

## Step 1: Mapping Regular Entities

### Patient

PID | DOB | InsuranceInfo | EmerContact | FName | MInitial | LName

### Insurance\_Provider

NULLIBLE for active policies

InsuranceState|CompanyName | InsuranceID | PolicyNo. | GroupNo. | SDate | EDate

### Treatment

TreatmentID | TreatmentCost | TreatmentName | ICD-10-PCSCode | VisitID

### Initial\_Assessment

AssessmentID | Vitals | NurseEmployeeID

### Diagnosis

DiagnosisID | Name | IDC-10-CM Code

### Department

DepartmentID | Name

### Employee

EmployeeID | SSN | DepartmentID | Name | Hourly | Salaried

### Additional\_Staff

EmployeeID | SSN | DepartmentID | FName | MInitial | LName | Hourly | Salaried

### Billing\_clerk

EmployeeID | SSN | DepartmentID | FName | MInitial | LName | Hourly | Salaried

### IT\_Support

EmployeeID | SSN | DepartmentID | FName | MInitial | LName | Hourly | Salaried

### Intake\_Clerk

EmployeeID | SSN | DepartmentID | FName | MInitial | LName | Hourly | Salaried

### Medical\_Staff

EmployeeID | SSN | DepartmentID | FName | MInitial | LName | Hourly | Salaried

### Nurse

NursingLicense | EmployeeID | SSN | DepartmentID | FName | MInitial | LName | Hourly | Salaried

### Service\_Provider

EmployeeID | SSN | DepartmentID | FName | MInitial | LName | Hourly | Salaried

### Nurse\_Practitioner

EmployeeID | SSN | DepartmentID | FName | MInitial | LName | Hourly | Salaried

### Doctor

EmployeeID | SSN | DepartmentID | FName | MInitial | LName | Hourly | Salaried

### Physicians\_Assistant

EmployeeID | SSN | DepartmentID | FName | MInitial | LName | Hourly | Salaried

### Notes:

Name: FName, MInitial, LName

EmployeeType: Hourly, Salaried

ActiveStatus: SDate, EDate (EDate is nullable for active policies)

EmerContact: Name, PhoneNo., Email

NursingLicense: State, Type, Expiry, ConferralDate

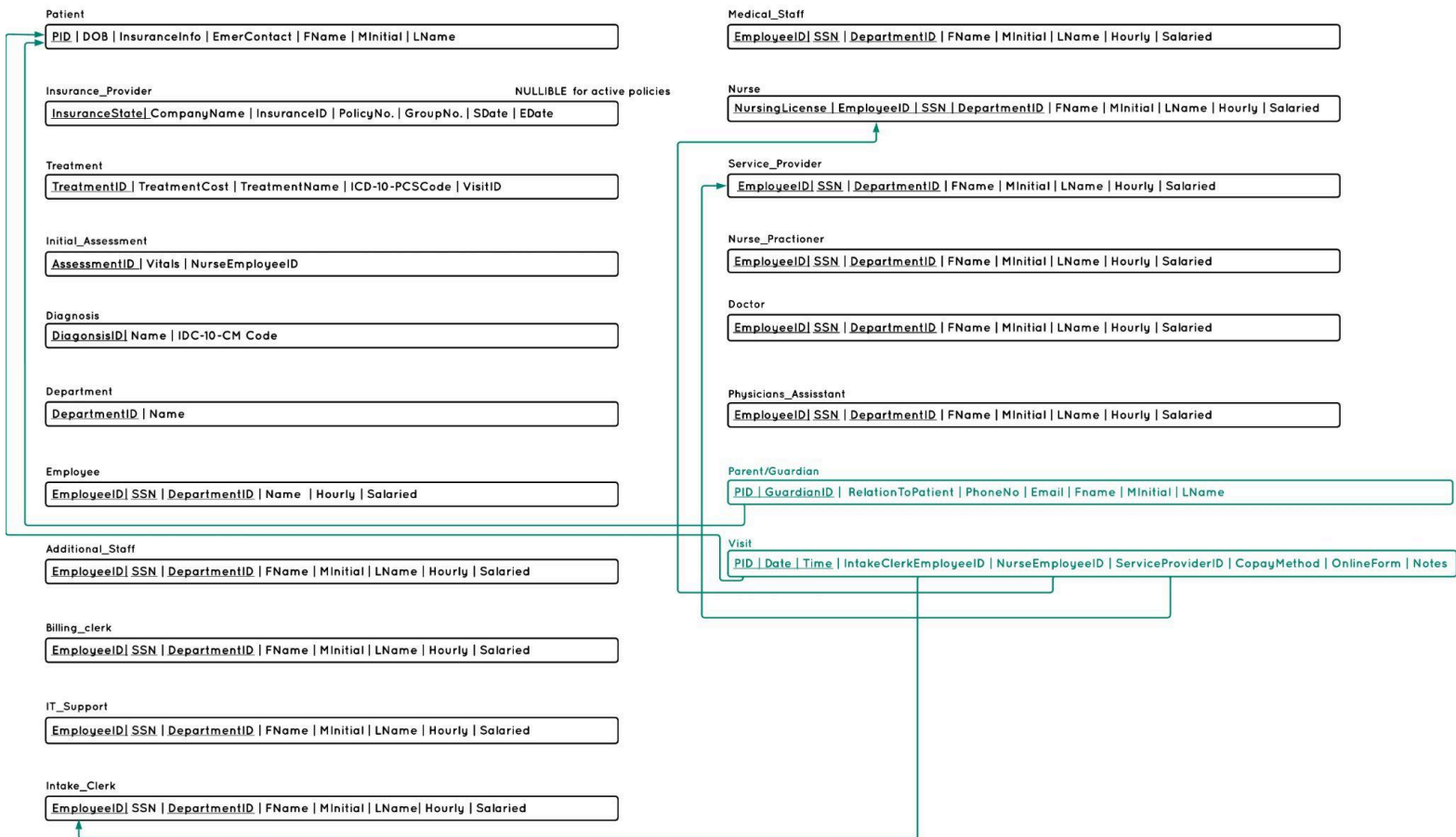
EmployeeIDs, Names, and SSNs are all unique and NOT NULL

EmployeeID, SSN, DepartmentID attributes of Medical\_Staff, Additional\_Staff,

Service\_Provider, Nurse, Physicians\_Assistant, IT\_Support, Billing\_Clerk, Intake\_Clerk,

Doctor, and Nurse\_Practitioner are inherited from the Employee entity.

## Step 2: Mapping Weak Entities



### Notes:

Name: FName, MInitial, LName

EmployeeType: Hourly, Salaried

ActiveStatus: SDate, EDate

EmerContact: Name, PhoneNo., Email

NursingLicense: State, Type, Expiry, ConferralDate

EmployeeIDs, Names, and SSNs are all unique and NOT NULL

ContactInfo: PhoneNo, Email

EmployeeID, SSN, DepartmentID attributes of Medical\_Staff, Additional\_Staff,

Service\_Provider, Nurse, Physicians\_Assistant, IT\_Support, Billing\_Clerk, Intake\_Clerk,

Doctor, and Nurse\_Practitioner are inherited from the Employee entity.

Addr is multivalued, so not attr of Parent/Guardian, will show up later in step 6

### Constraints:

Parent/Guardian PID FK's to Patient PID

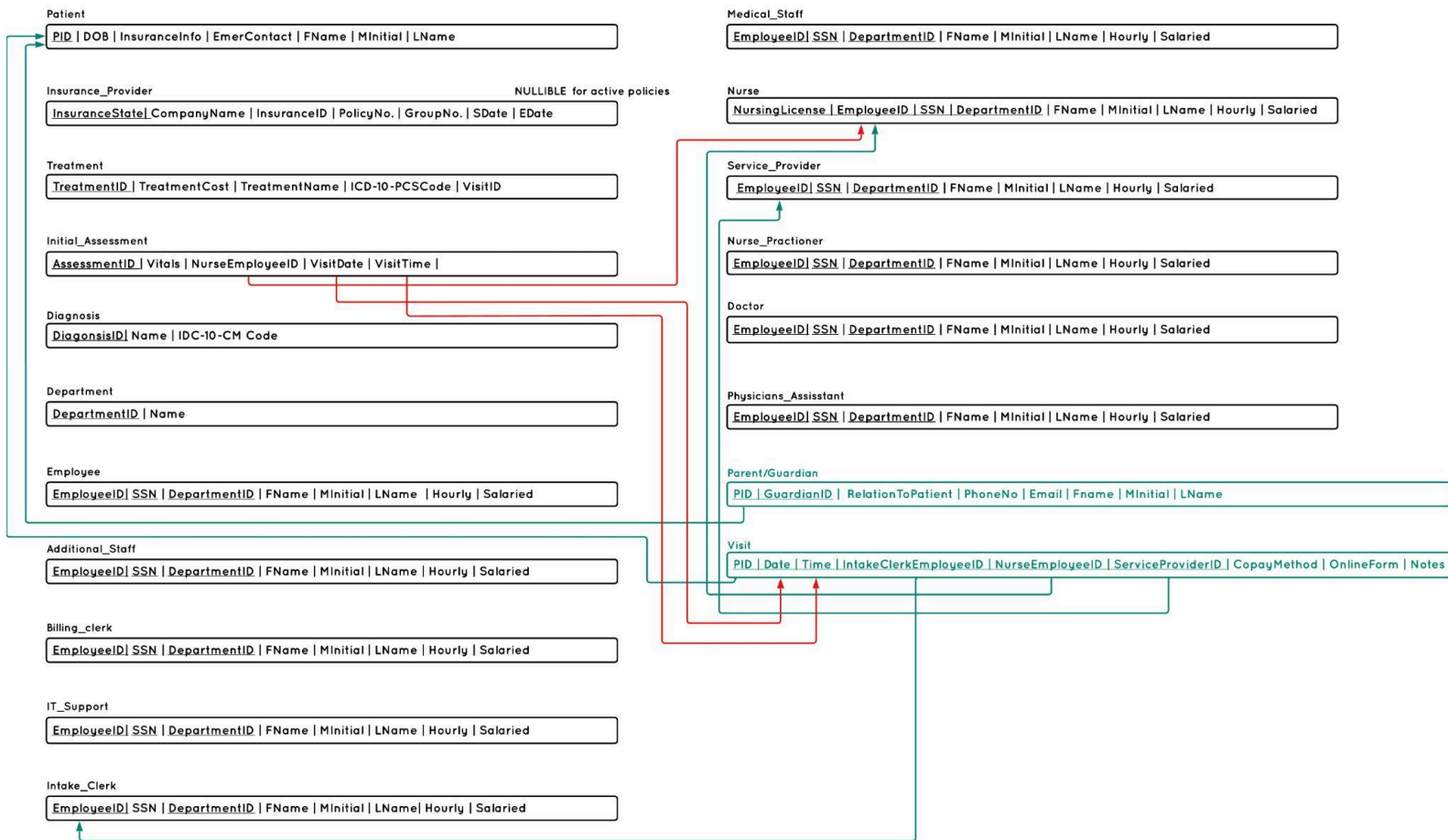
Visit PID FK's to Patient PID

Visit IntakeClerkEmployeeID FK's to Intake\_Clerk EmployeeID

Visit NurseEmployeeID FK's to Nurse EmployeeID

Visit ServiceProviderID FK's to Service\_Provider EmployeeID

## Step 3: Mapping Binary 1:1 Relationships



### Notes:

Name: FName, MInitial, LName

EmployeeType: Hourly, Salaried

ActiveStatus: SDate, EDate

EmerContact: Name, PhoneNo., Email

NursingLicense: State, Type, Expiry, ConferralDate

EmployeeIDs, Names, and SSNs are all unique and NOT NULL

ContactInfo: PhoneNo, Email

EmployeeID, SSN, DepartmentID attributes of Medical\_Staff, Additional\_Staff,

Service\_Provider, Nurse, Physicians\_Assistant, IT\_Support, Billing\_Clerk, Intake\_Clerk,

Doctor, and Nurse\_Practitioner are inherited from the Employee entity.

Addr is multivalued, so not attr of Parent/Guardian, will show up later in step 6

When mentioning VisitID (FK), we reference the Visit Date and Time Partial Keys

### Constraints:

Parent/Guardian PID FK's to Patient PID

Visit PID FK's to Patient PID

Visit IntakeClerkEmployeeID FK's to Intake\_Clerk EmployeeID

Visit NurseEmployeeID FK's to Nurse EmployeeID

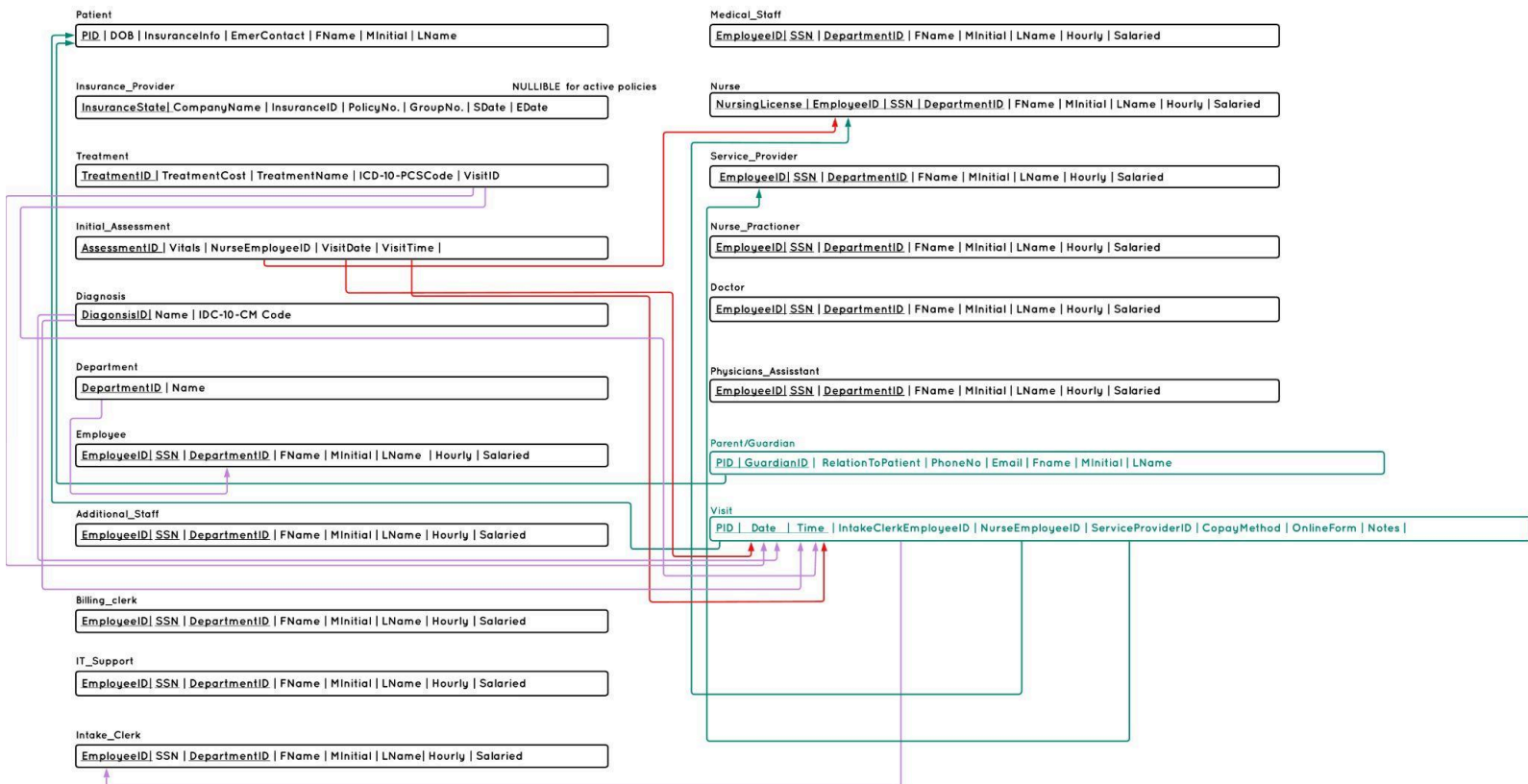
Visit ServiceProviderID FK's to Service\_Provider EmployeeID

Initial\_Assessment NurseEmployeeID FK's to Nurse EmployeeID

Initial\_Assessment VisitDate FK's to Visit Date

Initial\_Assessment VisitTime FK's to Visit TIme

## Step 4: Mapping Binary 1:N Relationships



### Notes:

Name: FName, MInitial, LName

EmployeeType: Hourly, Salaried

ActiveStatus: SDate, EDate

EmerContact: Name, PhoneNo., Email

NursingLicense: State, Type, Expiry, ConferralDate

EmployeeIDs, Names, and SSNs are all unique and NOT NULL

ContactInfo: PhoneNo, Email

EmployeeID, SSN, DepartmentID attributes of Medical\_Staff, Additional\_Staff, Service\_Provider, Nurse, Physicians\_Assistant, IT\_Support, Billing\_Clerk, Intake\_Clerk, Doctor, and Nurse\_Practitioner are inherited from the Employee entity.

Addr is multivalued, so not attr of Parent/Guardian, will show up later in step 6

When mentioning VisitID (FK), we reference the Visit Date and Time Partial Keys

### Constraints:

Parent/Guardian PID FK's to Patient PID

Visit PID FK's to Patient PID

Visit IntakeClerkEmployeeID FK's to Intake\_Clerk EmployeeID

Visit NurseEmployeeID FK's to Nurse EmployeeID

Visit ServiceProviderID FK's to Service\_Provider EmployeeID

Initial\_Assessment NurseEmployeeID FK's to Nurse EmployeeID

Initial\_Assessment VisitDate FK's to Visit Date

Initial\_Assessment VisitTime FK's to Visit Time

Treatment TreatmentID FK's to

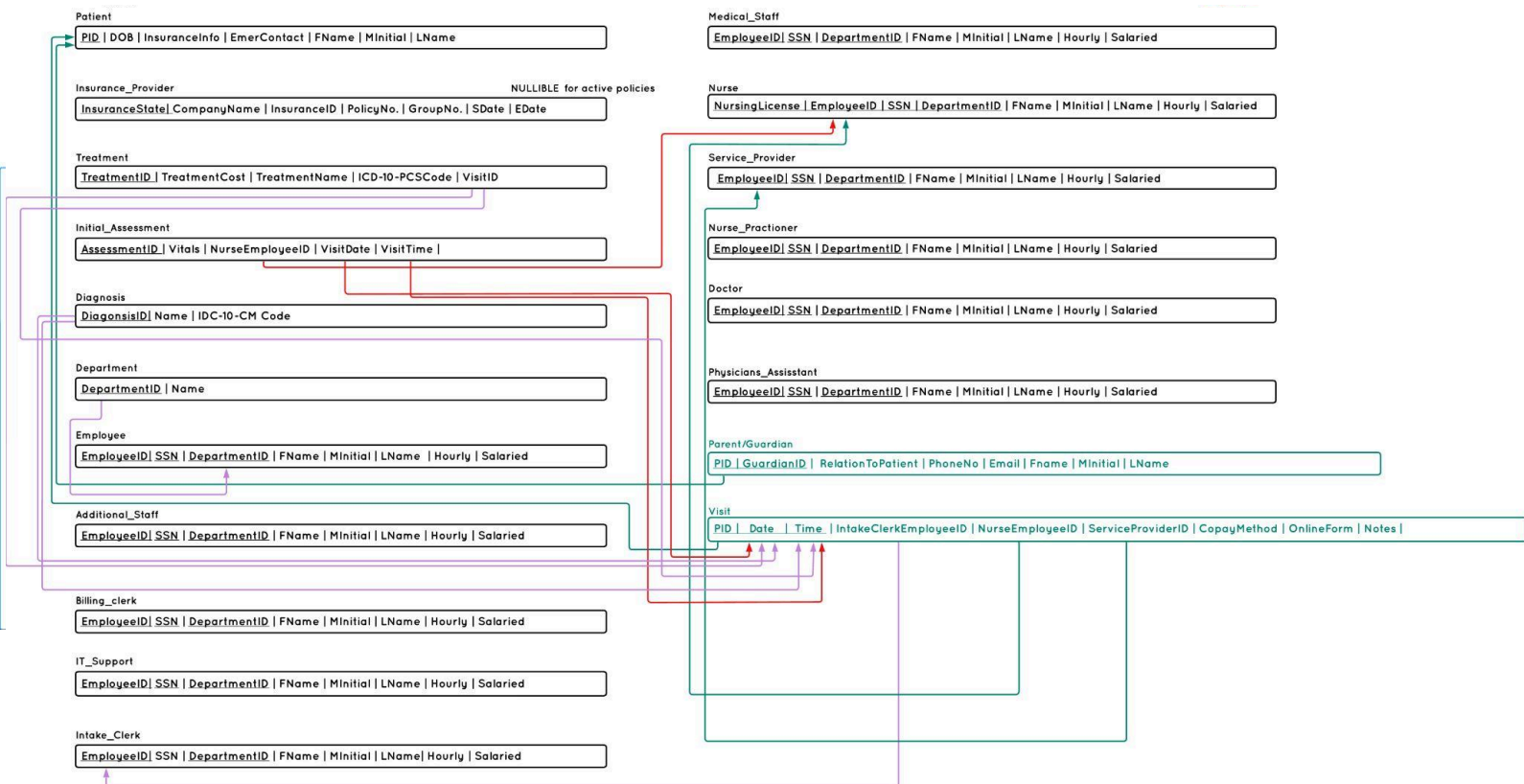
Visit IntakeClerkEmployeeID FK's to Intake\_Clerk EmployeeID

Department DepartmentID FK's to Employee DepartmentID

Treatment VisitID FK's Visit Date and Visit Time

Diagnosis DiagnosisID FK's to Visit Date and Visit Time

## Step 5: Mapping of Binary M:N relationship types



### Notes:

Name: FName, MInitial, LName

EmployeeType: Hourly, Salaried

ActiveStatus: SDate, EDate

EmerContact: Name, PhoneNo., Email

NursingLicense: State, Type, Expiry, ConferralDate

EmployeeIDs, Names, and SSNs are all unique and NOT NULL

ContactInfo: PhoneNo, Email

EmployeeID, SSN, DepartmentID attributes of Medical\_Staff, Additional\_Staff, Service\_Provider, Nurse, Physicians\_Assistant, IT\_Support, Billing\_Clerk, Intake\_Clerk, Doctor, and Nurse\_Practitioner are inherited from the Employee entity.

Addr is multivalued, so not attr of Parent/Guardian, will show up later in step 6

When mentioning VisitID (FK), we reference the Visit Date and Time Partial Keys

### Constraints:

Parent/Guardian PID FK's to Patient PID

Visit PID FK's to Patient PID

Visit IntakeClerkEmployeeID FK's to Intake\_Clerk EmployeeID

Visit NurseEmployeeID FK's to Nurse EmployeeID

Visit ServiceProviderID FK's to Service\_Provider EmployeeID

Initial\_Assessment NurseEmployeeID FK's to Nurse EmployeeID

Initial\_Assessment VisitDate FK's to Visit Date

Initial\_Assessment VisitTime FK's to Visit Time

Treatment TreatmentID FK's to

Visit IntakeClerkEmployeeID FK's to Intake\_Clerk EmployeeID

Department DepartmentID FK's to Employee DepartmentID

Treatment VisitID FK's Visit Date and Visit Time

Diagnosis DiagnosisID FK's to Visit Date and Visit Time

Has\_Guardian PID FK's to Patient PID

Has\_Guardian GuardianID FK's to Parent/Guardian GuardianID

Has\_Visit PID FK's to Patient PID

Has\_Visit VisitID FK's to VisitID (i.e. Visit Date and Visit Time)

Approve\_Minor GuardianID FK's to Parent/Guardian GuardianID

Approve\_Minor TreatmentID FK's to Treatment TreatmentID

Approve\_Minor VisitID FK's to VisitID (i.e. Visit Date and Visit Time)

Approve\_Minor PID FK's to Patient PID

Logs DiagnosisID FK's to Diagnosis DiagnosisID

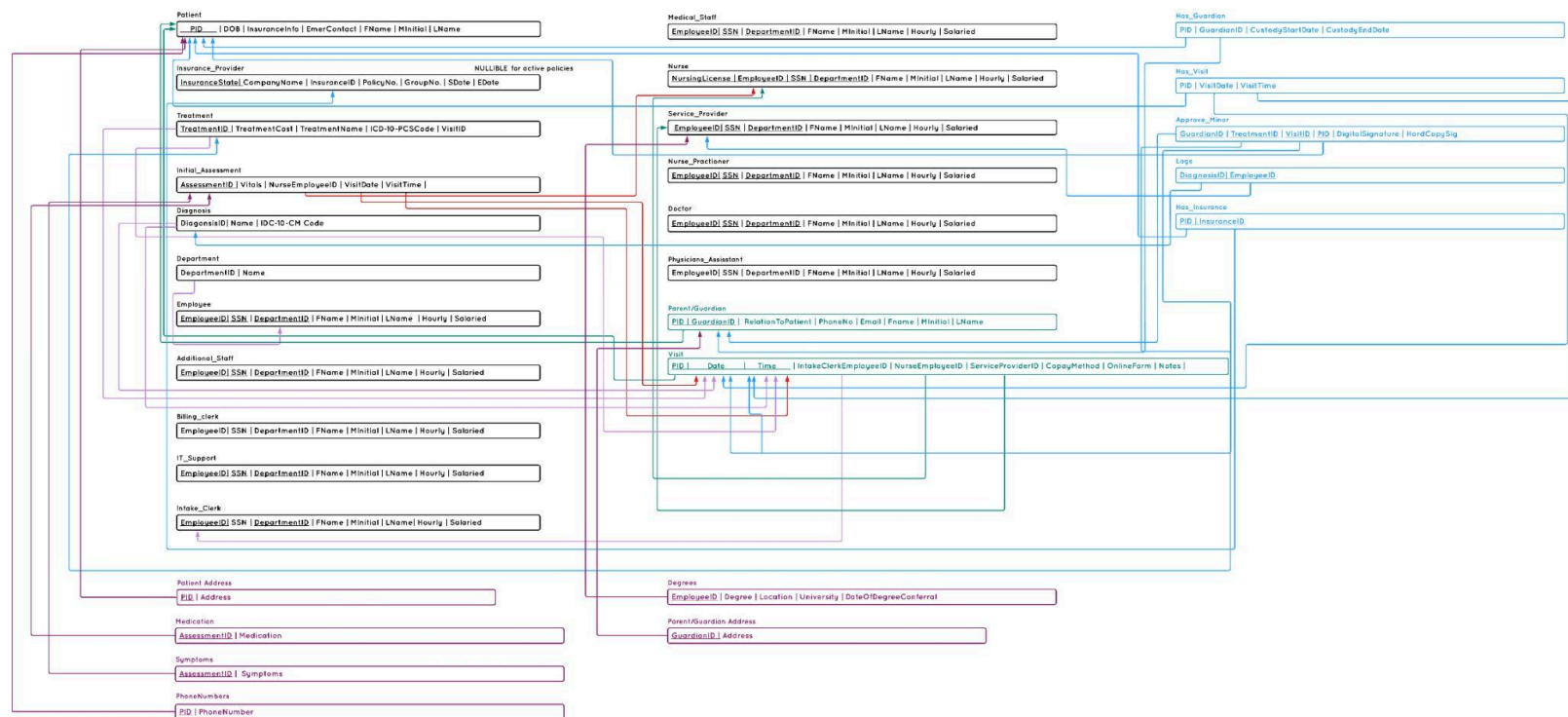
Logs EmployeeID FK's to Service\_Provider EmployeeID

Has\_Insurance PID FK's to Patient PID

Has\_Insurance InsuranceID to Insurance\_Provider InsuranceID



## Step 6: Mapping Multivalued Attributes



### Notes:

Name: FName, MInitial, LName

EmployeeType: Hourly, Salaried

ActiveStatus: SDate, EDate

EmerContact: Name, PhoneNo., Email

NursingLicense: State, Type, Expiry, ConferralDate

EmployeeIDs, Names, and SSNs are all unique and NOT NULL

ContactInfo: PhoneNo, Email

EmployeeID, SSN, DepartmentID attributes of Medical\_Staff, Additional\_Staff,

Service\_Provider, Nurse, Physicians\_Assistant, IT\_Support, Billing\_Clerk, Intake\_Clerk,

Doctor, and Nurse\_Practitioner are inherited from the Employee entity.

Addr is multivalued, so not attr of Parent/Guardian, will show up later in step 6

When mentioning VisitID (FK), we reference the Visit Date and Time Partial Keys

### Constraints:

Parent/Guardian PID FK's to Patient PID

Visit PID FK's to Patient PID

Visit IntakeClerkEmployeeID FK's to Intake\_Clerk EmployeeID

Visit NurseEmployeeID FK's to Nurse EmployeeID

Visit ServiceProviderID FK's to Service\_Provider EmployeeID

Initial\_Assessment NurseEmployeeID FK's to Nurse EmployeeID

Initial\_Assessment VisitDate FK's to Visit Date

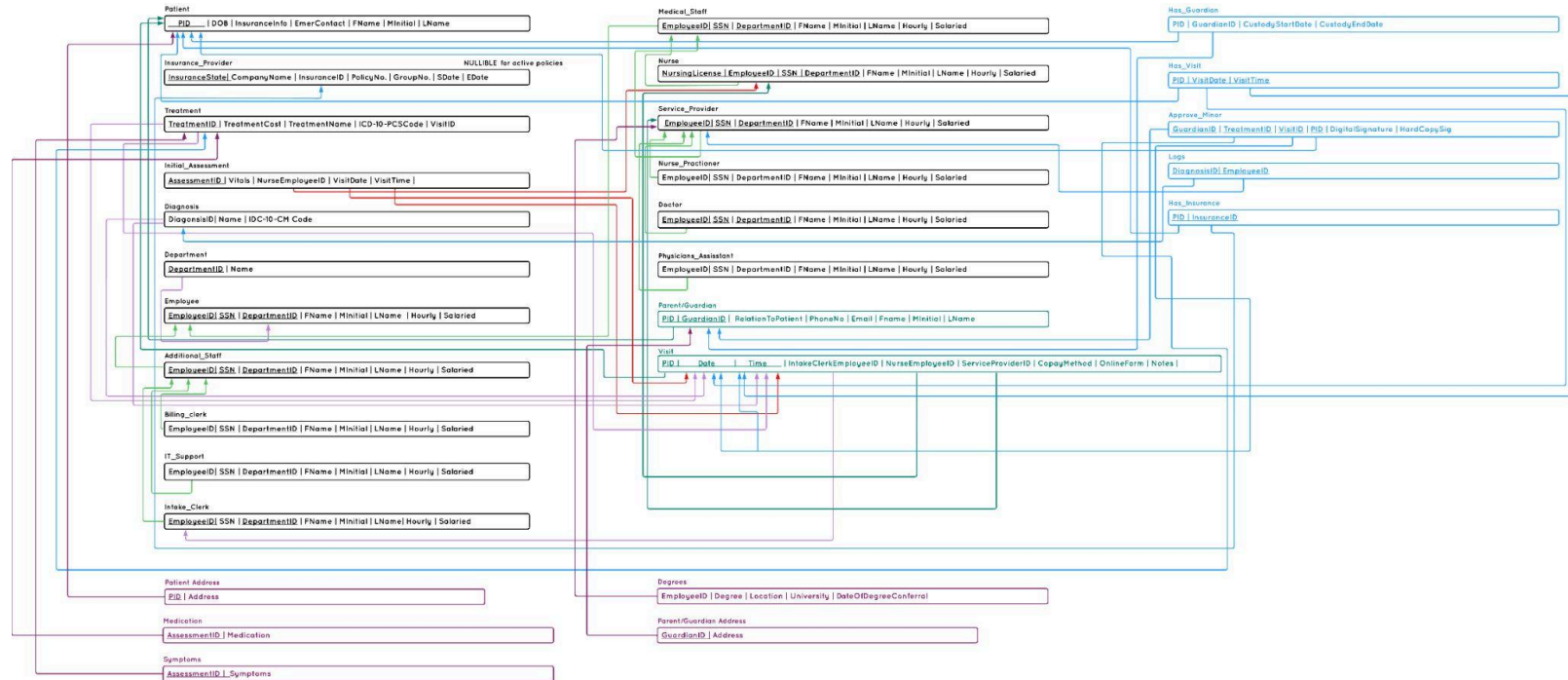
Initial\_Assessment VisitTime FK's to Visit Time

Treatment TreatmentID FK's to  
 Visit IntakeClerkEmployeeID FK's to Intake\_Clerk EmployeeID  
 Department DepartmentID FK's to Employee DepartmentID  
 Treatment VisitID FK's Visit Date and Visit Time  
 Diagnosis DiagnosisID FK's to Visit Date and Visit Time  
 Has\_Guardian PID FK's to Patient PID  
 Has\_Guardian GuardianID FK's to Parent/Guardian GuardianID  
 Has\_Visit PID FK's to Patient PID  
 Has\_Visit VisitID FK's to VisitID (i.e. Visit Date and Visit Time)  
 Approve\_Minor GuardianID FK's to Parent/Guardian GuardianID  
 Approve\_Minor TreatmentID FK's to Treatment TreatmentID  
 Approve\_Minor VisitID FK's to VisitID (i.e. Visit Date and Visit Time)  
 Approve\_Minor PID FK's to Patient PID  
 Logs DiagnosisID FK's to Diagnosis DiagnosisID  
 Logs EmployeeID FK's to Service\_Provider EmployeeID  
 Has\_Insurance PID FK's to Patient PID  
 Has\_Insurance InsuranceID to Insurance\_Provider InsuranceID  
 Patient\_Address PID FK's to Patient ID  
 Medications AssessmentID FK's to Initial\_Assessment AssessmentID  
 Symptoms AssessmentID FK's to Initial\_Assessment AssessmentID  
 Degrees EmployeeID FK's to Service\_Provider EmployeeID  
 Parent/Guardian GuardianID FK's to Parent/Guardian GuardianID

## Step 7: Mapping N-ary Relationship Types

There are no N-Ary Relationship Types so the diagram will remain the same.

## Step 8: Mapping Specialization and Generalization



### Notes:

Name: FName, MInitial, LName

EmployeeType: Hourly, Salaried

ActiveStatus: SDate, EDate

EmerContact: Name, PhoneNo., Email

NursingLicense: State, Type, Expiry, ConferralDate

EmployeeIDs, Names, and SSNs are all unique and NOT NULL

ContactInfo: PhoneNo, Email

EmployeeID, SSN, DepartmentID attributes of Medical\_Staff, Additional\_Staff,

Service\_Provider, Nurse, Physicians\_Assistant, IT\_Support, Billing\_Clerk, Intake\_Clerk,

Doctor, and Nurse\_Practitioner are inherited from the Employee entity.

Addr is multivalued, so not attr of Parent/Guardian, will show up later in step 6

When mentioning VisitID (FK), we reference the Visit Date and Time Partial Keys

### Constraints:

Parent/Guardian PID FK's to Patient PID

Visit PID FK's to Patient PID

Visit IntakeClerkEmployeeID FK's to Intake\_Clerk EmployeeID

Visit NurseEmployeeID FK's to Nurse EmployeeID

Visit ServiceProviderID FK's to Service\_Provider EmployeeID

Initial\_Assessment NurseEmployeeID FK's to Nurse EmployeeID

Initial\_Assessment VisitDate FK's to Visit Date

Initial\_Assessment VisitTime FK's to Visit Time

Treatment TreatmentID FK's to  
 Visit IntakeClerkEmployeeID FK's to Intake\_Clerk EmployeeID  
 Department DepartmentID FK's to Employee DepartmentID  
 Treatment VisitID FK's Visit Date and Visit Time  
 Diagnosis DiagnosisID FK's to Visit Date and Visit Time  
 Has\_Guardian PID FK's to Patient PID  
 Has\_Guardian GuardianID FK's to Parent/Guardian GuardianID  
 Has\_Visit PID FK's to Patient PID  
 Has\_Visit VisitID FK's to VisitID (i.e. Visit Date and Visit Time)  
 Approve\_Minor GuardianID FK's to Parent/Guardian GuardianID  
 Approve\_Minor TreatmentID FK's to Treatment TreatmentID  
 Approve\_Minor VisitID FK's to VisitID (i.e. Visit Date and Visit Time)  
 Approve\_Minor PID FK's to Patient PID  
 Logs DiagnosisID FK's to Diagnosis DiagnosisID  
 Logs EmployeeID FK's to Service\_Provider EmployeeID  
 Has\_Insurance PID FK's to Patient PID  
 Has\_Insurance InsuranceID to Insurance\_Provider InsuranceID  
 Patient\_Address PID FK's to Patient ID  
 Medications AssessmentID FK's to Initial\_Assessment AssessmentID  
 Symptoms AssessmentID FK's to Initial\_Assessment AssessmentID  
 Degrees EmployeeID FK's to Service\_Provider EmployeeID  
 Parent/Guardian GuardianID FK's to Parent/Guardian GuardianID  
 Doctor EmployeeID FK's to Service\_Provider EmployeeID  
 Nurse\_Practitioner EmployeeID FK's to Service\_Provider EmployeeID  
 Physicians\_Assistant EmployeeID FK's to Service\_Provider EmployeeID  
 Nurse EmployeeID FK's to Medical\_Staff EmployeeID  
 Service\_Provider EmployeeID FK's to Medical\_Staff EmployeeID  
 Medical\_Staff EmployeeID FK's to Employee EmployeeID  
 Intake\_Clerk EmployeeID FK's to Additional\_Staff EmployeeID  
 Billing\_Clerk EmployeeID FK's to Additional\_Staff EmployeeID  
 IT\_Support EmployeeID FK's to Additional\_Staff EmployeeID  
 Additional\_Staff EmployeeID FK's to Employee EmployeeID

#### Generalizations:

- Employee: General entity that encompasses various types of employees such as Medical\_Staff and Additional\_Staff

#### Specializations:

- Medical\_Staff: specialized into 2 subtypes
  - Nurse and Service\_Provider
- Service\_Provider: further specialized into 3 subtype
  - Doctor, Nurse\_Practitioner, and Physician\_Assistant

### **Step 9: Mapping of Categories/Union**

There are no unions/categories so there are no changes to the diagram.