Application Manual

CDC Post-Discharge Stroke Data Reporting App - Phase 2

Team 1

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Github Link: https://github.gatech.edu/gt-hit-fall2017/CDC-Post-Discharge-Stroke-Patient-Data

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Project Background

To get an adequate understanding of which events are more likely to lead to readmission, the Coverdell stroke registry project at the Centers for Disease Control and Prevention (CDC) is interested in collecting data once the patient transitions from the hospital to their next care setting (e.g. home, inpatient rehabilitation, nursing home). Automated identification of eligible stroke cases, chart abstraction of data elements from Electronic Health Records (EHRs), and write-back of post discharge data into EHRs can improve the process by bringing consistency, reducing re-entry of data, and increasing quality of the data reported.

Therefore, the main of objective of this project is to enhance and add functionality to a Post-Discharge Stroke web application and supporting services to demonstrate SMART on FHIR can be used in a stroke patient follow-up scenario.

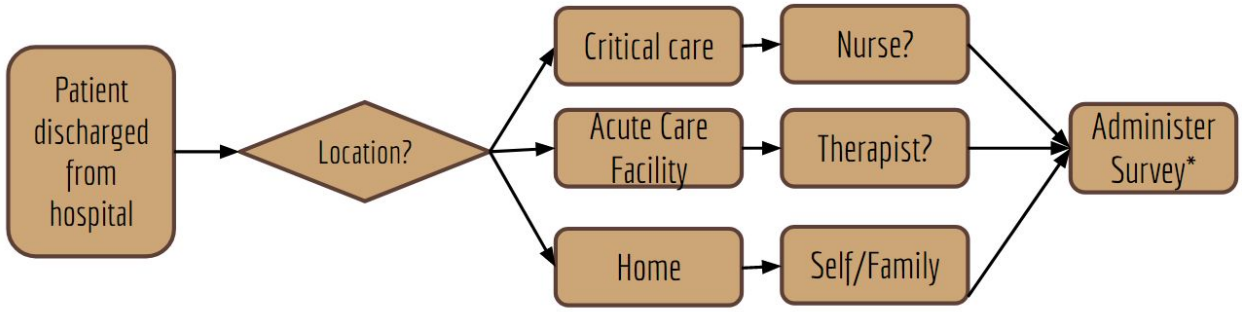
The main users of the site are nurses, doctors, therapists, etc. who would like to follow up with their patients after discharge. They log in to the application to view a list of their patients, and each patient's corresponding questionnaire will be available. The questionnaire availability is determined by the amount of time it has been since a patient was discharged. For example, the 7-day questionnaire would be available to patients who were discharged seven or more days prior. Administrators of the application are able to upload the questionnaires, as well as activate or deactivate the questionnaires.

Phase 2 of this project provides the following added features:

- Ability to host multiple questionnaires
- Patient list is pulled synchronously from the sandboxed FHIR server
- Questionnaire box user interface that includes submit and cancel buttons
- Ability to toggle a survey's status (active/inactive)
- Only the most appropriate survey is displayed for patients when multiple surveys are available

Post Discharge Flow

Below is a post discharge flow diagram and the logic used for questionnaire administration in the application:

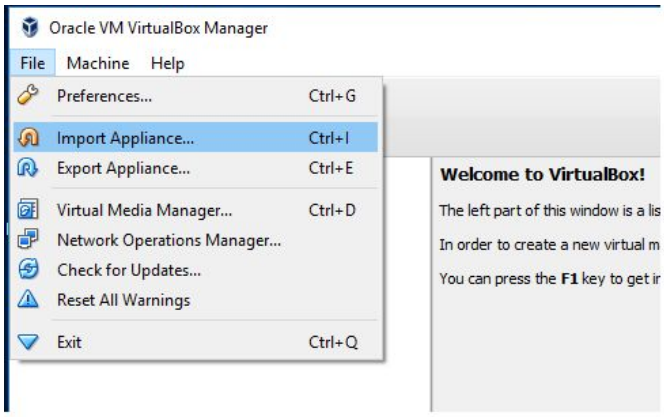


Parameters for questionnaire administration:

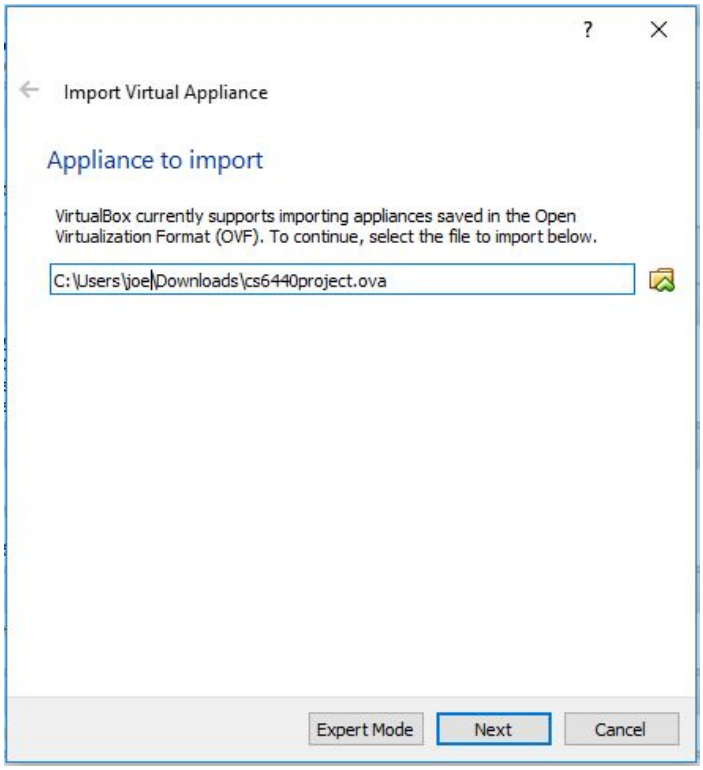
1. Date of Patient Discharge <= Current Date
2. Patient Age >= 18
3. Patient has one or more of the following ICD 10 codes:
    a. 60–I62: Non-traumatic intracranial hemorrhage (i.e., spontaneous subarachnoid, intracerebral or subdural hemorrhages)
    b. I63: Cerebral infarctions (i.e., due to a vessel thrombosis or embolus)
    c. I67–I68: Other cerebrovascular diseases
    d. I69: Sequelae of cerebrovascular disease (late effect)
    e. G45, G46 (if clinical diagnosis is TIA – Transient Ischemic Attack)
    f. Stroke in Pregnancy (ICD 10 Codes 000.411-099.419)

Application Startup Instructions

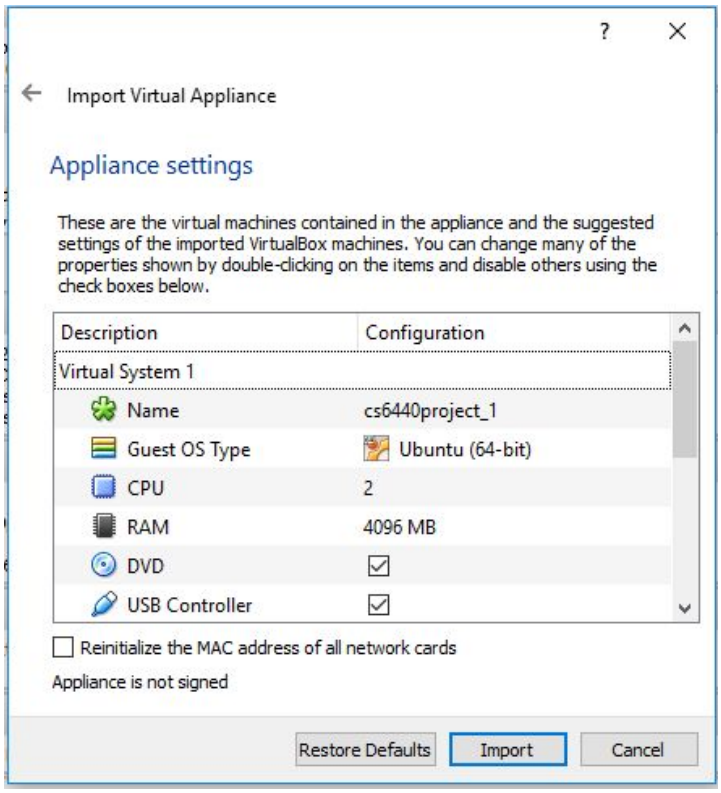
1. Download the ready VirtualBox appliance (cs6440project.ova) using this link: https://drive.google.com/open?id=1xV33YFI3iWQ9eLM_zH98IGmNT9OVbVFU
2. In Oracle VM VirtualBox, import the appliance by going to File -> Import Appliance…



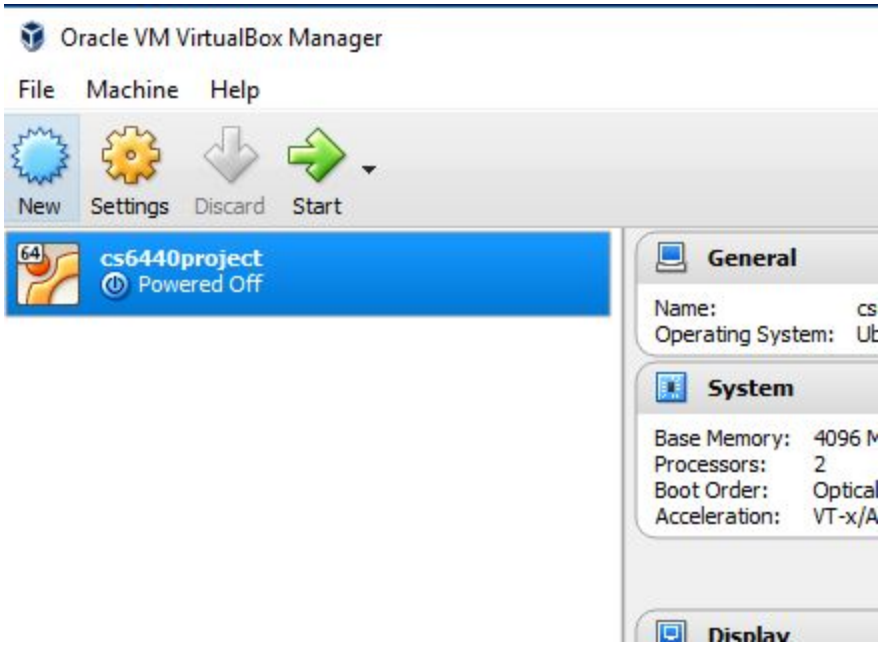
3. In the pop-up window, navigate to the downloaded cs6440project.ova file, select it, then click Next



4. Leave the default appliance settings alone, and click Import



5. Once the cs6440project is imported, you will see it in the main VirtualBox Manager Window. Select it and click start.

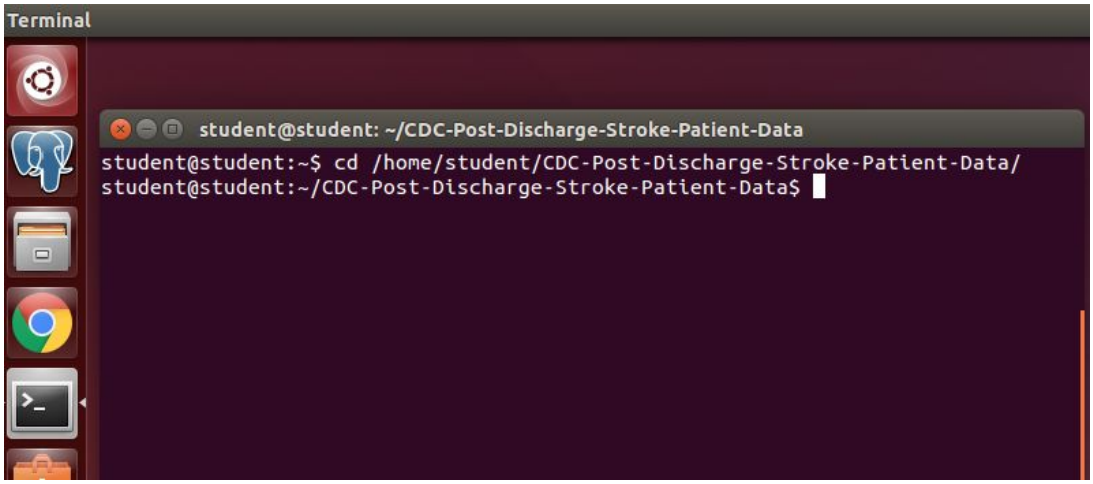


6. The Ubuntu virtual machine will boot up and automatically log in with the following credentials:

```
username - student
password - student
```

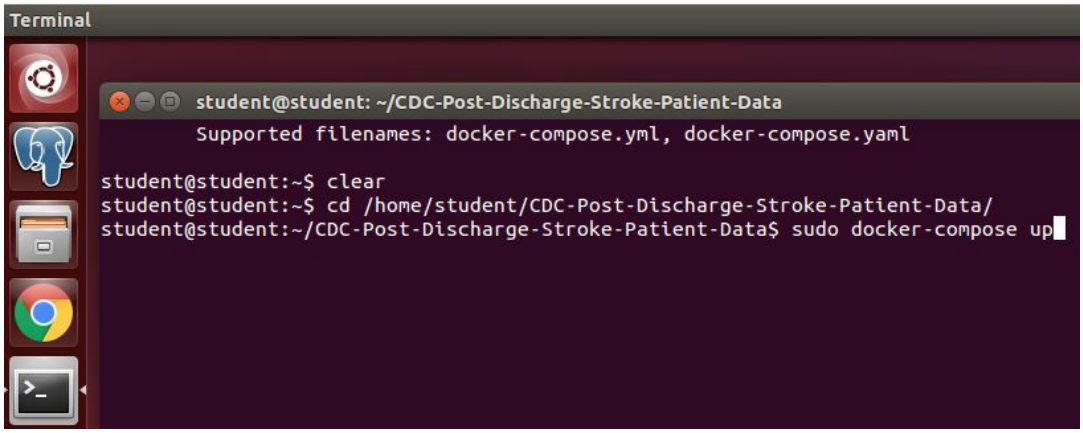
7. Open a terminal window and navigate to the CDC-Post-Discharge-Stroke-Patient-Data directory with this command:

```
cd /home/student/CDC-Post-Discharge-Stroke-Patient-Data/
```



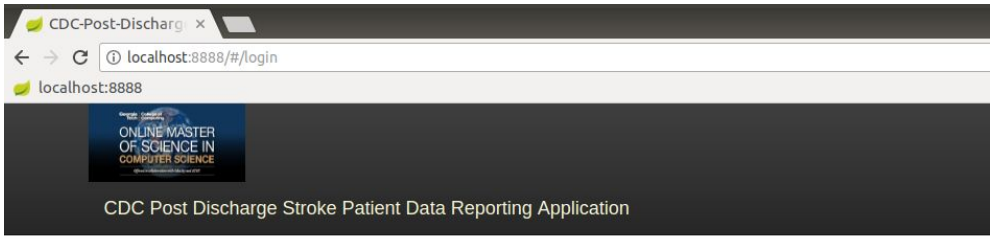
8. Start the application by entering the following command. Enter the student credentials (from step 6) when prompted:

```
sudo docker-compose up
```



9. Wait until you see the StrokeServiceApplication has started:

10. Open a web browser and type **`http://localhost:8888`** in the address bar. You will see the login page to the CDC Post Discharge Stroke Patient Data Reporting Application:



Using the Application

The CDC Post Discharge Stroke Patient Data Reporting Application has two types of user accounts - administrators and regular users (doctors, nurses, therapists). Administrators are able to upload, delete, and activate questionnaires. Regular users are able to view patients, view active questionnaires, and complete questionnaires. The following instructions can be used to navigate the application:

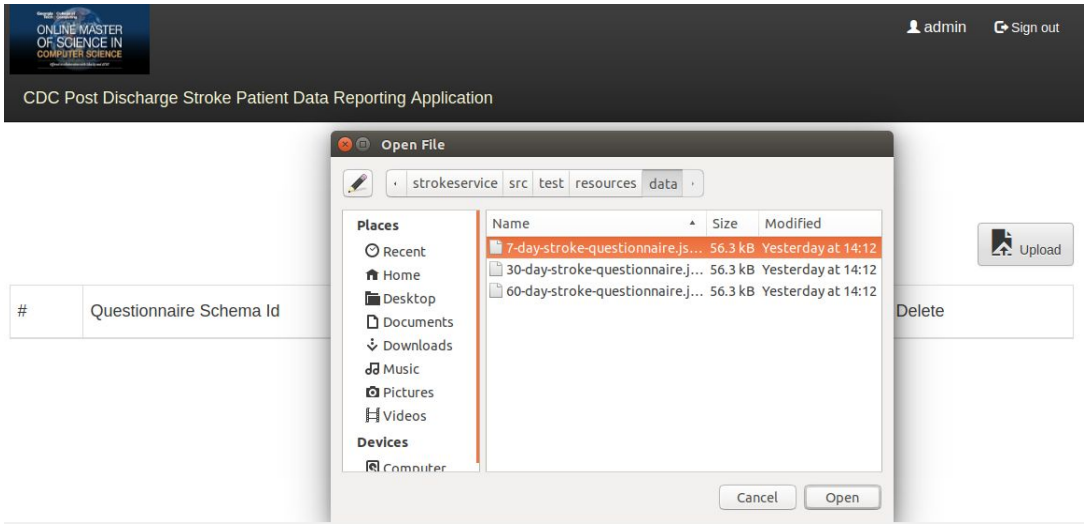
Administrator Accounts

1. Log in to the application using the following credentials:

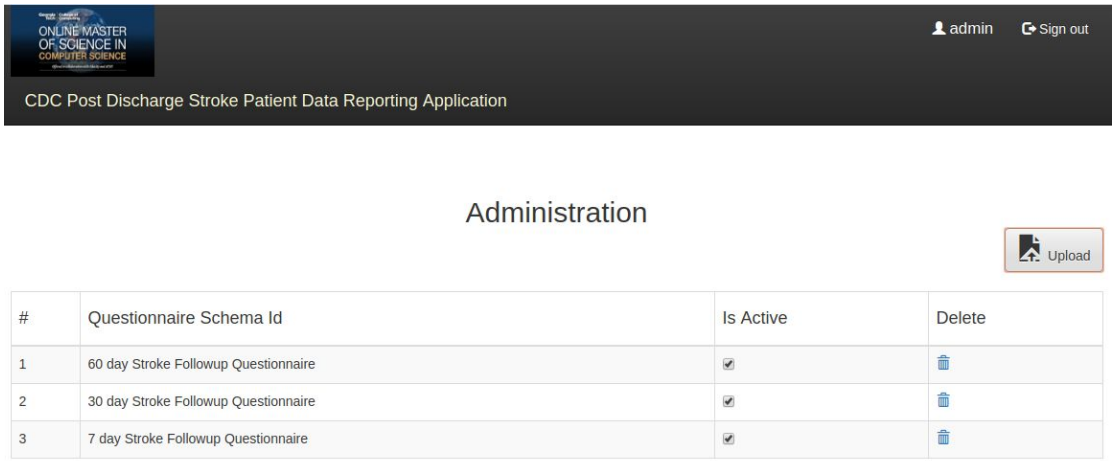
   ```
   username - admin
   password - password
   ```

2. To upload a questionnaire, click the Upload button on the right side then select a questionnaire and click Open. Example questionnaires to upload can be found here:

   ```
   CDC-Post-Discharge-Stroke-Patient-Data/strokeservice/src/test/resources/data/
   ```



3. You will see uploaded files now on the main Administration page. To delete a questionnaire, click the trash can icon on the right:



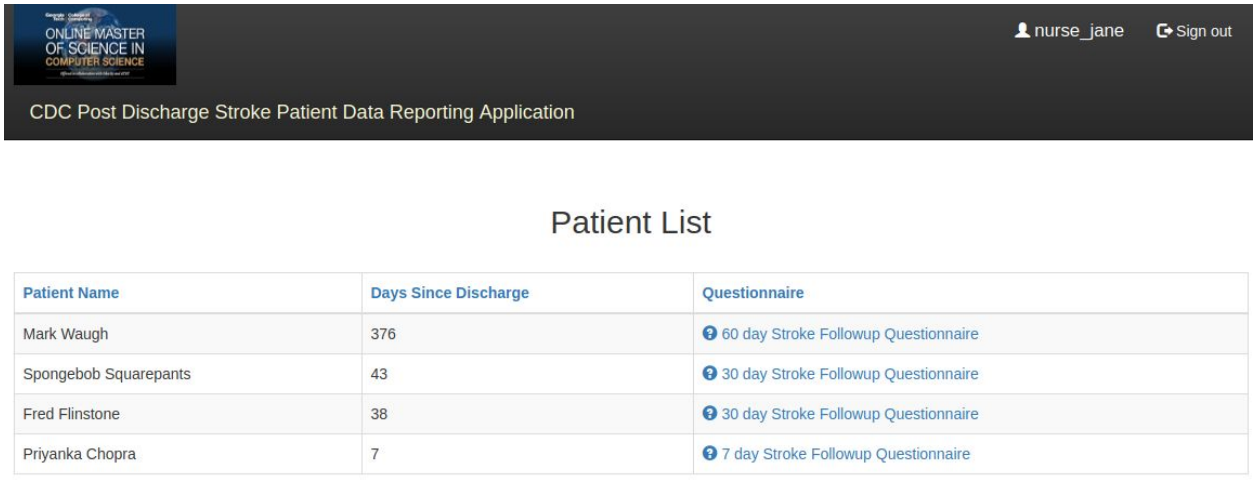
4. To sign out, click the Sign out button in the top right.

Regular User Accounts

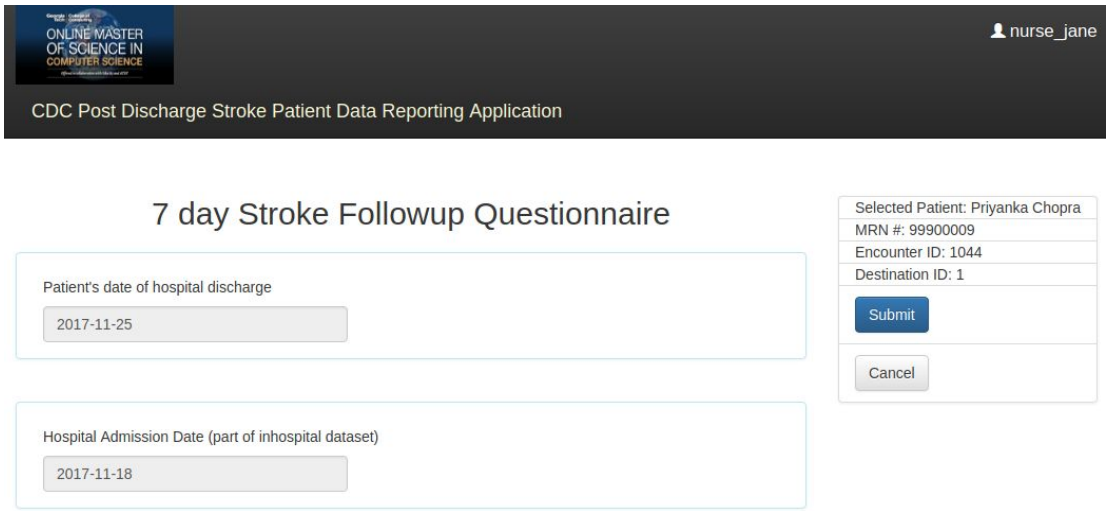
1. Log in to the application using the following credentials:

```
username - nurse_jane
password - password
```

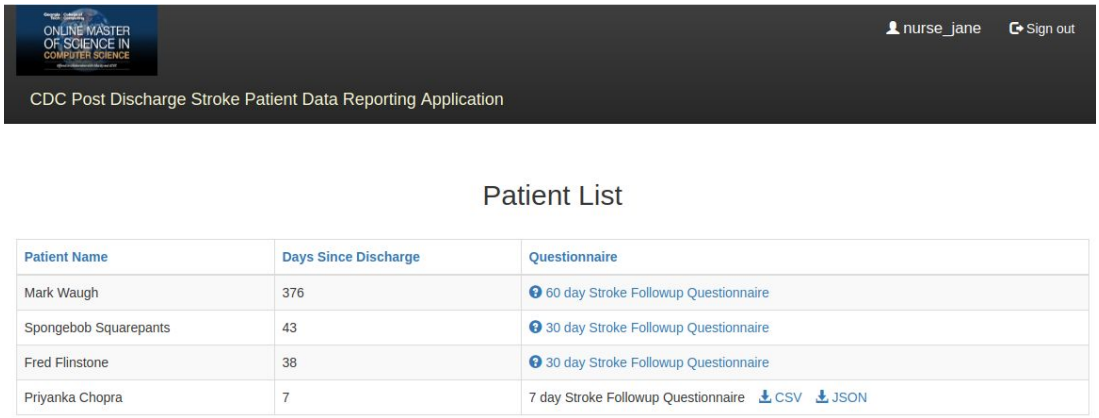
2. On the main Patient List screen, you will see a list of patients along with their corresponding, most-relevant questionnaire:



3. To complete a questionnaire, click on the questionnaire link and fill out the form. When complete, click Submit. The questionnaire will be saved in the database:



4. You will return to the main Patient List screen. Completed questionnaires will now be shown as links to either the completed .csv or .json file, while unfinished questionnaires are still shown as links:



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Source Code

Source code can be downloaded from:
https://github.gatech.edu/gt-hit-fall2017/CDC-Post-Discharge-Stroke-Patient-Data