Report on the Nurse Practitioners utilization In the Emergency Department.

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Introduction:

The Emergency Department and the Nurse Practitioners play crucial roles in the Healthcare system. As the Emergency Department Provides 24/7 Medical services to the patients in the Sickness or Injuries. The role of Nurse Practitioner becomes important to provide quality care to the patients.

This report will provide an overview of Utilization of Nurse practitioners, will also get to know pick hours of patient arrivals, their Triage levels, Volume of patients treated by Nurse practitioner vs non-nurse practitioner. Their length of stay and various metrics.

Data Overview:

This Dataset is a collection of one week of visits of patients in the Emergency Department. In which the records of date and time collected during various steps like Triage allocation, Registration, Disposition and When patients left ED., The patients treated by a Nurse Practitioner or non-Nurse Practitioners. The Age of patients and more.
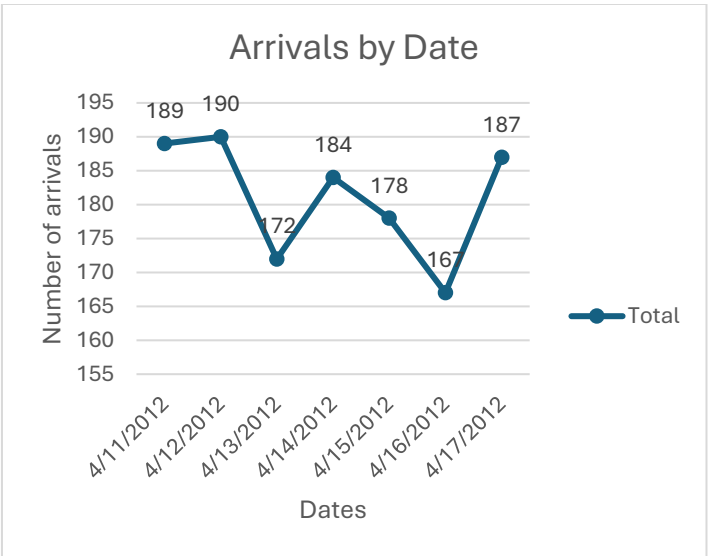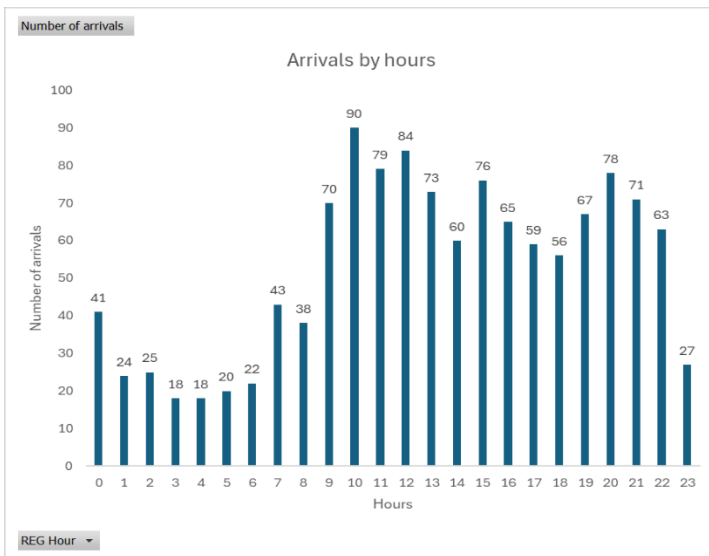
This data set had very few errors like Not allocation of Triage level and errors in Triage date and PT left ED dates, which we have not considered for analysis. The level of errors in the data set which is utilized is less than one percent.

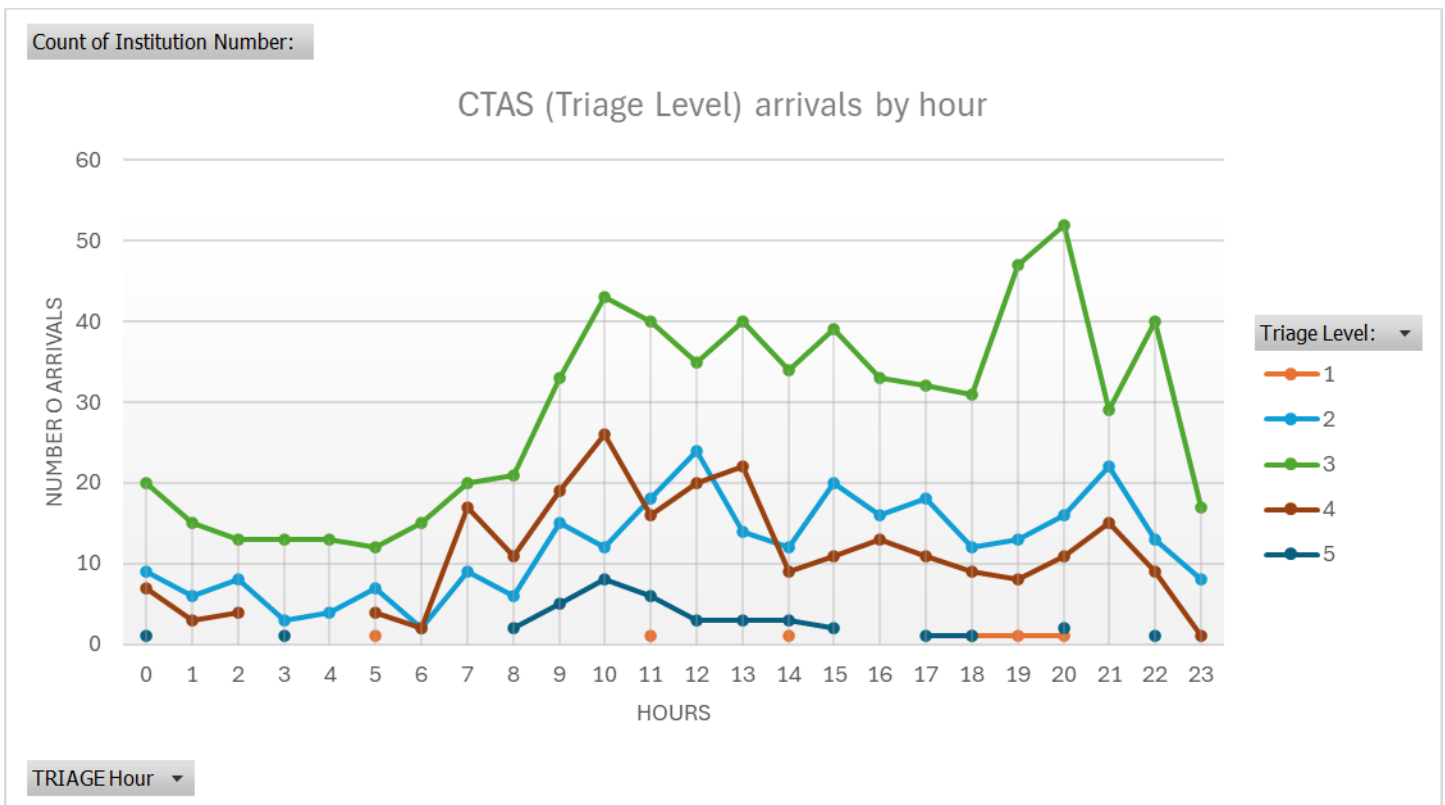# 1. Arrivals by hour in the ED by Registration date/time

Arrivals by date time	Dates							
REG Hours	4/11/2012	4/12/2012	4/13/2012	4/14/2012	4/15/2012	4/16/2012	4/17/2012	Grand Total
0	10	5	4	9	3	5	5	41
1	6	2		2	5	2	7	24
2	3	7	4	2	6		3	25
3	4	1	2	2		3	6	18
4	5	2	1	2	2	2	4	18
5		2	3	2	3	5	5	20
6	2	3	2	6	2	3	4	22
7	5	6	8	6	6	6	6	43
8	3	9	5	3	7	6	5	38
9	9	4	9	12	14	12	10	70
10	11	15	17	13	10	15	9	90
11	11	17	11	11	6	10	13	79
12	15	18	9	9	9	11	13	84
13	10	13	13	5	9	12	11	73
14	12	9	8	5	9	6	11	60
15	13	10	14	10	11	9	9	76
16	13	6	8	11	11	6	10	65
17	6	8	6	15	9	6	9	59
18	9	12	8	10	5	8	4	56
19	2	11	7	13	12	13	9	67
20	14	9	10	13	9	9	14	78
21	9	10	10	11	11	9	11	71
22	12	8	9	8	15	4	7	63
23	5	3	4	4	4	5	2	27
Grand Total	189	190	172	184	178	167	187	1267

- This data was collected from 11th of April to 17th April.
- During this Week an average of 181 patients are arriving per day in the Emergency Department.
- There are certain hours of day during the flow of patients have Double than other hours. Which are from 9 AM to 10 PM.
- The flow of patients is consistent for the whole week. In the range of 168 to 190.

The following charts will also help us to understand the frequency of Arrivals over the period of week.
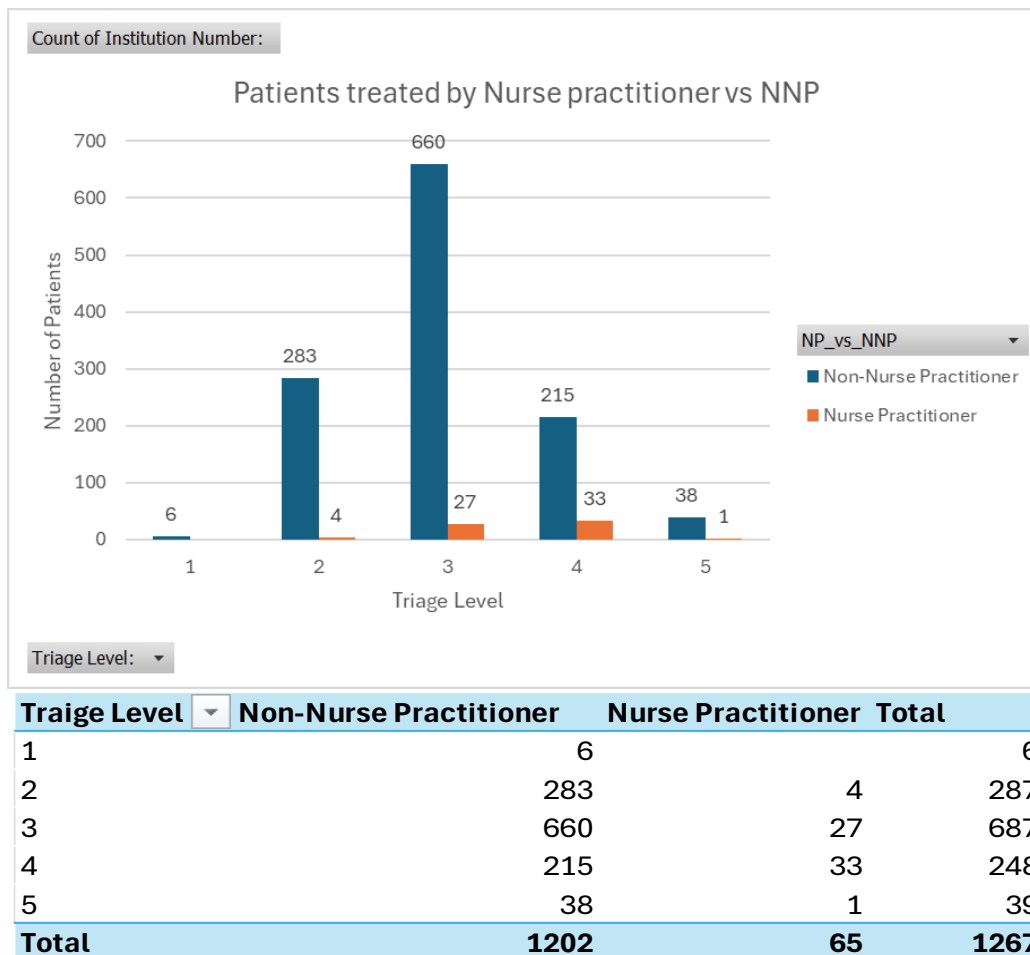
Arrivals by hours — Number of arrivals

REG Hour ▾

Arrivals by Date — Number of arrivals vs Dates (Total)

2. CTAS (Triage Level) arrivals by hour

Count of Institution Number:

CTAS (Triage Level) arrivals by hour — NUMBER O ARRIVALS vs HOURS

Triage Level: 1, 2, 3, 4, 5

TRIAGE Hour ▾

- From this Line chart, we get to know the Triage Level of Patients on their arrivals.
- Around 54 percent of total patients come under Triage Level 3, which is for Urgent: not life-threatening situations.

- While 22 percent of patients went to Triage Level 2 and approx. 20 percent to Triage 4 on their arrivals.
- Whereas only 6 patients came during a week for Triage level 1, which is good. But none of them given treatment by Nurse practitioner. We will see that in the following chart.
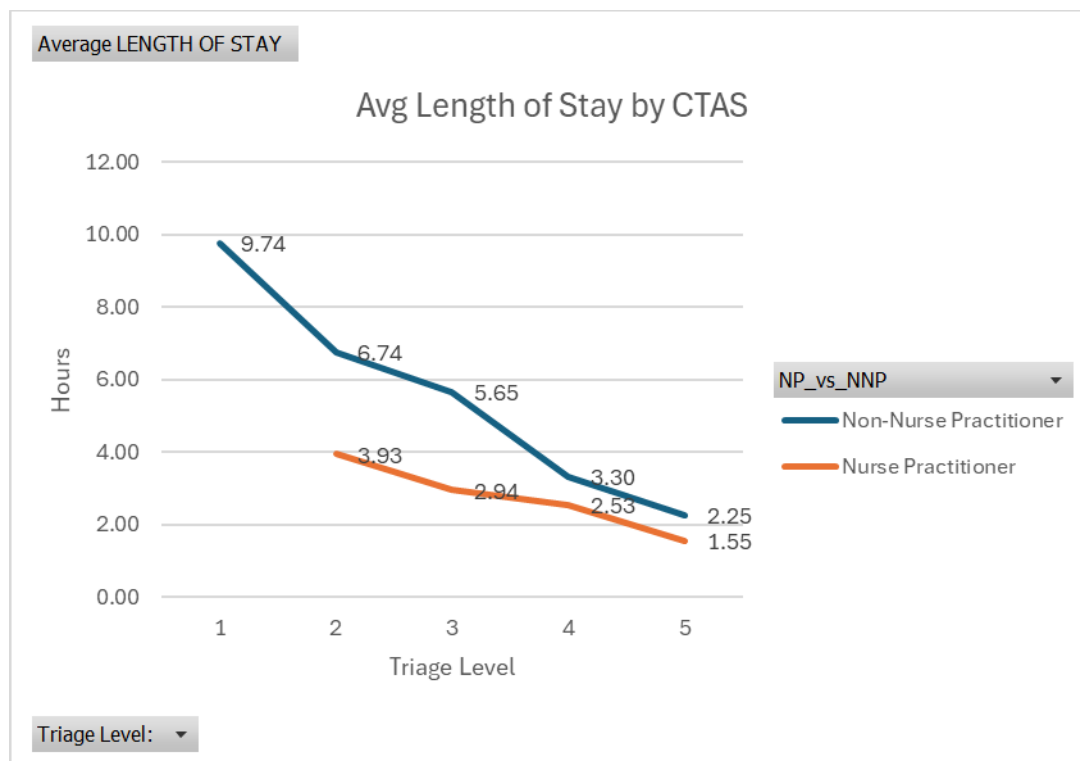
3. Volume and triage level of patients treated by a Nurse Practitioner (as the most responsible provider only) as compared to non-Nurse Practitioners

Count of Institution Number:

Patients treated by Nurse practitioner vs NNP

NP_vs_NNP
- Non-Nurse Practitioner
- Nurse Practitioner

Triage Level:

Traige Level	Non-Nurse Practitioner	Nurse Practitioner	Total
1	6		6
2	283	4	287
3	660	27	687
4	215	33	248
5	38	1	39
Total	1202	65	1267

- From this Column chart and table, we can Observe the volume of patients with their triage level and the treatment given by Nurse practitioner or Non-Nurse Practitioners.
- In our data set, the ratio is 1:9 for Nurse practitioner or Non-Nurse Practitioners.
- Out of total cases only 5 percent of them were observed by Nurse practitioner over the week, while the rest of them were observed by Non-Nurse Practitioners.

- More than Half of the cases which were came to Nurse practitioner were for CTAS 4-5.

4. Average Length of Stay of these patients by CTAS (Registration to Time Pt Left ED) for Nurse Practitioners as compared to non-Nurse Practitioners

From this Line graph, we can understand the average length of stay of patients under Nurse practitioner or Non-Nurse Practitioners.

- As for the triage level 1 patients, only non-nurse practitioners are treating the patients, so the average time of stay is 9.74 hrs.
- But for the CATS 2,3,4,5 the difference of patients stay is around average of 37 percent less in favor of Nurse practitioner compared to non-nurse practitioners.
- This suggests that Nurse Practitioner are more effective in overseeing patient care and ensuring timely discharges.

5. Percentage of CTAS 1-3 treated by Nurse Practitioner within 7 hours (Registration to Disposition (DISP))

- 96.77% of CTAS 1-3 were treated by NP within 7 hours of their Registration.

6. Percentage of CTAS 4-5 treated Nurse Practitioner within 4 hours (Registration to Disposition (DISP))

- 94.12% of CTAS 4-5 were treated by NP within 4 hours of their Registration.

7. Most effective Service Provider

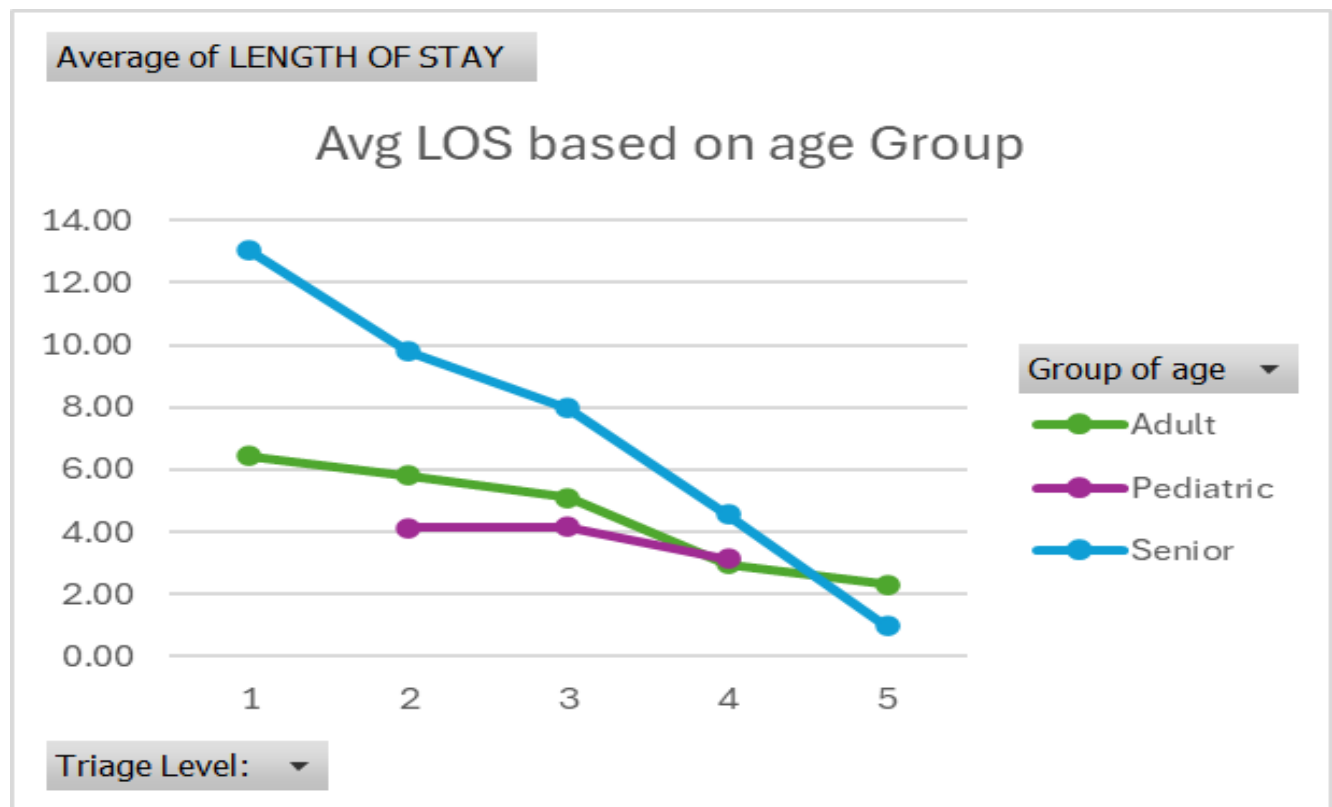| AVERAGE LENGTH OF STAY	Colu						
Most Responsible Provider Servic	1	2	3	4	5	Grand Total	Number of Cases
11004			0.57			0.57	1
1003				0.73		0.73	1
50		2.01	1.86	1.34	2.02	1.76	121.00
39			2.48			2.48	3
11001		3.53	2.78	2.29		2.69	63.00
11003 Nurse Practitioner		3.93	2.94	2.53	1.55	2.77	65.00
30				3.83		3.83	1.00
60		8.20	5.19	1.45		5.04	5.00
1	9.74	6.74	6.27	3.84	3.49	6.00	947.00
3		8.21	6.13	3.78		6.42	60.00
Grand Total	**9.74**	**6.70**	**5.55**	**3.20**	**2.23**	**5.27**	**1267.00**

From the **given Data**, Going through detail analysis,

- We can say that out of 10 service providers, **3 (50,11001, 11003 Nurse Practitioner) of them are very effective and efficient** at working on more patients with less avg length of their stay.
- Detailed interaction between the service providers can lead to opportunities for delivering treatment effective and reduce the time of stay.
- Though MRPS 11004 and 1003 have avg length of stay of their patients were 0.57 and 0.73 hours Respectively, but again they have treated only one patient each. So, it would be hard to consider them from this data.
- Service Provider Code 1 has an avg length of stay of 6 hours, but that person treated 947 cases in one week.

8. Average Length of stay based on Arrival of Ambulance

From the observation We have understood that if the patients come by Ambulance the length of their stay is 7.44 hours compared to when they come by their own, they tend to stay Approx. 4.79 hours.

9. Average Length of stay based on Age Group.

Average of LENGTH OF STAY

Avg LOS based on age Group

Group of age

- Adult
- Pediatric
- Senior

Triage Level:

For this Chart,

We have divided all patients into 3 major age groups.

Below 18 is For Pediatric, from 18 to 64 is Adult, and the rest of them are considered as Seniors.

The older the person is and the ill they are, there is a better chance of them staying in hospital longer. As here Average LOS for Pediatric is 3.99 while for Adult and Senior it is 4.59 and 8.13 hours respectively.

Recommendations:

- We need to Enhanced Utilization of Nurse Practitioner more compared to Non-Nurse Practitioners, As the efficiency demonstrated by Nurse Practitioner in the ED to optimize patient flow and reduce LOS.
- By Hiring more Nurse Practitioners, we can reduce the load of patients on some of the staff.
- Providing additional training and support for healthcare providers to increase their skills in managing patient care efficiently and effectively.
- Work closely with other departments of the Hospital so we can get the test results faster, that way we can treat patients quickly.
- Regularly check how long patients are staying in the ED and see if the changes you make are helping.

Conclusion

During the week of April 11th to 17th, the Emergency Department (ED) has an average daily patient count of 181, maintaining a steady flow with peak activity from 9 AM to 10 PM. Most cases fall under Triage Level 3 (54%), followed by Levels 2 (22%) and 4 (20%). Although Nurse Practitioners (NPs) only handle 5% of cases, they care for more than half of CTAS 4-5 patients and have a shorter average length of stay (LOS) for CTAS 2-5 cases compared to non-NPs, indicating their effectiveness in patient management.