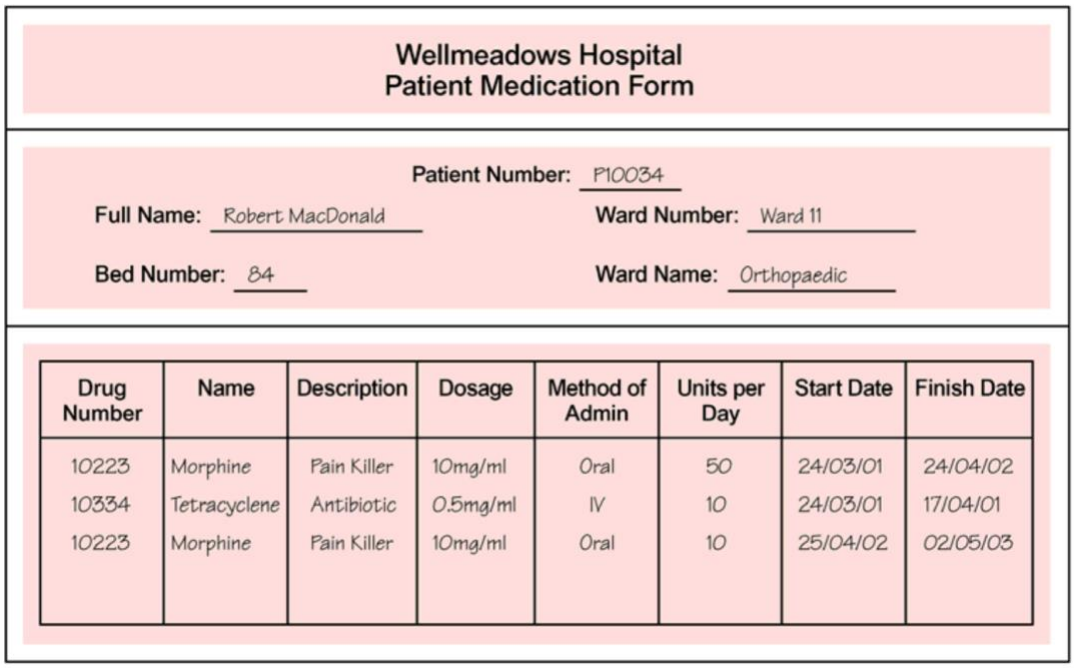
Solutions exercises

- **Describe and illustrate the process of normalizing the following data to first (1NF), second (2NF), third (3NF), and BCNF.**
  Patient No → Full Name
  Ward No → Ward Name
  Drug No → Name, Description, Dosage, Method of Admin
  Patient No, Drug No, Start Date → Units per Day, Finish date



Wellmeadows Hospital
Patient Medication Form

Patient Number: P10034
Full Name: Robert MacDonald **Ward Number:** Ward 11
Bed Number: 84 **Ward Name:** Orthopaedic

Drug Number	Name	Description	Dosage	Method of Admin	Units per Day	Start Date	Finish Date
10223	Morphine	Pain Killer	10mg/ml	Oral	50	24/03/01	24/04/02
10334	Tetracyclene	Antibiotic	0.5mg/ml	IV	10	24/03/01	17/04/01
10223	Morphine	Pain Killer	10mg/ml	Oral	10	25/04/02	02/05/03

In the 1NF we remove all the repeating groups (none), and assigned primary keys (candidate keys)
In the 2NF there are no partial dependencies
In the 3NF there is no transitive dependency
In the BCNF every determinant is a candidate key

UNF Hosiptal(Patient No, Drug No, Start Date, Full Name, Ward No, Ward Name, Bed No, Name, Description, Dosage, Method of Admin, Units per Day, Finish Date)

1NF Hosiptal(<u>Patient No, Drug No, Start Date</u>, Full Name, Ward No, Ward Name, Bed No, Name, Description, Dosage, Method of Admin, Units per Day, Finish Date)

keys(Patient No, Drug No, Start Date)

2NF Hosiptal(<u>Patient No, Drug No, Start Date</u>, Ward No, Ward Name, Bed No, Units per Day, Finish Date)
Drug(<u>Drug No</u>, Name, Description, Dosage, Method of Admin)
Patient(<u>Patient No</u>, Full Name)

keys(Patient No, Drug No, Start Date - Drug No - Patient No)

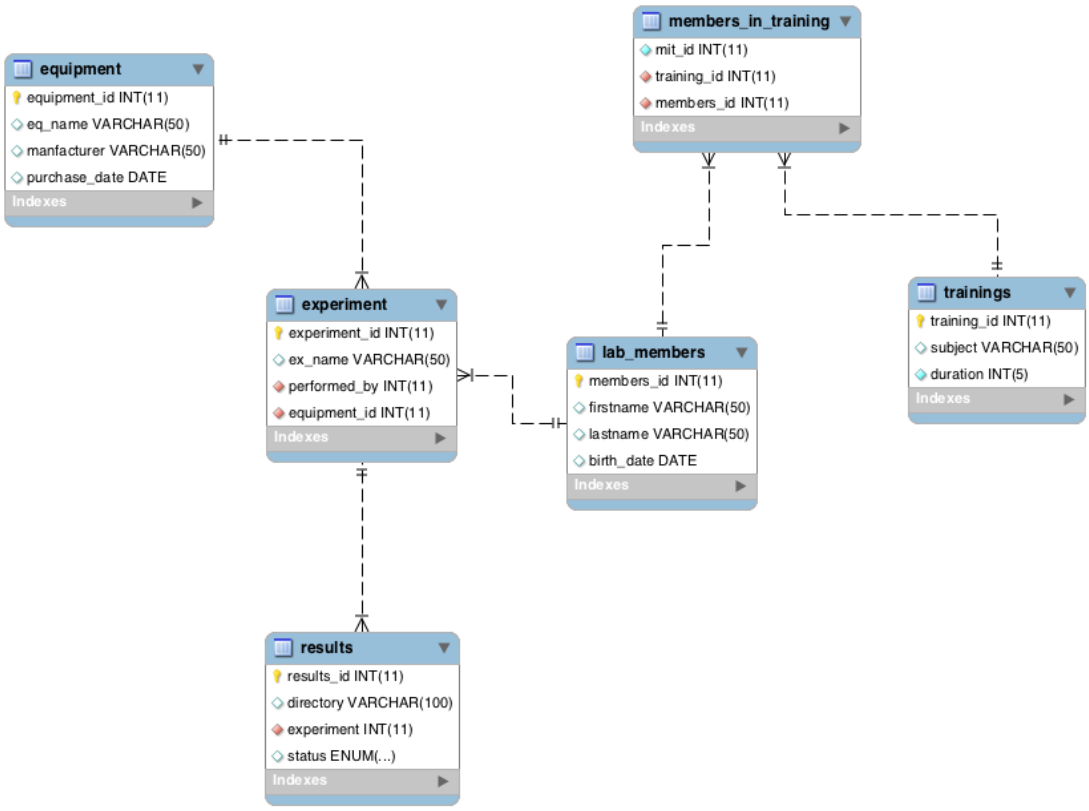
3NF Hosiptal(<u>Patient No, Drug No, Start Date</u>, Ward No, Bed No, Units per Day, Finish Date)
Drug(<u>Drug No</u>, Name, Description, Dosage, Method of Admin)
Patient(<u>Patient No</u>, Full Name)
Ward(<u>Ward No</u>, Ward Name)

keys(Patient No, Drug No, Start Date - Drug No - Patient No - Ward No)

BCNF 3NF

- **Create a new database model for your lab and include following data**
  - **All trainings**
    - **Subject, duration**
  - **All lab members**
    - **Name, lastname, birth_date, training**
  - **All equipment**
    - **Name, manufacturer, purchase_date**
  - **All experiments**
    - **Name, performed_by, equipment_used, date**
  - **All results**
    - **Directory, experiment, status**
  - **Forward engineer your model**

In a possible solution, your model could look like this.
Check the *lab.mwb* file on LEHO.



To forward engineer your data, in MySQL Workbench go to 'Database > Forward engineer' and follow the wizard.