Emergency Department Triage Application

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Abstract

As an ED provider, I would like to have tool to triage patients when they enter the Emergency Department. This tool would consist of a series of questions regarding symptoms and vitals signs that would result in a triage categorization of Red, Yellow or Green.

Project Champions

- Partners In Health

Objectives

Currently when a patient arrives at the Emergency Department, the nurses fill out a triage form for the patient. There are 3 versions of this form, one for Adults (> 12 years of age), Children (3-12 years) and Infants (0-3 years). The result of this form is a color, either Red (most serious), Orange , Yellow or Green (least serious). These guide the ED as to how quickly the patient needs to be treated.

The form should first identify the patient (either by prompting to search or passed from the page the form was launched from). After this, the form should collect the "Chief Complaint". This should be a required free-form text box to capture the cause of the emergency room visit.

The result of this form is a color, either Red (most serious), Orange , Yellow or Green (least serious) based on the form input and the business rules. These guide the ED as to how quickly the patient needs to be treated.

Requirements

- Java web application development
- Experience in the following areas:
    - Spring, Hibernate, MySQL, Tomcat, Git, Maven
    - UI development skills including AJAX, JQuery, AngularJS, SASS
    - Test-Driven Development or Behavior-Driven Development
- Willingness to learn / follow design patterns and best practices of the OpenMRS platform

Milestones

- All input fields captured on forms; concepts defined, approved, and incorporated into the CIEL dictionary (external coordination required)
- API development complete
- Integration into overall application complete, including integration testing
- Delivery to staging/test server for User Acceptance testing

Current Patient Flow for Emergency patients:

1. Patient is registered in system. Sometimes a patient may be registered as an "unknown" patient if their name, age, address etc… cannot be obtained. Either way, the patient is always registered.
2. Triage nurse fills out paper triage form for every patient.
3. Patient paper chart is placed on rack with other charts
4. Clinicians take patients based on the charts on the rack and their triage color.
5. Clinicians examine patient, enter consult note etc...

Desired Flow:

1. Patient is registered in system in the same way as currently
2. Triage nurse fills out electronic triage form for every patient.
3. Patient is displayed as an entry on electronic triage queue in the EMR
4. Clinicians remove patients from the triage queue
5. Clinicians examine patient, enter consult note etc... using the current process

ED Triage Note

- There are 3 sections of the form, which should be able to be entered at any time :
  - Chief Complaint
  - Symptoms
  - Vital Signs

  Chief Complaint
- Chief Complaint can be free form text to be entered at any time while filling out the form. Sometimes the complaint is known right away, sometimes it is not known until the symptoms and vitals are taken

  Symptoms
- User should be presented with questions about the patient's symptoms:
  1. Does the patient present **Burn** or **Trauma** symptoms?
  2. Is the patient experiencing **respiratory** or **digestive** symptoms?
  3. Is the patient experiencing **pain**? (include Severe, Moderate and Mild as choices - paper form only has severe and moderate)
  4. Is the patient experiencing **neurological** symptoms?
  5. Is the patient experiencing any **pregnancy** complications? (only for women)
  6. Any **other** emergency symptoms?
     - Diabetes symptoms should be included here
     - **Other** symptoms on the paper form should be displayed depending on the age of the patient (Adult, Infant, Child).
- Each of the symptoms should have an "None" and "Unknown" option in addition to the options on the paper form. There should not be a default answer chosen. The user should have to click one of the responses.

  Vitals
- User should be presented with Vitals form similar to current vitals form with the categories and answers on the paper form.
- Weight (Poids) should be included in the vitals section, which is currently at the top of the paper form.
- T/A (blood pressure) should be included for Adult, Child and Infant, even though on the paper form it is only included for adults.
- Blood Pressure, O2 Sat and Temp should have "Unobtainable" options

  Other Functionality
- The form cannot be saved until all the questions have been answered.
- Depending on the answers given and numerical values (from the paper form), the patient is categorized as Red, Orange, Yellow or Green.
- As the user is filling out the form, if possible, the triage color can be displayed, but it should be clear that it is "in progress". The patient is not truly triaged until the form is complete.
- The form should be saved as an encounter on OpenMRS and displayed on the patient visit dashboard, like a consult note, vitals currently etc.
- A report should be built of every patient ED Triage encounter

  Other Considerations
- The users of the form may not have any computer experience, so the form should be very easy to use

Triage Queue

- The should be a "queue" built to display patients after they have been triaged
- This should display a list of patients with:
  - Patient Name
  - Patient ID
  - Triage Time
  - Triage color
  - Any symptoms entered as "Yes"
  - Summary of Vitals Signs. If possible, vital signs in "critical" range can be highlighted.
- Patients should be sorted Red, then Orange, then Yellow. Waiting time should be secondary sort.
- For each patient there should be 2 options, both of which will remove the patient from the queue:
  - Begin Consult
  - Patient left without seeing clinician. This should update as a patient disposition and display on the visit dashboard, if possible.

Extra Credit

- The application should work on a touch screen (device) tablet
- Integration into hospital and primary care versions of the overall electronic medical record software for use in specific OpenMRS implementations
- Increased efficiency in facility operations, ensuring the most critical patients are attended to and triaged in an appropriate and urgent manner
- Improved patient care through identification of the chief complaints in conjunction with collected vital signs and indicators

Resources

- Adult Triage Form: AdultTriage.pdf
- Child Triage Form: ChildTriage.pdf

- Infant Triage Form: InfantTriage.pdf
- The South African Triage Scale: http://emssa.org.za/sats/