



# BANGLADESH UNIVERSITY OF PROFESSIONALS

## FACULTY OF SCIENCE AND TECHNOLOGY

### DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING (CSE)

#### Use Case Diagram + UI

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Course Code : CSE-3206

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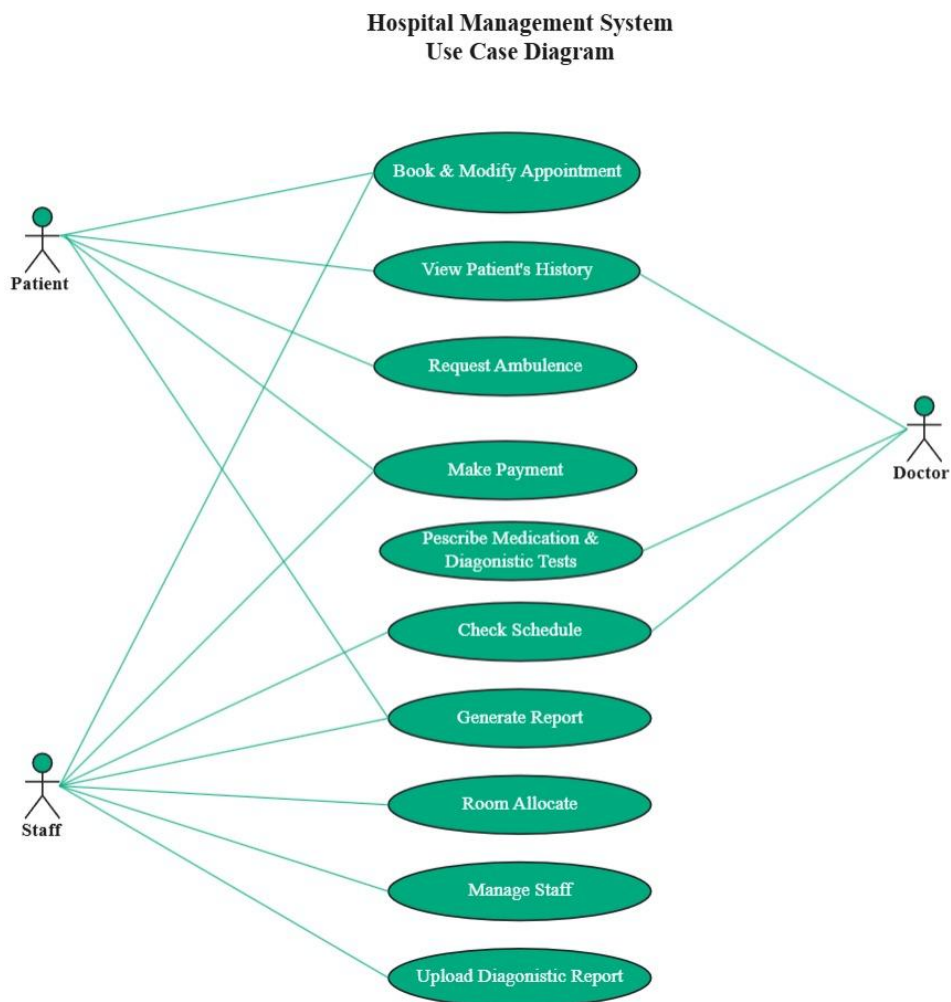
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Signature of Teacher

## Overview

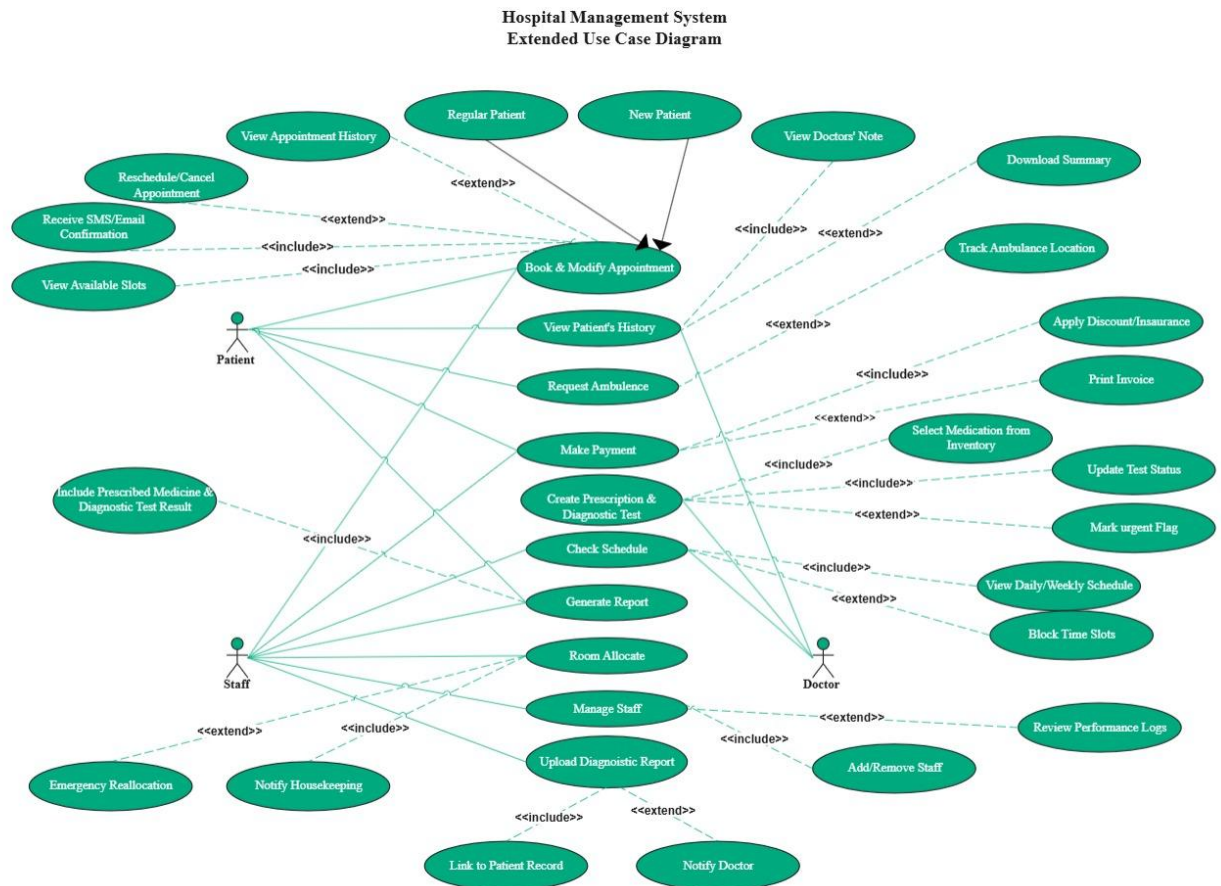
The Hospital Management System is designed to streamline healthcare operations by integrating patient management, clinical services, logistics, and administrative tasks into a unified platform. The use case diagrams serve as a visual blueprint that maps out all major functionalities and interactions between the system and its key external actors. Together, the diagrams emphasize both high-level system requirements and the nuanced relationships between various processes.

## Use Case Diagram



**Fig 1: Use Case Diagram**

## Extended Use Case Diagram



**Fig 2: Extended Use Case Diagram**

## Actors and Their Roles

1. **Patient** Patients interact with the system predominantly to manage their care. They are able to:
  - Book, modify, and cancel appointments.
  - View and update their appointment history.
  - Request emergency services such as ambulance support.
  - Make payments for services rendered.

- Access scheduled treatment plans and generate reports related to their medical records.
2. **Doctor** Doctors are central to clinical operations and use the system to:
- Access detailed patient histories and monitoring notes.
  - Prescribe medications and diagnostic tests.
  - Check and block time slots for consultations.
  - Download summary reports of patient visits and treatment outcomes.
  - Apply discounts or insurance adjustments as necessary.
  - Coordinate with medical teams through system notifications.
3. **Staff** Staff members, including administrative personnel and medical technicians, interact with the system by:
- Allocating rooms and scheduling patient admissions.
  - Uploading and linking diagnostic reports to patient profiles.
  - Managing hospital staff and overseeing room availability.
  - Reallocating resources in emergency situations.
  - Overseeing overall scheduling and report generation for hospital operations.

### **Functional Components and Use Cases**

Both diagrams collectively provide a thorough representation of the system's capabilities:

- **Appointment Management:** The system allows patients to schedule, view, modify, and cancel appointments. This functionality is crucial for coordinating visits and ensuring that both doctors and patients have access to updated schedules.
- **Emergency Services:** Patients can request ambulance services directly through the system, and staff can track the real-time status of ambulances. This extends the system's role from routine care to urgent, life-saving intervention.
- **Medical Documentation and Reporting:** Doctors and staff can generate comprehensive reports, manage treatment histories, and update diagnostic records. The process is facilitated by include and extend relationships that ensure all essential information is captured and readily available for decision-making.

- **Financial Transactions:** Integrated payment functionalities streamline billing processes. Patients can make payments online, while staff and doctors can apply and monitor discounts or insurance details when processing transactions.
- **Scheduling and Resource Allocation:** Beyond appointment management, the system is designed to support staff in allocating rooms, managing hospital resources, and ensuring efficient emergency reallocation during critical moments.

## Relationships and Process Dependencies

A key aspect of the diagrams is the depiction of relationships among various use cases:

- **Include Relationships:** Some use cases automatically invoke subsidiary processes. For instance, generating a report might include steps such as verifying patient details, updating medical histories, and linking diagnostic records.
- **Extend Relationships:** Optional processes or enhanced functionalities are depicted as extensions of a primary action. For example, while booking an appointment is the core function, the system may extend this process to include real-time notification of the doctor or automated reminders for the patient.

These relationships help in differentiating between the essential requirements and the optional enhancements of the system, ensuring that system designers and stakeholders have a clear framework to guide both development and future maintenance.

## Conclusion

The integrated use case diagrams provide a cohesive view of the Hospital Management System by highlighting all major interactions and the dependencies between processes. They illustrate a structured pathway for enhancing patient care, optimizing resource allocation, and ensuring efficient communication among all actors involved. By clearly delineating the responsibilities of patients, doctors, and staff, the diagrams support the objective of a responsive, reliable, and comprehensive healthcare management solution.

This documentation is intended to serve as a reference for developers, system architects, and hospital administrators, ensuring that every component of the system is designed, implemented, and maintained with a clear understanding of its role in the overall operational framework.

## Extended Use Case

### 1. Appointment Booking

Field	Details
Use Case	Appointment Booking
Actor(s)	Patient
Scenario	1. Patient logs into the system. 2. Navigates to the appointment booking module. 3. Selects a doctor and an available time slot. 4. Enters required details (reason for visit, contact info). 5. Submits the booking request. 6. System validates and confirms the appointment.
Exceptions	- Selected time slot is unavailable - Missing mandatory fields - System error or downtime
Preconditions	- Patient is registered and logged in - Doctor has available time slots
Post Conditions	- Appointment is booked and confirmed - A confirmation email/notification is sent - The selected time slot is marked as booked

### 2. Patient History Management

Field	Details
Use Case	Patient History Management
Actor(s)	Patient, Doctor, Medical Staff
Scenario	1. Authorized user logs into the system. 2. Navigates to the Patient History module. 3. Searches for and opens a patient record.

	4. Views complete medical history. 5. Optionally adds or updates history entries.
Exceptions	- Unauthorized access attempt - No existing records for a new patient - Database issues
Preconditions	- Patient record exists - User is authorized to access/edit the data
Post Conditions	- History displayed or updated - No records found” message for new patients

### 3. Staff Management

Field	Details
Use Case	Staff Management
Actor(s)	Admin, HR Staff
Scenario	1. Admin logs in 2. Navigates to Staff Management 3. Adds/Modifies/Removes staff records 4. Assigns roles and departments 5. Saves changes
Exceptions	- Missing details - Unauthorized modification - System error during save
Preconditions	- Admin is logged in
Post Conditions	- Staff records updated - Changes logged in audit trail

### 4. Room Allocation

Field	Details
Use Case	Room Allocation

Actor(s)	Receptionist, Hospital Admin
Scenario	<ol style="list-style-type: none"> <li>1. Receptionist logs in</li> <li>2. Searches for available rooms</li> <li>3. Selects and assigns a room</li> <li>4. Saves the allocation</li> </ol>
Exceptions	<ul style="list-style-type: none"> <li>- Room already occupied</li> <li>- System error during allocation</li> </ul>
Preconditions	<ul style="list-style-type: none"> <li>- Patient admitted</li> <li>- At least one room available</li> </ul>
Post Conditions	<ul style="list-style-type: none"> <li>- Room marked as “occupied” and linked to patient</li> </ul>

## 5. Medication Store Management

Field	Details
Use Case	Medication Store Management
Actor(s)	Pharmacist, Admin
Scenario	<ol style="list-style-type: none"> <li>1. Pharmacist logs in</li> <li>2. Reviews stock</li> <li>3. Adds/updates quantity, expiration</li> <li>4. Saves changes</li> </ol>
Exceptions	<ul style="list-style-type: none"> <li>- Stock over-dispensed</li> <li>- Invalid data entry</li> <li>- Inventory update failure</li> </ul>
Preconditions	<ul style="list-style-type: none"> <li>- User is authorized</li> </ul>
Post Conditions	<ul style="list-style-type: none"> <li>- Inventory updated</li> <li>- Low stock alerts triggered</li> </ul>



## 6. Diagnostic Services

Field	Details
Use Case	Diagnostic Services
Actor(s)	Doctor, Lab Technician
Scenario	1. Doctor orders a test 2. Order goes to lab 3. Technician performs and uploads results 4. Doctor reviews results
Exceptions	- Unauthorized access - System error during result upload
Preconditions	- Diagnostic order exists - User is authorized
Post Conditions	- Results stored and accessible in patient record

## 7. Role-Based Login

Field	Details
Use Case	Role-Based Login
Actor(s)	Admin, Doctor, Receptionist, Patient
Scenario	1. User opens login page 2. Enters credentials 3. System validates and assigns role 4. User redirected to dashboard
Exceptions	- Incorrect credentials - Unauthorized access attempts
Preconditions	- Valid user account exists

Post Conditions	<ul style="list-style-type: none"> <li>- User redirected to correct dashboard</li> <li>- Failed attempts show error</li> </ul>
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## 8. Ambulance Booking

Field	Details
Use Case	Ambulance Booking
Actor(s)	Patient, Hospital Staff
Scenario	<ol style="list-style-type: none"> <li>1. Accesses booking module</li> <li>2. Inputs location, contact, urgency</li> <li>3. Submits request</li> <li>4. System assigns ambulance</li> </ol>
Exceptions	<ul style="list-style-type: none"> <li>- No ambulance available</li> <li>- System booking error</li> </ul>
Preconditions	<ul style="list-style-type: none"> <li>- Emergency service active</li> <li>- Ambulance availability confirmed</li> </ul>
Post Conditions	<ul style="list-style-type: none"> <li>- Ambulance booked and dispatched</li> <li>- Notification sent</li> </ul>

## 9. Prescription Management

Field	Details
Use Case	Prescription Management
Actor(s)	Doctor, Pharmacist, Patient
Scenario	<ol style="list-style-type: none"> <li>1. Doctor logs in</li> <li>2. Enters medication, dosage, instructions</li> <li>3. Prescription sent to pharmacy and stored</li> </ol>
Exceptions	<ul style="list-style-type: none"> <li>- Invalid prescription</li> <li>- Medication unavailable</li> </ul>

Preconditions	- Valid consultation exists - Doctor is authorized
Post Conditions	- Prescription recorded - Pharmacy notified

## 10. Billing & Payment System

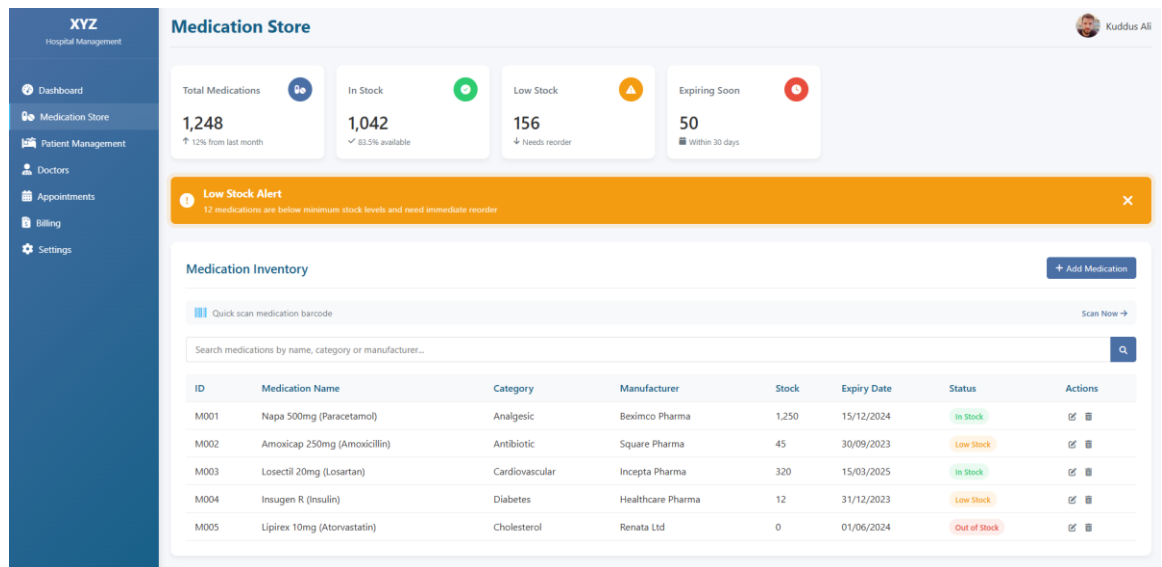
Field	Details
Use Case	Billing & Payment System
Actor(s)	Patient, Admin, Billing Staff
Scenario	1. Bill auto-generated post service 2. Patient views bill 3. Chooses payment method 4. Payment processed and receipt issued
Exceptions	- Payment gateway failure - Insufficient funds - Billing error
Preconditions	- Billing record exists - Payment method available
Post Conditions	- Payment marked "paid" - Receipt issued

# UI Design

## 1. Billing & Payment System (Mohaiminul Raju, 2252421020)



## 2. Medication Store (Shamoyeta Mourin Mouly, 2252421036)



### 3. Appointment Booking (Latifa Nishat Nishi, 2252421062)

**Patient Dashboard** Logout

**Book Appointment** My Appointments Doctor Schedule

**Book an Appointment**

Select Specialty:  
General Practitioner

Select Doctor:  
Dr. A (Mon, Wed, Fri) - Rating: 4.0

Select Date:  
dd - - - - - yyyy

Booking for Dependent? ☒

Dependent Name:

Available Slots:  
10:00 AM 11:00 AM 3:00 PM

**Confirm Appointment**

Patient Dashboard

Logout

Book Appointment

My Appointments

Doctor Schedule

My Appointments

ID	Date	Time	Doctor	Status	Actions
APT1	2025-06-15	10:00 AM	Dr. A (Mon, Wed, Fri) - Rating: 4.0	Scheduled	<div>CancelReschedule</div>
APT2	2025-06-20	2:30 PM	Dr. B (Tue, Thu, Sat) - Rating: 4.5	Rescheduled	<div>CancelReschedule</div>

Patient Dashboard

Logout

Book Appointment

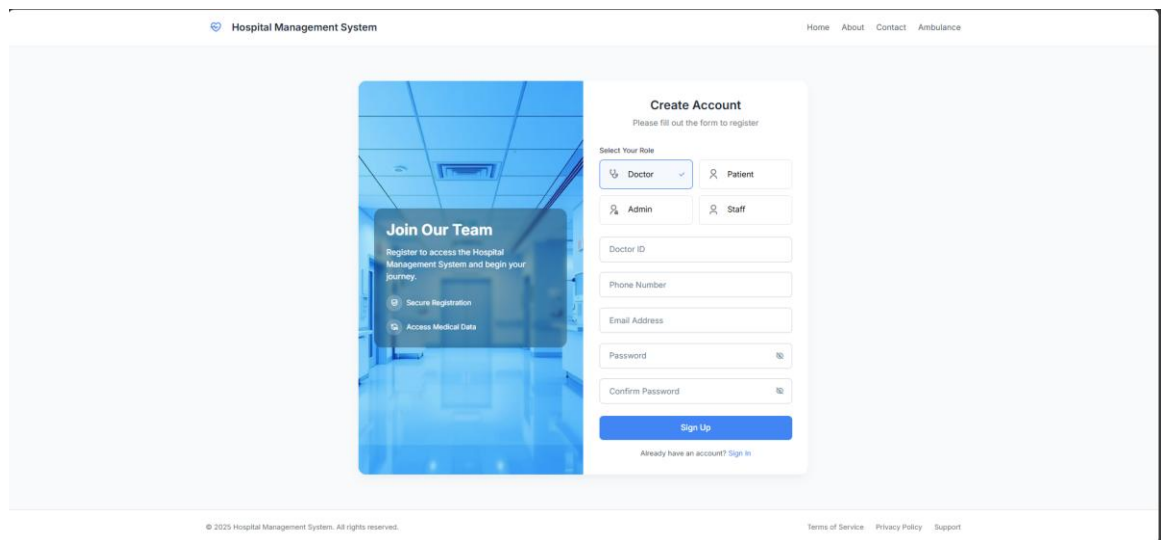
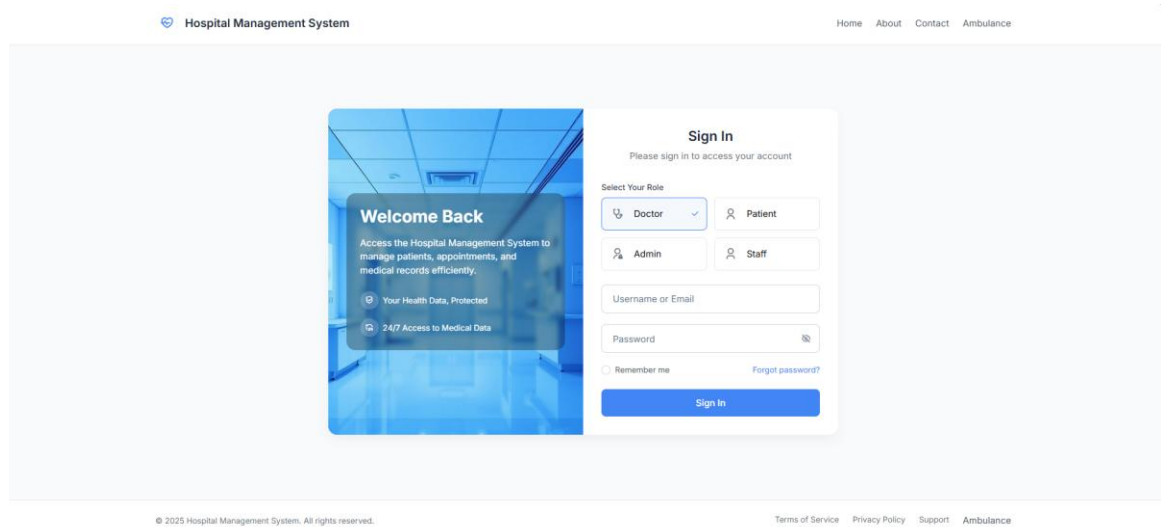
My Appointments

Doctor Schedule

Doctor Schedule

Doctor	Specialty	Available Days	Rating
Dr. A	General Practitioner	Mon, Wed, Fri	4.0
Dr. B	Cardiology	Tue, Thu, Sat	4.5
Dr. C	Dermatology	Mon, Thu, Sun	3.8

4. Role Based LogIn (Tahsina Tabassum Roza, 2252421084)



## 5. Staff Management (Raiyan Bin Sarwar, 2252421096)

Dashboard

All Employee

All Departments

Attendance

Leaves

Holidays

Settings

Light

Dark

All Employee

All Employee Information

Search

Raiyan

Employee Manager

Search

Add New Employee

Filter

Employee Name	Employee ID	Department	Designation	Type	Status	Action
Latifa Nishat	345321231	Surgery	General	Office	Permanent	<div><div></div><div></div><div></div></div>
Mohaiminul Islam	987890345	Internal Medicine	General	Office	Permanent	<div><div></div><div></div><div></div></div>
Shamoyeta Mourin	453367122	Gynecology	General	Office	Permanent	<div><div></div><div></div><div></div></div>
Tahsina Tabassum	345321231	Surgery	ENT	Office	Permanent	<div><div></div><div></div><div></div></div>

Showing

04

Showing 1 to 04 out of 20 records

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1

2

3

4

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