Normalization is the process of organizing data in a relational database so that it is free from redundancy and dependency. The goal of normalization is to reduce data anomalies, improve data consistency and integrity, and simplify database maintenance.

To normalize the ERD that you created for the hospital database, you would typically follow a set of guidelines known as Normal Forms. Here's how you might apply these guidelines to your ERD:

1. First Normal Form (1NF)

* Each table should have a primary key column that uniquely identifies each row.
* Each column should contain atomic values (i.e., indivisible).
* Example: All tables in the ERD have a primary key column that uniquely identifies each row, and all columns contain atomic values.

1. Second Normal Form (2NF)

* Each non-key attribute should depend on the entire primary key, not just part of it.
* If a table has a composite primary key, all non-key attributes should depend on the entire composite key.
* Example: All tables in the ERD have single-column primary keys, so there is no partial dependency.

1. Third Normal Form (3NF)

* Each non-key attribute should depend only on the primary key, not on any other non-key attribute.
* Example: All tables in the ERD have non-key attributes that depend only on the primary key.

1. Higher Normal Forms (4NF, 5NF)

* These normal forms deal with multi-valued dependencies and join dependencies, which may not be relevant to the hospital database ERD.

Based on these guidelines, the tables in the ERD should already be in at least 3NF. However, depending on the specific requirements of your hospital database, you may need to further normalize or deformalize the schema to optimize performance or simplify data access.

**Following are the normalization steps:**

1. First Normal Form (1NF):
   * Each column should have atomic values. This means that a single column should not contain multiple values or data elements.
   * Convert multivalued attributes to individual attributes.
2. Second Normal Form (2NF):
   * All non-key attributes should be dependent on the primary key.
   * Remove partial dependencies from the tables.
3. Third Normal Form (3NF):
   * All non-key attributes should be independent of each other.
   * Remove transitive dependencies from the tables.

**The final normalized tables will be:**

1. Patient (PK: PatientID)

* FirstName
* LastName
* Birthdate
* Phone
* Email

1. Doctor (PK: DoctorID)

* FirstName
* LastName
* Specialty
* Phone
* Email

1. Ward (PK: WardID)

* Type
* CountOfRooms

1. Nurse (PK: NurseID)

* FirstName
* LastName
* Type
* Phone
* Email
* DoctorID (FK to Doctor table)
* WardID (FK to Ward table)

1. Room (PK: Room\_no)

* Type
* NumberOfBeds
* WardID (FK to Ward table)

1. Procedure (PK: ProcedureID)

* Name
* Cost
* Description

1. Admission (PK: AdmissionID)

* Admitted
* AdmitDate
* ReleaseDate
* Diagnosis
* DoctorID (FK to Doctor table)
* PatientID (FK to Patient table)
* Room\_no (FK to Room table)

1. Prescription (PK: PrescriptionID)

* Date
* DoctorID (FK to Doctor table)
* PatientID (FK to Patient table)
* ProcedureID (FK to Procedure table)

Explanation:

* Patient, Doctor, Ward, Nurse, Room, Procedure, and Prescription tables are in 3NF as they contain only non-transitive functional dependencies.
* The Admission table is in 2NF as it contains a partial dependency on Room\_no. The Room\_no column is removed from the Admission table and placed in a separate Room table.
* The Admission table is still not in 3NF because it contains a transitive dependency on DoctorID through PatientID. This is resolved by moving DoctorID to the Admission table.
* The Prescription table is in 1NF, 2NF, and 3NF as it contains only non-transitive functional dependencies.