**Hospital Data Analysis: Case Study**

**Overview**

This case study analyzes hospital data from **January 2023 to December 2024**, focusing on **patient admissions, treatment costs, satisfaction levels, and readmission rates**. The goal is to identify key trends, inefficiencies, and actionable insights to improve hospital operations and patient care.

**Key Insights**

**1️. Patient Flow and Hospital Efficiency**

* **Peak Admission Periods:** Highest admissions occurred in **[December, January and February/Winter]**, indicating seasonal trends
* **Average Length of Stay:** **7.62 days**, with **Neurology** having the longest LOS of **8.08 days** indicating inefficiency or severe caseand **Cardiology** having the shortest LOS of **6.97 days** indicating efficiency
* **Department Performance:**
  + **Pediatrics** has the highest admissions.
  + **Neurology** has the highest treatment costs per patient.
* **Readmission:**
* **Department:**
  + **16 patients out of 49 were readmitted into Pediatrics department leading as the department with highest readmitted patients.**
  + **8 patients out of 35 were readmitted into Cardiology department leading as the department with lowest readmitted patients.**
* **Diagnosis:**
  + **14 Patients with stroke out of 39 were readmitted leading as the highest readmitted patients with Stroke**
  + **14 Patients with Diabetes out of 51 were readmitted leading as the second highest readmitted patients.**
  + **11 patients with Fracture out of 33 were readmitted leading as the lowest readmitted patients**

Theaboveindicates possible **incomplete recovery** or **inadequate post-discharge care**.

**2️. Financial Insights**

* **Treatment Cost Trends:**
  + The **average treatment cost** per patient is **$8,945**
  + **Neurology** has the highest treatment cost at **$9,850**, likely due to advanced procedures, critical care.
  + **Cardiology** has the lowest treatment cost at **$8,059.**
  + **Heart Disease** has the highest treatment cost at **$10,498.**
  + **Treatment cost** tendsto **increases** as **Length of stays increases.**
* **Insurance Coverage Impact:**
  + **54 patients had low insurance coverage (<51%)**, leading to high out-of-pocket expenses.
  + Patients with **low insurance coverage (<51%)** had a **lower satisfaction rate** at 6.8 average
  + Patients with **higher insurance coverage (>80%)** had a **higher satisfaction rate** at 8.4 average
* **Revenue:** The department that generated the most revenue is **Pediatric Department with $452,197.**

**3️. Recovery Trends**

* **Fast vs. Slow Recovery:**
  + Patients with **LOS <= 3 days** had a **low readmission rate (7%)**, meaning **effective treatment**.
  + Patients with **LOS > 7 days** had a **high readmission rate (13%)**, signaling **potential complications**.

**4️. Patient Satisfaction**

* **Satisfaction Score:**
  + The overall patient satisfaction score averaged **7.60/10**.
* **Top factors affecting satisfaction:**
  + Data showed as **Treatment cost increases, satisfaction score reduces signaling patients are not satisfied with the high cost,**
  + Also data showed the more patient the **length of stay increases** the more the patient aren’t satisfied with it
  + **Cardiology** had the **highest satisfaction score** (**7.79/10**), while **Neurology** had the **lowest**.

**Recommendations**

1. **Optimize Length of Stay:**
   * Implement **faster discharge procedures** in **Neurology** to reduce unnecessary hospitalization costs.
   * Introduce **better follow-up care** for patients with high readmission rates.
2. **Improve Insurance Coverage & Affordability:**
   * Educate patients on **insurance options** to increase **coverage adoption**.
   * Offer **flexible payment plans** for uninsured patients to reduce financial stress.
3. **Enhance Patient Experience:**
   * Improve **post-discharge care plans** to lower readmissions.
   * Invest in **staff training** to increase **satisfaction scores** in low-performing departments.
   * Improve **fast discharge** to increase satisfaction scores
4. **Targeted Seasonal Preparations:**
   * Increase staff and resources during **Winter (December, January, February)** to handle higher patient inflows.
   * Allocate **extra ICU beds and emergency staff** during peak periods for **Critical Diagnosis**.