

This Design Document alludes to the Database designed for a Dental Hospital. The task is to design and implement a realizable database which helps the Hospital, and its employees keep a track of the patients they have treated while at the same time helping them retain important information about their patients and employees themselves. The document captures the database entities and their details along with the business rules regarded while designing the Database.

Design Document

DENTAL - Model

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DOCUMENT VERSION

Date	Topic	Created By	Version
09-11-2021	Basic Draft – Dental model Visualizing the data model we need Identifying the entities Recognizing important business rules Splitting entities into entity clusters	Mayan Kumar Mishra NU Id – 001546926 Anushka Bhupendra Desai NU Id – 001004611 Neelesh Chandrakar NU Id - 001596268 Neeraja Dixit NU Id - 001584742	V_1.0
18-11-2021	Initial Draft for the Design Document – DENTAL model Finalizing attributes for the entities Adding Primary keys for all tables Providing sample data for each entity Designing the ER Diagram	Mayan Kumar Mishra NU Id – 001546926 Anushka Bhupendra Desai NU Id – 001004611 Neelesh Chandrakar NU Id - 001596268 Neeraja Dixit NU Id - 001584742	V_1.1
01-12-2021	Modifications in the Design Document Added RoomTypes, MastZipCode, Drug Store, Procedure entities Performed changes in existing entities Re-created the ER Diagram Made sure the model is capable enough to handle real world queries to retrieve certain basic information from the database	Mayan Kumar Mishra NU Id – 001546926 Anushka Bhupendra Desai NU Id – 001004611 Neelesh Chandrakar NU Id - 001596268 Neeraja Dixit NU Id - 001584742	V_1.2
15-12-2021	Final Design Document ready Added Companion Info table, date in Consent entity, removed expiry date for drugs Changed data type of phone numbers Enhanced business rules	Mayan Kumar Mishra NU Id – 001546926 Anushka Bhupendra Desai NU Id – 001004611 Neelesh Chandrakar NU Id - 001596268	V_1.3

	<p>Removed few typos in the document</p> <p>Created table in SQL of this data model</p> <p>Inserted data into the database</p> <p>Performed CRUD operations of the database</p> <p>Made a front-end application for the same in PHP</p>	<p>Neeraja Dixit</p> <p>NU Id - 001584742</p>	
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ENTITIES DESCRIPTION

1. OfficeLocation (Officeld, PhoneNo, AddressFirstLine, ZipCode, DrugStoreId, NoOfRooms)

The Office Location Entity will store each location of the Dental Office. The Officeld attribute will be unique to each Office and will be the primary key of the entity. Other attributes like PhoneNo, which will denote the phone number of the office, AddressFirstLine is the street address of the office. The ZipCode attribute is a foreign key reference to the MasterZipCodes entity. NoOfRooms states total number of rooms in an office. Data in this table is filled in by the staff of the clinic. Updates can be made to this table by the staff whenever needed.

2. MasterZipCodes (ZipCode, City, State)

This entity is the master zip code table where all zip codes are stored as primary key and the corresponding city and state is available for each code. ZipCode is the primary key. Data in this table gets entered dynamically while our system captures various addresses of patients, employees etc.

3. Rooms (RoomId, RoomTypeId, Officeld)

The Rooms Entity will store information regarding each room of the Dental Office. The RoomId attribute which will be unique to each room across offices and will be the primary key of the entity. The Officeld attribute will be unique to each Office and will be the foreign key of the entity. The RoomTypeId is a foreign key to the Room Types entity. Data in this table is filled in by the staff of the clinic. Updates can be made to this table by the staff whenever needed.

4. RoomTypes (RoomTypeId, RoomName)

This entity captures the possible room types in our Dental Office System. It contains the Id and room name. Room names in our system are- General, Hygienist, Endodontic, Orthodontic. Data in this table is pre-defined. We capture General, Hygienist, Endodontic and Orthodontic room types only, all of which are pre-assigned an ID. More can be added in the future.

5. Equipment (EquipmentId, EquipmentName, RoomId)

The Equipment Entity will store information regarding equipment used in the Dental Office. The EquipmentId attribute which will be unique to each equipment in an office and will be the primary key of the entity. The Room Id attribute which will be unique to each room and will be the foreign key of the entity. Whereas Equipment Name attributes stores name of each equipment. Data in this table is filled in by the staff of the clinic. Updates can be made to this table by the staff whenever needed.

6. DrugStore (DrugStoreId, DrugId, Quantity)

The DrugStore Entity will store information regarding medicines available related to the Dental Office. The DrugStoreId attribute which will be unique to each medicine/drug in the drug store and this along with the DrugId will be the composite key of the DrugStore entity. Drugs (i.e. DrugId) could be repeated for different drug stores, and this won't be a problem since DrugId along with DrugStoreId forms the primary key of the entity. Quantity attributes stores unique Id associated to a drug and its quantity. Data in this table is filled in by the staff of the clinic. Updates can be made to this table by the staff whenever needed.

7. Drugs (DrugId, DrugName, Usage, Price)

This entity captures the basic information about the Drugs. Drug Id is unique and a primary key attribute. Name, basic usage and price of this drug for our drugstore is captured. This table is populated by the pharmacy department (whose internal details we do not capture) upon receipt of drugs into the pharmacy. The purpose of this entity is to help us capture prescriptions of the dentists, which would include drugs/medicines. Data in this table is filled in by the staff of the clinic. Updates can be made to this table by the staff whenever needed.

8. Appointments (AppointmentId, AppointmentTypeName, PatientId, EmployeeId, OfficeId, RoomId, StartTime, EndTime, isCancelled)

The Appointments Entity will store information regarding each appointment made by the patient. The Appointment Type Name attribute denotes the general purpose of the appointment; it can have one of the following values: Emergency, General, Follow-up, Routine. The Office Id attribute which will be unique to each office and will be the foreign key of the entity. Whereas Start Time and End Time attributes stores start and end date-time of the appointment. In case an appointment is cancelled, it is captured in the isCancelled attribute. Data in this table is filled in by the staff of the clinic when they enter details while creating an appointment. Upon creation of a new record, the default value for isCancelled is 0 and later it is updated by the staff if the patient cancels the appointment.

9. Employees (EmployeeId, EmployeeTypeId, NPID, FirstName, LastName, AddressFirstLine, ZipCode, PhoneNo, Email, DOB, Gender, isWorking)

This entity captures the information about the Employees working. This entity and its records can only be accessed by Administrators having higher order access of the Database. The EmployeeId attribute is the Primary Key and the Foreign Key referring to the EmployeeType Entity. Information like Name, NPI ID, AddressFirstLine, PhoneNo, Email, DOB and Gender is captured. The ZipCode attribute is a foreign key reference to the MasterZipCodes entity. IsWorking field is used to capture if the employee is currently working or not, in the sense if the employee is on a leave, then the value is set to 0 indicating that this employee is currently unavailable. This is not to be confused with if an employee is busy with an appointment or not. Data in this table is filled in by the staff of the clinic. Upon creation of a new record, the default value for isWorking is 1 and later it is updated by the staff if the employee is on a leave or vacation. If any information in this table needs to be updated, the staff can update it.

10.EmployeeTypes (EmployeeTypeId, Job Title)

This weak entity contains records denoting the type of an employee. As in, what are their roles and responsibilities, also captures their job title. For now our model only captures dentists and hygienists. Data in this table is pre-defined. The system has Dentist and Hygienist as the two employee types. More can be added in the future.

11.EmployeeSpecializations (SID, EmployeeId, Specialization)

Dentists can have specializations; they can have multiple of these. In order to capture the same, this entity is made. To allow a single dentist (EmployeeId) to have more than one specializations, a SID primary key has been added which will be uniquely generated by the system upon every record entry. Various specializations include- orthodontics, prosthodontics, periodontics, pediatric dentistry, endodontics etc. Data in this table is filled in by the staff of the clinic. If an employee gets a new specialization, a new entry is created to capture the same.

12.Patient (PatientId, PrimaryDentistId, FirstName, LastName, PhoneNo, Email, DOB, Gender)

This entity captures the main information about the patients. The PatientId attribute is the Primary Key. PrimaryDentistId is a Foreign Key to the Employees entity. A primary dentist is assigned to every patient by the dental clinic to handle all the patient's procedures (depending on the primary dentist availability). Information like Name, PhoneNo, Email, DOB and Gender for the patient is also captured. Data in this table comes from the intake form that the dentist clinic provides to the patient upon their first visit. The PatientID is system generated and Primary dentist ID is assigned by the clinic staff. If any information in this table needs to be updated, the staff can update it.

13. PatientInfo (PatientId, AddressFirstLine, ZipCode, EmergencyFirstName, EmergencyLastName, EmergencyPhoneNo)

This entity captures other information about each patient. Address details and emergency contact and name are stored in this entity. The ZipCode attribute is a foreign key reference to the MasterZipCodes entity. Data in this table comes from the intake form that the dentist clinic provides to the patient upon their first visit. If any information in this table needs to be updated, the staff can update it. Every patient has a single entry in this table, no multiple entries allowed for any of the patient records.

14.CompanionInfo (PatientId, CompanionFirstName, CompanionLastName, CompanionPhoneNo, Relationship)

In case the patient that comes to the dental clinic is under 18 years of age, they require a companion with them in order to be allowed entry into our dental clinic. Details like name, phone number and the relationship to the patient are captured of this companion. Data in this table is filled in by the staff of the clinic upon first visit of the patient if the patient is under 18 years old. A patient may or may not have an entry in this table and no patient can have multiple entries.

15.Consent (PatientId, Signed, Date)

This entity captures advanced information about the consent given by a patient. There is a unique ConsentId associated with every application of a patient. Signed column tells if the patient has signed the consent or not. Date column allows us to record the date the consent form was signed by the patient. This essentially also captures the date this patient had first visited our clinic, since the consent form is always signed upon first entering the clinic. Data in this table comes from the consent form that the clinic provides to the patient upon this first visit along with the intake form. Every patient has a single entry in this table, no multiple entries allowed for any of the patient records.

16.MedicalHistory (PatientId, COVID-19, Diabetes, Chemotherapy, HIV, HighCholesterol)

This entity captures information about all the previous medical encounters/history of the patient. Information like if patients have/had COVID-19, diabetes, chemotherapy, HIV or high cholesterol in past. Data in this table comes from the intake form that the dentist clinic provides to the patient upon their first visit. If any information in this table needs to be updated, the staff can update it. Every patient has a single entry in this table, no multiple entries allowed for any of the patient records.

17. OtherMedications (PatientId, Medicine, Purpose)

This entity stores the information of patients whether they're currently taking and medicines and why. The primary key is a composite of PatientId and Medicine Attributes. Data in this table comes from the intake form that the dentist clinic provides to the patient upon their first visit. If any information in this table needs to be updated, the staff can update it. A patient may or may not have an entry in this table. A patient could also have multiple record entries in this table.

18.DentalHistory (PatientId, TopicalFluorideApplication, FluoridatedWater, Fluoride Supplement Diet)

This entity captures information about all the previous dental encounters/history of the patient. Data in this table comes from the intake form that the dentist clinic provides to the patient upon their first visit. If any information in this table needs to be updated, the staff can update it. Every patient has a single entry in this table, no multiple entries allowed for any of the patient records.

19. InsuranceInfo (PatientId, InsuranceId, HolderFirstName, HolderLastName, InsuranceCompany, MaxCoverage)

This entity captures the basic information about the insurance taken by the patient. Patient Id and Insurance Id are the two keys here which together form the composite key of this entity. Data in this table comes from the intake form that the dentist clinic provides to the patient upon their first visit. If any information in this table needs to be updated, the staff can update it. A patient can have different insurance. This is captured by the presence of a composite key.

20. Allergies (PatientId, CheckinDate, Antibiotic, Aspirin, Codeine, Darvon, Local Anesthetic, Nitrous Oxide, Others)

This entity captures the basic information about the things the patient is allergic to. These details are updated upon every check-in, that is upon every visit for an appointment. The PatientId and CheckinDate attributes form the composite key of this entity. Data in this table initially comes from the intake form that the dentist clinic provides to the patient upon their first visit. For the first entries the date considered is the date the table was populated since it will be the date when the patient first filled the entry form. Later, the new data keeps coming upon every visit of the patient when we hand them allergies form to fill before their appointment.

21. DentalRecords (PatientId, AppointmentId, Findings, Comments, ProcedureRequired)

This entity captures information about all the dental records of the patient. Information like what was the result of the last test and the comments associated with it. Also, if a dental procedure is needed or not is stored in the ProcedureRequired column. The primary key of the entity is a composite key consisting of attributes PatientId and AppointmentId. Data in this tables is filled in after every appointment of every patient. Comments and findings of the doctor are used to fill in data in this. AppointmentId and PatientId is selected by the staff depending on which appointment and patient these dental finding records were related to. A patient can have multiple records of entries in this table.

22.Procedure (ProcedureId, ProcedurePerformed, ProcedureComments, ToothAssociated, AppointmentId, PatientId)

This entity records all the procedures performed across our Dental Offices. Procedure performed, comments and tooth associated are captured. AppointmentId and PatientId are foreign keys. An appointmentId can have multiple Procedures associated/performed. Data in this table is filled after every dental procedure performed in the dental offices. Comments, procedure performed, tooth associated data is brought in from the dentist. AppointmentId and PatientId is selected by the staff depending on which appointment and patient was this dental procedure related to.

23.Prescriptions (PrescriptionId, AppointmentId, DrugId)

This entity records the information of the details prescribed by the dentist to the patient. Details like a unique prescription Id, the appointment id and the drug advised by the dentist are stored. Prescriptions are given during a appointment, so the appointmentId is filled as per this. DrugId is got from what drug the doctor has prescribed. PrescriptionId is system generated value.

BUSINESS RULES

OUT OF SCOPE

- 1: Employees other than Dentists and Hygienist are not captured
- 2: Employee salary is not considered
- 3: Employee ratings are out of scope
- 4: Dentist consulting fees are out of Scope
- 5: Operation fees are also not considered and are out of scope
- 6: Drugs charges are out of scope
- 7: Billing and payments are out of scope
- 8: Patient direct walk-in without appointment
- 9: Deletion of employee records is not in scope
- 10: Tracking patient activity and deleting inactive patients is out of scope

IN SCOPE

- 1: Every Patient has primary dentist
- 2: Symptoms will cover patient's wellness check (Covid) as well as reasons for doctor's appointment
- 3: Dental equipment can only be present inside rooms
- 4: Different types of doctors will have different types of offices assigned
- 5: Initial intake form is required to be filled by all patients
- 6: Patient record must have an allergy section
- 7: Allergy records are captured upon every new visit to the clinic
- 8: Multiple Insurance information of same patient must be captured
- 9: Drug inventory is maintained and captured by the data model
- 10: Drugs cannot be accessed without Prescription
- 11: Prescription can only be provided by a doctor, not a nurse
- 12: Prescriptions are only provided after appointments, with a link to which appointment the prescription was provided for
- 13: Necessary information pertaining to basic details should be filled in to make an appointment
- 14: Appointments can be cancelled
- 15: After each appointment, findings are captured in a dental records table
- 16: A track of all procedures performed is kept across clinics
- 17: Primary dentist can be transferred for a patient, depending on dentist availability
- 18: Working availability of Employees can be tracked by the attribute isWorking in the employee column. If an employee is currently predisposed or is on leave, the value of isWorking will be 0

POTENTIAL SCOPE

- 1: Employee's salaries and Perks can be added
- 2: Direct changes when insurance is not available can be added
- 3: Transfer patients directory can be added
- 4: More employees of the dental system can be added

ENTITIES

1. OFFICE Cluster

1.a. OfficeLocation ENTITY

Attributes	Data Type	Req	Key	Description
Officeld	Int	Unique	PK	Incremental Id assigned by the system
PhoneNo	Varchar(15)	Not Null		Primary Phone Number of the Office
AddressFirstLine	Varchar(50)			First Line of the Address of the Office
ZipCode	Varchar(10)	Not Null	FK	Zip code of the Office Location, references to the MasterZipCodes entity
DrugStoreId	Int		FK	Foreign Key referring to the Drug Store Entity
NoOfRooms	Int			Number of rooms in the Office

Example:

Officeld	PhoneNo	AddressFirstLine	ZipCode	DrugStoreId	NoOfRooms
1	6676676767	10, Huntington Ave	2115	1	4
2	6676676768	283 Fusce Rd.	36104	2	5
3	6676676769	606 Ullamcorper. Street	99801	3	6
4	6676676770	Ap #867 Sit Rd.	85001	4	7
5	6676676771	7292 Dictum Av.	78701	5	8
6	6676676772	Ap #651-8679 Sodales Av.	95814	6	9
7	6676676773	5037 Diam Rd.	29217	7	10
8	6676676774	191-103 Integer Rd.	6103	8	11
9	6676676775	P.O. Box 887 2508 Dolor. Av.	65101	9	12
10	6676676777	935-9940 Tortor. Street	68502	11	14

1.b. MasterZipCodes Entity

Attribute s	Data Type	Req	Key	Description
ZipCode	Varchar(10)	Uni que	PK	ZipCode for which entry is being made
City	Varchar(20)			Denotes the city of this zip code
State	Char(2)	Not Null		Denotes the state of this zip code

Example:

ZipCode	City	State
2115	Boston	MA
2903	Providence	RI
4330	Augusta	ME
6103	Hartford	CT
8608	Trenton	NJ
12207	Albany	NY
17101	Harrisburg	PA
19901	Dover	DE
21401	Annapolis	MD
27601	Raleigh	NC

1.c. Rooms Entity

Attributes	Data Type	Req	Key	Description
RoomId	Int	Unique	PK	Incremental Id assigned by the system
RoomTypeld	Int	Not Null	FK	Denotes the purpose of the Room
Officeld	Int	Not Null	FK	Denotes the Office in which the Room is located

Example:

RoomId	RoomTypeld	Officeld
1	1	1
2	1	5
3	2	6
4	2	7
5	3	8
6	3	12
7	1	14
8	2	19
9	3	3
10	4	8

1.d. RoomTypes Entity

Attributes	Data Type	Req	Key	Description
RoomTypeld	Int	Not Null, Unique	PK	Incremental Id assigned by the system
RoomName	Varchar(20)			Name of the type of room. Can be one of: General (Id: 1), Hygienist (Id: 2), Endodontic (Id: 3), Orthodontic (Id: 4)

Example:

RoomTypeld	RoomName
1	General
2	Hygienist
3	Endodontic
4	Orthodontic

1.e. Equipment Entity

Attributes	Data Type	Req	Key	Description
EquipmentId	Int	Not Null, Unique	PK	Incremental Id assigned by the system
EquipmentName	Varchar(20)	Not Null		Name of the equipment
RoomId	Int	Not Null	FK	Room in which the equipment is located/ can be found

Example:

EquipmentId	EquipmentName	RoomId
1	Dental PC	1
2	Dental Syringe	2
3	Mouth Mirror	3
4	Explorers	4
5	Cotton Forceps	5
6	Periodontal Probe	6
7	Ultrasonic Scaler	7
8	Extracting Forceps	8
9	Dental Elevator	9
10	Air Water Syringe	10
11	Saliva Ejector	11

1.f. DrugStore Entity

Attributes	Data Type	Req	Key	Description
DrugStoreId	Int	Not Null, Unique	PK	Incremental Id assigned by the system
DrugId	Int	Not Null	PK	Incremental Id for drug assigned by the system
Quantity	Int	Not Null		Quantity of Drug at Pharmacy, 1 unit denotes 1 pill/tablet

Example:

DrugStoreId	DrugId	Quantity
1	8	10
2	9	20
3	10	30
4	1	10
5	2	23
6	3	45
7	4	65
8	5	88
9	6	54
10	7	23

1.g. Drug Entity

Attributes	Data Type	Req	Key	Description
DrugId	Int	Not Null, Unique	PK	Incremental Id assigned by the system
DrugName	Varchar(20)	Not Null		Clinical Name of the Drug
Usage	Varchar(50)			Usage of the Drug
Price	Money	Not Null		Price of 1 unit of the Drug

Example:

DrugId	DrugName	Usage	Price
1	Motrin	Treatment of fever and pain.	10.99
2	Tylenol	Treat mild to moderate pain	12.49
3	Anbesol	Dental/Gum Pain/Cold Sores	17.81
4	Orajel	Anesthetic for oral mucosa.	16.54
5	Peridex	Oral rinse to treat Gingivitis	6.14
6	PerioChip	An agent used to treat periodontitis	355.5
7	PerioGard	Chlorhexidine gluconate oral rinse	3.98
8	Minocycline	Antibiotic for bacterial infection	25.72
9	Triclosan	Bacterial Infections and Mycoses	97
10	Orabase	Used for anti-inflammatory, antiallergic action	8.69
11	Oracort	Reduces the swelling, pain of mouth sores	22.69
12	Oralone	Used for relief of symptoms of oral ulcers	35

1.h. Appointments Entity

Attributes	Data Type	Req	Key	Description
AppointmentId	Int	Not Null, Unique	PK	Incremental Id assigned by the system
AppointmentType Name	Varchar(20)	Not Null		Denotes the general purpose of the appointment
PatientId	Int	Not Null	FK	Foreign key referring to the Patient who the appointment is scheduled for
EmployeeId	Int	Not Null	FK	Foreign key referring to the Employee who schedules the appointment
OfficeId	Int	Not Null	FK	Foreign key referring to the Office at which the appointment is scheduled at
RoomId	Int	Not Null	FK	Foreign key referring to the Room in which the appointment will take place
StartTime	DateTime	Not Null		Start time of the Appointment
EndTime	DateTime	Not Null		End time of the Appointment
isCancelled	Bit	Default Value		1 if appointment is cancelled, 0 if not (Default value set to 0)

Example:

Appointment Id	AppointmentType Name	PatientId	EmployeeId	OfficeId	RoomId	StartTime	EndTime	isCancelled
1	Emergency	1	1	1	2	2021-12-18 09:00:00	2021-12-18 10:00:00	0
2	General	2	2	2	16	2021-12-18 10:00:00	2021-12-18 11:00:00	0
3	Follow-up	4	3	3	1	2021-12-18 11:00:01	2021-12-18 12:00:01	0
4	Routine	5	2	4	15	2021-12-18 12:00:00	2021-12-18 12:30:00	0
5	General	6	3	2	2	2021-12-18 13:00:00	2021-12-18 13:45:00	0
6	Follow-up	7	4	5	1	2021-12-18 14:00:00	2021-12-18 15:00:00	0
7	Emergency	14	4	6	1	2021-12-21 11:00:01	2021-12-21 11:30:01	0
8	General	17	5	7	4	2021-12-18 11:00:01	2021-12-18 12:00:01	0
9	Follow-up	1	2	10	1	2021-12-19 09:00:00	2021-12-19 09:30:00	0

2. PROVIDER Cluster

2.a. Employees Entity

Attributes	Data Type	Req	Key	Description
EmployeeId	Int	Not Null, Unique	PK	Incremental Id assigned by the system
EmployeeTypeId	Int	Not Null	FK	Foreign Key referring to the Employee Type entity
NPID	Char(10)	Unique		This is the National Provider Identifier ID. It is a unique ID given to healthcare professionals
FirstName	Varchar(20)	Not Null		First Name of the employee
LastName	Varchar(20)			Last Name of the employee
AddressFirst Line	Varchar(50)	Not Null		First Line of the Address of the employee
ZipCode	Char(5)	Not Null	FK	Zip code of the Office Location, references to the MasterZipCodes entity
PhoneNo	Varchar(15)	Not Null		Phone Number of the employee
Email	Varchar(30)			Email id of the employee
DOB	Date	Not Null		Date of birth of the employee
Gender	Char(10)	Not Null		Gender of the employee
isWorking	Bit	Default Value		Denotes availability of the employee, i.e. if this employee is on a leave today or is on a vacation then we make this value 0 for that duration- 0-not available 1-available (Default value set to 1)

Example:

Employee Id	Employee Type Id	NPID	First Name	Last Name	Address First Line	Zip Code	Phone No	Email	DOB	Gender	isWorking
1	1	9572508368	Molly	Weasley	107 Cactus Rd	2115	6676461305	m.weasley@gmail.com	9/29/92	Female	0
2	1	2659463693	Amy	Dunne	43 Marchal St	36104	6676461306	amydone@yahoo.com	8/29/98	Female	1
3	1	9344345839	Claire	Smith	8919 4th St	99801	6676461307	claire.s@gmail.com	7/29/97	Female	1
4	1	2694866251	Madeleine	James	1185 Boylston St	85001	6676461308	mjms@gmail.com	6/25/99	Female	0
5	1	3704480461	Kate	Williams	81 Ann Dr.	78701	6676461309	k.williams@gmail.com	6/26/99	Female	1
6	1	6245940951	Emma	Miller	25 Allied Dr.	95814	6676461310	emmam@gmail.com	6/27/99	Female	1
7	1	6247318855	Jada	Hawthorne	13 Green St	29217	6676461311	jadah@gmail.com	6/28/99	Female	1
8	1	5774154611	Ang	Lee	83 NW	6103	6676461312	anglee@gmail.com	6/29/99	Male	1
9	1	5269224769	Willow	Smith	1 West Saxon St	65101	6676461313	smithw@gmail.com	6/30/99	Female	1
10	1	7145978215	Jake	Low	533 Penn Drive	59623	6676461314	jlowe@gmail.com	7/1/69	Male	1

2.b. EmployeeTypes Entity

Attributes	Data Type	Req	Key	Description
EmployeeTypeld	Int	Not Null, Unique	PK	Incremental Id assigned by the system
Job_Title	Varchar(10)	Not Null		Title associated with the job

Example:

EmployeeTypeld	JobTitle
1	Dentist
2	Hygienist

2.c. EmployeeSpecializations Entity

Attributes	Data Type	Req	Key	Description
SID	Int	Not Null, Unique	PK	Incremental Id assigned by the system
EmployeeId	Int	Not Null	FK	Reference to the employee whose specializations being captured
Specializations	Varchar(20)	Not Null		The sepcialization that this employee has. Only single specialziatio per entry

Example:

SID	EmployeeId	Specializations
1	1	Endodontist
2	1	Orthodontist
4	3	Pedodontist
5	3	Orthodontist
8	8	Periodontist
9	9	Orthodontist
10	10	Orthodontist
11	10	Prosthodontist
12	11	Endodontist
13	1	Oral Surgeon
14	7	Oral Surgeon
16	7	Anesthesiologist

3. PATIENT Cluster

3.a. Patient Entity

Attributes	Data Type	Req	Key	Description
PatientId	Int	Not Null, Unique	PK	This is the primary key of this table, references to the patient entity
PrimaryDentistId	Int	Not Null	FK	EmployeeId of the Primary Dentist of this Patient
FirstName	Varhar(20)	Not Null		First Name of the patient
LastName	Varchar(20)	Not Null		Last name of the patient
PhoneNo	Varchar(15)	Not Null		Phone Number of the patient
Email	Varchar(30)			Email Id of the patient
DOB	Date	Not Null		Date of birth of the patient
Gender	Char(10)	Not Null		Gender of the patient

Example:

PatientId	PrimaryDentistId	FirstName	LastName	PhoneNo	Email	DOB	Gender
1	1	Mark	Smith	6676696969	msmith@gmail.com	9/29/05	Male
2	2	Anthony	Rodriguez	6676696970	arod@gmail.com	9/30/96	Male
3	1	Donald	Brown	6676696971	dbrown@gmail.com	10/1/93	Male
4	2	Steve	Davis	6676696972	daviss@gmail.com	10/2/98	Male
5	3	Andrew	Wilson	6676696973	andywil@gmail.com	10/3/89	Male
6	4	Joshua	Thomas	6676696974	josht@gmail.com	10/4/95	Male
7	1	George	Taylor	6676696975	georgetay@gmail.com	10/5/07	Male
8	5	Edward	Lee	6676696976	lee.ed@gmail.com	10/6/96	Male
9	1	Jason	Thompson	6676696977	jason.thompson@gmail.com	10/7/86	Male

3.b. PatientInfo Entity

Attributes	Data Type	Req	Key	Description
PatientId	Int	Not Null, Unique	PK	This is the primary key of this table, references to the patient entity
AddressFirstLine	Varchar(50)	Not Null		First Line of Address of the patient
ZipCode	Varchar(10)	Not Null	FK	Zip code of the Office Location, references to the MasterZipCodes entity
EmergencyFirstName	Char(20)	Not Null		First name of emergency contact
EmergencyLastName	Char(20)			Last name of emergency contact
EmergencyPhoneNo	Varchar(15)	Not Null		Phone number of emergency contact

Example:

Patient Id	AddressFirstLine	ZipCode	EmergencyFirstName	EmergencyLastName	EmergencyPhoneNo
1	10900 Wilshire Blvd	2115	Sarah	Marshall	889891301
2	14 Vine St	36104	Blair	Waldorf	889891302
3	815 Woodland St	99801	Serena	Van der Woodsen	889891303
4	33 Lakeshore Drive	85001	Nate	Archibald	889891304
6	3 Chapel St	95814	Daniel	Humphrey	889891306
7	933 Amerige Lane	29217	Gregory	Hirsch	889891307
8	60 W Surrey Isl.	6103	Tom	Wambsgams	889891308
5	93 Garden Dr.	78701	Charles	Bass	889891305
9	66 Vernon St	65101	Nicholas	Murray	889891309
10	8 W. Sugar St	59623	Monica	Scott	889891310

3.c. CompanionInfo Entity

Attributes	Data Type	Req	Key	Description
PatientId	Int	Not Null, Unique	PK	This is the primary key of this table, references to the patient entity
CompanionFirstName	Varchar(20)	Not Null		First name of the companion of the patient
CompanionLastName	Varchar(20)			Last name of the companion of the patient
CompanionPhoneNo	Varchar(15)	Not Null		Phone number of the companion of the patient
Relationship	Varchar(20)	Not Null		Relationship of the companion to the patient

Example:

PatientId	CompanionFirstName	CompanionLastName	CompanionPhoneNo	Relationship
1	Martin	Smith	6676696969	Father
7	Phoebe	Taylor	6676696975	Mother
15	Gloria	Campbell	6676696983	Mother
23	Bina	Patel	6676696991	Mother
11	Jason	Scott	6676696979	Father

3.d. Consent Entity

Attributes	Data Type	Req	Key	Description
PatientId	Int	Not Null, Unique	FK	Foreign Key referring to the PatientInfo Entity
Signed	Bit	Not Null		1 - if signed, 0 - if not signed
Date	Date	Not Null		Represents the date this consent form was presented to the patient

Example:

PatientId	Signed	Date
1	0	9/19/21
2	1	9/20/21
3	1	9/21/21
4	1	9/22/21
5	1	9/23/21
6	1	9/24/21
7	1	9/25/21
10	1	9/26/21
12	1	9/26/21
17	1	9/26/21

3.e. MedicalHistory Entity

Attributes	Data Type	Req	Key	Description
PatientId	Int	Not Null, Unique	PK	Foreign Key referring to the PatientInfo Entity
COVID-19	Bit	Not Null		0 - if has not been detected, 1 - if detected
Diabetes	Bit	Not Null		0 - if has not been detected, 1 - if detected
Chemotherapy	Bit	Not Null		0 - if has not been detected, 1 - if detected
HIV	Bit	Not Null		0 - if has not been detected, 1 - if detected
HighCholestrol	bit	Not Null		0 - if has not been detected, 1 - if detected

Example:

PatientId	Covid-19	Diabetes	Chemotherapy	HIV	High Cholestrol
1	0	1	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
5	1	0	0	0	0
6	0	0	0	0	0
7	0	0	0	0	0
8	0	0	0	0	1
9	0	0	0	0	0
10	0	0	0	0	0

3.f. OtherMedications Entity

Attributes	Data Type	Req	Key	Description
PatientId	Int	Not Null	PK	Composite Primary Key referring to the PatientInfo Entity
Medicine	Varchar(10)	Not Null	PK	Composite Primary Key denoting Medicine patient is currently taking
Purpose	Varchar(50)			Purpose of the medicine

Example:

PatientId	Medicine	Purpose
2	Allegra	Allergies
2	Ibuprofen	Cold
2	Prozac	Anti depressant
4	Allegra	Allergies
6	Zoloft	Anti depressant
7	Lexapro	Anxiety medication
8	Lexapro	Anxiety medication
9	Loratadine	Allergy
10	Ibuprofen	Common Cold
10	Zoloft	Anti Depressant

3.g. DentalHistory Entity

Attributes	Data Type	Req	Key	Description
PatientId	Int	Not Null, Unique	PK	Foreign Key referring to the PatientInfo Entity
TopicalFluorideAp plication	Bit			1 – if receiving, 0 – if not
Fluoridated Water	Bit			1 – if receiving, 0 - if not
Fluoride Supplement Diet	Bit			1 - if receiving, 0 - if not

Example:

PatientId	TopicalFluorideApplication	FluoridatedWater	FluorideSupplementDiet
1	0	0	0
2	0	1	0
3	0	0	0
4	0	1	1
5	0	0	0
6	0	0	0
7	1	1	1
8	0	0	0
9	0	0	0
10	1	0	0

4. RECORDS Cluster

4.a. InsuranceInfo Entity

Attributes	Data Type	Req	Key	Description
PatientId	Int	Not Null	PK	Primary Key referring to the PatientInfo Entity
InsuranceId	Int	Not Null	PK	Identifier of insurance subscription
HolderFirstName	Varchar(20)	Not Null		First Name of the subscriber
HolderLastName	Varchar(20)	Not Null		Last Name of the subscriber
InsuranceCompany	Varchar(20)	Not Null		Name of the Insurance provider
MaxCoverage	Date	Not Null		Date till insurance coverage is provided

Example:

InsuranceId	PatientId	HolderFirstName	HolderLastName	InsuranceCompany	MaxCoverage
5509 6995-D	1	Mark	Smith	AllState	10/21/22
9709 6965-D	2	Anthony	Rodriguez	Nationwide	1/1/25
7709 6885-A	3	Donald	Brown	Progressive	1/1/22
0119 3645-B	4	Steve	Davis	Amica Insurance	11/30/22
0009 0945-B	5	Andrew	Wilson	Nationwide	9/11/22
6609 4590-C	6	Joshua	Thomas	AllState	5/20/20
2088 6190-A	7	George	Taylor	Progressive	1/15/22
2009 1191-A	8	Edward	Lee	MaxxHealth	1/1/24
4449 4490-B	9	Jason	Thompson	AllState	4/15/24
2709 6945-D	10	Ryan	White	Amica Insurance	1/1/22

4.b. Allergies Entity

Attributes	Data Type	Req	Key	Description
PatientId	Int	Not Null	PK	Foreign Key referring to the PatientInfo Entity
CheckinDate	Date	Not Null	PK	Check-in Date of the Patient
Antibiotic	Bit	Not Null		0 - if has not been detected, 1 - if detected
Aspirin	Bit	Not Null		0 - if has not been detected, 1 - if detected
Codeine	Bit	Not Null		0 - if has not been detected, 1 - if detected
Darvon	Bit	Not Null		0 - if has not been detected, 1 - if detected
Local Anesthetic	Bit	Not Null		0 - if has not been detected, 1 - if detected
Nitrous Oxide	Bit	Not Null		0 - if has not been detected, 1 - if detected
Others	Varchar(50)			List any other allergies the patient has

Example:

Patient Id	CheckinDate	Antibiotic	Aspirin	Codeine	Darvon	Local Anesthetic	Nitrous Oxide	Others
1	10/12/21	0	0	0	1	0	0	Kiwi
2	8/1/21	0	0	0	1	0	1	Peaches, celery
3	11/23/21	1	0	0	0	0	1	sesame
4	11/15/21	1	0	0	1	1	0	Kiwi
5	10/25/21	0	1	1	0	1	1	Peanuts, milk
6	7/19/21	1	0	0	0	0	1	Peanuts
7	10/31/21	1	1	1	0	0	1	soybeans
8	12/12/21	0	1	1	0	0	0	Peaches
9	12/30/20	0	1	1	0	0	0	Wheat
10	10/12/21	0	0	0	0	1	0	milk

4.c. DentalRecords Entity

Attributes	Data Type	Req	Key	Description
PatientId	Int	Not Null	PK	Foreign Key referring to the PatientInfo Entity
AppointmentId	Int	Not Null	PK	Foreign Key referring to the Appointment Entity
Findings	Varchar(255)			States the findings and results through the examination conducted during the appointment
Comments	Varchar(255)			States the comments on the examination
ProcedureRequired	Bit	Not Null		1 if dental procedure is required, 0 if not

Example:

PatientId	AppointmentId	Findings	Comments	ProcedureRequired
1	1	Rot on Left incisor	Conduct removal on the tooth	1
1	9	Infection on central incisor	Performed cleaning, root canal in next appointment	1
1	21	Infection on first premolar	Root canal to be performed in next appointment	1
2	2	Rot on maxillary first molar tooth	Perform dental filling in next appointment	1
2	14	Rot on left canine	Perform dental filling in next appointment	1
3	12	Infection on maxillary third molar	Root canal to be performed in next appointment	1
4	3	Bleeding on left gum due to wisdom tooth	Check if pain persists in next appointment	0
4	10	Bleeding on right gum due to wisdom tooth	Check if pain persists in next appointment	0
5	4	Rot on maxillary second molar	Perform a root canal treatment	1
6	5	No cavity found	Performed general cleaning	0

4.d. Procedures Entity

Attributes	Data Type	Req	Key	Description
ProcedureId	Int	Not Null, Unique	PK	Incremental Id generated by system, incremented by 1 for every row
ProcedurePerformed	Varchar(50)	Not Null		Details of the procedure performed
ProcedureComments	Varchar(255)			Comments regarding the procedure done
ToothAssociated	Int			Every tooth is assigned an integer using which it is reference
AppointmentId	Int	Not Null	FK	Foreign key to the appointmentId
PatientId	Int	Not Null	FK	Foreign key to the patientId

Example:

ProcedureId	ProcedurePerformed	ProcedureComments	ToothAssociated	AppointmentId	PatientId
1	1	2	Root canal treatment	Requires more work next week	2
2	5	3	Dental cavity filling	Second appointment is needed	1
3	2	4	Tooth extraction	X-ray is needed for first appointment	11
4	4	7	Dental crown procedure	Requires more work next week	10
5	3	6	Dental implants	Final appointment is needed	6
6	7	15	Braces	Requires next appointment	1
8	10	19	Root canal treatment	X-ray is needed for first appointment	12
9	8	20	Dental implants	Requires next appointment	15
10	11	15	Dental cavity filling	Requires next appointment	4
11	15	16	Root canal treatment	Requires more work next week	5

4.e. Prescriptions Entity

Attributes	Data Type	Req	Key	Description
PrescriptionId	Int	NotNull, Unique	PK	Incremental Id generated by system, incremented by 1 for every row
AppointmentId	Int	NotNull	FK	Foreign Key referring to the Appointment Entity
DrugId	Int	NotNull	FK	Drug prescribed during the appointment. Foreign key to the Drugs entity

Example:

PrescriptionId	AppointmentId	DrugId
1	2	1
2	5	8
3	8	6
4	15	8
5	1	5
6	10	2
7	14	9
8	9	6
9	16	1
10	3	9

DENTAL MODEL ER-DIAGRAM



