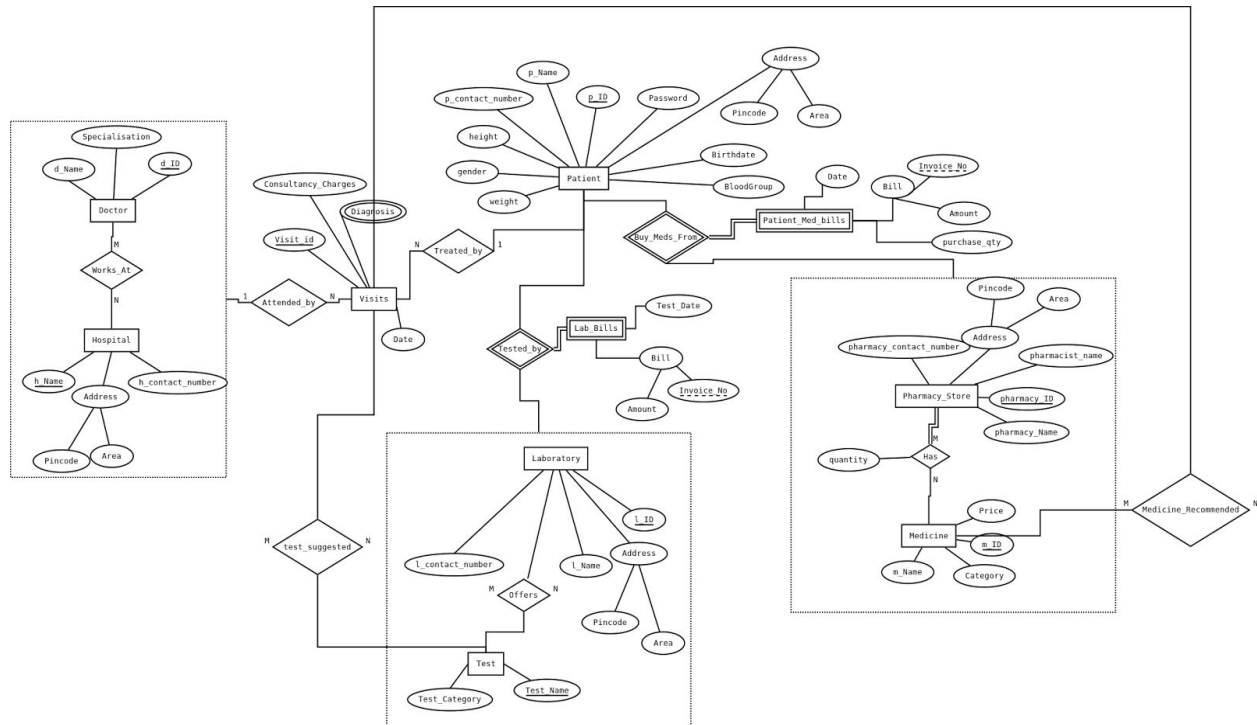


## Entity Relationship Diagram



```

    erDiagram
        Doctor ||--o{ Patient : "Prescribes"
        Doctor ||--o{ Hospital : "Works At"
        Doctor ||--o{ Medicine : "Recommends"
        Patient ||--o{ Medicine : "Buys Med From"
        Patient ||--o{ PharmacyStore : "Has Medicine"
        Patient ||--o{ Test : "Patient test"
        Hospital ||--o{ Test : "Test suggested"
        Test ||--o{ LabTest : "Lab test"
        Test ||--o{ Location : "Location"
        LabTest ||--o{ Location : "Location"
        PharmacyStore ||--o{ Medicine : "Medicine"
        PharmacyStore ||--o{ Laboratory : "Laboratory"
        Laboratory ||--o{ Location : "Location"
        Location ||--o{ Hospital : "Hospital"
        Location ||--o{ PharmacyStore : "Pharmacy Store"
        Location ||--o{ Laboratory : "Laboratory"

        Doctor {
            string d_Name varchar(30)
            string d_ID char(10)
            string Specialisation varchar(30)
        }
        Patient {
            string p_Name varchar(30)
            string p_ID char(10)
            string Password varchar(20)
            string Area varchar(40)
            date Birth_date
            string Blood_Grp varchar(5)
            integer Gender
            integer height
            numeric weight
            bigint p_contact_number
        }
        Medicine {
            string m_Name varchar(40)
            string m_ID char(10)
            string Category varchar(30)
            integer price
        }
        Hospital {
            string h_Name varchar(40)
            string Area varchar(40)
            bigint h_contact_number
        }
        Test {
            string Test_Name varchar(40)
            string Test_Category varchar(30)
        }
        LabTest {
            string Test_Name varchar(40)
            string l_ID varchar(10)
        }
        Location {
            numeric Pincode(6,0)
            string Area varchar(40)
        }
        PharmacyStore {
            string pharmacy_id char(10)
            string pharmacy_Name varchar(30)
            string pharmacist_Name varchar(30)
            string Area varchar(40)
            bigint pharmacy_contact_number
        }
        Laboratory {
            string l_ID char(10)
            string l_name varchar(40)
            string Area varchar(40)
            bigint l_contact_number
        }
        Diagnosis {
            string Checkup_details varchar(40)
        }
        TreatedBy {
            integer Consultancy_charges
            date Date
            string d_ID char(10)
            string h_Name varchar(40)
            string p_ID char(10)
            integer Visit_Id
        }
        BuysMedFrom {
            string pharmacy_ID char(10)
            string m_ID char(10)
            date Date
            integer Invoice_No
            integer Amount
            string p_ID char(10)
            integer purchase_qty
        }
        HasMedicine {
            string pharmacy_ID char(10)
            string m_ID char(10)
            integer quantity
        }
        TestSuggested {
            string Test_Name varchar(30)
            integer Visit_Id
        }
        MedicineRecommended {
            string m_ID char(10)
            integer Visit_Id
        }
    
```

## Canonical Form of FDs and their Normal form

1. Doctor(d\_Name,d\_ID,Specialisation)  
d\_ID->{d\_Name,Specialisation}  
Normal Form : BCNF
2. Hospital(h\_Name,Area,h\_contact\_number)  
h\_Name->{Area,h\_contact\_number}  
Normal Form : BCNF
3. Treated\_By(Consultancy\_charges,Date,d\_ID,h\_Name,p\_ID,Visit\_Id)  
{d\_ID,h\_Name,p\_ID,Visit\_Id} -> {Consultancy\_charges,Date}  
Normal Form : BCNF
4. Patient(p\_Name, p\_ID, Password, Area, Birth\_Date, Blood\_Grp,p\_contact\_number)  
p\_ID-> { p\_Name, Password, Area, Birth\_Date, Blood\_Grp,p\_contact\_number }  
Normal Form : BCNF
5. Diagnosis(Checkup\_details,Visit\_Id)  
Visit\_Id->{Checkup\_details}  
Normal Form : BCNF
6. Laboratory(l\_ID, Technician\_Name, l\_name,Area,l\_contact\_number)  
l\_ID->{l\_name, Technician\_Name , Area,l\_contact\_number}  
Normal Form: BCNF
7. Pharmacy\_Store(pharmacy\_ID, pharmacy\_Name, pharmacist\_Name, Area, pharmacy\_contact\_number)  
pharmacy\_ID -> { pharmacy\_Name, pharmacist\_Name, Area, pharmacy\_contact\_number}  
Normal Form: BCNF
8. Patient\_Test(Test\_date, Amount, Invoice\_No,l\_ID, p\_ID, Test\_Name)  
{l\_ID, p\_ID, Test\_Name, Invoice\_No} -> { Test\_date, Amount }  
Normal Form : BCNF
9. Tests(Test\_Name, Test\_Category)  
Test\_Name -> Test\_Category
10. Buys\_Med\_From(pharmacy\_ID ,m\_ID, p\_ID, Invoice\_No,Date, Amount, Purchase\_qty)  
{pharmacy\_ID ,m\_ID, p\_ID, Invoice\_No } -> { Date, lAmount, Purchase\_qty }  
Normal Form : BCNF

11. Medicine(m\_Name,m\_ID,Category,price)  
m\_ID->{ m\_Name, Category,price }  
Normal Form : BCNF

12. Location(Area,Pincode)  
Area->{Pincode}  
Normal Form : BCNF

13.Has\_Medicine(pharmacy\_ID,m\_ID,quantity )  
{pharmacy\_ID,m\_ID}->{quantity}  
Normal Form : BCNF

Here in the below relations, both have 2 columns with both the columns being key. Thus, they are trivial dependencies. Hence, they are in BCNF.

- Medicine\_Recommended(m\_ID,Visit\_Id)
- Test\_Suggested(Test\_Name,Visit\_Id)

The below listed relations are created from the M:N type of relationship instance with no attributes of the relationship instance. Due to this, all the attributes of these relations form the key. Thus, they are trivial dependencies. Hence, they are in BCNF.

- Works\_At(d\_ID, h\_Name)
- Lab\_Test(Test\_Name,l\_ID)