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A New Predicative Model to Emergency Hospital Admissions during Pandemic Situations

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ABSTRACT
Patients Facing many Problems in Hospital while Taking Admissions But it is not at all good at Emergency Department. Very serious cases will admit in Emergency Department. Need to use more innovation technique to ameliorate patient flow and prevent Overflowing. Data mining techniques will show us a pleasant method to predict the ED Admissions. Developing machine learning technique to predict ED admissions. Three algorithms to build the predicative models:1) Naïve Bayas; 2) Decision trees; and 3) Gradient boosted machines. Decisions support tools would provide a snapshot of predicated admissions from the ED at a given time.
Keywords: Emergency Hospital admissions during pandemic situations, Machine learning algorithms, Logistic regression, Decision tree, Gradient boosted machines.

I. INTRODUCTION

Crowding within emergency departments (EDs) can have significant negative consequences for patients. EDs therefore need to explore the use of innovative methods to improve patient flow and prevent overcrowding. One potential method is the use of data mining using machine learning techniques to predict ED admissions. This paper uses routinely collected administrative data (120 600 records) from two major a cute hospital in Northern Ireland to compare contrasting machine learning algorithms in predicting the risk of admission from the ED.

Motivation

We use three algorithms to build the predictive models: 1) logistic regression;2) decision trees; and 3) gradient boosted machines (GBM). The GBM performed better (accuracy D80:31%, AUC-ROC D 0:859) than the decision tree (accuracy D 80:06%, AUC-ROC D 0:824) and the logistic regression model (accuracy D 79:94%, AUC-ROC D 0:849). Drawing on logistic regression,we identify several factors related to hospital admissions, including hospital site, age, arrival mode, triagecategory, care group, previous admission in the past month, and previous admission in the past year. This paper highlights the potential utility of three common machine learning algorithms in predicting patient admissions.

EXISTING W0RK

Healthcare blockchain could solve some of the biggest problems in healthcare, such as compliance, interoperability, and data security issues, according to a recent study by CB Insights. The report looked at healthcare blockchain use cases in the short, medium, and long term.

LIMITATIONS

- There are no methods for predicting admissions based on the test data set.
- There is no data set extraction using fast techniques.
- It takes more time consumption for practical use of database system.

II. PROPOSED WORK

This paper highlights the potential utility of three common machine learning algorithms in predicting patient admissions. Practical implementation of the models developed in this paper in decision support tools would provide a snapshot of predicted admissions from the ED at a given time, allowing for advance resource planning and the avoidance bottlenecks in patient flow, as well as comparison of predicted and actual

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admission rates. When interpretability is a key consideration.

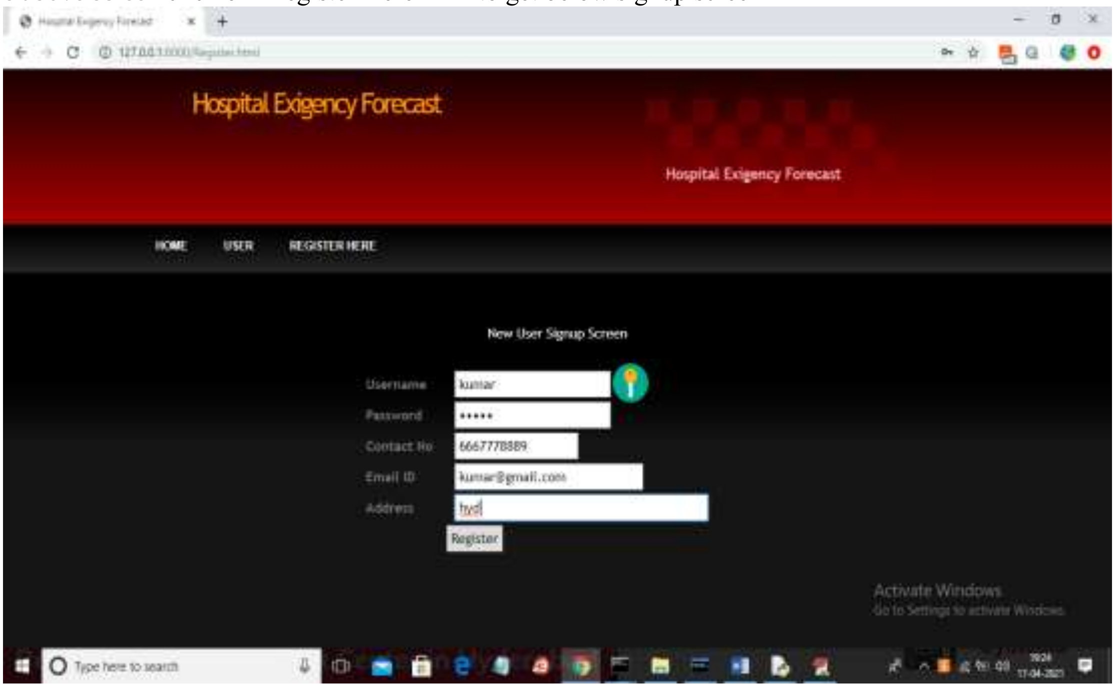
III. RELATED WORK

Using a range of clinical and demographic data relating to elderly patients, used Manually prediction of admissions to hospital, and ED re-attendance. They predicted admissions with moderate accuracy, but were unable to predict ED re-attendance accurately. The most important factors predicting admission were age, Emergency Severity Index (ESI) triage score, heart rate, diastolic blood pressure, and chief complaint.

IV. RESULTS

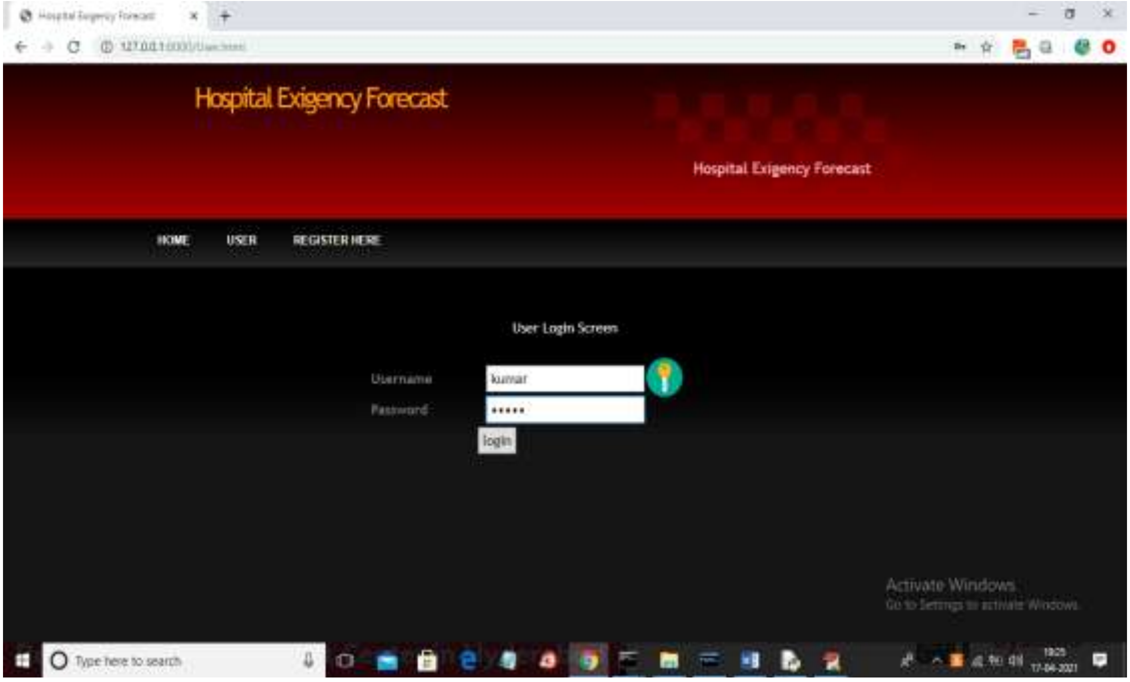
Screen.1:Home Page

In the above screen click on 'Register Here' link to get below signup screen



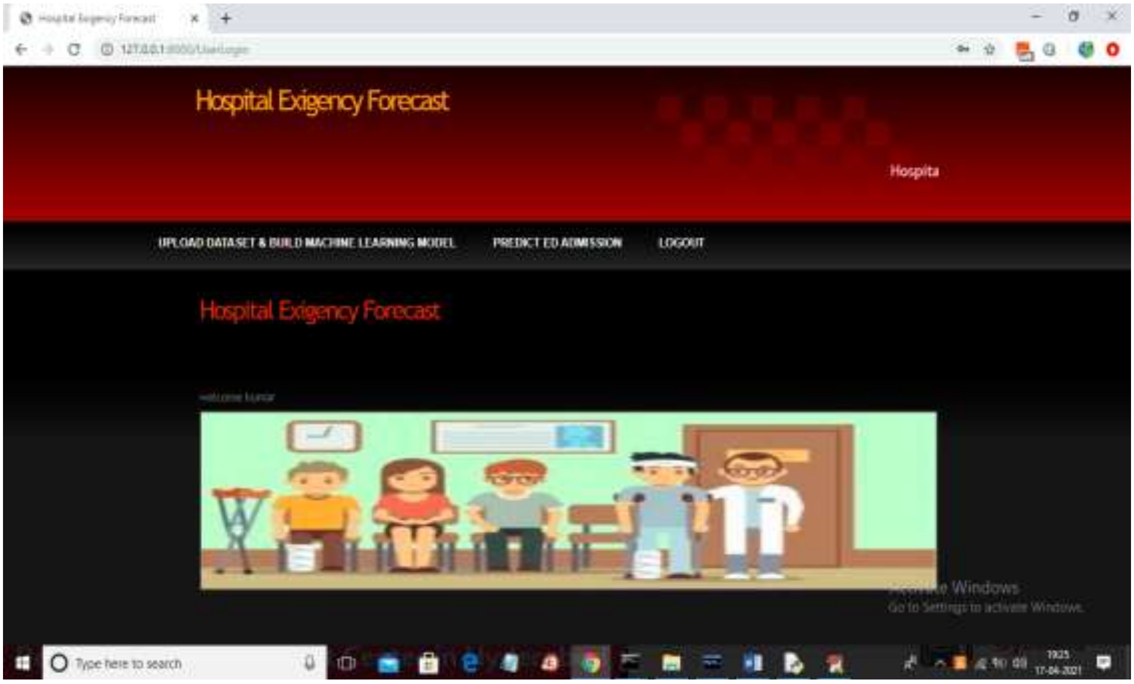
Screen.2:Register Page

In above screen user adding signup details and then click on 'Register' button to get below screen.



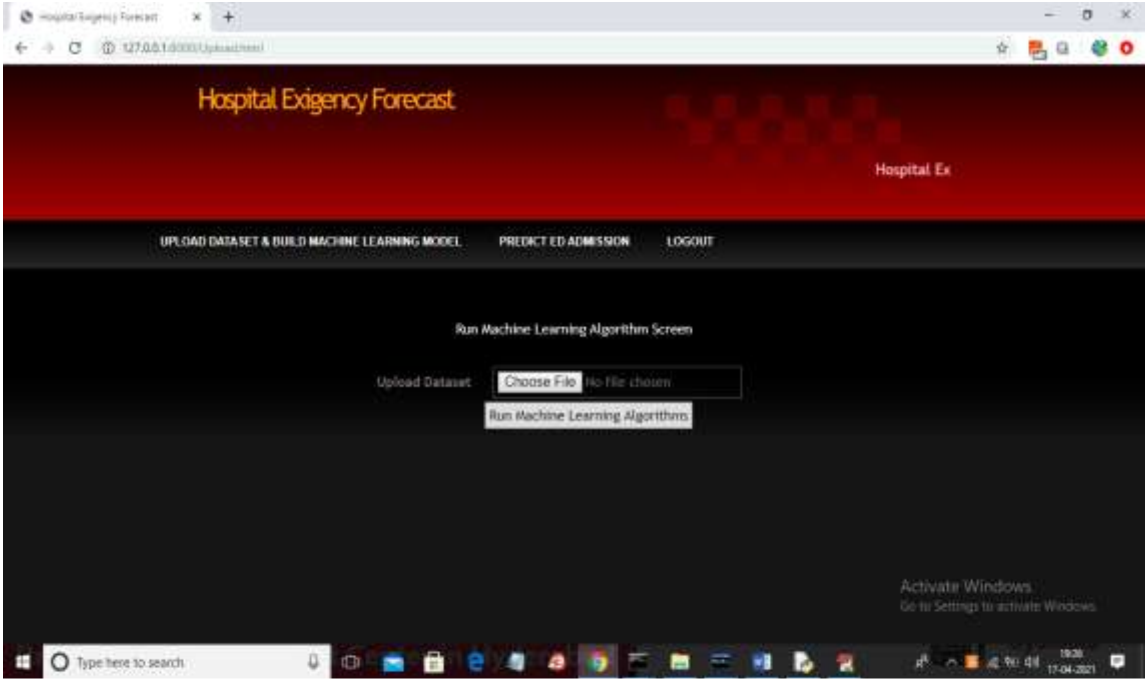
Screen.3:Login page

In above screen user is login and after login will get below screen.



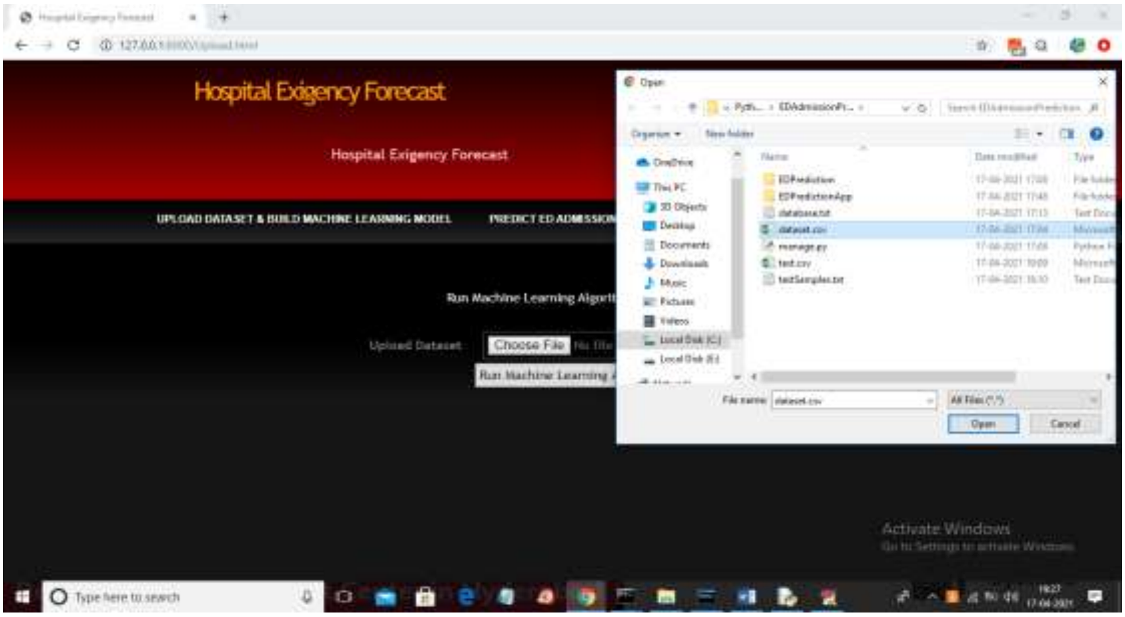
Screen.4:Upload Database

In above screen click on 'Upload Dataset & Build Machine Learning Model' link to get below screen.



Screen.5

In above screen click on 'Choose File' button and upload 'dataset.csv' file to and then click on 'Run Machine Learning Algorithms' button to build model and get below screen.



Screen .6:Database

In above screen selecting and uploading 'dataset.csv' file and then click on 'Open' button and then click on Run button to get below output.

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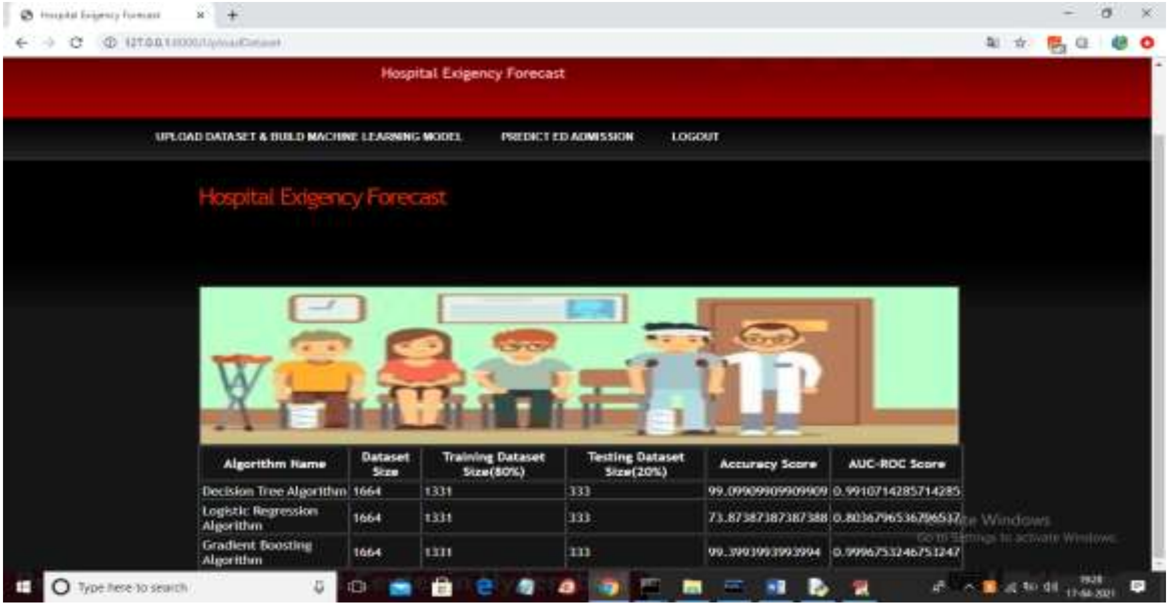
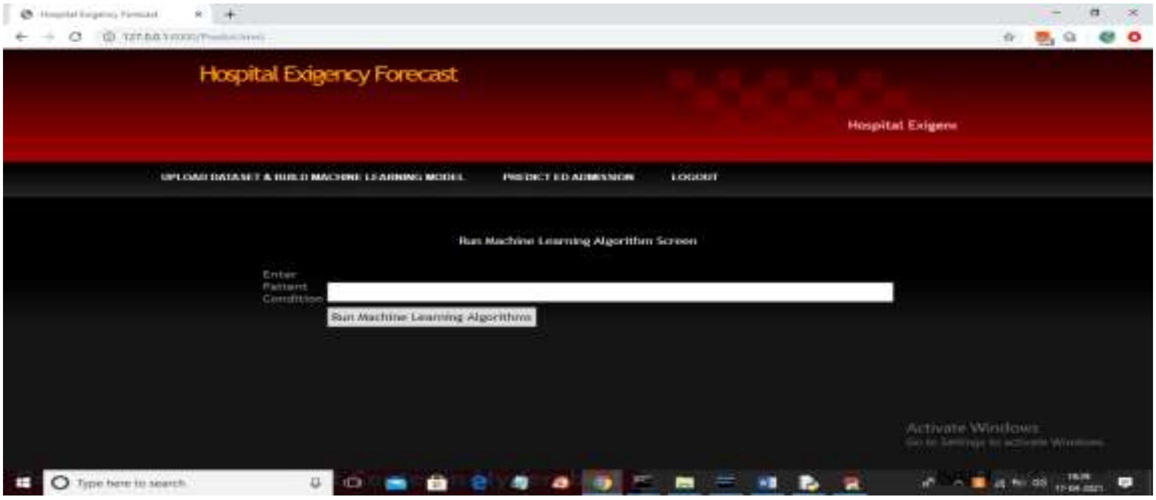


Screen .7

In above screen we can see we ran 3 algorithms by splitting dataset into train and test and in all algorithms gradient boosting is giving better result and now algorithm train model is ready and now
Click on 'Predict ED Admission' link to get below link.



Screen .8:File

In above screen we can copy patient vitals from testSamples.txt file and paste here to get admission prediction.

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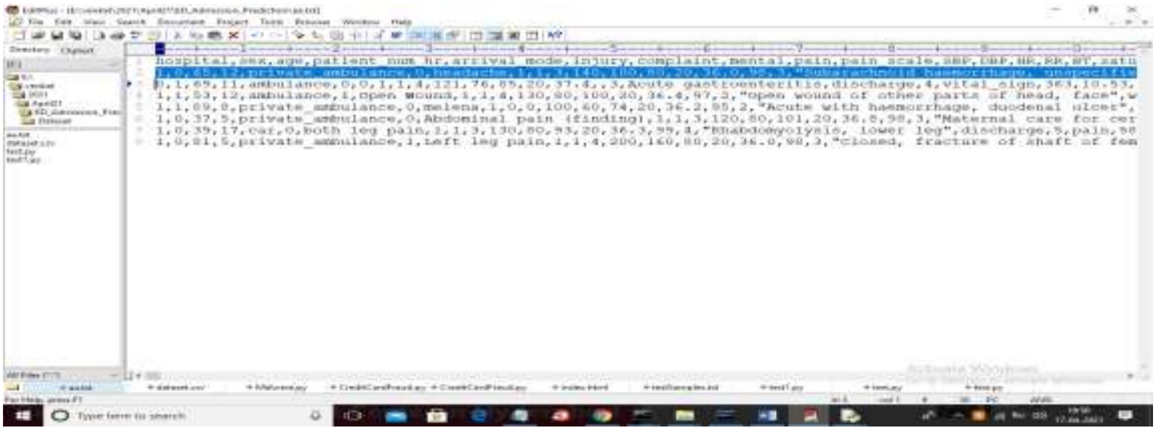
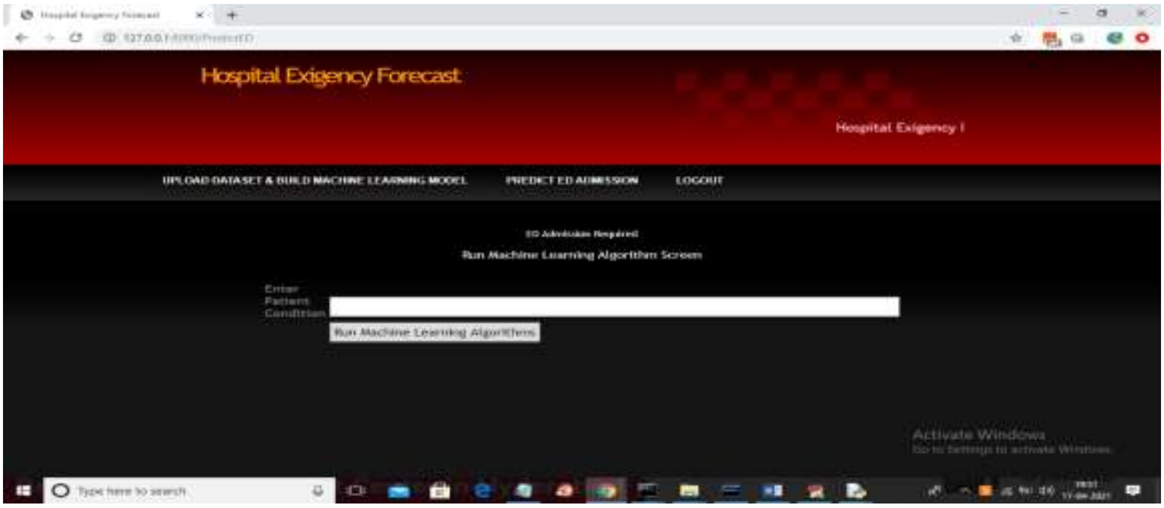


Screen. 9

In above screen I am selecting first records and then copy and paste in below screen.



Screen.10: Predicted Result

V. CONCLUSION

This study involved the development and comparison of three machine learning models aimed at predicting hospital admissions from the ED. Each model was trained using routinely collected ED data using three different data mining algorithms, namely logistic regression, decision trees and Gradient boosted machines. Overall, the GBM performed the best when compared to logistic regression and decision trees but the decision tree and logistic regression also performed well. The three models presented in this study yield comparable, and in some cases improved performance compared to models presented in other studies. Implementation of the models as a decision support tool could help hospital decision makers to more effectively plan and manage resources based on the expected patient I know from the ED. This could help to improve patient ow and reduce ED crowding, therefore reducing the adverse effects of ED crowding and improving patient satisfaction.

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