

# **Final Release Document**

# **HIV Clinic Management System**

Development Team

January 2025 — Ho Chi Minh City

## Record of Changes

| Version | Date       | A*M,<br>D | In charge           | Change Description   |
|---------|------------|-----------|---------------------|--|
| V1.0    | 07/01/2025 | A         | Development<br>Team | Initial Final Release document for<br>HIV Clinic Management System |

*\*A - Added M - Modified D - Deleted*

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# 1 Deliverable Package

This section lists all source programs, scripts, and documents included in the HIV Clinic Management System release.

| No. | File                                  | Notes  |
|-----|---------------------------------------|--|
| 1   | schema.sql                            | Database schema including table structures for all entities  |
| 2   | data.sql                              | Initial data including user accounts, roles, and sample data |
| 3   | RDS_Document_HIV_Clinic_Filled.tex    | Final Requirements and Design Specification Document         |
| 4   | SDS_HIV_Clinic_LaTeX.tex              | Final Software Design Specification Document                 |
| 5   | Project_Tracking_HIV_Clinic_LaTeX.tex | Complete project tracking with sprint iterations             |
| 6   | Issues_Report_HIV_Clinic_LaTeX.tex    | Final issues tracking report for the entire project          |
| 7   | pom.xml                               | Maven project configuration with dependencies                |
| 8   | package.json                          | Frontend dependencies and build configuration                |
| 9   | HivClinicBackendApplication.java      | Spring Boot main application class                           |
| 10  | Source Code (Backend)                 | Complete Spring Boot backend with REST API                   |
| 11  | Source Code (Frontend)                | Complete React frontend application                          |
| 12  | setup-database.bat                    | Database setup script for Windows                            |
| 13  | start-application.sh                  | Application startup script for Linux/-Mac                    |
| 14  | README.md                             | Project documentation and setup instructions                 |

## 1.1 Project Information

- **Project Name:** HIV Clinic Management System
- **Version:** 1.0.0
- **Release Date:** January 2025
- **Technology Stack:** Spring Boot 3.2.0, React 18.2.0, Microsoft SQL Server
- **Repository:** <https://github.com/ruskicoder/swp-hiv-clinic>

## 1.2 Other Related Deliverables

- **Source Code Repository:** <https://github.com/ruskicoder/swp-hiv-clinic>
- **Frontend Application:** <http://localhost:3000>

- **Backend API:** <http://localhost:8080/api>
- **Database:** Microsoft SQL Server (hiv\_clinic database)

## 2 Installation Guides

This section provides comprehensive installation instructions for setting up the HIV Clinic Management System.

### 2.1 System Requirements

| Component  | Version | Description                                  |
|------------|---------|--|
| Java JDK   | 17+     | Required for Spring Boot backend             |
| Node.js    | 18+     | Required for React frontend                  |
| Maven      | 3.9+    | Build tool for Java backend                  |
| SQL Server | 2019+   | Database server (Express edition acceptable) |
| Git        | Latest  | Version control system                       |

### 2.2 Backend Installation

#### 1. Clone the Repository:

```
git clone https://github.com/ruskicoder/swp-hiv-clinic.git
cd swp-hiv-clinic
```

#### 2. Configure Database:

- Install Microsoft SQL Server
- Create database named `hiv_clinic`
- Update connection string in `src/main/resources/application.properties`

#### 3. Run Database Setup:

```
# For Windows
setup-database.bat
```

```
# For Linux/Mac
chmod +x setup-database.sh
./setup-database.sh
```

#### 4. Build and Run Backend:

```
mvn clean install
mvn spring-boot:run
```

#### 5. Verify Backend Installation:

- Backend starts on port 8080
- Health check: <http://localhost:8080/api/health>
- API documentation: <http://localhost:8080/api>

## 2.3 Frontend Installation

### 1. Install Dependencies:

```
npm install
```

### 2. Configure Environment:

- Create `.env` file if needed
- Verify API endpoint configuration

### 3. Start Frontend:

```
npm run dev
```

### 4. Verify Frontend Installation:

- Frontend starts on port 3000
- Application available at: `http://localhost:3000`

## 2.4 Database Setup

### 1. Create Database:

```
CREATE DATABASE hiv_clinic;  
USE hiv_clinic;
```

### 2. Execute Schema:

- Run `src/main/resources/db/schema.sql`
- This creates all required tables and relationships

### 3. Load Initial Data:

- Run `src/main/resources/db/data.sql`
- This creates default user accounts and sample data

## 2.5 Quick Start Script

For easy deployment, use the provided startup script:

```
# Make script executable  
chmod +x start-application.sh
```

```
# Start both backend and frontend  
./start-application.sh
```

```
# Start only backend  
./start-application.sh backend
```

```
# Start only frontend
```

```
./start-application.sh frontend  
  
# Stop all services  
./start-application.sh stop
```

## 3 User Manual

This section provides comprehensive user guidance for the HIV Clinic Management System.

### 3.1 Overview

The HIV Clinic Management System is a comprehensive web application designed to manage HIV patient care, appointments, and treatment workflows. The system supports four main user roles with specific access levels and functionalities.

#### 3.1.1 System Architecture

- **Frontend:** React 18.2.0 single-page application
- **Backend:** Spring Boot 3.2.0 REST API
- **Database:** Microsoft SQL Server with normalized schema
- **Authentication:** JWT token-based security
- **Authorization:** Role-based access control (RBAC)

#### 3.1.2 User Roles

| Role    | Primary Functions          | Key Responsibilities  |
|---------|----------------------------|---|
| Patient | Personal health management | View appointments, manage profile, receive medication reminders   |
| Doctor  | Patient care delivery      | Manage appointments, update patient records, prescribe treatments |
| Admin   | System administration      | Manage users, system settings, full access to all features        |
| Manager | Clinic operations          | Oversee operations, generate reports, manage staff                |

### 3.2 Authentication and Access

#### 3.2.1 Login Process

1. Navigate to `http://localhost:3000`
2. Enter your username and password
3. Click "Login" button
4. System redirects to role-appropriate dashboard

### 3.2.2 Default User Accounts

| Role    | Username | Password   | Description                            |
|---------|----------|------------|--|
| Admin   | admin    | admin123   | System administrator with full access  |
| Doctor  | doctor1  | doctor123  | Test doctor account for demonstration  |
| Patient | patient1 | patient123 | Test patient account for demonstration |
| Manager | manager1 | manager123 | Test manager account for demonstration |

## 3.3 Patient Workflow

### 3.3.1 Patient Registration

1. Click "Register" on login page
2. Fill in personal information:
  - Username (unique)
  - Email address
  - Password (minimum 8 characters)
  - First and Last name
  - Contact information
3. Select "Patient" role
4. Submit registration form
5. Account activation (if required)

### 3.3.2 Appointment Booking

1. Login to patient dashboard
2. Click "Book Appointment"
3. Select preferred doctor from dropdown
4. Choose appointment date using calendar
5. Select available time slot
6. Add appointment notes (optional)
7. Confirm booking
8. Receive appointment confirmation



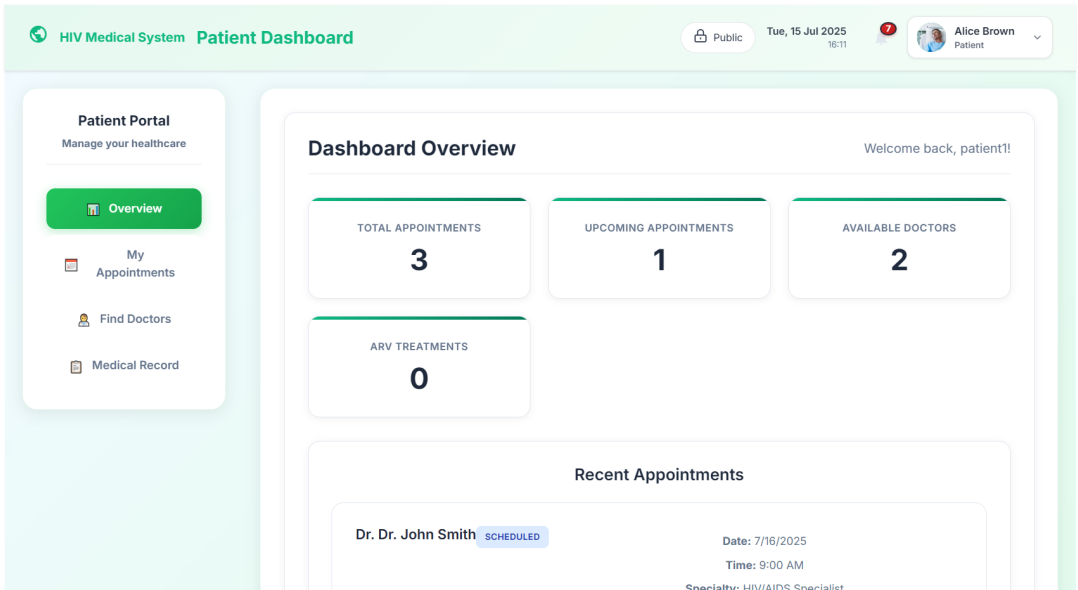


Figure 1: Patient Login Interface

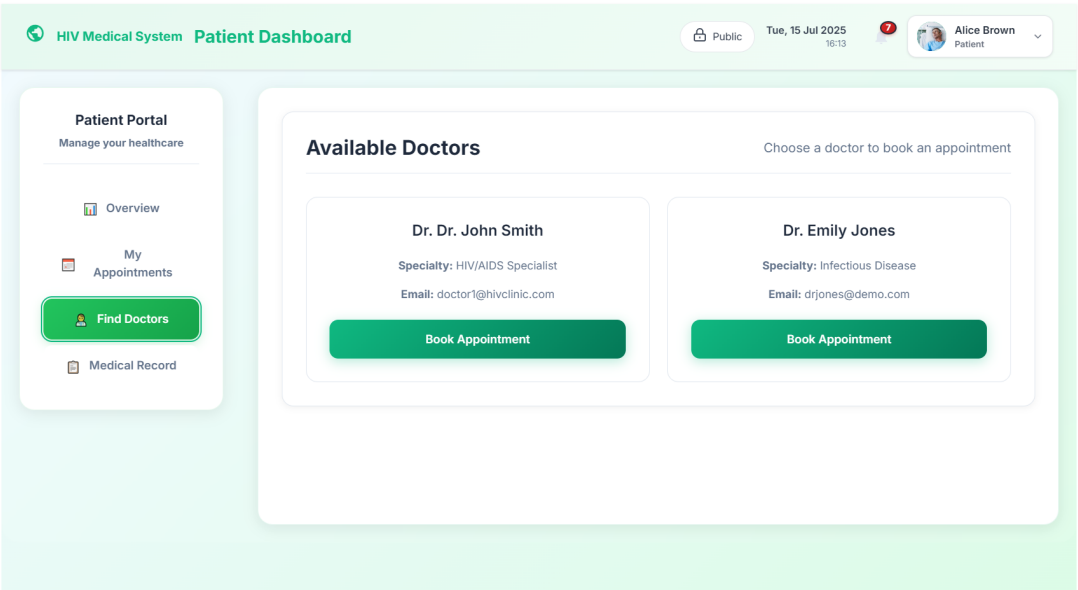


Figure 2: Patient Registration Interface

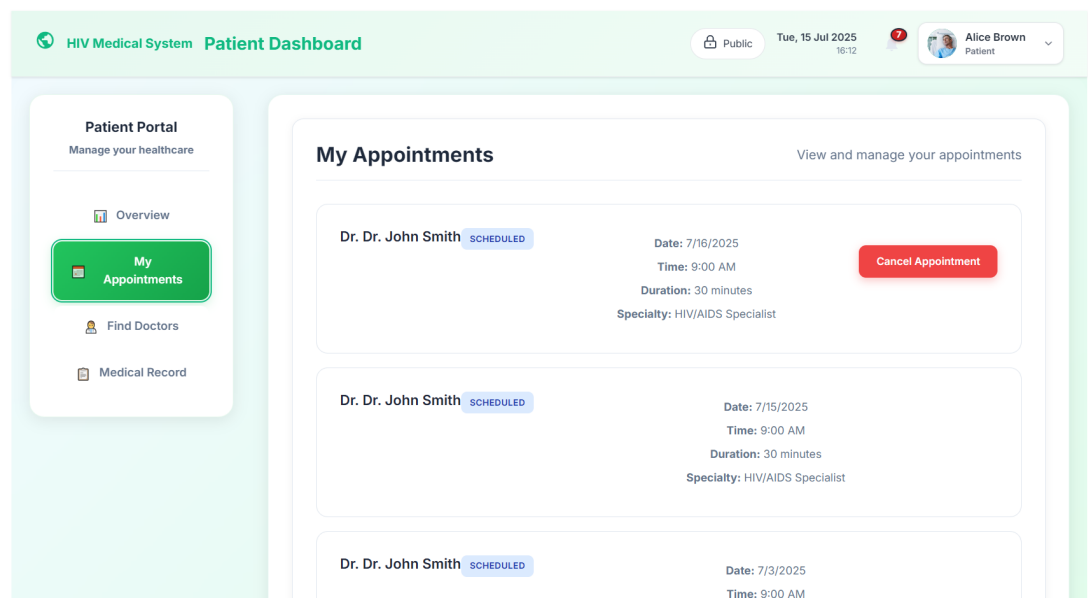


Figure 3: Patient Appointment Booking Interface

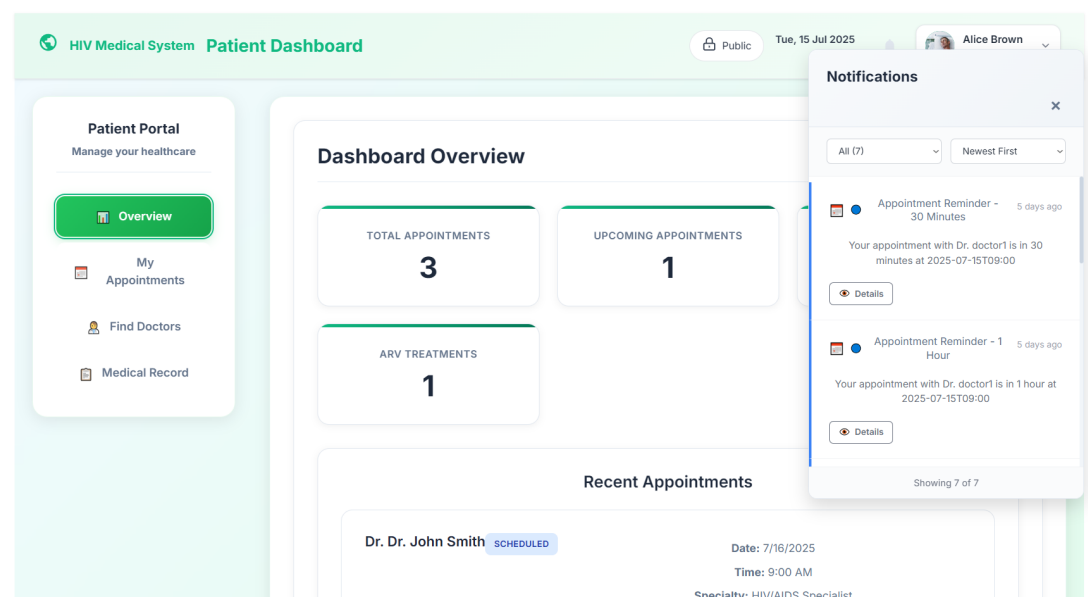


Figure 4: Patient Dashboard Interface

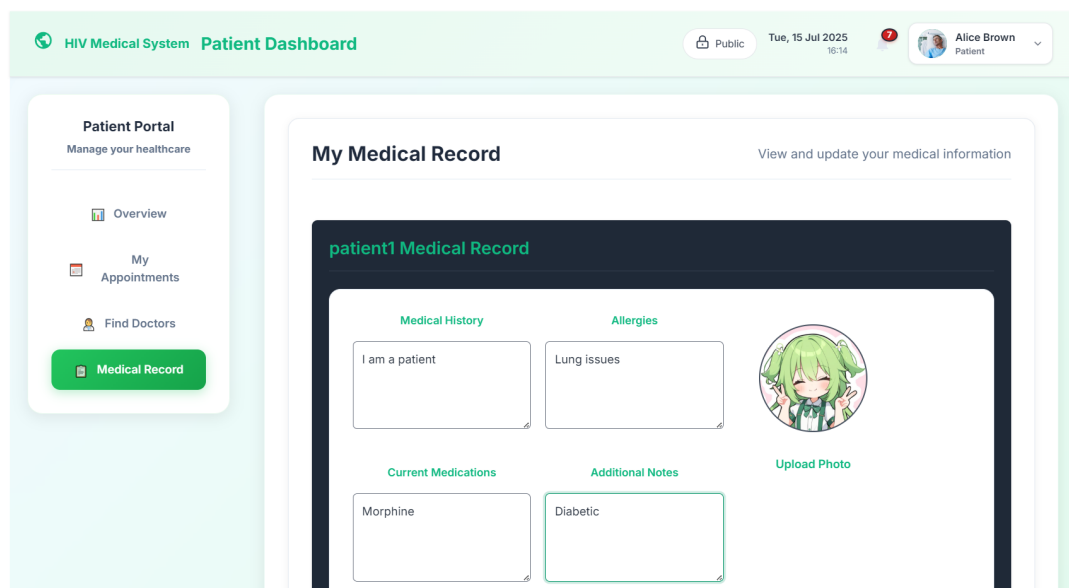


Figure 5: Patient Medical Records Interface

## 3.4 Doctor Workflow

### 3.4.1 Availability Management

1. Login to doctor dashboard
2. Click "Manage Availability"
3. Select dates for availability
4. Set time slots (start and end times)
5. Save availability schedule
6. View and edit existing slots

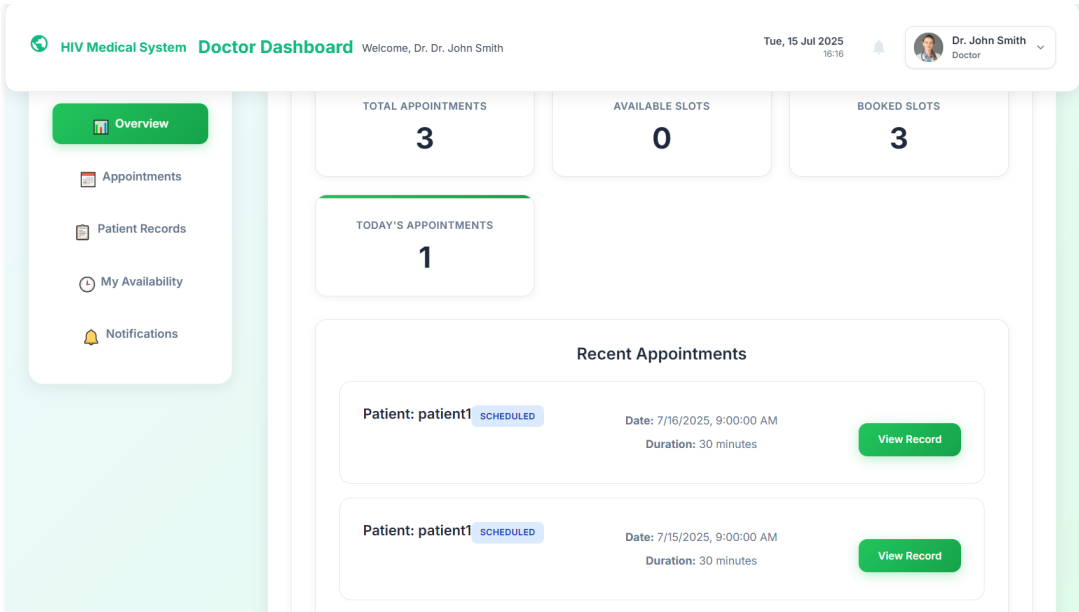


Figure 6: Doctor Login Interface

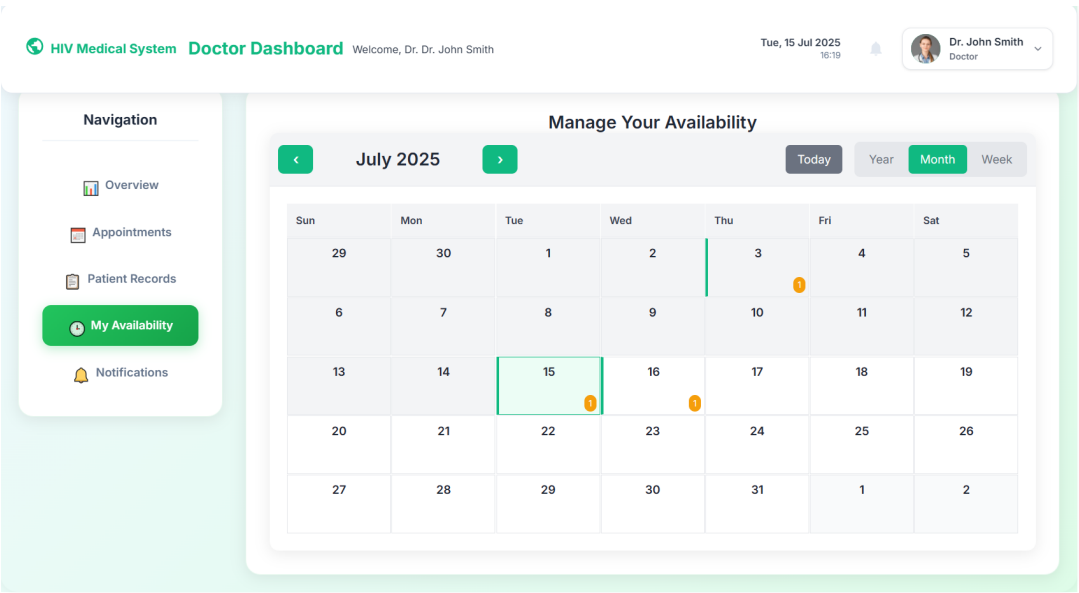


Figure 7: Doctor Availability Management Interface

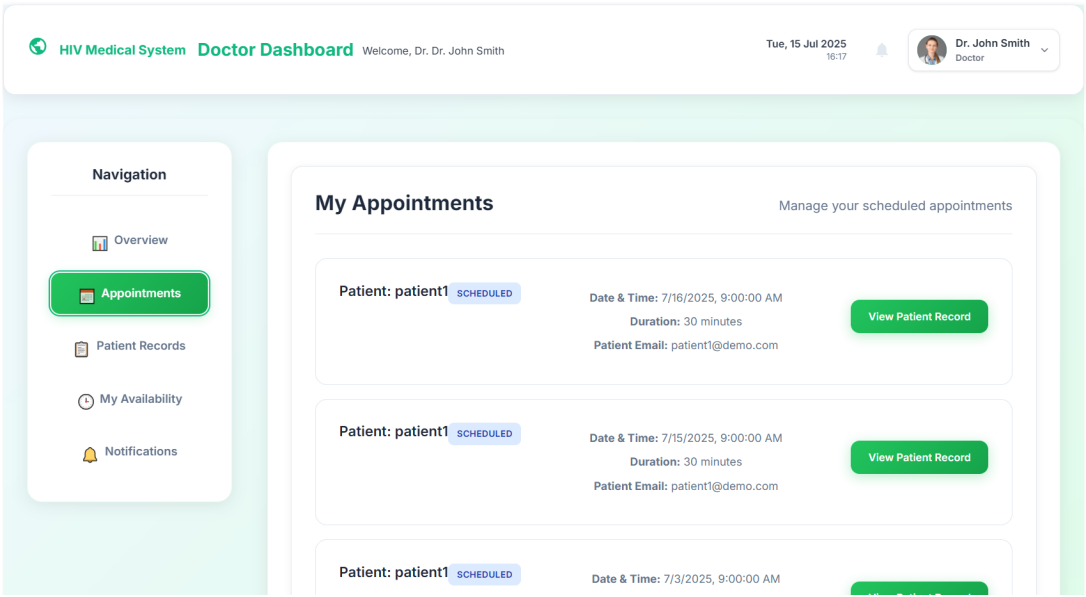


Figure 8: Doctor Dashboard Interface

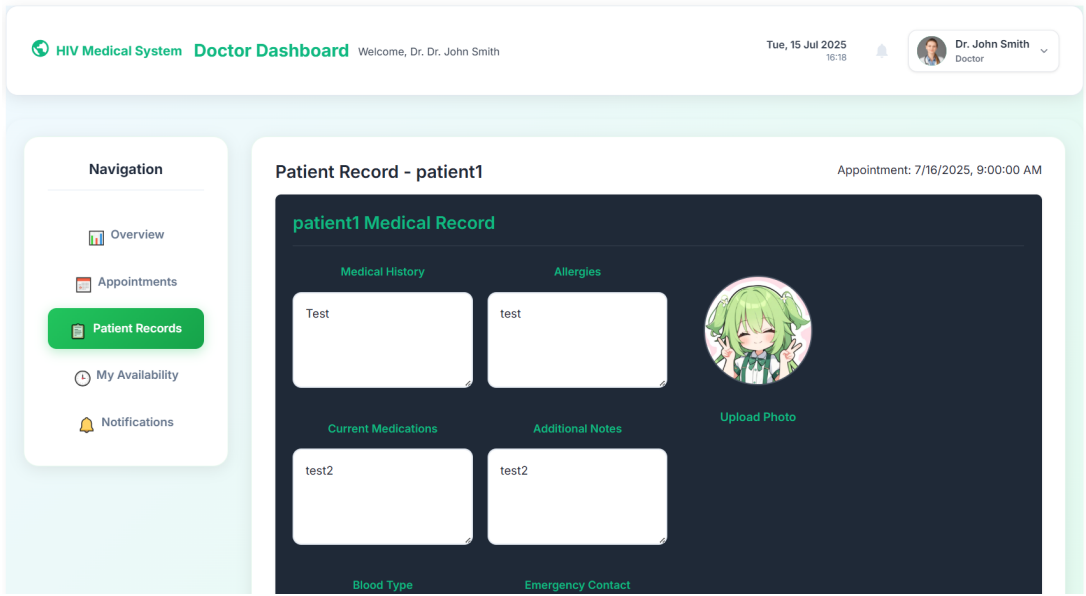


Figure 9: Doctor Patient View Interface

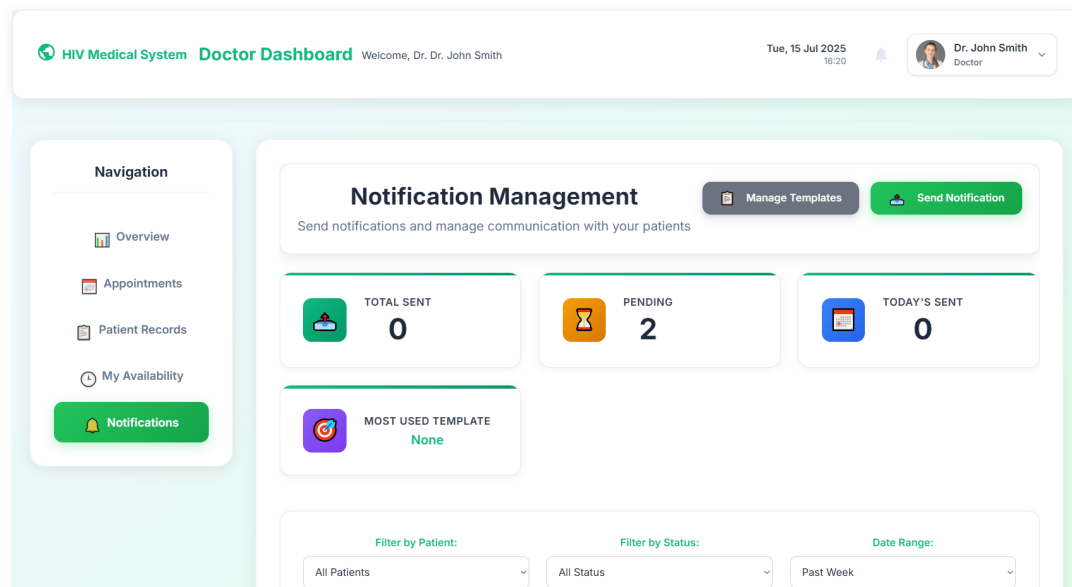


Figure 10: Doctor Treatment Management Interface

### 3.5 Administrative Functions

#### 1. User Management:

- Login as admin user
- Navigate to "User Management"
- View all system users
- Create new user accounts
- Modify user roles and permissions
- Deactivate or delete users
- Reset user passwords

#### 2. System Settings:

- Access "System Settings" menu
- Configure notification templates
- Set system-wide preferences
- Manage notification schedules
- Configure email settings
- Update system parameters

### 3.6 Notification System

#### 3.6.1 Appointment Reminders

The system automatically sends appointment reminders:

- 24 hours before appointment
- 1 hour before appointment
- 30 minutes before appointment

### 3.6.2 Medication Reminders

Patients receive daily medication reminders:

- Based on prescribed medication routines
- Customizable reminder times
- Adherence tracking
- Missed dose notifications

## 3.7 Security Features

### 3.7.1 Data Protection

- JWT token-based authentication
- Role-based access control
- Password encryption (BCrypt)
- Session timeout management
- Audit trail for all activities

### 3.7.2 Privacy Controls

- Patient-controlled data visibility
- HIPAA-compliant data handling
- Secure data transmission (HTTPS)
- Regular security audits
- Data backup and recovery

## 4 Troubleshooting

### 4.1 Common Issues

| Issue        | Cause               | Solution                                 |
|--------------|---------------------|--|
| Login failed | Invalid credentials | Check username/password, reset if needed |

|                           |                        |                                      |
|---------------------------|------------------------|--------------------------------------|
| Database connection error | SQL Server not running | Start SQL Server service             |
| Frontend not loading      | Backend not started    | Start backend service first          |
| Port already in use       | Service conflict       | Stop existing service or change port |
| API requests failing      | CORS configuration     | Check backend CORS settings          |

4.2 Support Information

- **Technical Support:** Check application logs for detailed error messages
- **Documentation:** Refer to README.md for additional setup instructions
- **Database Issues:** Verify SQL Server installation and configuration
- **Network Issues:** Check firewall settings and port availability

5 System Specifications

5.1 Technical Requirements

| Component        | Specification                       | Notes                            |
|------------------|-------------------------------------|----------------------------------|
| Operating System | Windows 10+, Linux, macOS           | Cross-platform compatibility     |
| Web Browser      | Chrome 90+, Firefox 88+, Safari 14+ | Modern browser required          |
| Memory           | 8GB RAM minimum                     | 16GB recommended for development |
| Storage          | 2GB available space                 | Additional space for database    |
| Network          | Internet connection                 | Required for some features       |

5.2 Performance Metrics

- **Response Time:** < 2 seconds for typical operations
- **Concurrent Users:** Supports 100+ concurrent users
- **Database Capacity:** Handles 10,000+ patient records
- **Uptime:** 99.9

6 Conclusion

The HIV Clinic Management System v1.0 provides a comprehensive solution for HIV patient care management. The system successfully implements all planned features



including appointment booking, patient record management, ARV treatment tracking, and automated notification systems.

Key achievements include:

- Secure role-based access control
- Comprehensive patient data management
- Automated appointment and medication reminders
- Intuitive user interfaces for all roles
- Robust database design with audit trails
- Scalable architecture for future enhancements

The system is ready for production deployment and can be extended with additional features as needed.