

Web Technology – Mobile Platforms (MAPD712)
Project: Patient Data Mobile App with React-Native
Submitted to: Prof. Rania Arbash

By: Group - 3

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1. Introduction

The effective management of patient clinical data is not only necessary, but also a crucial component of offering high-quality healthcare services in today's quickly changing healthcare environment. In an effort to improve patient care and lighten administrative duties, hospitals and other medical facilities are increasingly turning to digital solutions to streamline and optimize their workflows. A substantial step towards attaining this objective has been made with the Patient Data REST API initiative.

1.1. Background

To manage patient information in the past, healthcare providers used paper-based records and fragmented systems. This method has frequently led to waste, delays, and the potential for mistakes in patient care. Electronic health records (EHRs) and modern technology have caused a paradigm change in the healthcare sector. The difficulty, though, is in successfully utilizing digital tools' power to offer easy access to patient data while protecting data security and privacy.

1.2. Scope

The design, creation, and deployment of a RESTful API service suited to the requirements of healthcare professionals, including doctors and nurses, are all included in the project's scope. The API enables the addition and retrieval of comprehensive clinical test results as well as general patient information. A critical patient identification tool is also included, which analyzes health indicators to identify patients with critical conditions.

The goal of the project is to strike a balance between scalability, data security, and user-friendliness. It seeks to provide a complete answer to the problems healthcare providers confront in effectively handling patient data.

2. Requirement analysis

A. User Authentication and Authorization:

- The ability for users (healthcare providers) to securely log in is required.
- Different user roles (such as doctors and nurses) ought to have different access levels and permissions.

B. Add Patient Information:

- General patient data, such as name, age, gender, contact information, and medical history, should be added by healthcare professionals.
- This information needs to be securely validated and stored by the system.

C. View Patient Information:

- Users should be able to do a search using patient identifiers and read the general information for a particular patient.

D. List All Patients Information:

- A list of each patient's general information, which can be paginated for convenience, should be provided via the API.

E. Add Clinical Tests for a Patient:

- The ability to input clinical test information for a single patient, including the date, time, type of data, and readings or values, is required.
- The data should be verified by the system, and it should be linked to the appropriate patient.

F. View Clinical Tests of a Patient:

- Users ought to have access to and be able to examine comprehensive clinical test data for a particular patient.
- The information must be structured and presented clearly.

G. Delete Patient Information:

- In order to comply with data privacy laws, healthcare providers should have the flexibility to erase patient information as needed.
- The deletion procedure must be secure and permanent.

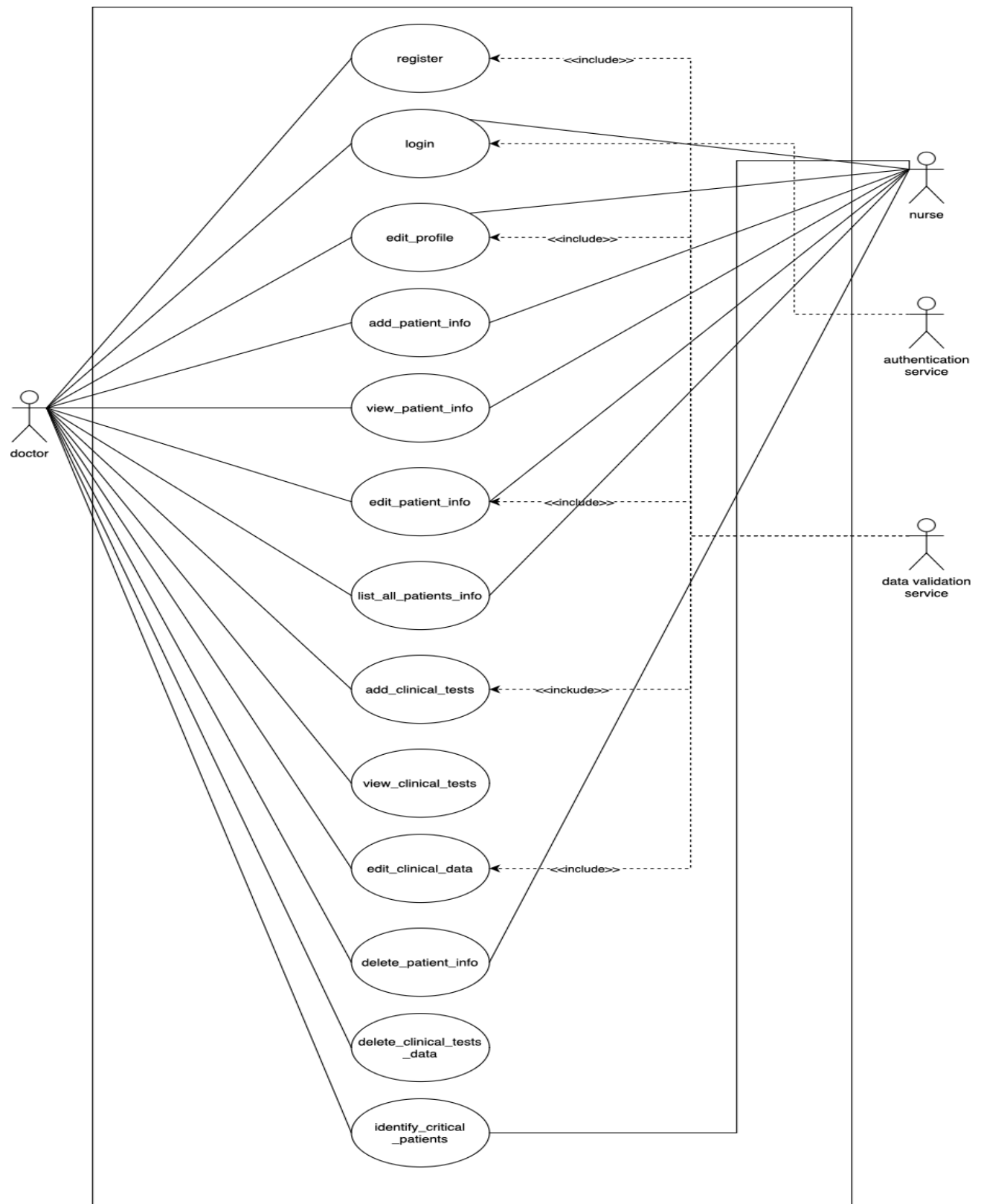
H. Delete Clinical Test Data:

- When appropriate, clinical test data for a single patient should be erasable by healthcare providers.
- Deletion must be carried out safely and with a log for auditing.

I. Identify critical patients:

- A component that allows the system to recognize patients in critical condition based on particular health parameter criteria, like blood pressure, should be included.
- Reliable and prompt identification of critical patients is required.

3. Use case Diagram



A. Use case descriptions

- **Login:**
 - **Actor:** Doctor, Nurse
 - **Description:** Allows healthcare providers to log into the system securely using their credentials.
- **Add patient info:**
 - **Actor:** Doctor, Nurse
 - **Description:** Enables healthcare providers to add general patient information, including name, age, gender, contact details, and medical history.
 - **Relationship:** <<include>> Data Validation: Includes data validation checks through the "Data Validation Service" to ensure correctness and data type compliance.
- **View patient info:**
 - **Actor:** Doctor, Nurse
 - **Description:** Allows healthcare providers to view the general information of a specific patient by searching using patient identifiers.
- **List all patient info:**
 - **Actor:** Doctor, Nurse
 - **Description:** Provides a list of all patients' general information for quick access. This can be paginated for easier navigation.
- **Add clinical tests:**
 - **Actor:** Doctor
 - **Description:** Permits doctor to add clinical test data for a specific patient, including date/time, type of data, and readings/values.
 - **Relationship:** <<include>> Data Validation: Includes data validation checks through the "Data Validation Service" to ensure correctness and data type compliance.
- **View clinical tests:**
 - **Actor:** Doctor
 - **Description:** Enables doctor to retrieve and review detailed clinical test data for a specific patient.
- **Delete patient info:**
 - **Actor:** Doctor, Nurse
 - **Description:** Allows healthcare providers to delete patient information if required. The deletion process should be secure and logged for auditing.
- **Delete clinical test data:**
 - **Actor:** Doctor
 - **Description:** Permits doctor to delete clinical test data for a specific patient when necessary. Deletion should be done securely and logged for auditing.

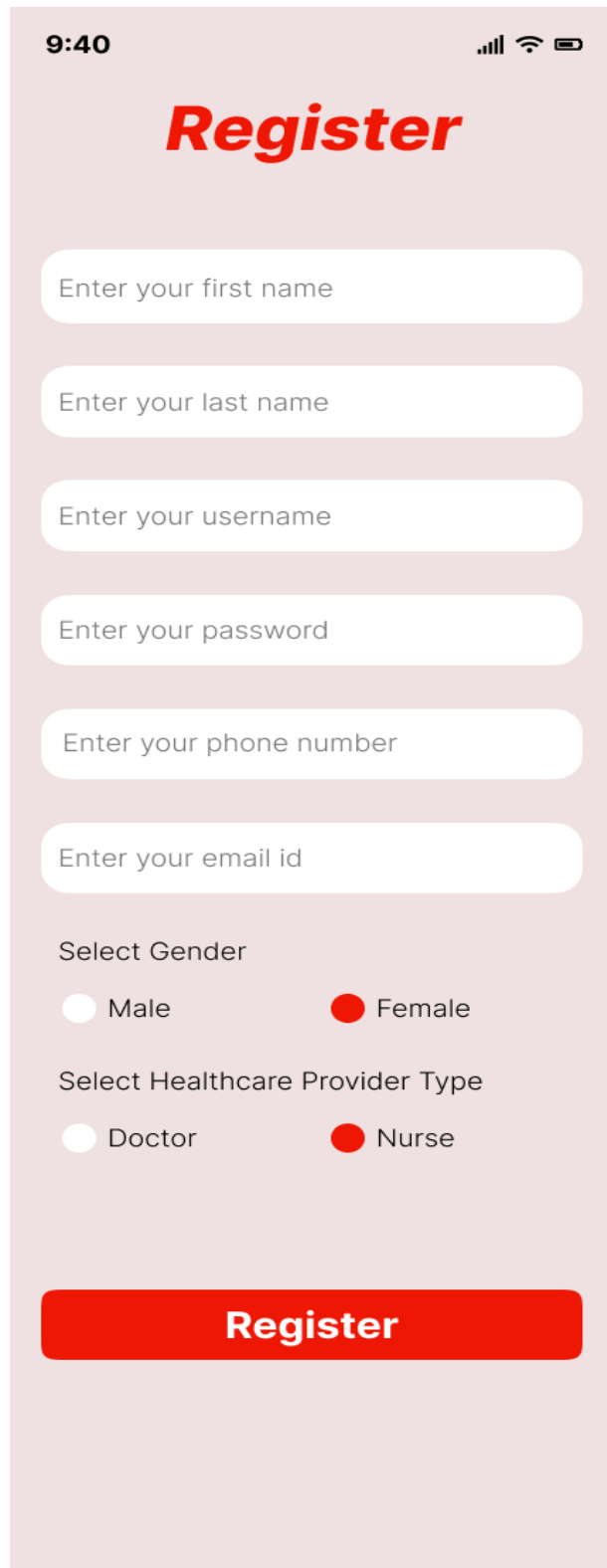
- **Identify critical patients:**
 - **Actor:** Doctor, Nurse
 - **Description:** The system has a feature to identify patients in critical condition based on specific health parameter criteria, such as blood pressure. Critical patient identification should be reliable and immediate.

4. Mockups

- **Mockup link:** <https://www.figma.com/proto/T15RHQKRQOVbWO5hcV5VjP/React-native?type=design&node-id=4-27&t=lhAmfU63DxqMZdo4-1&scaling=scale-down&page-id=0%3A1&mode=design>
- **Initial page:** This will be the first welcome page and after that welcome page will appear.



- **Registration page:** Here doctors will be able register themselves by entering their details.



A mobile application registration screen with a light pink background. At the top, the status bar shows the time 9:40, signal strength, Wi-Fi, and battery icons. The word "Register" is displayed in a large, bold, red, italicized font. Below it are six white rounded rectangular input fields with gray placeholder text: "Enter your first name", "Enter your last name", "Enter your username", "Enter your password", "Enter your phone number", and "Enter your email id". Under the email field, there are two sections for selection. The first is "Select Gender" with two radio buttons: "Male" (unselected) and "Female" (selected, indicated by a red dot). The second is "Select Healthcare Provider Type" with two radio buttons: "Doctor" (unselected) and "Nurse" (selected, indicated by a red dot). At the bottom is a large red rounded rectangular button with the word "Register" in white bold text.

9:40

Register

Enter your first name

Enter your last name

Enter your username

Enter your password

Enter your phone number

Enter your email id

Select Gender

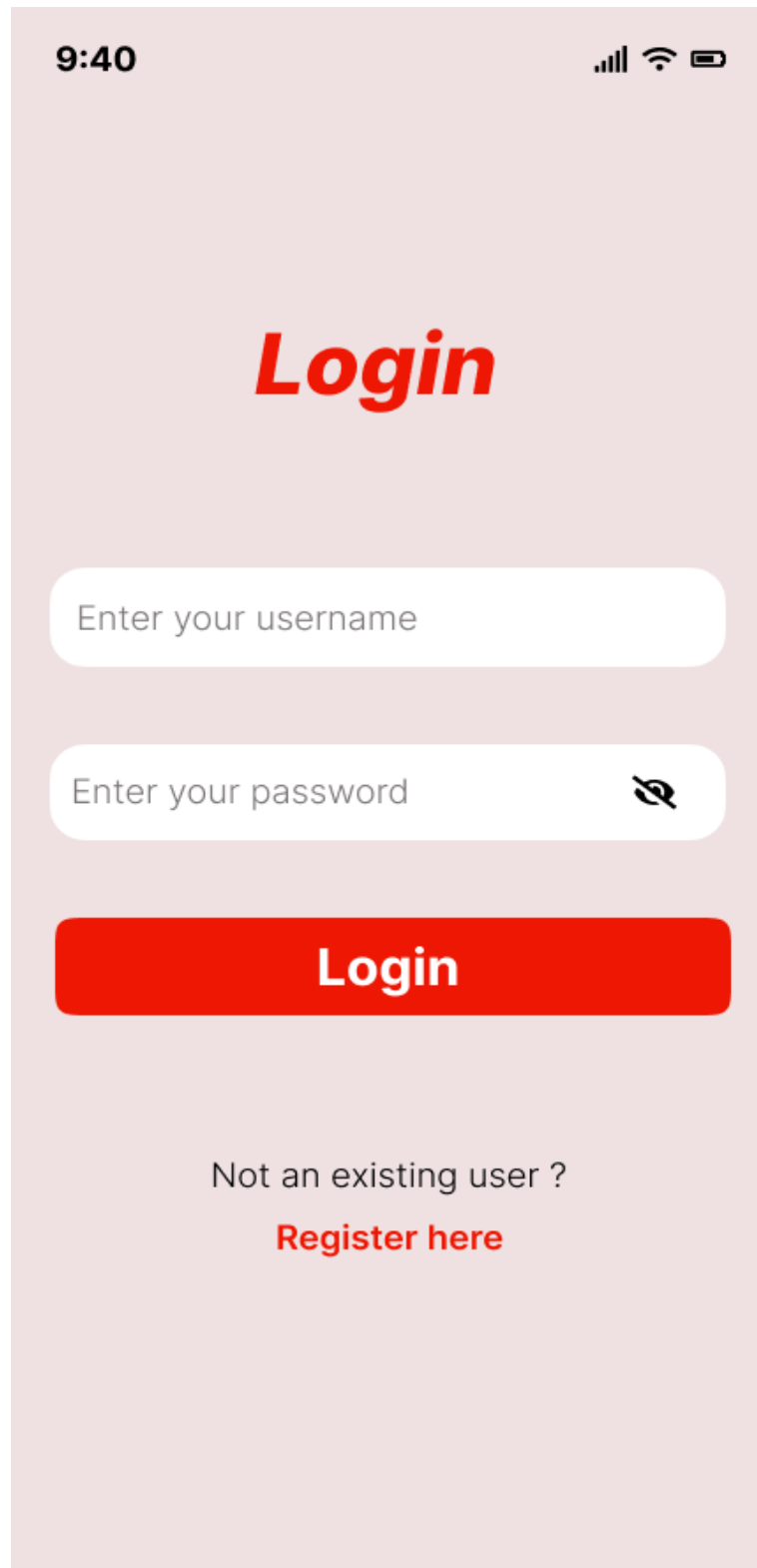
☐ Male ☒ Female

Select Healthcare Provider Type

☐ Doctor ☒ Nurse

Register

- **Login page:** After registration doctor or nurse will be able to login using this page or there this an option where they can go to registration page.



A mobile app login screen with a light pink background. At the top, the status bar shows the time 9:40, signal strength, Wi-Fi, and battery icons. The word **Login** is displayed in a large, bold, red, italicized font. Below it are two white input fields with rounded corners. The first field contains the placeholder text 'Enter your username'. The second field contains the placeholder text 'Enter your password' and a black eye icon on the right side. Below the input fields is a large red button with the word **Login** in white. At the bottom, the text 'Not an existing user ?' is displayed in a dark gray font, followed by the text **Register here** in a red font.

9:40

Login

Enter your username

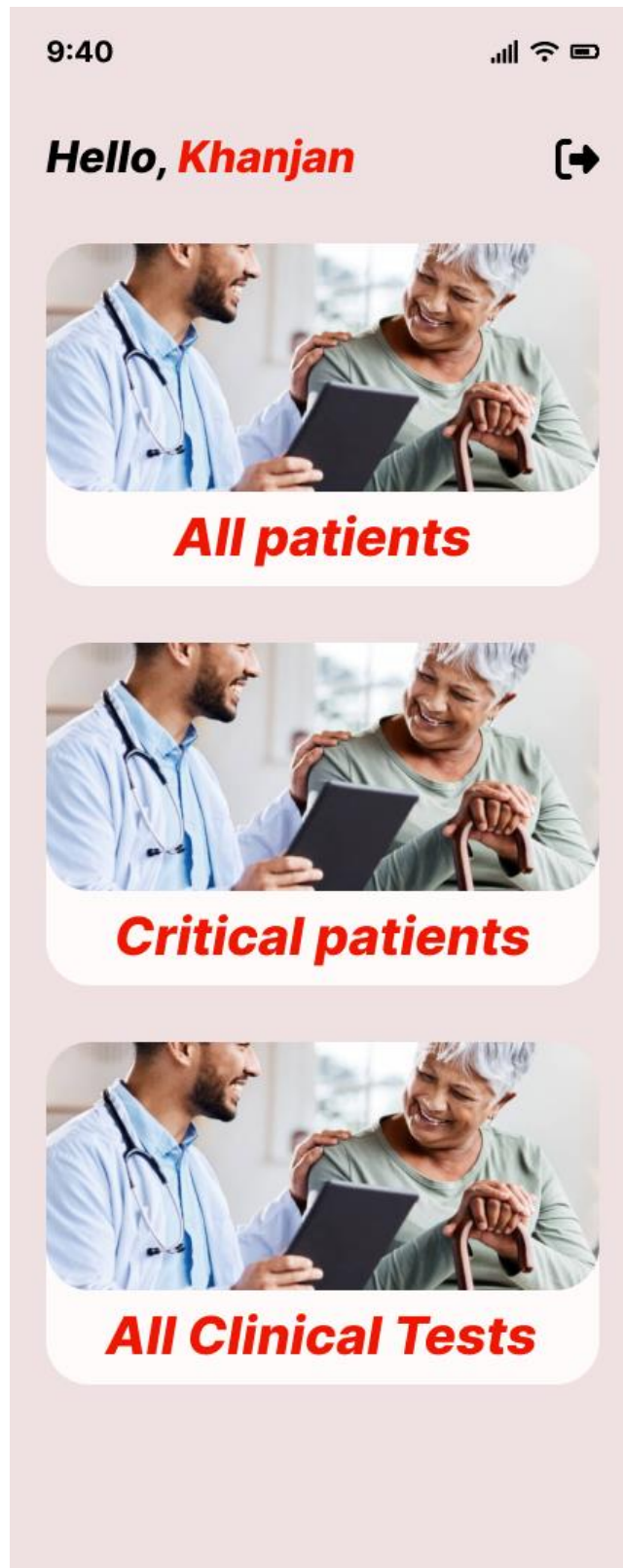
Enter your password

Login

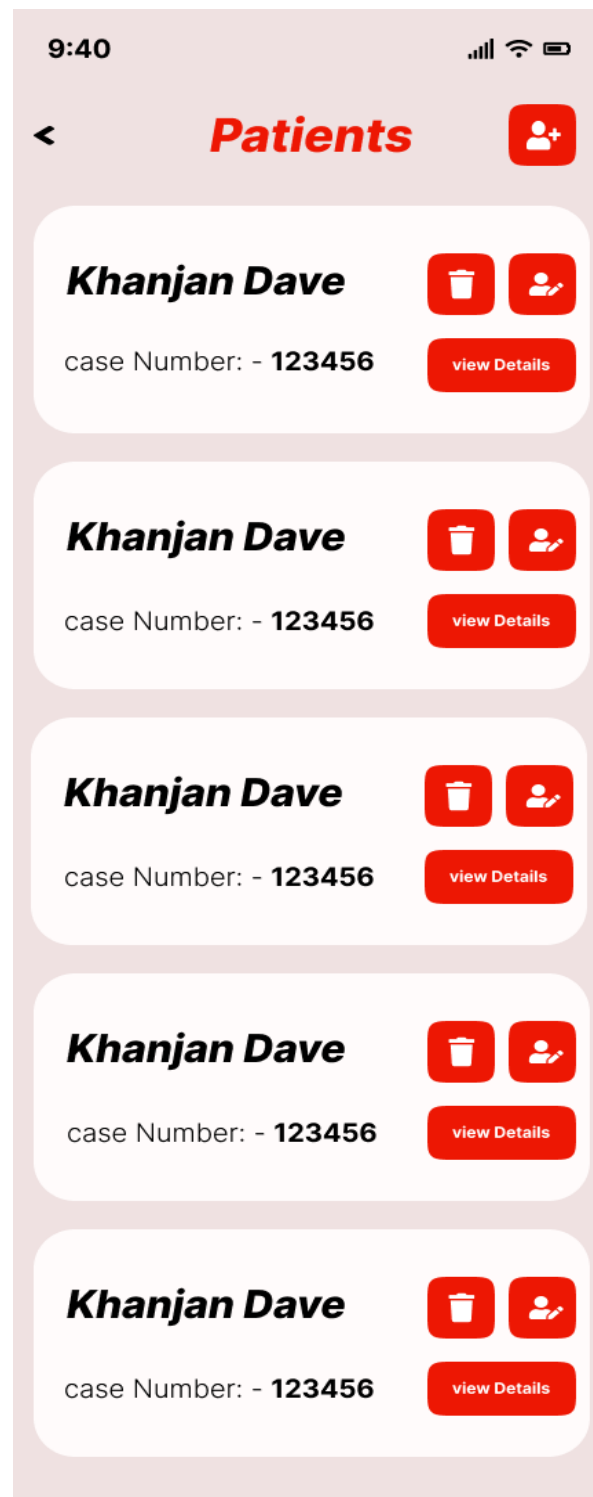
Not an existing user ?

Register here

- **Home page:** Here healthcare providers will be able to see the list where they can redirect to the list of all patients or critical patients and all clinical tests.



- **Patient lists:** From homepage after clicking on patients list, it will redirect to this page where list of all patients will be there and with that there will be options to edit patients details, delete patients information, or view all of their details.



- **Add patients:** Here healthcare providers will be able to add patients details using this form.

A mobile application interface for adding patient details. The screen has a light pink background. At the top, the status bar shows the time 9:40, signal strength, Wi-Fi, and battery icons. Below the status bar is a navigation bar with a back arrow and the title 'Add Patient Details' in red. The form consists of several white rounded rectangular input fields stacked vertically: 'Enter patient first name', 'Enter patient last name', 'Enter patient email address', 'Enter patient phone number', 'Enter patient weight in KG', 'Enter patient height in CM', and a larger 'Enter patient address' field. Below these fields is a 'Select Gender' section with two radio buttons: 'Male' (unselected) and 'Female' (selected). At the bottom of the form is a large red button with the text 'Add Details' in white.

9:40

< **Add Patient Details**

Enter patient first name

Enter patient last name

Enter patient email address

Enter patient phone number

Enter patient weight in KG

Enter patient height in CM


Enter patient address

Select Gender

☐ Male ☒ Female

Add Details

- **View patient details:** This is the page where healthcare providers will be able to see the patients details and they will have a button from which they can edit/update or delete the patients information.



A mobile application interface for viewing patient details. The screen has a light pink background. At the top, the status bar shows the time 9:40 and signal icons. Below the status bar, there is a back arrow icon and the title "Patient Details" in red. The patient's name "KHANJAN DAVE" is displayed in large, bold, black capital letters. Below the name, there is a list of patient details in a two-column format. At the bottom of the screen, there are two red buttons: one with a white icon of a person and a pencil (edit) and another with a white trash can icon (delete).

Case number: -	123456
Height: -	170 CM
Weight: -	80 KGs
Gender: -	Male
phone number: -	+ 1 (111) 111 1111
email address: -	abcd@gmail.com
Address : -	56 storey place, Markham, Ontario L3S 3B4

- **Edit patient details:** This is form for editing/updating the patients details.

A mobile application interface for editing patient details. The screen has a light pink background. At the top, the status bar shows the time 9:40, signal strength, Wi-Fi, and battery icons. Below the status bar is a navigation bar with a back arrow and the title 'Edit Patient Details' in red. The form consists of several white rounded rectangular input fields stacked vertically: 'Enter patient first name', 'Enter patient last name', 'Enter patient email address', 'Enter patient phone number', 'Enter patient weight in KG', 'Enter patient height in CM', and a larger 'Enter patient address' field. Below these fields is a 'Select Gender' section with two radio buttons: 'Male' (unselected) and 'Female' (selected). At the bottom of the form is a large red button with the text 'Update' in white.

9:40

< **Edit Patient Details**

Enter patient first name

Enter patient last name

Enter patient email address

Enter patient phone number

Enter patient weight in KG

Enter patient height in CM

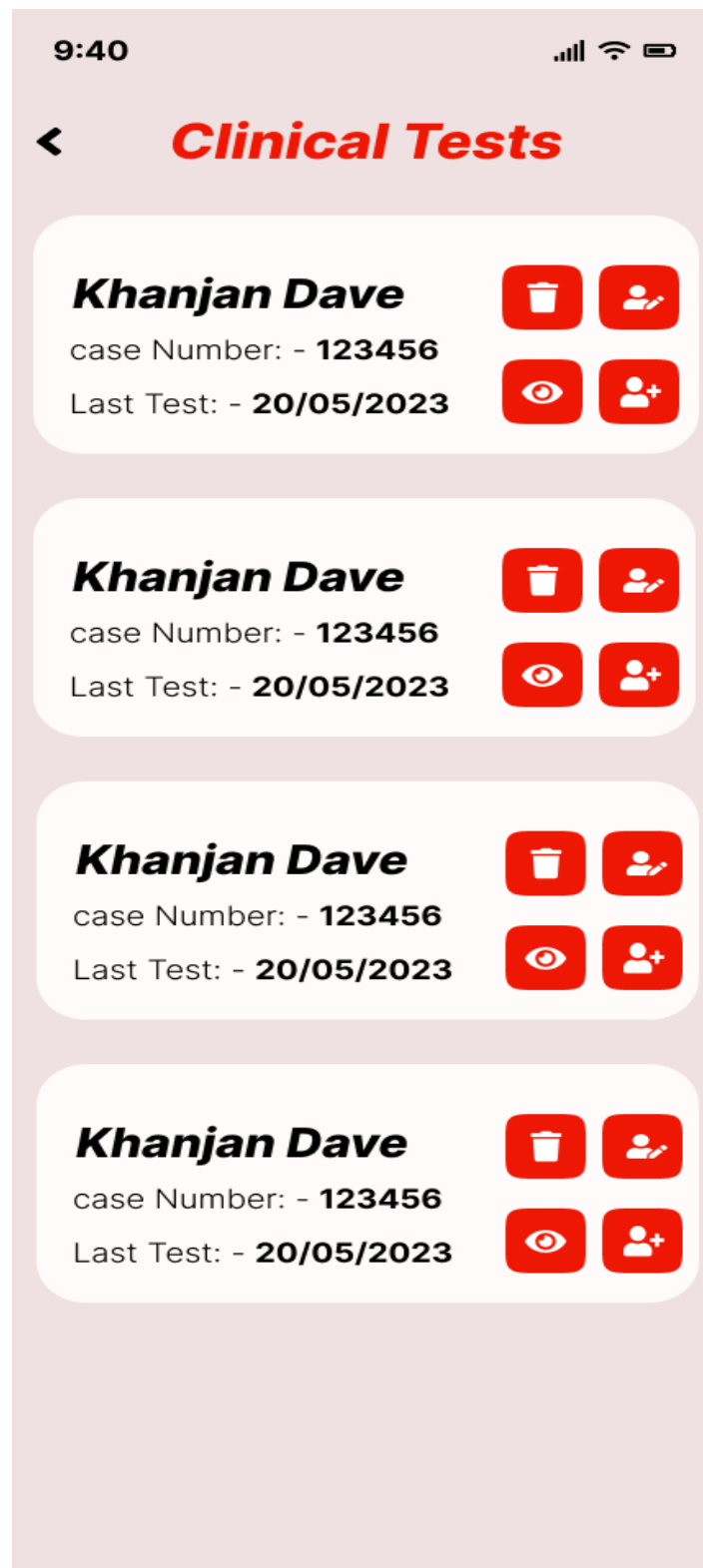
Enter patient address

Select Gender

☐ Male ☒ Female

Update

- **Clinical test list:** This page will contain the clinical test data of patients and doctor will be able to delete, edit/update, view the patients data. It will also have the details like case number and last test date.



- **Add clinical test:** Using this page, doctor will be able add the test details of specific patient and the patient name and case number will be auto generated.

The image shows a mobile application interface for adding clinical test details. At the top, the status bar displays the time 9:40 and signal icons. Below this is a header with a back arrow and the title "Add Test Details" in red. The form contains pre-filled patient information: "Patient name: - Khanjan Dave" and "case Number: - 123456". Below these are five input fields for clinical data: "Enter Blood Pressure (X/Y mmHg)", "Enter Respiratory Rate (X/min)", "Enter Blood Oxygen Level (X%)", "Enter Heartbeat Rate (X/min)", and "Patient's chief complaint". These are followed by three larger text areas for "Patient's past medical history", "medical diagnosis", and "medical prescription". At the bottom is a red button labeled "Add Details".

9:40

< **Add Test Details**

Patient name: - **Khanjan Dave**

case Number: - **123456**

Enter Blood Pressure (X/Y mmHg)

Enter Respiratory Rate (X/min)

Enter Blood Oxygen Level (X%)

Enter Heartbeat Rate (X/min)

Patient's chief complaint

Patient's past medical history

medical diagnosis

medical prescription

Add Details

- **Edit patient tests:** This form will be used for updating the patients clinical test data.

The screenshot shows a mobile application interface for editing patient test details. At the top, the status bar displays the time 9:40 and signal icons. The app header features a back arrow and the title 'Edit Test Details' in red. Below the header, the patient's name 'Khanjan Dave' and case number '123456' are listed. The form contains several input fields: 'Enter Blood Pressure (X/Y mmHg)', 'Enter Respiratory Rate (X/min)', 'Enter Blood Oxygen Level (X%)', and 'Enter Heartbeat Rate (X/min)'. These are followed by four larger text areas for 'Patient's chief complaint', 'Patient's past medical history', 'medical diagnosis', and 'medical prescription'. At the bottom, a red 'Update' button is visible.

9:40

< **Edit Test Details**

Patient name: - **Khanjan Dave**

case Number: - **123456**

Enter Blood Pressure (X/Y mmHg)

Enter Respiratory Rate (X/min)

Enter Blood Oxygen Level (X%)

Enter Heartbeat Rate (X/min)

Patient's chief complaint

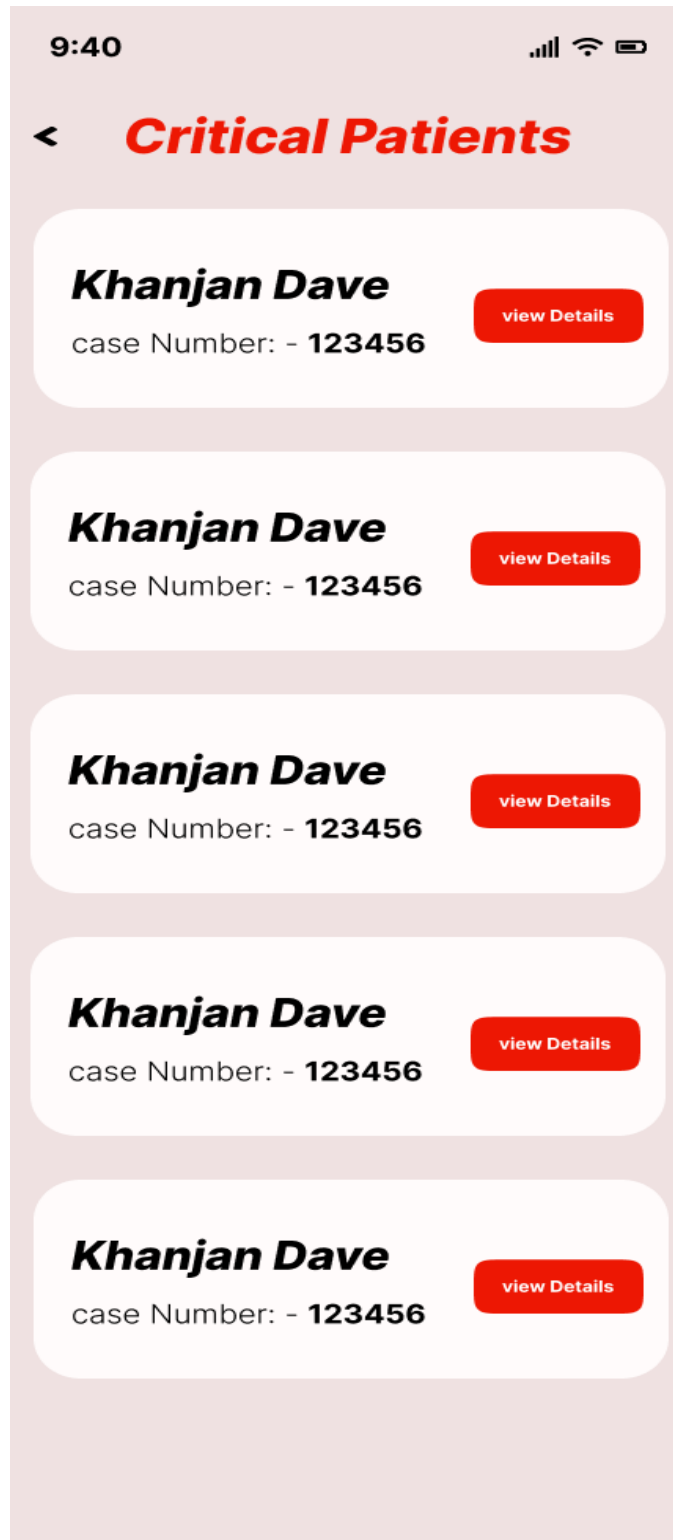
Patient's past medical history

medical diagnosis

medical prescription




Update


- **Critical patient list:** This list will be generated by filtering the blood pressure, respiratory rate, blood oxygen or heartbeat rate if any of these is high then that patients name and all details will appear here so that doctor can monitor critical patients.



- **Critical patient details:** This is how critical patients data will be show to the doctor.

9:40



 **Critical Patient Details**

KHANJAN DAVE

Case number: -

123456

Height: -

170 CM

Weight: -

80 KGs

Gender: -

Male

phone number: -

+ 1 (111) 111 1111

email address: -

abcd@gmail.com

Address : -

56 storey place,
Markham,
Ontario
L3S 3B4

Blood Pressure: -

130

Respiratory Rate: -

80

Blood Oxygen Level: -

80

Heart Rate: -

80

Gender: -

Male

Chief complaint: -

Headache and little
bit fever

Past Medical
History: -

Headache and little
bit fever

Medical Diagnosis: -

Headache and little
bit fever

Medical
Prescription : -

Headache and little
bit fever