

## **CSCI 4707: Practice of Database Systems, Fall 2019**

### **Case Study: New Haven Urgent Care**

You have been hired to create a database for the New Haven Urgent Care. The care center is a stand-alone urgent care that is not associated with any one hospital system but was created to provide affordable health care to the wider community. The current system is antiquated and needs replacing. In fact, nearly everything is still done on paper and billing has become a nightmare. Ideally, the billing department will be fully automated but for now you are only tasked with getting the information in the system for the billing department (and not worrying about the billing itself.) The administrators of the urgent care want to ensure that proper billing is performed and that patient records are maintained in an efficient and effective manner. After speaking with a number of employees of the urgent care including administrators, clerks, and medical providers you have come up with the following description of what is necessary to create the database:

- **Patient:** A person who is treated at the urgent care facility. Each patient has a unique patient identifier (PID), full name, full address, phone number(s), emergency contact information, dob, and insurance information. If the patient is under the age of 18, parent/guardian information must be maintained. A parent or guardian is only created and tracked if there is a patient needing to have this information.
- **Insurance Providers:** Many patients that will be seen have insurance but not all will have insurance. The intake clerk will collect all information from the patient by requesting their insurance card and inputting their information in the database. If a patient's insurance information changes, the old information must be stored and be retrievable so that billing may properly occur. You will need to keep track of the dates that the insurance information is valid. The current insurance information will have an end date with no value. If a patient does not have insurance, it must be recorded as "NO INSURANCE." Copays are collected at the time of service and may be paid for by cash or credit card. Uninsured patients are required to pay for the entire initial appointment at the time of registration. An initial visit costs \$100. If uninsured, the additional costs of the visit (e.g. labs, etc) are billed via mail.
- **Service Provider:** A patient is be seen by a doctor or a physician assistant (both known as the service provider). Nurses always assist the service provider during the visit. All notes will be generated for a patient's visit by the service provider and the assisting nurse. A service provider is identified by a unique service provider ID, full name, and a unique social security number. Nurses are identified by a unique ID, full name, and unique social security number.
- **Diagnosis:** A patient needs to have a diagnosis logged by the service provider; the nurse cannot do this. The International Classification of

Diseases (ICD) is used to identify the diagnosis/diagnoses. The ICD-10-CM is used to code the patient's condition. Each diagnosis is coded with the ICD-10-CM code and name.

- Treatment: Patients are treated onsite and may have additional tests/procedures ordered that are completed (e.g. lab work, x-rays). These are performed at the urgent care facilities. The ICD-10-PCS codes are used to account for these treatments. Each test/procedure is identified by its ICD-10-PCS code, name, and the cost of the test/procedure at the urgent care facility. If the patient is a minor, then a form is signed and the test/procedure is updated as approved in the system. The hard copy is stored.
- Employees: All employees of the care center that are involved in data collection for a patient must be identified by an employee ID and full name. Intake clerks take insurance information and copay or initial payment. Nurses take vitals and can transcribe for the doctor notes. Doctors enter diagnoses and request tests/procedures. Additional tests/procedures are not always needed.
- There are additional employees that we need to keep track of such as IT support staff, billing clerks, payroll clerks etc. We keep track of these staff members and in the future we will be writing a new payroll system. For now we keep their employee information, department, and whether or not they are hourly or salaried employees in the system.
- Initial Assessment: An initial assessment must be performed for each patient. The patient's vital records are collected by a nurse. This is performed for all patients that are capable of having their information collected. The initial assessment needs to have the nurse's id on it. Each assessment can be for only one patient and only one nurse can complete the assessment. The nurse's id must be listed on the assessment.

#### Additional Notes:

- Each employee is assigned to work in one and only one department of the urgent care center. Every department has at least one employee assigned to it. The departments include billing, payroll, intake, assessment, administration, IT, and patient care.
- A patient is initially seen by the intake clerk. They collect the medical information of the patient, collect copays or initial visit money and an online form is generated to be used by the nurses for the initial assessment and physicians/physician assistants to annotate notes, diagnoses, and billing information. The date of the visit is necessary and the clerk's employee ID is assigned to the record as part of the documentation.
- After intake, the patient's vital records are collected by a nurse. The patient's height, weight, blood pressure, temperature, and medical condition description is collected (e.g. symptoms). In addition, all medications are listed. This is the initial assessment.
- The patient is taken to a room to be seen by the doctor. One doctor or physician assistant must see the patient. Each patient must have a medical

diagnosis made by the physician/physician's assistant. The time in and out of the patient is required for reporting purposes.