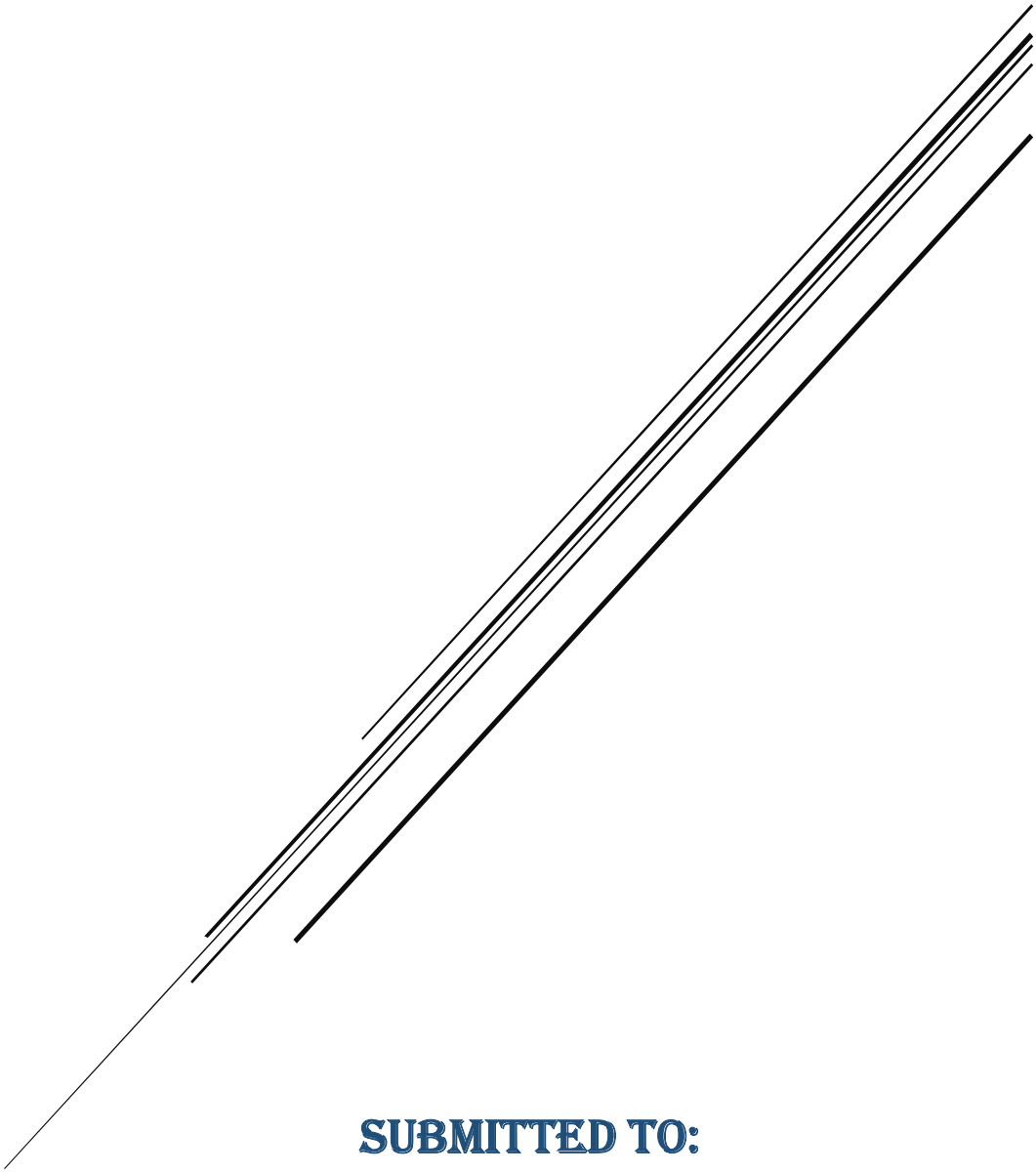
ERD

Dental Clinic Database



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Statement:

Dental Clinic with Multiple Visit Treatments and Equipment Use

Treatments like root canals span several appointments. Each visit logs performed procedures, tools used, medications prescribed, and pain level reported. Equipment usage is tracked to ensure sterilization logs are complete. Follow-up visits are auto-scheduled, and patients receive reminders. Equipment nearing end-of-life is flagged for replacement.

Solution:

DENTAL CLINIC DATABASE

Entities:

- **Treatment**
- **Patient**
- **Dentist**
- **Reminder**
- **Tools/Equipment**
- **Sterilisation_log**
- **Medication**
- **Procedure**
- **Visit**
- **Appointment (Associative entity)**

Entities along with their attributes:

- ***Treatment:***

1. *Treatment_id (**PK**)*
2. *Name*
3. *Description*
4. *Patient_id (**FK**)*

- ***Patient:***

1. *Patient_id (**PK**)*
2. *DOB*
3. *Phone_no (multivalue attribute)*
4. *Name (composite attribute)*
5. *Reminder_id (**FK**)*
6. *Visit_id **(FK**)*
7. *Dentist_id (**FK)***
8. *Treatment_id (**FK**)*

- ***Dentist:***

1. Dentist_id (**PK**)
2. Name (composite)
3. Specialization (multivalue attribute)
4. Patient_id (**FK)**
5. Visit_id(**FK)**

- ***Reminder:***

1. Reminder_id (**PK**)
2. Date
3. Message
4. Visit_id(**FK**)
5. Patient_id(**FK**)

- **Tool:**

1. Serial_no(**PK**)
2. End_of_life
3. Name
4. Sterilisation_id(**FK)**
5. Visit_id(**FK**)

- ***Medication:***

1. M_ID(**PK**)
2. Name
3. Dosage
4. Visit_id(**FK**)

- ***Procedure:***

1. P_id (**PK**)
2. Name
3. Description
4. Visit_id(**FK**)

- ***Visit:***

1. *Visit_id(**PK**)*
2. *P_id (**FK**)*
3. *Tool_id **(FK)***
4. *M_id (**FK)***
5. *Reminder_id(**FK**)*
6. *Patient_id(**FK)***
7. *Dentist_id**(FK)***
8. *VisitDate*
9. *Pain_level*
10. *Reason*

Sterilisation_log:

1. Sterilisation_id (**PK**)
2. Serial_no(**FK**)
3. DateTime
4. Method

Relationship:

- A patient can be treated by many Dentist.

  One-to-Many relationship

- A patient can take multiple treatment.

  One-to-many relationship

- Multiple reminder is received by only one patient.

  Many to –one relationship.

- Multiple visits can be done by the a single patient.

  Many-to One relationship

- Reminder can trigger only one visit.

  One to one relationship

- Dentist can conducted multiple visits by appointment.

  One to many relationship

- A visit can Follow up with only one visit(***unary relationship***).

  1 to 1 or 1-0..1

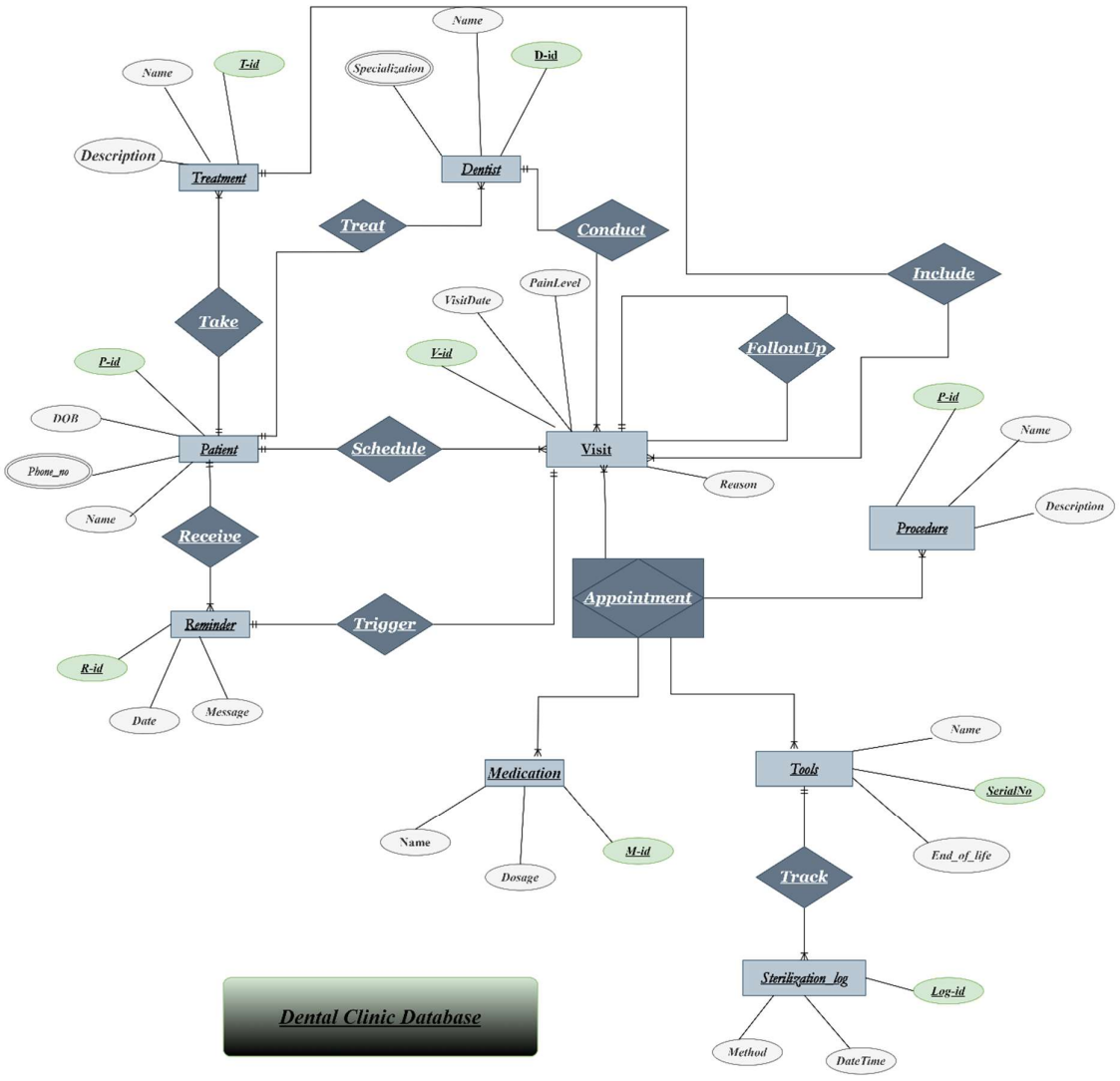
- A visit can logs to many procedure, medication prescribed and tools.

  Many –to –Many relationship exist.

Cardinality:

- One to One (visit)
- One to many
- Many to many (associative entity)

Visual representation:



Schema design:

1. ***Treatment****(T_Id ,name ,description)*

Visit*(V_Id, T_Id ,visit_date,painLevel)*

2. ***Patient*** *(P_Id,name,DOB)*

PhoneNo*(P_Id,Ph)*

Treatment*(T_Id, P_Id ,name ,description)*

3. ***Patient*** *(P_Id,name,DOB)*

PhoneNo*(P_Id,Ph)*

Visit*(V_Id, P_id, visit_date,painLevel)*

4. ***Patient*** *(P_Id,name,DOB)*

PhoneNo*(P_id,Ph)*

Reminder*(R_Id, P_Id, message ,date)*

5. ***Visit****(V_Id,visit_date,painLevel)*

Reminder*(R_Id, V_Id, message ,date)*

6. ***Dentist****(D_Id,name)*

Specialization*(D_Id,specialization*

Patient *(P_Id), D_Id,name,DOB)*

PhoneNo*(P_Id,Ph)*

7. ***Dentist****(D_Id,name)*

Specialization*(D_Id ,specialization)*

Visit*(V_Id,D_Id,visit_date,painLevel)*

8. ***Visit****(V_Id, visit_date,painLevel, Id)*

Folowup*(Id, last_visit_date)*

9. ***Visit****(V_Id,visit_date,painLevel)*

Procedure*(P_Id,name ,description)*

Appointment*(V_Id, P_Id)*

10. ***Visit****(V_Id,visit_date,painLevel)*

Medication*(M_Id,name ,dosage)*

Appointment*(V_Id, M_Id)*

11. ***Visit****(V_Id,visit_date,painLevel)*

Tools*(SerialNO,name ,End_of_life)*

Appointment*(V_Id, SerialNo)*

Assumptions:

The following assumptions were made during the design of the ER diagram to clarify uncertainties.

It is assumed that:

1. Each patient can **undergo** multiple treatments, but a treatment is **linked** to only one patient.

2. Multiple visits can be **scheduled** for a patient.

3. One dentist can **treat** many patients, but each patient is treated by one primary dentist at a time.

4. A patient can **receive** more than one reminders based on the number of visits.

5. Each visit is **associated** with only one ongoing treatment rather than multiple treatments.

6. A dentist can **conduct** multiple visits.

7. A visit can **result** in a Followup.

8. Track is used to **maintain** sterilization.

9. Tasks, tools and procedures are **part** of appointment.

10. A tool can be used in more than one visit and its sterilization must be **logged** each time.

11. Each visit has exactly one reminder and each reminder is **linked** to exactly one visit.