**CIS 340 Project**

**E-R Model (50 Points)**

**Due Sunday, Oct 31, by 11:59 PM**

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**PART 1: Identify entity types with brief description:**

**Wards**

Hospital

Short-term Patients Ward: staying short term/ Outpatient visits

Long-term Patients Ward: staying long term/ Admitted Overnight patient

Outpatient clinic: short term visits

**Staff**

Medical Director: controls hospital resources

Personnel Officer: Responsible for getting the correct number of patients to the ward and outpatient clinics

Charge Nurse: Over sees day to day operations and all other nurses

Senior Nurse: staff nurses that report to charge nurse

Junior Nurse: staff nurses that report to Senior and Charge nurse

Auxiliaries: Other Staff members/ Receptionist, janitor, dietitian

Specialist: consultants/ physiotherapists

Doctor:

**Patients**

Patient

**Patient’s Next of Kin**

Next of Kin

**Local Doctors**

Doctor

**Patient Appointments**

Patient

Hospital Consultant

**Outpatients**

Outpatient

**Inpatients**

Inpatient

**Patient Medication**

Medication

**Surgical and Nonsurgical Supplies**

Surgical Supplies

Nonsurgical Supplies

**Pharmaceutical Supplies**

Pharmaceutical Supplies

**Ward Requisitions**

Central stock of supplies

Requisitions Form

**Suppliers**

Supplier

**Part 2: Identify relationship types with brief description. You must include the multiplicity and attributes if any.**

**Wards Relationships**

Patient 1(0) -- stays at – 1(1) ward

Attributes: arrival date, leave date, Ward Number, Patient ID, Bed Number, Ward Name

* Patient stays in either long- or short-term clinic
* Patient can stay at one ward, but wards can hold multiple patients

Ward M(1) -- creates M(0) -- Ward Requisitions form

Attributes: Ward Number, Ward Name Requisition Number, Requisition Date, Received Date, Charge Nurse

* Ward creates Ward Requisition Form
* Multiple Wards can create multiple Ward Requisitions forms

Ward M(1) – uses – M(1) Surgical and Nonsurgical Supplies

Attributes: Ward Number, Ward Name, Item ID of supplies

* Multiple Wards uses multiple Surgical and Nonsurgical Supplies

Ward M(1) – uses – M(1) Pharmaceutical Supplies

Attributes: Ward Number, Ward Name, Item ID of supplies

* Many Wards use Multiple Pharmaceutical Supplies

Ward M(1) – awaiting – M(0) Patient Appointments

Attributes: Ward Number, Ward Name, Appointment Number, Patient Number

* Many Wards are awaiting many Patients Appointments
* Each patient can have many patients

**Patient Relationships**

Patient M(0) -- sleeps in – M(1) Bed

Attributes: Patient Number, Bed Number

* There are many Patients and many Beds
* One patient to one Bed

Patient M(1) — go through – 1(1) Outpatient clinic

Attributes: Patient Number, Ward Number, Outpatient clinic Name,

* Many Patients go through the Outpatient clinic

Patient M(1) – is referred to ­by — M(1) Local Doctor

Attributes: Patient Id, Doctor name

* Multiple patients are referred to by many Local Doctors
* One patient has one Local Doctor

Patient M(0) – stays in – M(1) ward

Attributes: Patient Id, Ward Name, Ward Id, Charge Nurse

* Many Patients stay in Many wards
* One patient stays in one ward
* Wards can have no Patients

Patient M(0) – has – M(1) Staff

Attributes: Patient Id, Staff Id

* Multiple Patients have Many Staff
* One patient has one staff
* One staff can have no patients

Patient 1(1) – has – M(0) Next of Kin

Attributes: Patient Id, Next of Kin Name,

* One Patient has multiple next of kin
* One patient can have no next of kin

Patient M(1) – is given an – M(0) Appointment

Attributes: Patient Id, Examination room number, Appointment Number, Appointment Date

* Multiple patients are given multiple appointments
* A Patient can have no appointments

Patient M(1) – is prescribed – M(0) Medication

Attributes: Patient Id, Start Date, End Date, Drug Id, Drug Name

* Multiple Patients can be prescribed multiple Medications
* Patients can be prescribed no medication

**Staff Relationships**

Medical Director – Manages – Hospital

Attributes: Staff Id, Hospital name,

Medical Director – Manages -- Surgical and Nonsurgical Supplies

Attributes: Staff Id, Idem Id,

Personnel Officer – manages staffing in – Ward and Outpatient clinic

Attributes: Staff Id, Ward Id, Ward Name,

Charge Nurse – manages – One Ward

Attributes: Staff Id, Ward Id, Ward Name

Charge Nurse – reports to – Medical Director

Attributes: Staff Id

Junior/ Senior nurse – report to – Charge nurse

Attributes: Staff ID, Ward ID

Staff -- works in – ward/Outpatient clinic

Attributes: Staff ID, Ward Number, Staff Position

Patient Appointment – decided whether to go to

**Suppliers Relationships**

Surgical and Nonsurgical Supplies M(1) – are used in – M(0) Ward

Attributes: Item Id, Ward ID, Ward Name, Medical Director, Charge Nurse

* Each ward contains numerus Surgical and Nonsurgical Supplies
* A closed ward would need no supplies

Pharmaceutical Supplies M(1) – are used in – M(1) Ward

Attributes: Item Id, Ward ID, Ward Name, Medical Director, Charge Nurse, Drug Id, Drug Name, Patient name, patient Id

* Each ward contains numerous Pharmaceutical Supplies
* A closed ward would need no supplies

Suppliers M(1) – supplies – 1(1) Hospital/Central stock

Attributes: Item Id, Drug Id, Drug Name, Ward ID, Ward Name, Suppliers Name,

* Multiple Suppliers Deliver supplies to the Hospital/Central stock
* There is only one hospital/Central stock

**Part 3: Describe each entity type in detail:**

**Patient**

* Patient ID:
* Name: Composite (firstName, lastName)
* Date Of Birth:
* Age: Derived
* Phone: Multi-Value

Primary Key: Patient

Alternate Key: Name

**Patients Next of Kin**

* Name: Composite (firstName, lastName)
* Relationship
* Address: Multi-value
* Phone number: multi-value

Primary Key: Name

Alternate Key: Address

**Patient Appointments**

* Appointment Number
* Patient Name: Composite (firstName, lastName)
* Staff number: (ID given Employee)
* Consultant: Required
* Date and Time: Multi-value
* Examination room: (Room appointed)

Primary Key: Appoint Number

Alternate Key: Patient Name

**Outpatients**

* Patient number: (Letter, 5 digits)
* Patient name: Composite (firstName, lastName)
* Address: Multi-value
* Phone: Multi-value
* Date of Birth: Multi-value
* Sex: (M or F)
* Date and time: multi-value

Primary Key: Patient number

Alternate Key: Patient

**Inpatients**

**Patient Medication**

* Patient Name: Composite (firstName, lastName)
* Patient Id:
* Drug ID
* Drug Name
* Amount:
* MOA:
* Start Date: Multi-value
* End Date: Multi-value
* Refill

Primary Key: Patient Id

Alternate Key: Drug Id

**Local Doctors**

* Name: Composite (firstName, LastName)
* Clinic number
* Clinic address: multi-value
* Clinic phone number: multi-value

Primary Key: Clinic Number

Alternate Key: Name

**Beds**

* Bed Number:
* Location
* Occupied

Primary Key: Bed Number

Alternate Key: Location

**Staff**

* Staff ID
* Staff Name (firstName, LastName)
* Staff Position
* Date Of Birth: Multi-value
* Sex
* Address: Multi-value
* Phone number: multi-value
* NIN (National Insurance Number)
* Ward Station
* Current Salary
* Salary Scale
* Paid Schedule:(Days or Weeks)

Primary Key: Staff Id

Alternate Key: Staff Name

**Staff Qualifications**

* Staff ID
* Staff Name
* Type:
* Date: Multi-value
* Institutions:

Primary Key: Staff ID

Alternate Key: Staff Name

**Work Experience**

* Staff ID
* Staff Name
* Position
* Start Date: Multi-value
* Finish Date: Multi-value
* Organization

Primary Key: Staff ID

Alternate Key: Staff Name

**Ward**

* Ward ID
* Ward Name
* Charge Nurse
* Location
* Phone Number: Multi-value
* Number of Beds

Primary Key: Ward ID

Alternate Key: Ward Name

**Suppliers**

* Name: (firstName, lastName)
* Number: (ID)
* Address: Multi-value
* Phone Number: Multi-value
* Fax Number: Multi-value
* Item Id (surgical, non-surgical, and pharmaceutical items)
* Drug Id
* Drug name

Primary Key: Number

Alternate Key: Address

**Requisition Form**

* Requisition ID
* Ward Number
* Ward Name
* Filled out by
* Requisition Date: Multi-value

Primary Key: Requisition Number

Alternate Key: Ward Number

**Part 4:** **Draw the E-R diagram: Show the primary key for each table. You must specify the multiplicity on the E-R diagram.**

Diagram

Description automatically generated