ER Modelling Exercise – Hospital

Consider the following requirements for inpatients at a hospital:

All patients admitted to the hospital are given a unique patient number. The patient's name, address, age, and sex are recorded. Private patients are allocated a private room, identified by the room number. Private rooms are of different types, e.g., standard, deluxe, palatial, etc. NHS patients are allocated a bed IN A WARD, beds being identified by the ward name and bed number. Wards are of different types, e.g., pediatric, cancer, etc, with a named sister in charge of each one. Each patient is allocated to a named consultant who supervises the medical care of the patient. The consultant decides on the treatments to be given to the patient. A treatment is any medical procedure performed on the patient. Each treatment is given a unique treatment number, and a description of the treatment and the date it is performed are recorded.

Design an E-R diagram for the above database. Derive a corresponding relational scheme from your E-R diagram.

The E-R diagram must show attributes, keys, cardinalities, and constraints. The relational scheme must be in third-normal form, with primary and foreign keys clearly indicated.

Superclass Patient: Unique patient number (primary key), patient name, patient address, patient age, patient sex, treatment id (foreign key), consultant (foreign key)

Subclass Private patient (Private room): Room number, room type? (Private room : Standard, deluxe, palatial?), Patient number (Foreign key)

Subclass NHS patient (Ward): Ward name (primary key), ward type? (Wards: Pediatric, cancer), named sister?, Patient number (Foreign key)

Bed: Bed number (primary key), Ward number (Foreign key)

Consultant – Name?, Consultant ID (primary key)

Superclass Treatment: Unique treatment number (primary key), treatment description, treatment date performed (foreign key is patient), consultant (foreign key)

Patient and Treatment – One to many (patient can have many treatment, but treatment can only have one patient (will have different treatment ID))

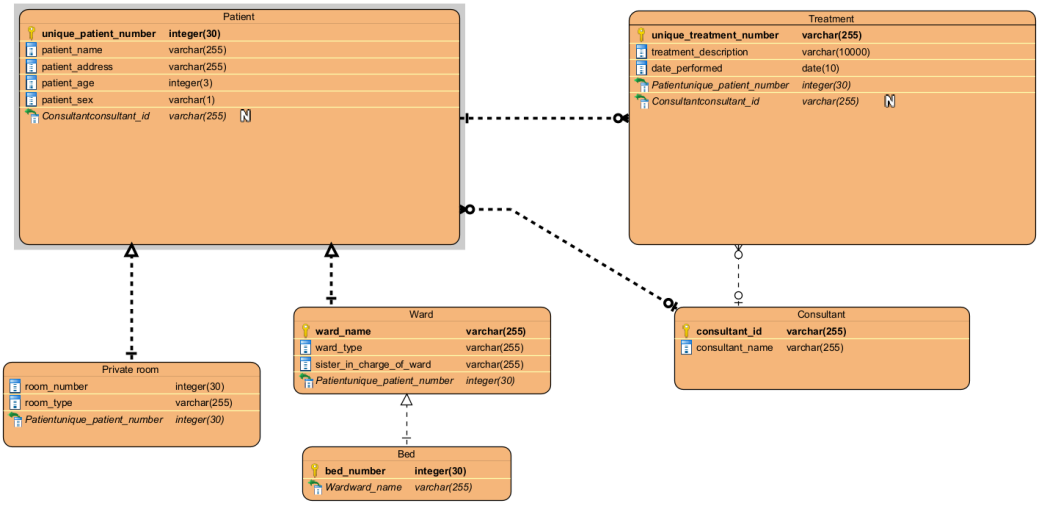
Each patient is allocated to a named consultant: 1-1 RS

Private room and Ward are subclasses of patients.

Consultant and patient – One to many (Consultants have many patients, but patients get one consultant).

The consultant decides on the treatments to be given to the patient (One to many, consultant can give many treatments)

E-R Diagram:


Patient
unique_patient_number integer(30)
patient_name varchar(255)
patient_address varchar(255)
patient_age integer(3)
patient_sex varchar(1)
Consultantconsultant_id varchar(255) N
Treatment
unique_treatment_number varchar(255)
treatment_description varchar(10000)
date_performed date(10)
Patientunique_patient_number integer(30)
Consultantconsultant_id varchar(255) N
Ward
ward_name varchar(255)
ward_type varchar(255)
sister_in_charge_of_ward varchar(255)
Patientunique_patient_number integer(30)
Consultant
consultant_id varchar(255)
consultant_name varchar(255)
Private room
room_number integer(30)
room_type varchar(255)
Patientunique_patient_number integer(30)
Bed
bed_number integer(30)
Wardward_name varchar(255)