1. User

Attributes:
User_ID (PK), Username, Password_Hash, Email, Phone, Role, Created_At

Relationships:

- One-to-One with a Patient — a user can be a patient.
- A user serves as the authentication base for all system roles including patient, healthcare provider, and administrative users.
- One-to-Many with **Notification** — a user can receive multiple notifications.
-

2. Patient

Attributes:
Patient_ID (PK), User_ID (FK → User.User_ID), First_Name, Last_Name, Date_Of_Birth, Gender, Address, National_ID, Blood_Type

Relationships:

- One-to-One with **User** — each patient is linked to one user account.
- One-to-Many with **Appointment** — a patient can book multiple appointments.
- One-to-Many with **Medical_Record** — a patient can have multiple medical records.
- One-to-Many with **Check_In** — a patient can have multiple check-ins for appointments.

3. Healthcare Provider

Attributes:
Provider_ID (PK), Facility_ID (FK → Healthcare_Facility.Facility_ID), Name, Specialization, Licence_Number, Is_Available

Relationships:

- Many-to-One with **Healthcare_Facility** — each provider works in one facility.
- One-to-Many with **Appointment** — a provider can handle multiple appointments.

4. Healthcare Facility

Attributes:
Facility_ID (PK), Name, Address, Phone, Latitude, Longitude, Operating_Hours

Relationships:

- One-to-Many with **Healthcare_Provider** — a facility can have multiple healthcare providers.
- One-to-Many with **Appointment** — appointments are associated with a specific facility.

5. Appointment

Attributes:
Appointment_ID (PK), Patient_ID (FK → Patient.Patient_ID), Provider_ID (FK → Healthcare_Provider.Provider_ID), Facility_ID (FK → Healthcare_Facility.Facility_ID), Appointment_Date, Status, Type, Notes

Relationships:

- Many-to-One with a Patient — each appointment belongs to one patient.
- Many-to-One with **Healthcare_Provider** — each appointment is assigned to one provider.
- Many-to-One with **Healthcare_Facility** — each appointment is linked to a single facility.
- One-to-One with **Queue** — each appointment has one queue entry.
- One-to-Many with **Check_In** — each appointment can have one or more check-ins.

6. Queue

Attributes:
Queue_ID (PK), Appointment_ID (FK → Appointment.Appointment_ID), Position, Status, Join_Time, Estimated_Time

Relationships:

- One-to-One with **Appointment** — each appointment has one queue record.

---

7. Check_In

Attributes:
CheckIn_ID (PK), Patient_ID (FK → Patient.Patient_ID), Appointment_ID (FK → Appointment.Appointment_ID), CheckIn_Time, Method

Relationships:

- Many-to-One with a Patient — each check-in is linked to one patient.

- Many-to-One with **Appointment** — each check-in corresponds to a specific appointment.

8. Notification

Attributes:
Notification_ID (PK), User_ID (FK → User.User_ID), Type, Message, Sent_At, Is_Read, Channel

Relationships:

- Many-to-One with **User** — each notification is sent to one user.

9. Medical Record

Attributes:
Record_ID (PK), Patient_ID (FK → Patient.Patient_ID), Visit_Date, Diagnosis, Prescription, Notes

Relationships:

- Many-to-One with a Patient — each medical record belongs to one patient.

Relationship Summary Table

Relationship	Description
User → Patient	One user corresponds to one patient record
User → Notification	One user can have many notifications
Facility → Provider	One facility employs many healthcare providers
Provider → Appointment	One provider manages many appointments
Facility → Appointment	One facility hosts many appointments
Patient → Appointment	One patient can book multiple appointments
Appointment → Queue	One appointment is linked to one queue record
Appointment → Check-In	One appointment can have multiple check-ins
Patient → Medical Record	One patient can have multiple medical records