User Manual
Emergency Department Triage System
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Overview

This web app solves the core issues of Emergency Department Triage system: maximizing the use of available resources. This web app aims to utilize the ED resources so that all the patients get the most effective care without having to wait long hours.

The app will be used within a hospital upon notification of a catastrophic event occurring within range of that facility. This system will be the first course of action. Each user will be able to identify the staff to contact for duty, complete an assessment of patients, rating algorithm to prioritize treatment and patient progress update.

Intended Use

This web app is intended to use for the sole purpose of triaging the catasthropic situation in an Emergency Department where the influx of patients is higher than the resources that are available. The intended user of this is the ER Nurse who can quickly assess the basic condition of the patient.

Core Features/Functionalities

1. Dashboard
2. On Call support
3. Patient Assessment
4. Resource Management
5. Patient Risk
6. Staff Management

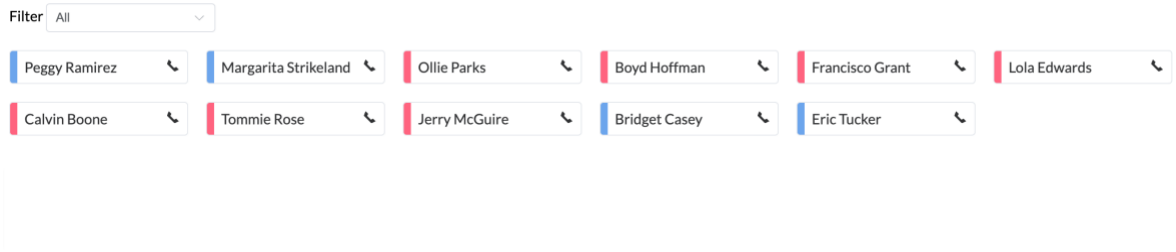
Dashboard/On call support

The dashboard provides a quick way to analyze all the available resources and patients in the queue. The on call section quickly allows the user to see the doctors and nurses on-call so that they can be quickly contacted during the high influx of patients. The practitioners are readably displayed and the user can click on any doctor/nurse to get more information about the patient. If in a rush, the user can also utilize the First available on-call personnel to call. The list of the staff can also be filtered.

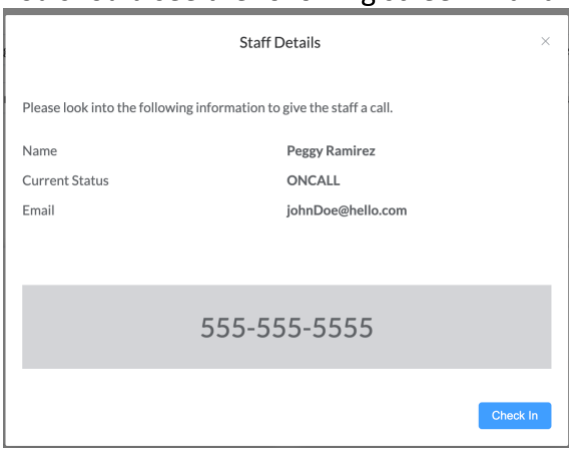
How to…

View the details of the doctor/nurse to call?

- Click on any of the doctor or nurse card



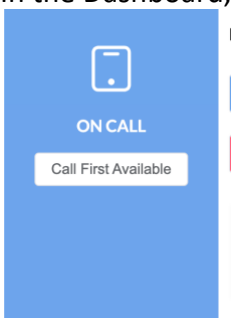
- You should see the following screen with the staff details



- You can then call the staff.

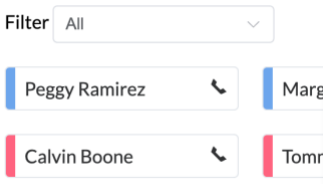
Call the first available staff

- In the Dashboard, you can click on “Call First Available” button to do so



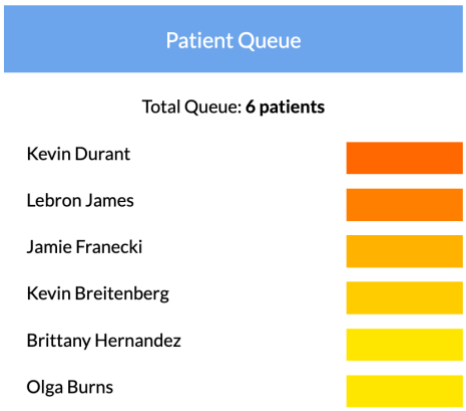
Filter the staff by doctor/nurse

- Click on the filter dropdown and select the desired type



Analyze the stats

- In the Patient Queue section you can see the total patients that are currently on the queue. The list of patients is sorted by the highest priority (dark red) to lowest priority (yellow). NOTE: Currently, this list of patients is non-interactive and only for information purposes.



The patient queue risk calculation is dynamic. For example, if there are 5 patients with a flu and 1 patient with a back pain, the person with back pain would have significantly higher priority. However, if a new patient is incoming with 5 different injuries and acute condition, the other 6 patients that were in the queue all will have a very low priority.

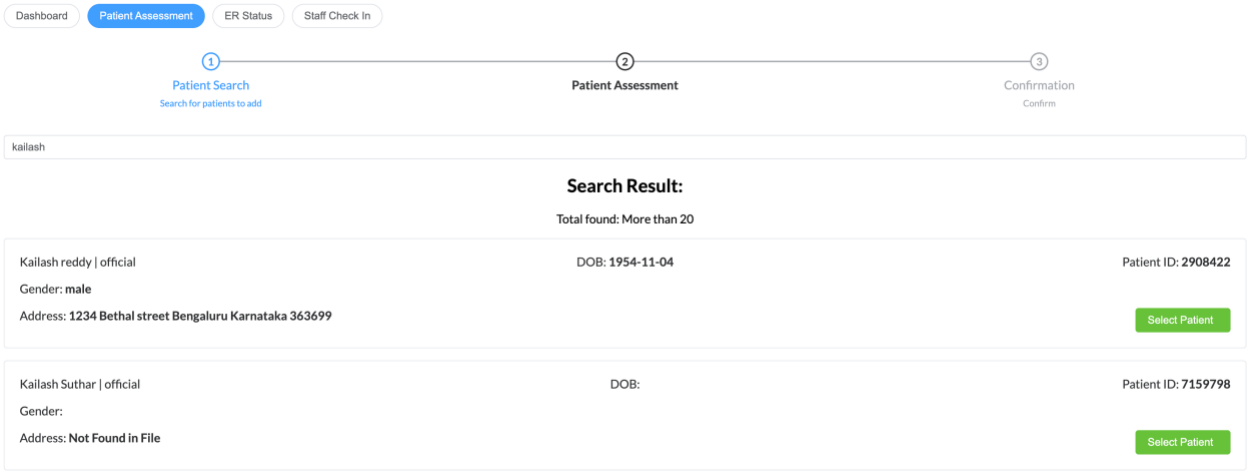
- In the right hand side of Patient Queue, you can see various stats like total patients waiting, total beds available and total beds being used.

Patient Assessment

This page is used to assess a patient when they come in an ambulance or walk in during the time of catastrophy. Currently, only the patients with a patient ID in HAPI FHIR test server can be admitted. As a part of this POC, that provides all the patient data. Follow these steps to enroll a patient

Search for the patient

- Navigate to “Patient Assessment”. You will see a search bar where you can either enter the patient id or the name.

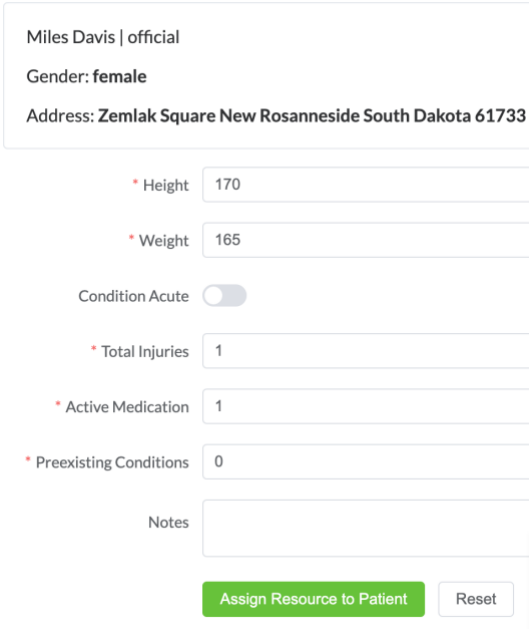


- Choose the patient from the list of patients by clicking on “Select Patient”

Assessment Step

This is an important step in admitting the patient into ER. The typical process takes very long where the patients are asked about various conditions and details of those conditions so that an informed decision can be made for treatment. That is not the purpose of this application. The goal is to identify critical nature of the patient and assign resources accordingly so that the most critical cases are handled first. Since the application’s use is during catastrophic events, it is highly important that the assessment can be completed with less paperwork.

Capture all the data points to compute the risk and priority of the patient.



Height and weight: These metrics are used to compute BMI that contributes to the final score.

Condition Acute: Determine if the condition is acute. This should be toggled ON only if it is visually in an acute condition. For example, someone who came in an ambulance with blood all over and struggling.
Total Injuries: This represents the total number of injuries that the EMS team reports
Active Medication: This represents the total number of medications that patient is on.
Preexisting conditions: This represents the total number of preexisting conditions of the patient.

NOTE: These are some basic data points captured for the POC but can be expanded more to see what the medications are to gain more accurate risk of the patient

Once everything is captured, click on "Assign Resource to Patient".

Confirmation Step

This step shows the confirmation of if the patient was successfully added to the database and assigned a resource (bed). The following image shows the successful case. If the patient cannot be added, it will show you an error page.

Patient Risk

When the patient is assessed and added to the database, risk and priority is automatically calculated. Based on the priority of the patient, they might OR might not be assigned a bed even though there might be beds available. This scenario occurs when it's a low priority patient. For example, if the patient priority is 7 out of 10, there might still be a chance that they will be added to the queue instead of assigning the empty bed. The high priority patient is not assigned a bed only if there is even patient who has even higher priority/risk still waiting on the queue.

The risk is calculated based on the following:

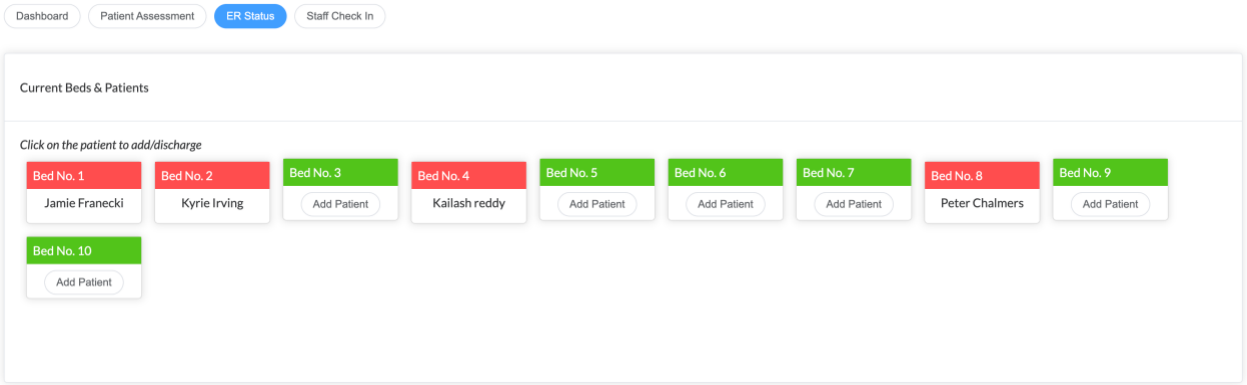
The priority is calculated to range 0-10 (0 – lowest, 10 – highest).

Weight and Height: BMI is calculated and contributes to 15% of the risk of patient.
Condition Acute: This Boolean value contributes to 35% of the risk of patient. The value is much higher since for acute patients, we would want them to be rated significantly higher. This is

currently the case since we do not have a lot of data points and can be reduced as more analysis can be done in the users injury and medication details.
Injuries: Injuries contribute to 20% of the patient risk. This is assigned to capture the most recent injuries caused by catastrophic event.
Preexisting conditions: Contributes to 20% of the patient risk. Preexisting conditions also highly affects the patients well-being compared to a healthy individual before the event. So, they are prioritized higher.
Active Medication: Contributes to 10% of the patient risk.

Resource Management (ER Status)

This page shows the status of the patients and the ER resources that are currently being used vs free. It shows all the beds in the ER that are completely editable. You can add a patient or discharge a patient.

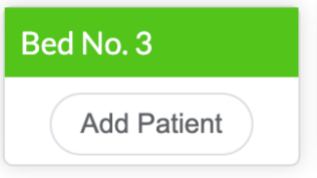


The green cards mean that they are empty currently and the red cards mean that they are currently being occupied.

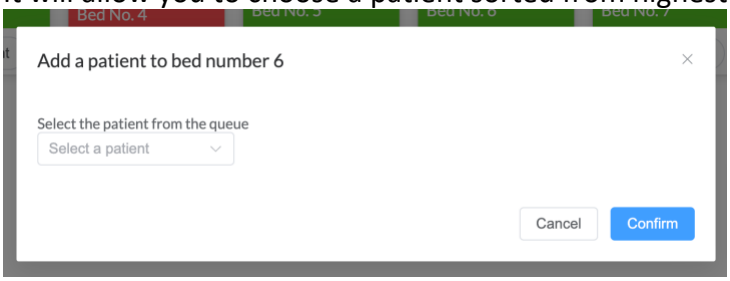
How to…

Add a patient to bed

- To add a patient to bed, click on the “Add Patient” button on the green bed cards.



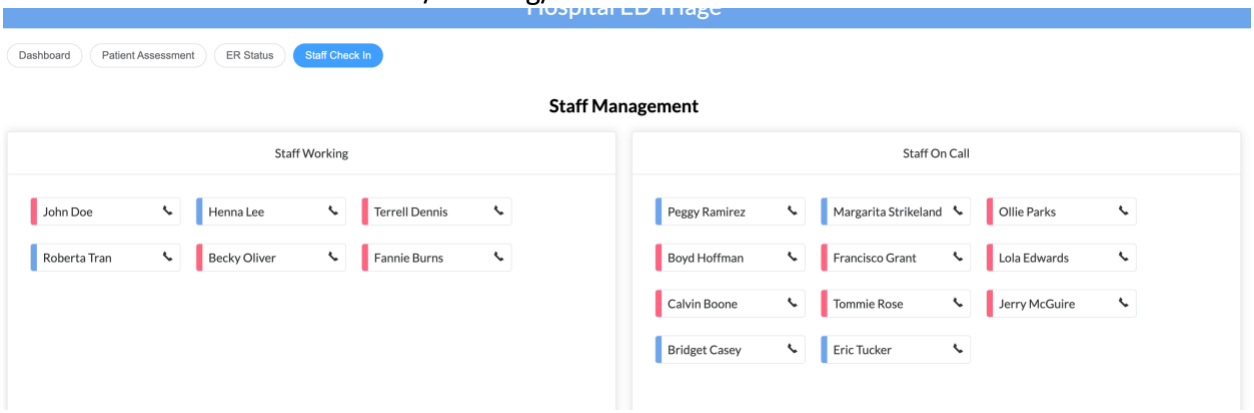
- It will allow you to choose a patient sorted from highest priority to lowest



- Choose a patient you want to assign a bed to and click “Confirm”.
- There is also a separate flow of automatically adding a patient to bed through Patient Assessment. Check the Patient Assessment section for more details.

Staff Management

This page allows the staff to clock in and clock out of their shift so that there is always an up to date list of staffs that are on-call/working/on-vacation.

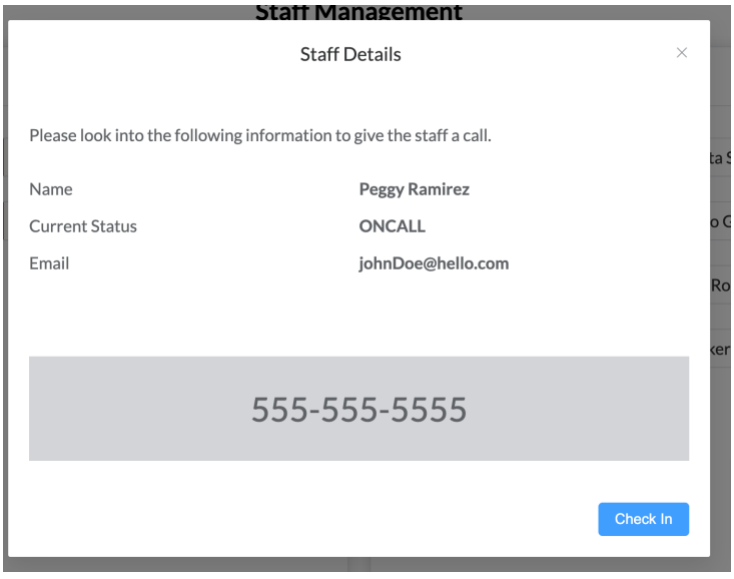


The left side represents all the current staffs that are currently working their shift in the ER and the right side represents all the staffs on call. The on call staffs are the same ones as it is in the Dashboard.

How to…

Clock in and Clock out

- As a user who wants to clock in when they get to the hospital, they can click on their name on the on-call list of staff and click on “Check in” button.



- As a user who is done with their shift, they can find their name in left side of the page and click on “Leave for the day”