Independent Exploration Findings

1. Are there seasonal patterns in admissions?

Monthly Admissions

Year	Month	Month_Name	Admissions
2023	1	January	784
2023	2	February	784
2023	3	March	865
2023	4	April	749
2023	5	May	825
2023	6	June	817
2023	7	July	842
2023	8	August	866
2023	9	September	805
2023	10	October	873
2023	11	November	838
2023	12	December	927
2024	1	January	25

Quarterly Admissions

Year	Quarter	Admissions
2023	1	2433
2023	2	2391
2023	3	2513
2023	4	2638
2024	1	25

Monthly Index v/s Average Admissions

Year	Month	Month_Name	Admissions	Monthly_index
2023	1	January	784	1.019
2023	2	February	784	1.019
2023	3	March	865	1.125
2023	4	April	749	0.974
2023	5	May	825	1.073
2023	6	June	817	1.062
2023	7	July	842	1.095
2023	8	August	866	1.126
2023	9	September	805	1.047
2023	10	October	873	1.135
2023	11	November	838	1.089
2023	12	December	927	1.205
2024	1	January	25	0.033

2. Which doctors treat the most complex cases successfully?

Doctor_ID	Name	Years_Of_Experience	Total_Complex_Cases	Successful_Complex Cases	Complex_CasesRate
D1210	Dr_210	10	18	16	0.889
D1037	Dr_37	29	22	19	0.864
D1249	Dr_249	6	17	14	0.824
D1260	Dr_260	28	21	17	0.81
D1008	Dr_8	22	20	16	0.8
D1019	Dr_19	8	15	12	0.8
D1021	Dr_21	4	24	19	0.792
D1151	Dr_151	26	19	15	0.789
D1065	Dr_65	18	23	18	0.783
D1043	Dr_43	22	27	21	0.778

Finding 2 – Top 10 Doctors with highest complex case success rate is shown above

3. Can we cluster patients by treatment patterns?

I've classified treatments into 3 clusters based on cost and treatment duration.

➢ Average cost less than 2000 and duration less than 5 days (Low-cost cases)
➢ Average cost between 2000 and 5000 and duration between 5 to 10 days (Medium-cost cases) else (High-cost cases)

Patient_Cluster	Total_Patients
High-Cost Cases	3344
Medium-Cost Cases	322
Low-Cost Cases	7

Finding 3 – The count of patients in each cluster is shown above.

4. Build a model (optional stretch) to predict readmission likelihood.

1. First, calculated total admissions per patient (CTE).
2. Creates fields needed for the model:
   - Critical → 1 or 0
   - Long Duration → 1 or 0
   - Total Visits → from previous CTE
3. Then computed numeric risk score.
4. AT last converts Risk Score into a human label (High/Med/Low).

Output is large, so a sample is shown below:

Record_ID	Patient_ID	Outcome	Treatment_Duration_Days	Total_visits	Risk_Score	Predicted_Readmission_Risk
T100004	P4724	Critical	18	3	13	High Readmission Risk
T100012	P4530	Critical	19	3	13	High Readmission Risk
T100042	P4179	Critical	20	2	13	High Readmission Risk
T100067	P2927	Critical	15	4	13	High Readmission Risk
T100077	P1518	Critical	15	2	13	High Readmission Risk

Record_ID	Patient_ID	Outcome	Treatment_Duration_Days	Total_visits	Risk_Score	Predicted_Readmission_Risk