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1 – Introduction

There are various complex processes that need to be performed in a hospital, which are related to a patient, like receiving a patient, recording the basic information of a patient... With a database system, the processes would be greatly simplified. A complete understanding of the business concerned with patient would be of a great help to the database system design. Therefore, we provide this document to describe the business requirements.

2 – System Overview

The system contains 23 entities in total. They are:

1. Patient
2. Insurance Plan
3. Surrogate
4. Allergy
5. Immunization
6. Disability
7. Medical History
8. Address
9. AddressType
10. Event
11. Accident
12. Inpatient
13. Doctor
14. Doctor List
15. Staff
16. Staff List
17. Prescription
18. Medication Details
19. Procedure Cost
20. Test Details
21. Test Image
22. Test Standard
23. Vital Set

The high level diagram of these entities is shown below:

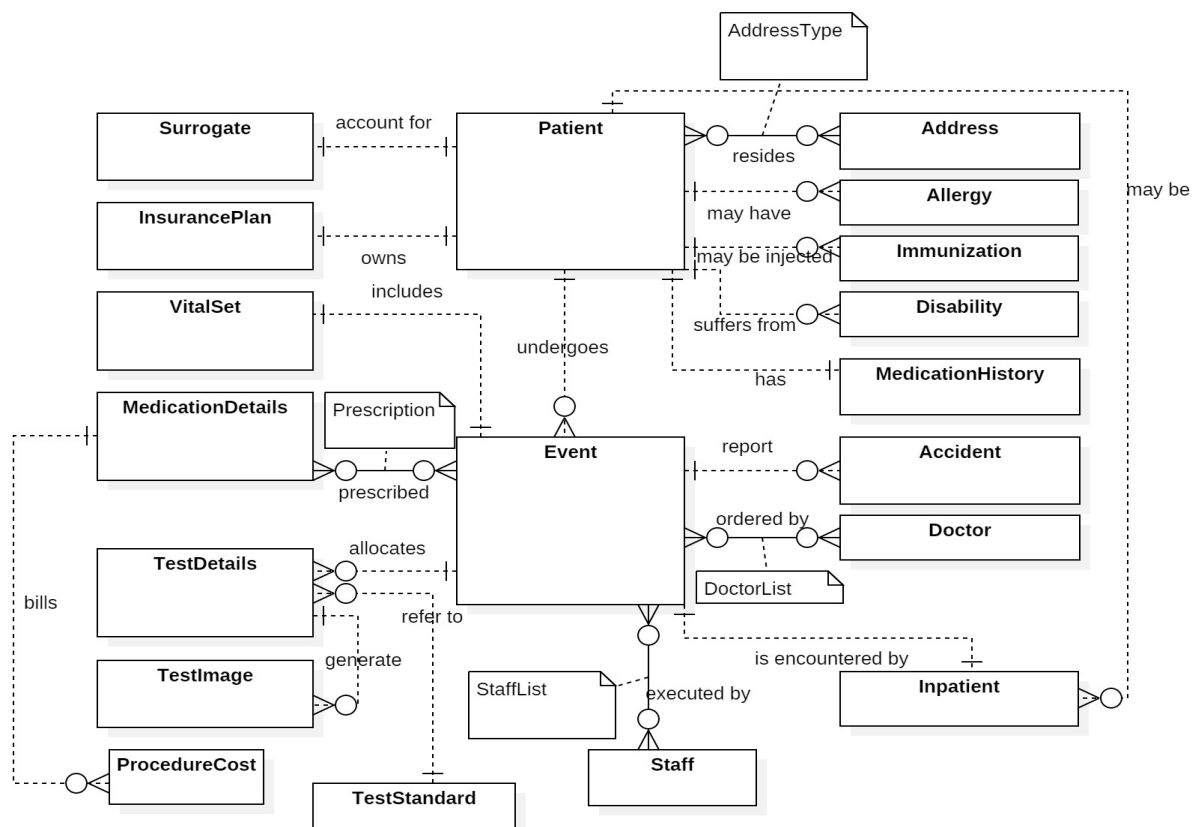


Figure 1: High level diagram of the system

3 – Scope Definition

1. In Scope Item

Serial No.	Scope item description
IS001	Record patient information: patient ID, name, date of birth, gender, allergies, existing conditions. (Patient Entity, Allergy Entity and Medical History Entity)
IS002	Family history information needs to be recorded. (Patient Entity)
IS003	A link to the healthcare proxy is needed if available. (Patient Entity)
IS004	Primary Care Physician (PCP) information is managed in the system. (Patient Entity)
IS005	Insurance information should be managed as part of the system. Insurance information consists of insurance plan ID, insurance plan details and insurance duration. (Insurance Plan Entity)
IS006	Surrogate's information should be recorded. (Surrogate Entity)
IS007	The system will record immunization detail of the patient. (Immunization Entity)
IS008	Disabilities information will be housed. (Disability Entity)

Continue

Serial No.	Scope item description
IS009	Patient's medical history should be considered. (Medical History Entity)
IS010	The address of the patient needed to be considered. (Address Entity and Address Type Entity)
IS011	There should be an entity that can house the detail of things happened to the patient in the hospital. (Event Entity)
IS012	Injury of the patient like work injury should be stored in a separated table. (Accident Entity)
IS013	Location of the patient while staying in the hospital. (Inpatient Entity)
IS014	Record doctor information: National Provider Id (NPID), Doctor's First and Last Name, Contact Information. (Doctor Entity and Doctor List Entity)
IS015	Consider the information of the staff that associated with the patient. The information should contain: staff ID, staff's first name and last name, contact number, etc. (Staff Entity and Staff List Entity)
IS016	Medication details should be recorded. (Medical Details Entity and Prescription Entity)
IS017	House information about medical procedure and procedure cost. (Procedure Cost Entity)
IS018	Test Results captured from blood/pathology and radiology tests, etc., with values like: range (low/high of the test), test Image (type, size). (Test Details Entity, Test Image Entity and Test Standard Entity)
IS019	There should be an entity that can house patient's vital signs. Vital signs contain: Heart rate, Respiratory Rate, Blood Pressure, Date of the record. (Vital Set Entity)

2. Out of Scope Item

Serial No.	Scope item description
OS001	Inventory is not managed as part of the system.
OS002	Claim history is not in scope.
OS003	Entities to hold patient appointment schedules (date & time, doctor name), which can both search and arrange appointments are out of scope.
OS004	Doctor's experience is not considered in the system.
OS005	Don't need to record the information about the food provided to the patient.
OS006	Table to store the data for the levels of patient care, such as emergency, or normal level is not needed.
OS007	History based rate cards for continuing patients is not considered in the system.
OS008	Schedule regular checkups for patients according to their age slot.
OS009	The severity of allergies is out of scope.
OS010	Specialization of the doctor is out of scope.
OS011	Credit card information is not in scope of the system.
OS012	Do not record SSN information.
OS013	The relation between family members is not need to consider.

4 – Entities

1. Patient

A patient is defined as the person that has a history of medical records and may be admitted to the hospital in case of emergency. This entity will house all the basic details of the patient.

Attribute Name	Data Type	Null	Key	Definition
PatientID	Integer	No	PK	Unique identifier assigned by the system increments by one for each new patient.
PFirstName	Character(10)	No		A common first name that the patient is referred to by staff and doctor.
PLastName	Character(10)	No		A common last name that the patient is referred to by staff and doctor.
DOB	Date	No		Date of Birth of the patient. If we don't know the exact date store it as 1/1/Year.
Gender	Character(10)	No		Gender of the patient.
PrimaryCarePhysician	Character(35)	Yes		Name of the Primary Care Physician of the patient. There should be a space between first name and last name. In case of the patient has not been assigned a PCP, this attribute can be null.
Contact	Character(10)	Yes		Record a contact number where the patient can be reached.
HealthcareProxyFormLink	Varchar(500)	Yes		The link to the Healthcare proxy form.

Sample Data

PatientID	78953451	78953452	78953453
PFirstName	Ron	Show	Jane
PLastName	David	Johnson	Edson
DOB	1/1/2015	1/12/2011	2/2/2015
Gender	Male	Female	Male
PrimaryCarePhysician	Jason Mraz	null	Steve Jobs
Contact	7475981	null	74864146
HealthcareProxyFormLink	www.legalnature.com/lp/hpro/healthcare-proxy	www.legalnature.com/lp/lthcare-proxy	www.legalnature.com/lp/hprosefse/e-proxy

2. Insurance Plan

The insurance plan that owned by the patient. This entity will house the detail of the insurance plan.

Attribute Name	Data Type	Null	Key	Definition
InsurancePlanID	Integer	No	PK	Unique identifier assigned by the system increments by one for each new insurance plan record.
PatientID	Integer	No	FK	Unique identifier assigned by the system increments by one for each new patient.
InsuranceCompany	Character(50)	No		The companies that provide insurance to the patient.
InsuranceNumber	Integer	No		The number of the insurance. The number of different company can be the same.
InsurancePlanDetails	Varchar(Max)	No		The details of the insurance plan.
EffectiveDate	Date	No		The plan's effective date.
ExpiryDate	Date	No		The expiry date of the plan. Must larger than effective dates and the day the patient go to the hospital.

Sample Data

InsurancePlanID	4353451	4353452	4353453	4353454
PatientID	6568484	6568484	6568484	6568484
InsuranceCompany	AG Insurance	Asurion	EFU Life	CGM Gallagher
InsuranceNumber	34543857	2345245	9875243	987589347
InsurancePlanDetails	Monthly Premium:\$170.5 9. Annual Deductible:Part A: \$1,288 Part B: \$166. Doctor/Hospital Choice: Any Doctor or medical provider that accepts Medicare. Office Visit: No charge after Part B deductible. Out-of-Pocket Max: No Limit.	a. \$4,900 for services you receive from in-network providers. b. \$4,900 for services you receive from any provider. Your limit for services received from in-network providers will count toward this limit.	Deductible Individual: \$3,000.Coinsurance : 20% after deductible. Coinsurance Limit: \$0. Maximum Lifetime Coverage: \$100,000. Out of Pocket Limit: \$10,000.	Deductible Individual: \$5,000.Coinsurance: 20% after deductible. Coinsurance Limit: \$0. Maximum Lifetime Coverage: \$100,000. Out of Pocket Limit: \$10,000.
EffectiveDate	1/1/2010	1/2/2010	1/3/2010	1/4/2010
ExpiryDate	3/1/2015	6/1/2015	7/1/2015	7/11/2015

3. Surrogate

Details of the information of the patient's surrogate. He/she is authorized to take decisions on behalf of the patient in case of emergency.

Attribute Name	Data Type	Null	Key	Definition
SurrogateID	Integer	No	PK	Unique identifier assigned by the system increments by one for each new surrogate.
PatientID	Integer	No	FK	Unique identifier assigned by the system increments by one for each new patient.
SFirstName	Character(10)	No		The first name of the surrogate.
SLastName	Character(10)	No		The last name of the surrogate.
Contact	Character(10)	Yes		Records a contact number where the surrogate can be reached.

Sample Data

SurrogateID	8377489	8377490	8377491	8377492
PatientID	34243	2435435	14532	4756
SFirstName	Pet	Rocky	Lily	Jon
SLastName	Smith	Bryant	Bush	Zhang
Contact	6174587949	6924607912	6924607912	6748289124

4. Allergy

The allergies a patient may have.

Attribute Name	Data Type	Null	Key	Definition
AllergyID	Integer	No	PK	Unique identifier assigned by the system increments by one for each new Allergy record.
PatientID	Integer	No	FK	Unique identifier assigned by the system increments by one for each new patient.
AllergyName	Character(50)	No		The exact name for the type of allergy.
AllergyDesc	Varchar(500)	Yes		The description that the allergy may be described.

Sample Data

AllergyID	9234234	9234235	9234236
PatientID	2234234	23453454	9235243
AllergyName	Adenoids	Hay fever	Anaphylaxis
AllergyDesc	An exaggerated response to a substance produced by the release of histamine.	Allergic reaction caused by the pollens.	Severe, life-threatening allergic response.

5. Immunization

The immunization a patient had in the past. This entity will house the details of the immunization.

Attribute Name	Data Type	Null	Key	Definition
ImmunizationID	Integer	No	PK	Unique identifier assigned by the system increments by one for each new Immunization record.
PatientID	Integer	No	FK	Unique identifier assigned by the system increments by one for each new patient.
ImmunizationName	Character(50)	No		The exact name for the type of immunization.
ImmunizationDesc	Varchar(500)	Yes		The description that the immunization may be described.

Sample Data

ImmunizationID	045656	045657	045658
PatientID	2246839	869734	346579
ImmunizationName	Pertussis vaccine	Measles Vaccine	Pertussis vaccine
ImmunizationDesc	A vaccine that protects against whooping cough.	A vaccine that is very effective at preventing measles.	A vaccine that protects against whooping cough.

6. Disability

The disability a patient may suffer. This entity will house the details of the patient's disability information.

Attribute Name	Data Type	Null	Key	Definition
DisabilityID	Integer	No	PK	Unique identifier assigned by the system increments by one for each new disability record.
PatientID	Integer	No	FK	Unique identifier assigned by the system increments by one for each new patient.
DisabilityName	Character(50)	No		The exact name for the type of disability.
DisabilityDesc	Varchar(500)	Yes		The description that the disability may be described.

Sample Data

DisabilityID	2678678	2678679	2678680
PatientID	23456	434566	9345635
DisabilityName	Deaf	Blind	Idiot

Continue

DisabilityDesc	null	A person cannot see anything.	A person with an IQ of 0–30.
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7. Medical History

This entity is defined as the medical history a patient may have in the past. This entity will house details about the existing condition, family history and past surgery.

Attribute Name	Data Type	Null	Key	Definition
MedicalHistID	Integer	No	PK	Unique identifier assigned by the system increments by one for each medical history.
PatientID	Integer	No	FK	Unique identifier assigned by the system increments by one for each new patient.
ExistingConditions	Varchar(500)	No		The existing condition for each medical history. In case of new born, record "No medical history".
FamilyHistory	Varchar(max)	Yes		The family medical history a patient may have. If not know the family history, record "Family history not knows".
PastSurgery	Varchar(500)	Yes		The past surgery a patient may take. If the patient doesn't have past surgery, record "No past surgery".

Sample Data

MedicalHistID	222673	222674	222675
PatientID	224523	2453464	9346346
ExistingConditions	Having a fever. Body temperature: 39 C.	No obvious symptom.	Left eye injury.
FamilyHistory	Family history not knows.	Grandfather has Heart Disease.	Father has diabetes.
PastSurgery	No past surgery.	Heart pass.	Bone marrow transportation.

8. Address

The Address that the patient resides. This entity will house all details about the patient's address.

Attribute Name	Data Type	Null	Key	Definition
AddressID	Integer	No	PK	Unique identifier assigned by the system increments by one for each new Address.

Continue

Attribute Name	Data Type	Null	Key	Definition
Street	Varchar(100)	No		Patient's address-street name.
City	Character(20)	No		Patient's address-city name.
State	Character(2)	No		Must be a standard US Postal State Code of 2 digits as defined by US Postal Service. http://pe.usps.gov/text/pub28/28apb.htm
Zip	Character(10)	No		Must be a 5-digit Number or a 5-digit number followed by a hyphen and a 4-digit number.
AddressType	Character(20)	No		The type of the address, work address or home address.

Sample Data

AddressID	1453453	1453454	1453455
Street	37 Stephen St	24 Stephen St	75 Alphonsus St
City	Boston	Los Angeles	New York
State	MA	CA	NJ
Zip	02114	02345	02115

9. Address Type

The bridge-table that connected patient and address table.

Attribute Name	Data Type	Null	Key	Definition
AddressID	Integer	No	PFK	Unique identifier assigned by the system increments by one for each new Address.
PatientID	Integer	No	PFK	Unique identifier assigned by the system increments by one for each new patient.

Sample Data

AddressID	678678	678679	678680
Patient ID	223452345	234527644	1258799

10. Event

The event is defined as the things happened in the hospital related to the patient.

Attribute Name	Data Type	Null	Key	Definition
EventID	Integer	No	PK	Unique identifier assigned by the system increments by one for each new event.

Continue

Attribute Name	Data Type	Null	Key	Definition
PatientID	Integer	No	FK	Unique identifier assigned by the system increments by one for each new patient.
EventDate	Datetime	No		The exact date time of the event happens.
EventType	Character(20)	No		The type of the event.
Location	Varchar(50)	Yes		Location where the event is scheduled. If the event is related to an inpatient, then it may be empty.

Sample Data

EventID	1345345	1345346	1345347
PatientID	942695814	74678514	46014
EventDate	11/11/2014 15:22:45	02/12/2015 12:07:12	1/1/2015 22:35:17
EventType	Visit	Blood Test	Physical Exam
Location	308 Harward Building	103 Endocrine Building	101 Ell Building

11. Accident

Accident is defined as the injure the patient is suffered from. It can be work injury or non-work injury.

Attribute Name	Data Type	Null	Key	Definition
AccidentID	Integer	No	PK	Unique identifier assigned by the system increments by one for each new accident.
PatientID	Integer	No	FK	Unique identifier assigned by the system increments by one for each new patient.
WorkInjury	Character(1)	No		Work injure is an indicator of the accident type. Record Y for work injury accident, N for non-work injury accident.
AccidentDesc	Varchar(500)	No		The description that the accident may be described.
EmployerName	Varchar(35)	Yes		If the accident is a work injury, then the employer's name should be recorded.
EmployeeID	Integer	Yes		If the accident is a work injury, then the patient's employee ID should be recorded.

Sample data

AccidentID	89843	89844	89845	89846
PatientID	8377489	8442784172	78746974	482075
WorkInjury	Y	N	N	Y

Continue

AccidentDesc	Fell down while walking on the street, and injured right leg.	Left thumb has been injured while working.	Car collision, injury on right leg.	Bruised left arm while working.
EmployerName	Blue cross	null	null	Apple
EmployeeID	34534502	null	null	346304

12. Inpatient

The patient who should be hospitalized in the hospital for a while. This entity will house the information related to the inpatient.

Attribute Name	Data Type	Null	Key	Definition
InpatientID	Integer	No	PK	Unique identifier assigned by the system increments by one for each new inpatient.
PatientID	Integer	No	FK	Unique identifier assigned by the system increments by one for each new patient.
EventID	Integer	No	FK	Unique identifier assigned by the system increments by one for each new event.
RoomNum	Integer	No		The number of the exact room which the inpatient should be in.
Floor	Integer	No		The number of the floor the inpatient should be at.
Building	Character(20)	No		The building name the inpatient should be in.
CheckInTime	DateTime	No		The exact check in time of the inpatient.
CheckOutTime	DateTime	Yes		Record the exact check out time if the inpatient can check out from the hospital.

Sample data

InPatientID	66054	66055	66056	66057
EventID	8377489	8442784172	78746974	482075
RoomNum	003	010	409	502
Floor	1	20	10	5
Building	Inpatient 02	Oncology 03	Orthopedics 01	Surgery 04
CheckInTime	2016-02-24 12:32:54	2014-04-30 16:43:40	2016-03-25 16:45:20	2016-04-01 02:24:30
CheckOutTime	Null	2016-04-14 15:30:35	2015-04-14 12:30:38	2016-04-13 14:23:54

13. Doctor

A person who treats the patient and prescribes medicines or assigns tests to the patient.

Attribute Name	Data Type	Null	Key	Definition
NPID	Bigint	No	PK	A unique 10-digit identification number issued to health care providers in the United States by the Centers for Medicare and Medicaid Services (CMS).
DFirstName	Character(10)	No		A common first name that the doctor is referred to.
DLastName	Character(10)	No		A common last name that the doctor is referred to.
Contact	Character(10)	No		Records a contact number where the doctor can be reached.

Sample Data

NPID	7672428945	2471427485	2746856348	2645626424
DFirstName	Steve	Hudson	Ron	Jane
DLastName	David	Jon	Johnson	Shawn
Contact	6178552469	6178552454	64272688852	764275287

14. DoctorList

A bridge table that connected doctor and event.

Attribute Name	Data Type	Null	Key	Definition
EventID	Integer	No	PFK	Unique identifier assigned by the system increments by one for each new event.
NPID	Bigint	No	PFK	A unique 10-digit identification number issued to health care providers in the United States by the Centers for Medicare and Medicaid Services (CMS).

15. Staff

Staff is defined as the person who will execute the event that related to the patient. This entity will house information that about all the staff.

Attribute Name	Data Type	Null	Key	Definition
StaffID	Integer	No	PK	Unique identifier assigned by the system increments by one for each new staff person.
StFirstName	Character(10)	No		A common first name that the staff is referred to.
StLastName	Character(10)	No		A common last name that the staff is referred to.
Contact	Character(10)	No		Records a contact number where the staff can be reached.

Sample Data

StaffID	8377489	8377490	8377491	8377492
StFirstName	Pet	Rocky	Lily	Jon
StLastName	Smith	Bryant	Bush	Zhang
Contact	6174587949	6924607912	6924607912	6748289124

16. Staff List

A bridge table that connected staff and event.

Attribute Name	Data Type	Null	Key	Definition
StaffID	Integer	No	PFK	Unique identifier assigned by the system increments by one for each new staff person.
EventID	Integer	No	PFK	Unique identifier assigned by the system increments by one for each new event.

Sample Data

StaffID	8377489	8442784172	78746974	482075
EventID	28482646	2746	72248779	1354657

17. Prescription

A bridge table that connected medication details and event.

Attribute Name	Data Type	Null	Key	Definition
EventID	Integer	No	FK	Unique identifier assigned by the system increments by one for each new event.
MedicationDetailID	Integer	No	PK	Unique identifier assigned by the system increments by one for each new medication.

Sample Data

EventID	28482646	28482647	28482648
MedicationDetailID	109548	109543	109549

18. Medication Details

Details of the medication prescribed to the patient by the doctor.

Attribute Name	Data Type	Null	Key	Definition
MedicationDetailID	Integer	No	PK	Unique identifier assigned by the system increments by one for each new medication.
Dosage	Character(20)	Yes		A dosage is the amount of a medicine or drug that someone takes or should take.
MedicationName	Varchar(500)	Yes		A common name that the medication is referred to.
MedicineType	Varchar(50)	Yes		The type of the medicine.

Sample Data

MedicationDetailID	837591	837592	837593
Dosage	2 caplets/day	5 tablets/day	1 injection/day
MedicationName	TYLENOL® 8 HR Extended-Release Caplets	Betamethasone	Morphine
MedicineType	Muscle relaxants	Nonsteroidal anti- inflammatory drugs (NSAIDs)	Anti-anxiety drugs

19. Procedure Cost

The procedure cost is defined as the money the patient should pay to the hospital for each procedure he/she has taken. This entity will house every detail related to the cost.

Attribute Name	Data Type	Null	Key	Definition
CostID	Integer	No	PK	Unique identifier assigned by the system increments by one for each new cost.
MedicationDetailID	Integer	No	FK	Unique identifier assigned by the system increments by one for each new medication detail.
Amount	Money	No		The amount of money that the patient should pay to the hospital.
CostType	Varchar(20)	No		The type of the cost.

Sample data

CostID	231	232	233	234
MedicationDetailID	8377489	8442784172	78746974	482075
Amount	\$123	\$333	\$2423	\$2352
CostType	Clinic	Hospital	Skilled Nursing	Clinic

20. Test details

This entity is defined as the details of the test that was assigned to the patient by the doctor.

Attribute Name	Data Type	Null	Key	Definition
TestID	Integer	No	PK	Unique identifier assigned by the system increments by one for each new test.
EventID	Integer	No	FK	Unique identifier assigned by the system increments by one for each new event.
StandardID	Integer	No	FK	Unique identifier assigned by the system increments by one for each new test standard.
TName	Varchar(50)	No		The exact name that the test is referred to.
TestResults	Varchar(10)	No		Results of the test performed, values could be absent in case tests have not been performed yet. In case the result is positive or negative, record "Positive" for positive result and "Negative" for negative result.
Value	Character(10)	No		Comparison of the normal test result, Like: High, Low, and Normal etc.

Sample Data

TestID	385741	385742	385743
EventID	28482646	3242746	72248779
StandardID	13423	64564	23423
TName	Blood Test-WBC	Blood Test-RBC	Analysis of Urine-WBC
TestResults	5.0	3,70	5
Value	Normal	Low	High

21. Test Image

Image of the test that was assigned to the patient by the doctor. This entity will house all details that related to the test image.

Attribute Name	Data Type	Null	Key	Definition
ImageID	Integer	No	PK	Unique identifier assigned by the system increments by one for each new image.
TestID	Integer	No	FK	Unique identifier assigned by the system increments by one for each new test.
ImageName	Varchar(35)	No		The name that the image is referred to.
ImageType	Character(15)	No		The type of the image.
ImageSize	Decimal(12,2)	No		The size number of the image
Unit	Character(10)	No		The unit of the image size.
ImageLink	Varchar(500)	No		The exact image link.

Sample Data

ImageID	135645	135646	135647
TestID	323423	32445	365464
ImageName	X-Ray	B ultrasound	color doppler ultrasound
ImageType	jpg	png	bmp
ImageSize	123	544	64.65
Unit	m	mb	kb
ImageLink	www.ehealth_XRay.jpg	www.Ehealth_2132.BUltra.png	www.health_34234.cdu.bmp

22. Test Standard

The test standard is defined as the standard result of a certain test. The test result of the patient can refer to them.

Attribute Name	Data Type	Null	Key	Definition
StandardID	Integer	No	FK	Unique identifier assigned by the system increments by one for each new test standard.
TestName	Varchar(50)	No		A common name that the test is referred to.
TestItem	Varchar(10)	No		The specific item of the test.
LowRange	Integer	No		The lowest range of the test should be.
HighRange	Integer	No		The highest range of the test should be.
Unit	Character(10)	No		The unit of the test value.

Sample Data

StandardID	13421	13422	13423
TestName	Blood Test	Blood Test	Blood Test
TestItem	WBC	RBC	HGB
LowRange	4.0	4.2	12.0
HighRange	11.0	5.4	16.0
Unit	K/MM3	M/MM3	GM/DL

23. Vital Set

The vital signs of the patient.

Attribute Name	Data Type	Null	Key	Definition
VitalRecordID	Integer	No	PK	Unique identifier assigned by the system increments by one for each new vital record.
EventID	Integer	No	FK	Unique identifier assigned by the system increments by one for each new event.
HeartRate	Integer	No		Heart rate of patient.

Continue

Attribute Name	Data Type	Null	Key	Definition
RespiratoryRate	Integer	No		Respiratory rate of patient.
BloodPressure	Integer	No		Recorded blood pressure of patient.
Date	DateTime	No		Date and Time at which the vitals were records.

Sample Data

VitalRecordID	836541	836542	836543
EventID	72462744	7752648746	742674
HeartRate	78	79	97
RespiratoryRate	79	86	68
BloodPressure	89	78	76
Date	11/11/2015 12:12:12	12/12/2015 12:12:12	1/1/2015 12:12:12

5 – Relationships

a. Patient->Resides->Address (m:n).

One patient can resides in many addresses. An address can be resided by many patients. PatientID and AddressID act as the primary foreign key constraint for this relationship.

b. Patient->account for-> Surrogate (1:1).

One patient can be accounted by only one surrogate. PatientID acts as the foreign key constraint for this relationship.

c. Patient->may have->Allergy (1:m)

One patient may have many allergies. PatientID acts as the foreign key constraint for this relationship.

d. Patient->may be injected->Immunization (1:m).

One patient may be injected of many immunizations. PatientID acts as the foreign key constraint for this relationship.

e. Patient->suffers from->Disability (1:m).

One patient may have many disabilities. PatientID acts as the foreign key constraint for this relationship.

f. Patient->has->Medical History (1:1).

One patient can has only one medical history. PatientID acts as the foreign key constraint for this relationship.

g. Patient->may be->Inpatient (1:1).

One patient may be an inpatient. PatientID acts as the foreign key constraint for this relationship.

h. Patient->suffers from->Accident (1:m).

One patient can suffer from many accidents. PatientID acts as the foreign key constraint for this relationship.

i. Patient->owns->Insurance Plan (1:1).

One patient owns only one insurance plan in the scope of this database. PatientID acts as the foreign key constraint for this relationship.

j. Patient->undergoes->Event (1:m).

One patient can undergo many events. PatientID acts as the foreign key constraint for this relationship.

k. Event->report->Accident (1:m).

One event may report many accidents. PatientID acts as the foreign key constraint for this relationship.

l. Event->ordered by ->Doctor (m:n).

One event can be ordered by different doctors. One doctor can order many events. EventID and NPID act as the primary foreign key constraint for this relationship.

m. Event->executed by->Staff (m:n).

One event can be executed by many staffs. A staff may execute many events. EventID and StaffID act as the primary foreign key constraint for this relationship.

n. Event->encountered by->Inpatient (1:m).

One event can be encountered by one inpatient at one time. EventID acts as the foreign key constraint for this relationship.

o. Event->allocate->Test Details (1:m).

One event can allocate different tests to a patient. EventID acts as the foreign key constraint for this relationship.

p. Event->prescribes->Medication Details (m:n).

One event can prescribe different medications to a patient. A medication detail can be prescribed by many events. EventID and MedicationDetailID act as the primary foreign key constraint for this relationship.

q. Event->includes->Vital Set (1:1).

One event includes only one set of vitals. PatientID acts as the foreign key constraint for this

relationship.

r. Test Details->generate->Test Image (1:m).

One test detail may generate many test images. TestID acts as the foreign key constraint for this relationship.

s. Test Details-> refer to->Test Standard (m:1).

Many test details may refer to one test standard. StandardID acts as the foreign key constraint for this relationship.

t. Medication Details-> bills ->Procedure cost (1:m).

One medication detail can bill different procedure cost. MedicationDetailID acts as the foreign key constraint for this relationship.

Abbreviations

- SSN= Social Security Number
- ID= Identification
- DOB = Date Of Birth
- PCP= Primary Care Physician
- NPID= National Provider Identifier
- Desc= Description
- WBC= White Blood Cell
- RBC= Red Blood Cell
- HGB= Hemoglobin