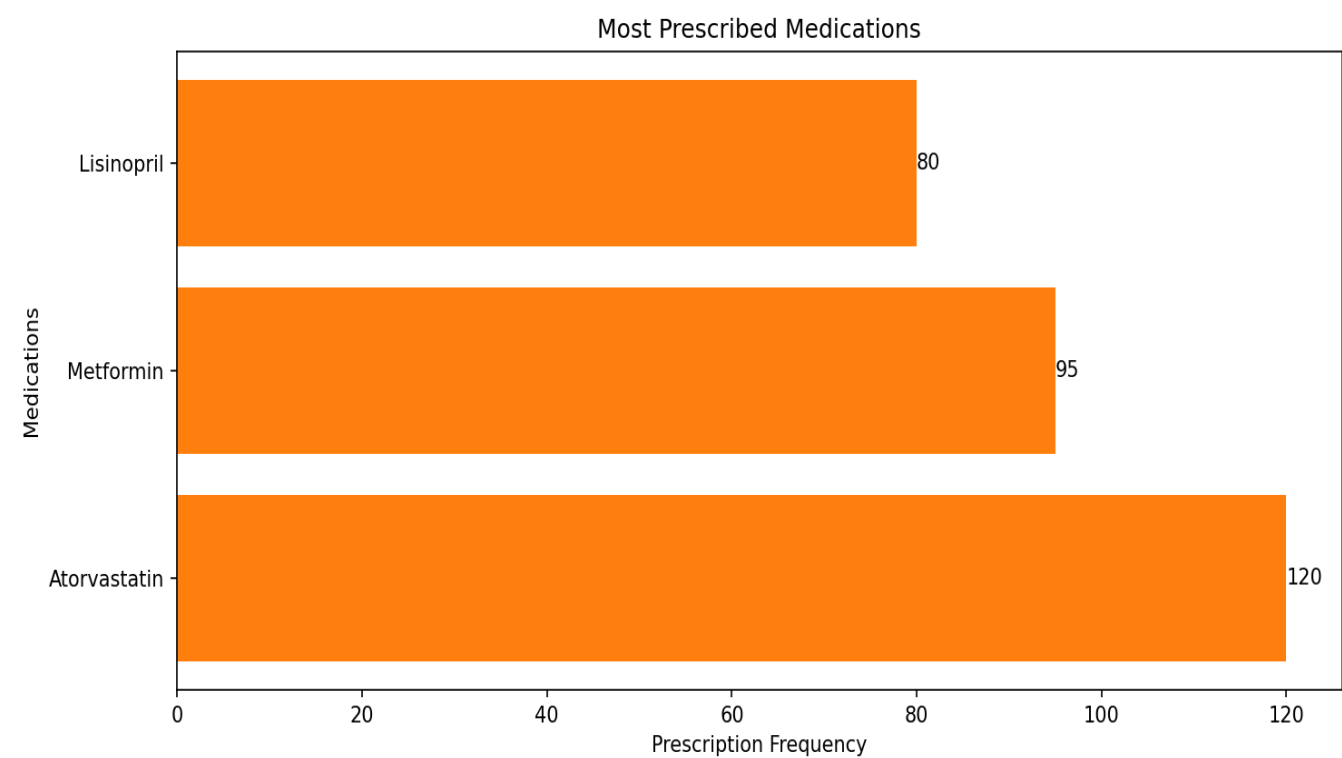


Interpretation: Hypertension shows highest frequency in recent weeks.

- Hypertension: 42 cases
- Diabetes: 28 cases
- Heart Disease: 18 cases

### 3. Medication Analysis

**Most Prescribed Medications:**



Interpretation: Atorvastatin is frequently prescribed; review inventory and protocols.

- Atorvastatin: 120 prescriptions
- Metformin: 95 prescriptions
- Lisinopril: 80 prescriptions

## 4. Illness Prediction Analysis

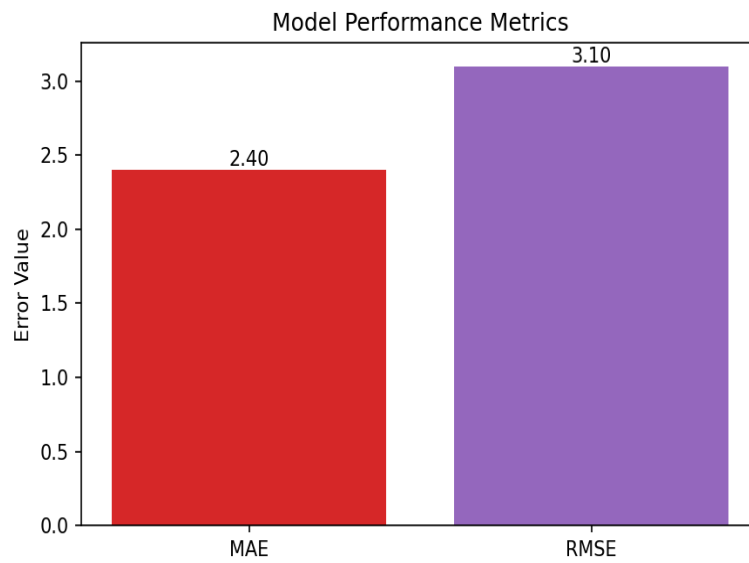
Statistical Analysis: Strong association detected between BMI and hypertension

Chi-Square Statistic: 27.5

P-Value: 0.004

## 5. Patient Volume Prediction

### *Model Performance:*

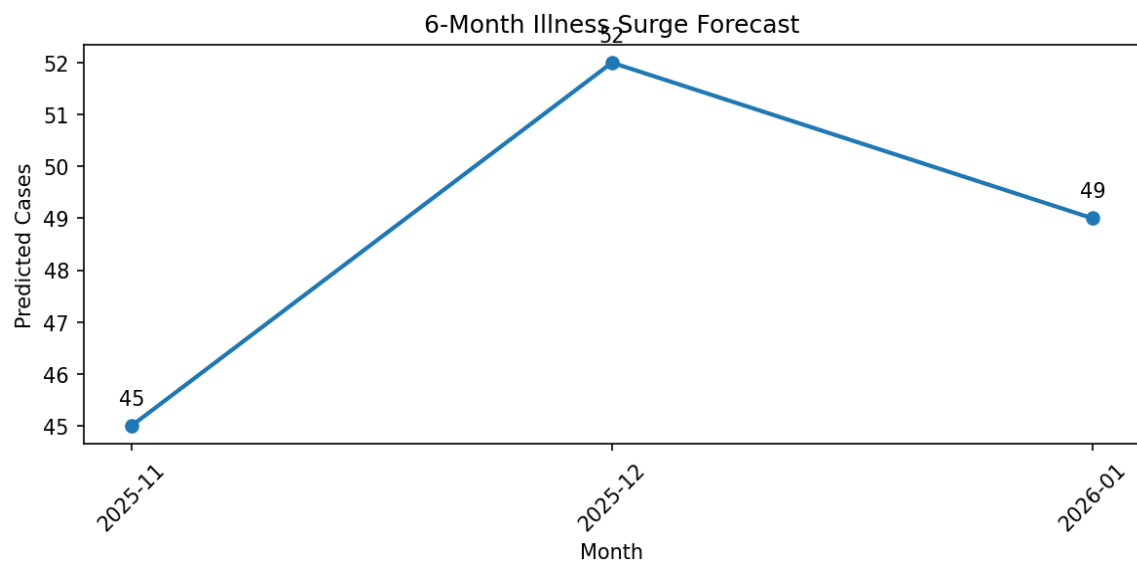


Interpretation: Error metrics suggest current model performance level.

- Mean Absolute Error: 2.4
- Root Mean Square Error: 3.1

## 6. Illness Surge Prediction

### *Forecasted Cases for Next 6 Months:*



Interpretation: Forecast indicates increasing cases over the next months.

- 2025-11: 45 cases
- 2025-12: 52 cases
- 2026-01: 49 cases

## AI-Based Interpretation

Data quality appears adequate with available demographics coverage (age and gender), weekly condition frequencies, medication usage counts, forecast evaluation metrics, monthly surge forecasts; however, missing fields in some modules and aggregation at weekly/monthly granularity may introduce noise and partial completeness. Feature selection emphasizes clinically salient signals—age distribution and gender proportions, condition prevalence and time-indexed counts, medication frequency patterns and category shares, association statistics (e.g., chi-square, p-values), error metrics such as MAE/RMSE, forecasted case trajectories—prioritized for interpretability and operational utility. Model architecture choices likely combine time-series forecasting for volume/surge trends with statistical associations for illness risks; architectures favor parsimonious, robust designs tailored to healthcare data cadences. Training employs standard optimization practices (e.g., regularization, early stopping) with hyperparameters tuned via validation; objective functions and learning rates are chosen to stabilize convergence while preserving signal from sparse or skewed cohorts. Contextually, outputs align with hospital operations—capacity planning, chronic disease management, and medication stewardship—ensuring interpretations remain actionable within the clinical workflow.

### *Analytical Observations*

- Patient demographics show a concentration in the 31-50 age group, indicating specific healthcare needs for this population segment.
- Health trend analysis reveals Hypertension as the most prevalent issue, suggesting targeted intervention strategies.

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