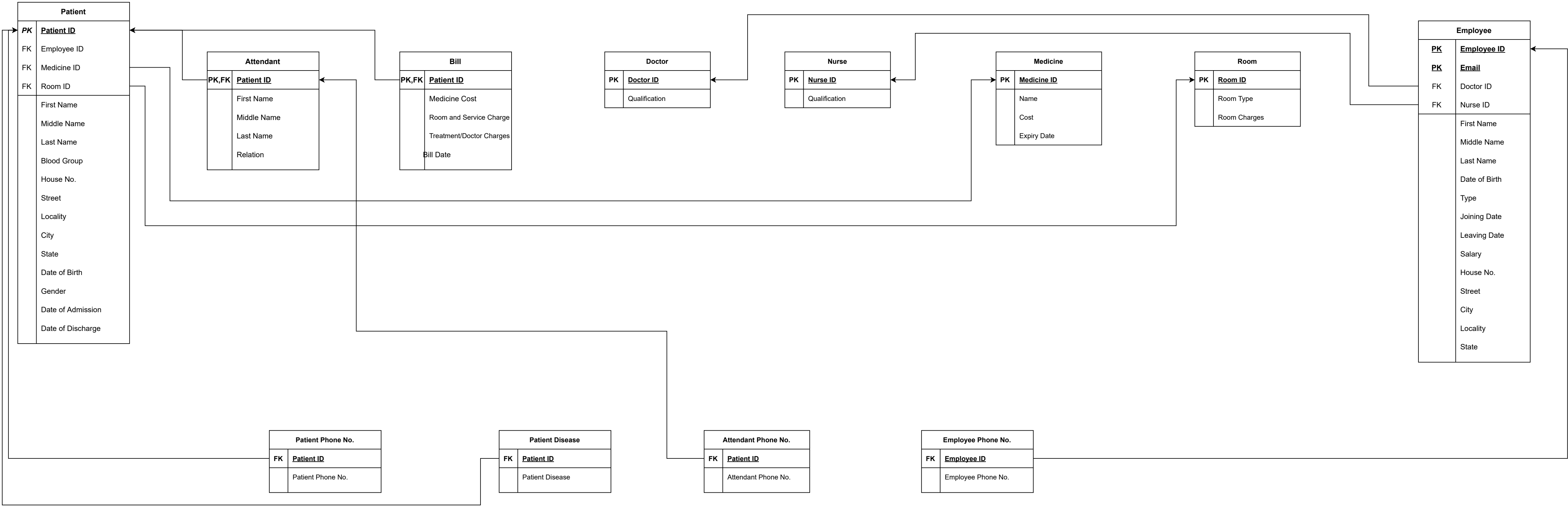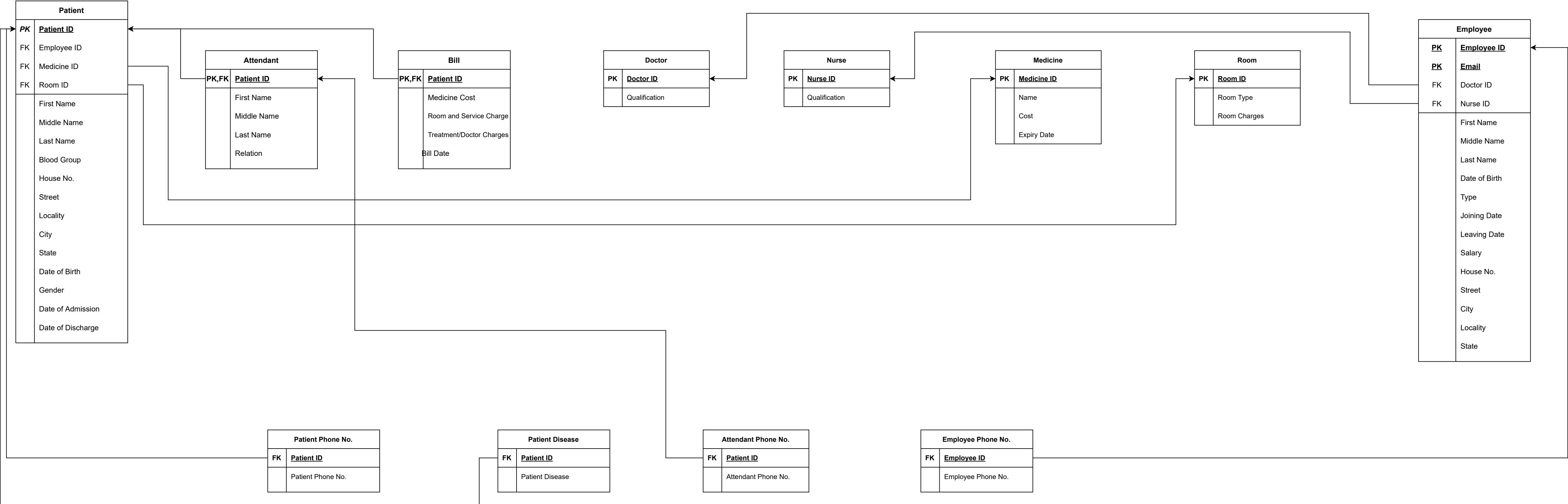# ER to Relational Model

MiniWorld: Hospital Management System
Team Name: Deoxyribonucleic Acid
Team Members:
a. Chandan Shrivastava - 2020101015
b. Nachiket Patil - 2020101018
c. Yash Bhatia - 2020101007

Patient

PK	Patient ID
FK	Employee ID
FK	Medicine ID
FK	Room ID
	First Name
	Middle Name
	Last Name
	Blood Group
	House No.
	Street
	Locality
	City
	State
	Date of Birth
	Gender
	Date of Admission
	Date of Discharge

Attendant

PK,FK	Patient ID
	First Name
	Middle Name
	Last Name
	Relation

Bill

PK,FK	Patient ID
	Medicine Cost
	Room and Service Charge
	Treatment/Doctor Charges
	Bill Date

Doctor

PK	Doctor ID
	Qualification

Nurse

PK	Nurse ID
	Qualification

Medicine

PK	Medicine ID
	Name
	Cost
	Expiry Date

Room

PK	Room ID
	Room Type
	Room Charges

Employee

PK	Employee ID
PK	Email
FK	Doctor ID
FK	Nurse ID
	First Name
	Middle Name
	Last Name
	Date of Birth
	Type
	Joining Date
	Leaving Date
	Salary
	House No.
	Street
	City
	Locality
	State

Patient Phone No.

FK	Patient ID
	Patient Phone No.

Patient Disease

FK	Patient ID
	Patient Disease

Attendant Phone No.

FK	Patient ID
	Attendant Phone No.

Employee Phone No.

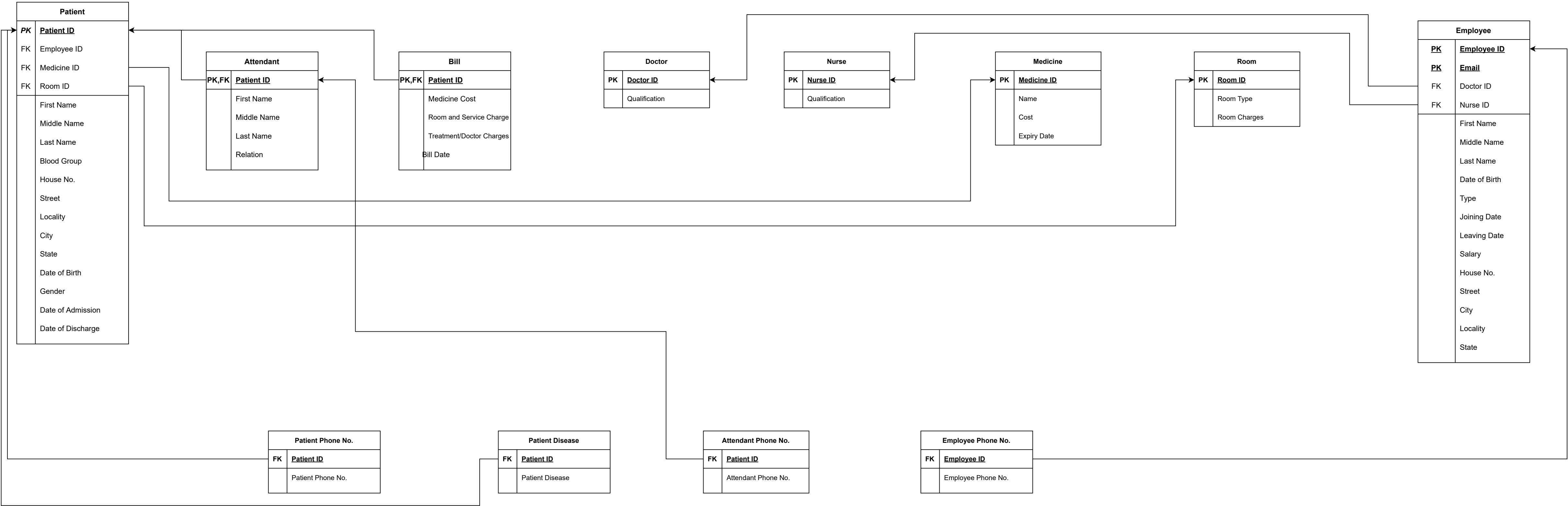|	
FK	Employee ID
	Employee Phone No.

ER to Relational Model:
1. It states that an attribute of a table cannot hold multiple values. It must hold only single-valued attribute.
2. First normal form disallows the multi-valued attribute, composite attribute, and their combinations. So, It is broken in same table.

1st Normal Form

Patient

PK	Patient ID
FK	Employee ID
FK	Medicine ID
FK	Room ID
	First Name
	Middle Name
	Last Name
	Blood Group
	House No.
	Street
	Locality
	City
	State
	Date of Birth
	Gender
	Date of Admission
	Date of Discharge

Attendant

PK,FK	Patient ID
	First Name
	Middle Name
	Last Name
	Relation

Bill

PK,FK	Patient ID
	Medicine Cost
	Room and Service Charge
	Treatment/Doctor Charges
	Bill Date

Doctor

PK	Doctor ID
	Qualification

Nurse

PK	Nurse ID
	Qualification

Medicine

PK	Medicine ID
	Name
	Cost
	Expiry Date

Room

PK	Room ID
	Room Type
	Room Charges

Employee

PK	Employee ID
PK	Email
FK	Doctor ID
FK	Nurse ID
	First Name
	Middle Name
	Last Name
	Date of Birth
	Type
	Joining Date
	Leaving Date
	Salary
	House No.
	Street
	City
	Locality
	State

Patient Phone No.

FK	Patient ID
	Patient Phone No.

Patient Disease

FK	Patient ID
	Patient Disease

Attendant Phone No.

FK	Patient ID
	Attendant Phone No.

Employee Phone No.

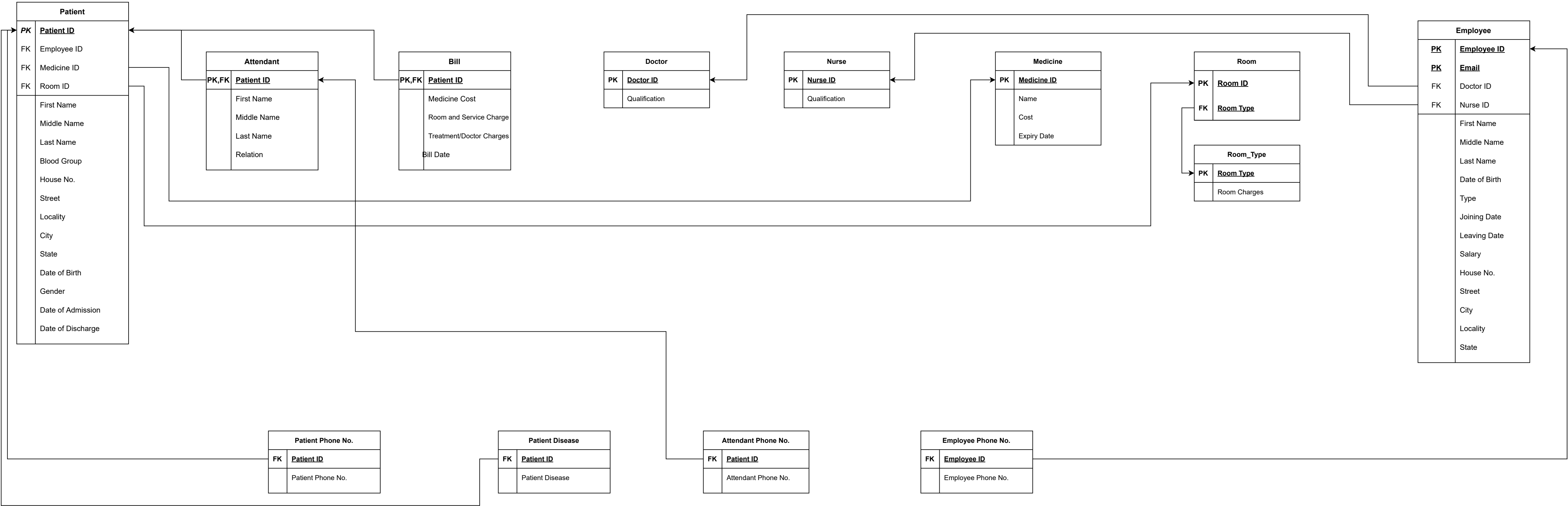| FK	Employee ID
	Employee Phone No.

In 1NF:
1. A relation will be 1NF if it contains an atomic value.
2. It states that an attribute of a table cannot hold multiple values.
It must hold only single-valued attribute.
3. First normal form disallows the multi-valued attribute, composite attribute, and their combinations. So, It is broken in same table.

2nd Normal Form (Same as 1st Normal Form)

Patient

PK	Patient ID
FK	Employee ID
FK	Medicine ID
FK	Room ID
	First Name
	Middle Name
	Last Name
	Blood Group
	House No.
	Street
	Locality
	City
	State
	Date of Birth
	Gender
	Date of Admission
	Date of Discharge

Attendant

PK,FK	Patient ID
	First Name
	Middle Name
	Last Name
	Relation

Bill

PK,FK	Patient ID
	Medicine Cost
	Room and Service Charge
	Treatment/Doctor Charges
	Bill Date

Doctor

PK	Doctor ID
	Qualification

Nurse

PK	Nurse ID
	Qualification

Medicine

PK	Medicine ID
	Name
	Cost
	Expiry Date

Room

PK	Room ID
	Room Type
	Room Charges

Employee

PK	Employee ID
PK	Email
FK	Doctor ID
FK	Nurse ID
	First Name
	Middle Name
	Last Name
	Date of Birth
	Type
	Joining Date
	Leaving Date
	Salary
	House No.
	Street
	City
	Locality
	State

Patient Phone No.

FK	Patient ID
	Patient Phone No.

Patient Disease

FK	Patient ID
	Patient Disease

Attendant Phone No.

FK	Patient ID
	Attendant Phone No.

Employee Phone No.

FK	Employee ID
	Employee Phone No.

2NF is same as 1NF because:
1. All non-key attributes are fully functional dependent on the primary key

3rd Normal Form

Patient

PK	Patient ID
FK	Employee ID
FK	Medicine ID
FK	Room ID
	First Name
	Middle Name
	Last Name
	Blood Group
	House No.
	Street
	Locality
	City
	State
	Date of Birth
	Gender
	Date of Admission
	Date of Discharge

Attendant

PK,FK	Patient ID
	First Name
	Middle Name
	Last Name
	Relation

Bill

PK,FK	Patient ID
	Medicine Cost
	Room and Service Charge
	Treatment/Doctor Charges
	Bill Date

Doctor

PK	Doctor ID
	Qualification

Nurse

PK	Nurse ID
	Qualification

Medicine

PK	Medicine ID
	Name
	Cost
	Expiry Date

Room

PK	Room ID
FK	Room Type

Room_Type

PK	Room Type
	Room Charges

Employee

PK	Employee ID
PK	Email
FK	Doctor ID
FK	Nurse ID
	First Name
	Middle Name
	Last Name
	Date of Birth
	Type
	Joining Date
	Leaving Date
	Salary
	House No.
	Street
	City
	Locality
	State

Patient Phone No.

FK	Patient ID
	Patient Phone No.

Patient Disease

FK	Patient ID
	Patient Disease

Attendant Phone No.

FK	Patient ID
	Attendant Phone No.

Employee Phone No.

FK	Employee ID
	Employee Phone No.

In 3NF:
1. A relation will be in 3NF if it is in 2NF and not contain any transitive partial dependency.

Changes made:
Entity Room is broken into two parts because Room Charges and Room Type is related to each other which violates 3NF condition