|  |  |
| --- | --- |
| CarePartner | Team members: Isabelle Bichindaritz |

ContactManagement Database Project

[Introduction 1](#_Toc24909625)

[Project Overview 1](#_Toc24909626)

[Project Scope 1](#_Toc24909627)

[Client 2](#_Toc24909628)

[Main Functionality 2](#_Toc24909629)

[Document Overview 3](#_Toc24909630)

[Conceptual Data Model 4](#_Toc24909631)

[Use Case Diagram 4](#_Toc24909632)

[Class Diagram 6](#_Toc24909633)

[Logical Data Model 7](#_Toc24909634)

[User Views 7](#_Toc24909635)

[AuthenticateUserUI 8](#_Toc24909636)

[ContactHomeUI 9](#_Toc24909637)

[ContactUI 10](#_Toc24909638)

[ProblemUI 13](#_Toc24909639)

[SymptomUI 14](#_Toc24909640)

[MedicationUI 16](#_Toc24909641)

[ProcedureUI 18](#_Toc24909642)

[LabUI 20](#_Toc24909643)

[DiagnosisUI 22](#_Toc24909644)

[TreatmentUI 24](#_Toc24909645)

[StatsUI 25](#_Toc24909646)

[External Data Model 27](#_Toc24909647)

[Internal Data Model 29](#_Toc24909648)

[Data Dictionary 32](#_Toc24909649)

[ Figure 1 Use case diagram. 5](#_Toc24909863)

[ Figure 2 Conceptual class diagram. 6](#_Toc24909864)

[ Figure 3 Logical class diagram. 30](#_Toc24909865)

[ Figure 4 Data model. 32](#_Toc24909866)

|  |  |
| --- | --- |
| Part | Introduction |
| 1 |

# Introduction

The ContactManagement project is part of the CarePartner project effort and aims at creating an electronic contact form and management system to replace the current phone answering service of the Long-Term Follow-Up (LTFU) unit at Fred Hutchinson Cancer Research Center (FHCRC). An electronic contact management system over the Internet would offer many benefits both for home care providers and LTFU staff.

## Project Overview

The Long-Term Follow-Up unit currently handles by phone and mail all inquiries from home care providers in need of diagnosis and treatment advice for patients transplanted at Fred Hutchinson Cancer Research Center. Inquiries are received by LTFU nurses, who discuss with a LTFU expert clinician during regular clinical meetings. The nurses call back the physicians to provide them with the expert advice of LTFU clinicians. This process generally takes several days. Moreover, contact information is recorded on paper forms, and a very time consuming process of abstracting the information manually from hand-written contact forms takes place. Research nurses select pertinent clinical events and enter them in the clinical research database for research purposes.

By contrast, the ContactManagement project will have the benefit of having all contact information entered in electronic format in a database. More data will be available for research investigations, such as medications and their dosage, not currently abstracted in the clinical research database. The ContactManagement system will also provide real-time access over the Internet by home care providers to a knowledge-based decision-support system, part of the CarePartner project effort. Home care providers will receive instant answers for their inquiries in more than 95% of the cases. Thus, the ContactManagement system will benefit the efficiency and quality of both care and research , for home care providers and FHCRC alike.

## Project Scope

The scope of the project is to allow all contact information to be entered electronically, both by home care providers and LTFU clinicians. Home care providers will use the system to place a contact, view the answer to the contacts they have placed, and browse the history of contacts. LTFU staff will use the system to view contacts placed by home care providers, provide solutions to the contact inquiries, and generate statistics from the data gathered during contact management.

In a first stage, the system will not link automatically to the decision-support system, but only LTFU staff will provide solutions to the clinical problems. Neither will it be linked with the electronic patient record.

In a second stage, which will be presented in another report, the ContactManagement system will be integrated with the decision-support system (see DecisionSupportSystem project report) and the ElectronicPatientRecord (see ElectronicPatientRecord project report). Only then will the CarePartner system be complete.

## Client

The client for this project is LTFU, and particularly Dr. Keith M. Sullivan, LTFU head. The system will be used by:

1. LTFU staff handling phone and mail inquiries with home care providers, currently 5 nurses and clinicians.
2. LTFU data coordinators, currently 3 research nurses who may generate statistics from the system.
3. Most users will be home care providers, up to 1,500 actively caring for a patient transplanted at FHCRC in Seattle.

Users may have any level of computer proficiency, and the user interface, as most Web-based interfaces should not require training.

## Main Functionality

Primary care provider users will access the ContactManagement system to:

1. Place contact: a user places a contact through an electronic contact form with a reason for contact, a list of current problems, a list of signs and symptoms, a list of medications, a list of procedure results, and a list of allergies.
2. View contact: a user visualizes a complete contact, including a list of diagnosis assessment tests, and a list of treatment actions.
3. Browse contacts: a user browses the list of contacts, for a specific patient.

LTFU users will access the ContactManagement system to:

1. Browse contacts: a user browses the list of contacts, and can rank them according to several criteria. The user can also select a subset of contacts, such as for a specific patient, or a specific primary care provider, for instance.
2. Provide solution: a user types in a proposed solution to a contact inquiry, as a list of diagnosis assessment steps, and a list of treatment action steps.
3. Generate statistics: a user generates statistics such as graph the number of contacts per day, or cluster the contacts per reason for contact for instance.

Among the non-functional requirements, the system is a Web-application running on the Internet so that any home care provider in the nation, and over the world, can contact LTFU 24 hours a day and 7 days a week over the Internet. Some of the non-functional requirements for this system are:

* High security and confidentiality of any patient-identifiable information, including strong authentication, encryption, audit trails, role-based access to data, and organizational security plan (see CarePartner Security report).
* System reliability and fault-tolerance.
* Web-application developed with Java Server Pages (JSP).
* 2,000 patients to follow-up, and 1,500 active home care providers who may place concurrently an average of 100 contacts a day. They may also consult contact follow-up information concurrently.

## Document Overview

This document presents, after an overview of the project, the conceptual data model, the logical data model, and a data dictionary that provides a description for each data element.

|  |  |
| --- | --- |
| Part | Conceptual Data Model |
| 2 |

# Conceptual Data Model

## Use Case Diagram

The use-case diagram represents in use cases the main functionality of the system. Two actors are represented for future connection, the DecisionSupportSystem, and the ElectronicMedicalRecord. The KnowledgeBase is a database system which will provide information to the ContactManagementSystem, such as the list of problems, or the list of diagnoses.



1. Figure Use case diagram.

## Class Diagram



1. Figure Conceptual class diagram.

|  |  |
| --- | --- |
| Part | Logical Data Model |
| 3 |

# Logical Data Model

## User Views

The logical data model should account for each single data element on each input and output to the system. The user screens presented here define corresponding database user views. A set of normalized relations, in 3rd normal form, is listed for each view. Underlined attributes correspond to the primary key of each relation.

### AuthenticateUserUI

**1. user name**

**2. password**



1. user name: user name

2. password: password

**Normalized relations:**

USER(userName, password)

### ContactHomeUI

**1. name**

**2. contact date**



**3. patient name**

1. name: user full name

2. contact date: contact date

3. patient name: patient full name

**Normalized relations:**

USER(username, firstName, middleInitial, lastName)

CONTACT(contactDate, patientUpn)

PATIENT(patientUpn, firstName, middleName, lastName)

### ContactUI

**3. provider name**

**6. gender**

**11. taken by**

**7. date of last contact**

**2. patient upn**

**1. patient name**

**4. age**

**8 date estimated**

**12 name**

**24. problems**

**23. height**

 **unit**

**18. reason**

**22. height**

**21. weight**

**unit**

**20. weight**

**19. KPS**

**17. contact type**

**16. fax**

**13. source**

**15. phone**

**9. date of contact**

**10. contact mean**

**5. birth date**



**14. title**

1. patient name: patient full name

2. upn: patient upn

3. provider name: full provider name

4. age: patient age

5. birth date: patient birth date

6. gender: male of female

7. date of last contact: last date when this user placed a contact

8. date estimated: estimated or not for data of last contact

1. date of contact:: date when contact has been placed

10.contact mean: mean for contact ("MD/RN CDSS", "MD/RN Conversation", "Pt/Fam Conversation", "MD/RN Voice Mail", "Pt/Fam Voice Mail", "MD/RN Correspondence", "Pt/Fam Correspondence", "MD/RN Email", "Pt/Fam Email", "Pt Clinic Visit at FH", "Pt Spec not obtained at FH", "Other", "Unknown")

1. taken by: whether contact was Taken by or Placed by
2. contact name: name of person taking the contact
3. source: source of contact / recipient of contact
4. title: title of source / recipient (“MD”, “RN”, “Patient”, “Family”, “Other”)
5. phone: phone number of contact source
6. fax: phone number of contact source
7. contact type: type of contact ("LTFU Contact" (C ), "Clinic Note" (N), "Laboratory Result" (L), "Procedure Result" (P), "Medication Record" (M), "FHCRC Summary" (F), "LTFU Study Form - MD" (D), "LTFU Study Form - PT" (T), "Home Town Workup" (H), "Treatment/Protocol Schedule" (S), "Departure Workup" (W), "Other" (O))
8. reason: reason for contact, in free textr
9. KPS: KPS/LPPS score in percent
10. weight: weight
11. weight unit: kg or lbs
12. height:: height
13. height unit: inches or cms
14. problems: list of problems

**Normalized relations:**

USER(username, firstName, middleInitial, lastName)

CONTACT(contactDate, patientUpn, contactType, contactMean, contactDirection, contactTakenBy, source, title, phone, fax, reasonForContact, KPS, weight, weightUnit, height, heightUnit)

PATIENT(patientUpn, firstName, middleName, lastName, birthDate, gender, providerName)

PROVIDER(username, lastContactDate, lastDateEstimated)

PROBLEM(contactDate, patientUpn, rank, problemCode, dateObserved, comment, text)

### ProblemUI

**2. patient upn**

**1. rank**



**7. text**

**6. comment**

**5. problem snomed code**

**4. date observed**

**3. name**

1. rank: problem rank

2. patient upn: patient upn

3. name: problem name

4. date observed: date when problem was observed

5. problem snomed code: problem code

6. comment: problem comment

7. text: problem text

**Normalized relations:**

CONTACT.PROBLEM(patientUpn, contactDate, rank, problemCode, dateObserved, comment, text)

KB.PROBLEM(problemCode, name)

### SymptomUI

**2. patient upn**

**1. rank**



**6. list of sites**

**7. site code**

**8. list of organisms**

**9. organism code**

**5. symptom snomed code**

**4. date observed**

**3. name**

**10. comment**

1. rank: symptom rank

**11. text**

2. patient upn: patient upn

3. name: symptom name

4. date observed: date when symptom was observed

5. symptom snomed code: symptom code

6. list of sites

7. site code: site snomed code

8. list of organisms

9. organism code: organism snomed code

10. comment: symptom comment

11. text: symptom text

**Normalized relations:**

CONTACT.SYMPTOM(patientUpn, contactDate, rank, dateObserved, symptomCode, siteCode, organismCode, comment, text)

KB.SYMPTOM(symptomCode, name)

KB.SITE(siteCode, name)

KB.ORGANISM(organismCode, name)

### MedicationUI

**3. name**

**2. patient upn**

**1. rank**



**12. medication snomed code**

**11. date end**

**10 date start**

**9. route**

**8. frequency**

**7. calculated dose**

**6. exponent**

**5. unit**

**4. dose**

**13. comment**

**14. text**

1. rank: problem rank

2. patient upn: patient upn

3. name: medication name

4. dose: medication dose

5. unit: medication unit

6. exponent:: exponent by which to multiply a dose

7. calculated dose: dose to multiply by exponent

8. frequency: frequency to take the medication (" " , "bid" , "tid" , "qid" , "dly" , "qod" , "biwkly", "wkly" , "bimo" , "mo" , "triwkly" , "NOS")

9. route: medication route (" " ,"PO", "IV" , "IM", "LT","TD", "SC", "IT", "IN")

10. date start: date when to start the medication

11. date end: date when to stop the medication

12. medication snomed code: medication code

13. comment: medication comment

14. text: medication text

**Normalized relations:**

CONTACT.MED(patientUpn, contactDate, rank, medCode, dose, unit, exponent, calcDose, frequency, route, dateStart, dateEnd, comment, text)

KB.MED(medCode, name)

### ProcedureUI

**2. patient upn**

**1. rank**

 

**8. organism snomed code**

**9. list of organisms**

**7. list of sites**

**6. site snomed code**

**5. procedure snomed code**

**4. date result**

**3. name**

**10. comment**

1. rank: problem rank

2. patient upn: patient upn

**11. text**

3. name: procedure name

4. date result: date procedure was made

5. procedure snomed code: procedure code

6. site snomed code: site code

7. list of sites

8. organism snomed code: organism code

9. list of organisms

10. comment: procedure comment

11. text: procedure text

**Normalized relations:**

CONTACT.PROCEDURE(patientUpn, contactDate, rank, dateResult, procCode, siteCode, organismCode, comment, text)

KB.PROCEDURE(procCode, name)

KB.SITE(siteCode, name)

KB.ORGANISM(organismCode, name)

### LabUI

**2. patient upn**

**1. rank**

 

**21. text**

**20. comment**

**19. source**

**18. lab snomed code**

**17. evolution**

**16. interpretation**

**14. comparison**

**15. normal range**

**13. normal sup**

**12. normal inf**

**11. delay**

**10. interval**

**9. method**

**8. dose**

**7. unit**

**6. value**

**5. date begin**

**4. date result**

**3. name**

1. rank: problem rank

2. patient upn: patient upn

3. name: lab name

4. date result: date when lab result was taken

5. data begin: date when medication was started

6. value: medication name

7. unit: medication unit

8. dose: medication dose

9. method: lab method (" ", "RIA", "HPLC", "TDX")

10. interval: interval between medication doses (" ", "Pre", "Post", "Random")

11. delay: delay between medication given and lab taken

12. normal inf: inferior value of normal range

13. normal sup: superior value of normal range

14. comparison: relational symbol (“ “, “<” , “<=”, “>” , “>=”)

15. normal range: normal range when character string value

16. interpretation: whether the lab is “normal”, “low”, “very-low”, “high”, “very-high”

17. evolution: whether the lab is stable (s), increasing (i), increasing-very-much (I), decreasing (d), decreasing-very-much (D)

18. lab snomed code: lab code

19. source: name of laboratory having provided this lab result

20. comment: lab comment

21. text: lab text

**Normalized relations:**

CONTACT.LAB(patientUpn, contactDate, rank, dateResult, dateBegin, value, unit, dose, method, interval, delay, normalInf, normalSup, comparison, normalRange, interpretation, evolution, source, labCode, comment, text)

KB.LAB(labCode, name)

### DiagnosisUI

**3. name**

**2. patient upn**

**1. rank**



**13. list of organisms**

**11. list of sites**

**12. organism**

**10. site**

**9. snomed code**

**8. abstraction**

**7. outcome**

**6. date ended**

**5. date started**

**4. date observed**

**14. comment**

**15. text**

1. rank: problem rank

2. patient upn: patient upn

3. name: problem name

4. date observed: date when diagnosis was made

5. date started: date when disease started

6. date ended: date when disease ended

7. outcome: disease outcome (“resolved”, “on going”, “at death”, “start”, “stop”)

8. abstraction: whether this diagnosis has been abstracted or not (“y”, “n”)

9. snomed code: diagnosis code

10. site: site code

11. list of sites

12. organism: organism code

13. list of organisms

14. comment: diagnosis comment

15. text: diagnosis text

**Normalized relations:**

CONTACT.DIAGNOSIS(patientUpn, contactDate, rank, dateObserved, dateStarted, dateEnded, outcome, abstraction, diagCode, siteCode, organismCode, comment, text)

KB.DIAGNOSIS(diagCode, name)

KB.SITE(siteCode, name)

KB.ORGANISM(organismCode, name)

### TreatmentUI

**2. patient upn**

**1. rank**

 

**5. date ended**

**8. text**

**7. comment**

**6. snomed code**

**4. date started**

**3. name**

1. rank: problem rank

2. patient upn: patient upn

3. name: problem name

4. date started: date when treatment was started

5. date ended: date when treatment was ended

6. snomed code: treatment code

7. comment: treatment comment

8. text: treatment text

**Normalized relations:**

CONTACT.TREATMENT(patientUpn, contactDate, rank, dateStarted, dateEnded, treatCode, comment, text)

KB.TREATMENT(treatCode, name)

### StatsUI

 

**3. like name**

**4 snomed code**

**5. connector**

**10. average contacts**

**6. list of search criteria**

**2. name**

**1. type**

**7. total patients**

**8. average patients**

**9. total contacts**

1. type: type to search on (Problem, Symptom, Medication, Procedure, Lab, Diagnosis, Treatment)

2. name: list of names for this type

3. like name: name to look for

4. snomed code: code for this name

5. connector: AND, OR, AND NOT

6. list of search criteria

7. total patients: total number of patients found

8. average patients: average per patient

9. total contacts: total number of contacts found

10. average contacts: average per contact

**Normalized relations:**

CONTACT.PROBLEM(patientUpn, contactDate, rank, problemCode)

CONTACT.SYMPTOM(patientUpn, contactDate, rank, symptomCode)

CONTACT.MEDICATION(patientUpn, contactDate, rank, medCode)

CONTACT.PROCEDURE(patientUpn, contactDate, rank, procCode)

CONTACT.LAB(patientUpn, contactDate, rank, labCode)

CONTACT.DIAGNOSIS(patientUpn, contactDate, rank, diagCode)

CONTACT.TREATMENT(patientUpn, contactDate, rank, treatCode)

KB.PROBLEM(problemCode, name)

KB.SYMPTOM(symptomCode, name)

KB.MEDICATION(medCode, name)

KB.PROCEDURE(procCode, name)

KB.LAB(labCode, name)

KB.DIAGNOSIS(diagCode, name)

KB.TREATMENT(treatCode, name)

## External Data Model

The external data model is composed of all the user views previously defined. To ensure that the entities and attributes across these views are coherent, we merge the relations into a single set of relations. This step of view integrations will permit to remove synonyms, homonyms, transitive dependencies, and eventually to define class/subclass relationships. The resulting set of normalized relations is the following:

CONTACT.CONTACT(contactDate, patientUpn, contactType, contactMean, contactDirection, contactTakenBy, source, title, phone, fax, reasonForContact, KPS, weight, weightUnit, height, heightUnit)

CONTACT.DIAGNOSIS(patientUpn, contactDate, rank, dateObserved, dateStarted, dateEnded, outcome, abstraction, diagCode, siteCode, organismCode, comment, text)

CONTACT.LAB(patientUpn, contactDate, rank, dateResult, dateBegin, value, unit, dose, method, interval, delay, normalInf, normalSup, comparison, normalRange, interpretation, evolution, source, labCode, comment, text)

CONTACT.MED(patientUpn, contactDate, rank, medCode, dose, unit, exponent, calcDose, frequency, route, dateStart, dateEnd, comment, text)

CONTACT.PROBLEM(contactDate, patientUpn, rank, problemCode, dateObserved, comment, text)

CONTACT.PROC(patientUpn, contactDate, rank, dateResult, procCode, siteCode, organismCode, comment, text)

CONTACT.SYMPTOM(patientUpn, contactDate, rank, dateObserved, symptomCode, siteCode, organismCode, comment, text)

CONTACT.TREATMENT(patientUpn, contactDate, rank, dateStarted, dateEnded, treatCode, comment, text)

KB.DIAGNOSIS(diagCode, name)

KB.LAB(labCode, name)

KB.MED(medCode, name)

KB.ORG(organismCode, name)

KB.PROBLEM(problemCode, name)

KB.PROC(procCode, name)

KB.SITE(siteCode, name)

KB.SYMPTOM(symptomCode, name)

KB.TREATMENT(treatCode, name)

PATIENT(patientUpn, firstName, middleName, lastName, birthDate, gender, providerName)

PROVIDER(username, lastContactDate, lastDateEstimated)

USER(username, password, firstName, middleInitial, lastName)

## Internal Data Model

The internal data model represents the set of normalized relations derived from the class diagram, which are the same as the set of normalized relations obtained from the external data model. We update the class diagram to reflect this set of relations. The data model generated from the logical data model reflects the associations between the classes in the foreign keys. It is a set of tables that will be implemented in MySQL DBMS. This first data model will be refined during implementation in the physical model, in particular with SQL data types.



1. Figure 3 Data model.

|  |  |
| --- | --- |
| Part | Data Dictionary |
| 4 |

# Data Dictionary

A description of the data required by the system is presented here.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***Class*** | ***Attribute*** | ***Data type*** | ***Description*** | ***Key*** |
| AttributeValue | attribute | String | Any attribute name. | PK |
|  | value | String | Any value of the corresponding attribute. |  |
|  | rank | Integer | Relative number of this diagnosis in the list. | PK (FK) |
|  | contactDate | TimeStamp | Timestamp when contact was placed. | PK (FK) |
|  | patientUpn | String | Patient unique patient number, or identifier. | PK (FK) |
| Contact | contactDate | TimeStamp | Timestamp when contact was placed. | PK |
|  | contactType | String | Type of contact, such as real contact, or follow-up. |  |
|  | contactMean | String | Whether the contact was placed by phone, mail, … |  |
|  | contactDirection | Boolean | Whether the contact was Taken by, or Placed by, LTFU. |  |
|  | contactTakenBy | String | Name of person having taken the contact. |  |
|  | source | String | Name of person having placed the contact. |  |
|  | title | String | Title of the person having placed the contact. |  |
|  | phone | String | Phone number of the person having placed the contact. |  |
|  | fax | String | Fax number of the person having placed the contact. |  |
|  | reasonForContact | String | Brief description of the reason motivating the contact. |  |
|  | KPS | Integer | KPS is a score of general wellness of the patient. |  |
|  | weight | Integer | Current weight of the patient. |  |
|  | weightUnit | Boolean | Whether the weight is in kg or pounds. |  |
|  | height | Integer | Current height of the patient. |  |
|  | heightUnit | Boolean | Whether the height is in cms or in inches. |  |
|  | patientUpn | String | Patient unique patient number, or identifier. | PK (FK) |
|  | userName | String | Unique user name. | FK |
| Diagnosis | diagnosisCode | String | SNOMED diagnosis code. |  |
|  | rank | Integer | Relative number of this diagnosis in the list. | PK |
|  | contactDate | TimeStamp | Timestamp when contact was placed. | PK (FK) |
|  | patientUpn | String | Patient unique patient number, or identifier. | PK (FK) |
|  | dateObserved | Date | Date when diagnosis was observed. |  |
|  | dateStarted | Date | Date when this disease was first diagnosed. |  |
|  | dateEnded | Date | Date when this disease ended. |  |
|  | abstraction | String | Whether this diagnosis has been abstracted in the clinical database. |  |
|  | siteCode | String | SNOMED site code. |  |
|  | organismCode | String | SNOMED organism code. |  |
|  | outcome | String | What was the outcome of this disease. |  |
|  | comment | String | A general comment added to this diagnosis. |  |
|  | text | String | All the information above as text in case some codes did not exist. |  |
| Laboratory | labCode | String | SNOMED laboratory code. |  |
|  | rank | Integer | Relative number of this diagnosis in the list. | PK |
|  | contactDate | TimeStamp | Timestamp when contact was placed. | PK (FK) |
|  | patientUpn | String | Patient unique patient number, or identifier. | PK (FK) |
|  | dateResult | Date | Date when the lab result was made. |  |
|  | dateBegin | Date | Date when a medication was started. |  |
|  | value | String | Value of the lab result. |  |
|  | unit | String | Unit in which the lab result was measured. |  |
|  | method | String | Method used to perform the lab measurement. |  |
|  | interval | String | Time interval when repeated measures. |  |
|  | dose | String | Dose of medication taken before lab. |  |
|  | delay | Integer | Number of minutes between the time the medication was taken, and the lab was measured. |  |
|  | source | String | Name of the laboratory having performed the measurement. |  |
|  | normalInf | String | Value of the inferior value of the normal range. |  |
|  | normalSup | String | Value of the superior value of the normal range. |  |
|  | comparison | String | Relational operator used to compare with normal range. |  |
|  | normalRange | String | Normal range when it is expressed in character string. |  |
|  | interpretation | String | Whether the lab value is normal, or elevated, or low. |  |
|  | evolution | String | Whether the lab value has decreased, increased, or remained stable since the last measure. |  |
|  | comment | String | A general comment added to this lab. |  |
|  | text | String | All the information above as text in case some codes did not exist. |  |
| LTFUSpecialist | Username | String | User name. | PK(FK) |
| Medication | medicationCode | String | SNOMED medication code. |  |
|  | rank | Integer | Relative number of this medication in the list. | PK |
|  | contactDate | TimeStamp | Timestamp when contact was placed. | PK (FK) |
|  | patientUpn | String | Patient unique patient number, or identifier. | PK (FK) |
|  | dose | Double | Dose of medication given. |  |
|  | unit | String | Unit of medication dose given. |  |
|  | exponent | Integer | Exponent value of dilution for dose. |  |
|  | calcDose | Double | Value of medication dose as calculated from dilution. |  |
|  | dateStart | Date | Date when this medication was started. |  |
|  | dateEnd | Date | Date when this medication was ended. |  |
|  | frequency | String | Frequency at which this medication should be taken. |  |
|  | route | String | Route of medication, such as per os, or through blood. |  |
|  | comment | String | A general comment added to this medication. |  |
|  | text | String | All the information above as text in case some codes did not exist. |  |
| Patient | patientUpn | String | Patient unique patient number, or identifier. | PK |
|  | firstName | String | First name of the patient. |  |
|  | lastName | String | Last name of the patient. |  |
|  | middleName | String | Middle name, or initial, of the patient. |  |
|  | birthDate | Date | Date of birth. |  |
|  | gender | Boolean | Male or Female. |  |
|  | username | String | User name. | FK |
| PrimaryCareProvider | username | String | User name. | PK (FK) |
|  | lastContactDate | Date | Last date when a contact was placed with this provider. |  |
|  | lastDateEstimated | Boolean | Whether the lastContactDate was estimated or not. |  |
| Problem | problemCode | String | Unique problem code. |  |
|  | rank | Integer | Relative number of this problem in the list. | PK |
|  | contactDate | TimeStamp | Timestamp when contact was placed. | PK (FK) |
|  | patientUpn | String | Patient unique patient number, or identifier. | PK (FK) |
|  | dateObserved | Date | Date when problem was observed. |  |
|  | comment | String | A general comment added to this problem. |  |
|  | text | String | All the information above as text in case some codes did not exist. |  |
| Procedure | procedureCode | String | SNOMED procedure code. |  |
|  | rank | Integer | Relative number of this procedure in the list. | PK |
|  | contactDate | TimeStamp | Timestamp when contact was placed. | PK (FK) |
|  | patientUpn | String | Patient unique patient number, or identifier. | PK (FK) |
|  | dateResult | Date | Date when procedure result was determined. |  |
|  | siteCode | String | SNOMED site code. |  |
|  | organismCode | String | SNOMED organism code. |  |
|  | comment | String | A general comment added to this procedure. |  |
|  | text | String | All the information above as text in case some codes did not exist. |  |
| Symptom | symptomCode | String | SNOMED symptom code. |  |
|  | rank | Integer | Relative number of this symptom in the list. | PK |
|  | contactDate | TimeStamp | Timestamp when contact was placed. | PK (FK) |
|  | patientUpn | String | Patient unique patient number, or identifier. | PK (FK) |
|  | dateObserved | Date | Date when symptom was observed. |  |
|  | siteCode | String | SNOMED site code. |  |
|  | organismCode | String | SNOMED organism code. |  |
|  | importance | String | Whether the importance of this level was low, high, or moderate. |  |
|  | level | String | Whether the level or intensity was high, average, or low. |  |
|  | comment | String | A general comment added to this symptom. |  |
|  | text | String | All the information above as text in case some codes did not exist. |  |
| Treatment | treatmentCode | String | Unique treatment code. |  |
|  | rank | Integer | Relative number of this treatment in the list. | PK |
|  | contactDate | TimeStamp | Timestamp when contact was placed. | PK (FK) |
|  | patientUpn | String | Patient unique patient number, or identifier. | PK (FK) |
|  | dateStarted | Date | Date when treatment was started. |  |
|  | dateEnded | Date | Date when treatment was ended. |  |
|  | comment | String | A general comment added to this treatment. |  |
|  | text | String | All the information above as text in case some codes did not exist. |  |
| User | userName | String | Unique user name. | PK |
|  | password | String | Password for user to access the system. |  |
|  | firstName | String | First name of the user. |  |
|  | lastName | String | Last name of the user. |  |
|  | middleName | String | Middle name, or initial, of the user. |  |
|  | institution | String | Institution where the user works. |  |
|  | email | String | User email address. |  |
|  | phoneNumber | String | User phone number. |  |
|  | streetNumber | String | User street number. |  |
|  | streetName | String | User street name. |  |
|  | addressComplement | String | User complement of address. |  |
|  | zipcode | String | User zip code. |  |
|  | state | String | User state. |  |
|  | position | String | User position at his/her institution. |  |