

# Interoperable Clinical Pathways through Standards and Modeling Tools: Human Trafficking

## Credits

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# Problem (Business Case) / Solution (Use Case)

**Human Trafficking (HT)** cases in both adults and children can be identified by clinicians during patient healthcare encounters [1], such as:

- Emergency Department (ED) Visits
- Inpatient Admission
- Outpatient Visits
- Telehealth Visits



Once a victim is identified, the next steps include:

- Case investigation
- Case management and evaluation including reporting to public health and law authorities as per jurisdictional policies [2]
- Case mitigation through appropriate service coordination

## **Use Case (IT Solution)**

Automatic case detection in Electronic Health Records (EHR) system based on

- specified triggers: visit, age, chief complaint
- patient screening via a survey tool [3]

1. Hachey L, Phillippi, J. Identification and management of human trafficking victims in the emergency department. *Advanced Emergency Nursing Journal*. 2015; 39(1): 31-51.

2. Florida: General Statutes (GS) § 39.201; Hawaii Revised Statutes (HRS) § 350-1, HRS § 577A; North Carolina: GS § 7B-301, GS § 90-21.5, GS § 14-318.6

3. Greenbaum V, Dodd M, McCracken C. A short screening tool to identify victims of child sex trafficking in the health care setting. *Pediatric Emergency Care*. 2018b; 34(1): 33-37

# Name Identification of Child Sex Trafficking Victims in ED

**Actors**  
**Business Actors:** Patient, Parent/Guardian/Companion, Registration Clerk, Clinicians, Social Worker/Case Manager, Interpreter Services, Primary Care Provider (PCP)  
**Technical Actors:** EHR (NOTE: ADT and Registration Document Repository could be used for patient registration and legal health record), PCP EHR

## Data Categories

**Flow of Events**

1. Patient with parent/guardian/companion presents to Emergency Department
2. Patient is registered by registrar and given armband information is entered in the EHR
3. Patient placed in Triage room. Clinician conducts triage, verifies/obtains patient's information and enters information in EHR. NOTE: *in the case of Live-Threatening event, critical care is provided before triage & patient registration*
4. Patient is moved to treatment room per facility protocol. Clinician is notified
- 5.1 If indication for CST by EHR, clinician activates standing order for Greenbaum tool and alerts to clinician to administer Greenbaum tool
6. Clinician administer the tool according with organizational policies and enters responses into EHR
7. Based on survey results: 7.1 If positive, EHR generates an alert to clinician for case investigation with social worker/case manager involvement. Clinician authorizes case investigation via signatures; 7.2 If negative, proceed with routine care
8. Clinician provides appropriate medical care as indicated based on patient's chief complaint and enters information into EHR
9. EHR sends electronically visit summary/care plan to PCP to coordinate care

## Clinical Pathways: Workflow & Data Flow

- 1&2. Patient, visit, clinician, facility demographics; reason for visit; consents to treat & information sharing
3. Chief complaint, weight, vital signs, medical/surgical history, allergies, current medications, acuity level; clinician discretion (of possible CST)
4. Room information, notification to clinician
- 5.1 Standing order for Greenbaum tool survey data; Alert to clinician
6. Patient, clinician demographics; Greenbaum tool survey data; for failure to screen, eg, refusal
7. Patient, clinician demographics; Greenbaum tool survey data. 7.1 Alert for case investigation and notification to social worker/case manager; 7.2 Notification to proceed with routine care
8. Encounter data, CPOE for labs and procedures, treatment documentation, lab and imaging results, ancillary entity demographics, care plan, medications, referrals, e-signatures
9. Visit summary, continuity of care document

## Data by Event

Pre-Condition: EHR  
 Post-Conditions: Primary Care Providers EHR



# Data Categories & FHIR Resources: Examples

## Use Case: Identification of Child Sex Trafficking Victims in ED

### Data Categories

1&2. Patient, visit, clinician, facility demographics; reason for visit; consent to treat & information sharing

3. Chief complaint, weight, vital signs, medical/surgical history, allergies, current medications, acuity level; clinician discretion (of possible CST)

<https://www.hl7.org/fhir/resourcelist.html>

### FHIR Resources

Patient-<https://www.hl7.org/fhir/patient.html>

Facility-<https://www.hl7.org/fhir/organization.html>

Encounter-<https://www.hl7.org/fhir/encounter.html>

Episode of care-<https://www.hl7.org/fhir/episodeofcare.html>

Care team-<https://www.hl7.org/fhir/careteam.html#9.7>

Task-<https://www.hl7.org/fhir/task.html#Task>

Consent-<https://www.hl7.org/fhir/consent.html>

Chief complaint-<https://www.hl7.org/fhir/condition.html>

Practitioner-<https://www.hl7.org/fhir/practitioner.html>

Practitioner role-<https://www.hl7.org/fhir/practitionerrole.html#PractitionerRole>

Age, weight, vital signs (Observation)-<https://www.hl7.org/fhir/observation.html>

Questionnaire response-

<https://www.hl7.org/fhir/questionnaireresponse.html#QuestionnaireResponse>

Substance-<https://www.hl7.org/fhir/substance.html>

Allergy intolerance-

[https://www.hl7.org/fhir/allergyintolerance.html#AllergyIntolerance\\_Adverse](https://www.hl7.org/fhir/allergyintolerance.html#AllergyIntolerance_Adverse)

events-<https://www.hl7.org/fhir/adverseevent.html#AdverseEvent>



# How do we capture the Business Case (requirements)?

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## **Planning Statements for Clinical Pathways (Business Processes/Workflow & Data Flow Requirements)**

- Specify: *WHY* (Policies, Values, Goals, Success Criteria)  
*WHO* (Actors/Participants)  
*WHAT* (Business Processes as Pathways (Workflow/Dataflow))



## **Business Processes Models**

- Specify: *HOW* (Clinical Pathways Models, Workflow/Data Flow)

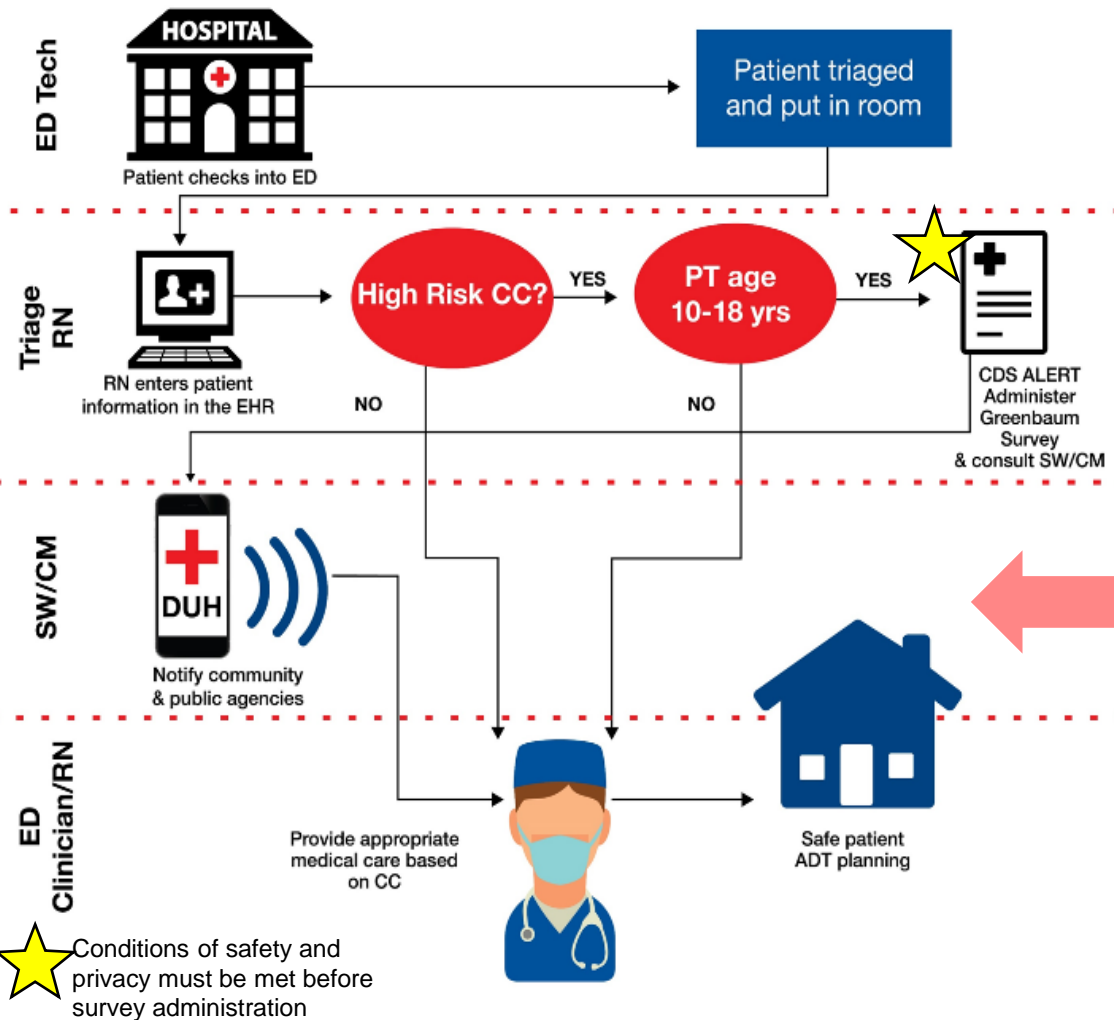


## **Data Models Templates (Entities and Relationships)**

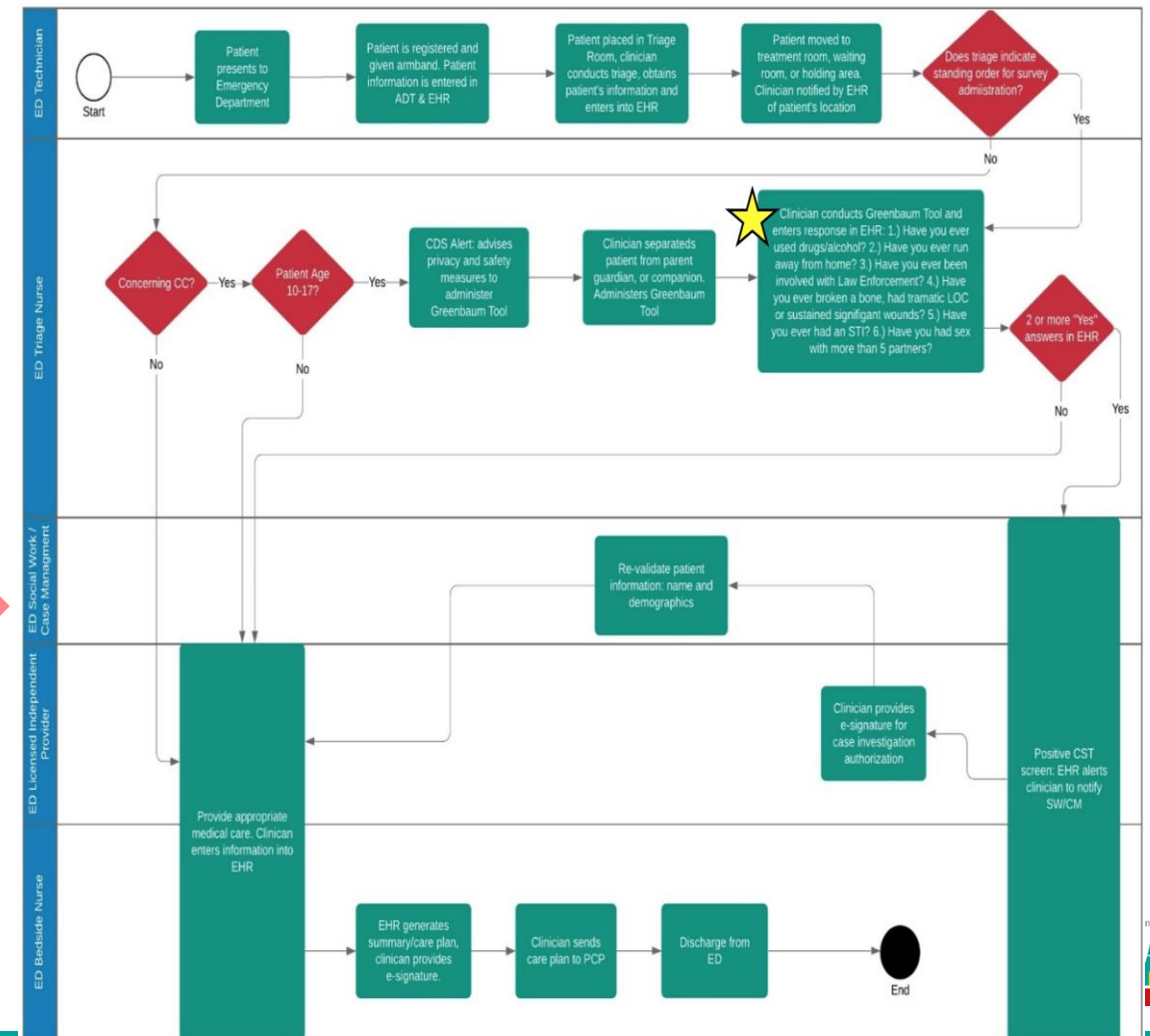
- Derive: *WHAT* (Data Sets & Rules from Clinical Pathways)

# Moving from Concept to BPMN Model

## Conceptual Diagram



## Business Process (Workflow) Model



# Live Demonstration ...by Michael Cesino

[www.visible-systems.com](http://www.visible-systems.com)

**Visible** Visualize. Align. Transform.

Hello Michael | Home | Create | Request | Submit | Return

- Views**
  - Business Rules
  - Planning Statement Hierarchy
  - Planning Statement Outline
  - Association Matrix - Planning Statements vs. Entities
  - Sensitive Data Check
- Models**
  - Business Process**
    - ED Workflow
    - Patient Registration - Walk in
  - Entity Relationship**
    - Appointment Request
    - Care Plan and Services
    - Consent for Treatment
    - Eligibility for Coverage
    - Episode of Care
    - Initial Triage
    - Insurance Claim
    - Participating Organization
    - Participating Party
    - Payment Arrangements
  - Use Case**
    - Patient Registration - Walk in
- Objects**
  - Business Glossary**
    - status
  - Activity**
    - CDS Alert advises privacy and safety mea
    - Clinical provides e-signature for case i
    - Clinican conducts Greenbaum Tool and ent
    - Clinican sends care plan to PCP
    - Clinican separates patient from parent g
    - Discharge from ED
    - EHR generates summary/care plan, clinic
    - Identify patient

	What Data	How Function	Where Network	Who People	When Time	Why Motivation
<b>Scope Planner</b>	List of Things ENTITY = Class of Business Entities	List of Processes PROCESS = Class of Business Processes	List of Locations NODE = Class of Business Locations	List of Organizations PEOPLE = Class of Business Organizations	List of Cycles CYCLE = Class of Business Cycles	List of Goals END = Class of Business Objectives
<b>Business Model Owner</b>	e.g., Semantic Model ENTITY = Business Entity RELATION = Business Relationship	e.g., Business Process Model I/O = Business Resources PROCESS = Business Process	e.g., Logistics Network NODE = Business Location LINK = Business Linkage	e.g., Work Flow Model PEOPLE = Organization Unit WORK = Work Product	e.g., Master Schedule TIME = Business Event CYCLE = Business Cycle	e.g., Business Plan ENDS = Business Objective MEANS = Business Strategy
<b>System Model Designer</b>	e.g., Logical Data Model ENTITY = Data Entity RELATION = Data Relationship	e.g., Application Architecture I/O = User Views PROCESS = Application Function	e.g., Distributed System Architecture NODE = IS Function LINK = Line Characteristics	e.g., Human Interface Architecture PEOPLE = Role WORK = Deliverable	e.g., Processing Structure TIME = System Event CYCLE = Processing Cycle	e.g., Business Rule Model ENDS = Structural Assertion MEANS = Action Assertion
<b>Technology Model Builder</b>	e.g., Data Design ENTITY = Table/Segment/etc. RELATION = Key/Pointer/etc.	e.g., System Design I/O = Data Elements/Sets PROCESS = Computer Function	e.g., Technology Architecture NODE = Hardware/System Software LINK = Line Specifications	e.g., Presentation Architecture PEOPLE = User WORK = Screen/Device Formats	e.g., Control Structure TIME = Execute CYCLE = Component Cycle	e.g., Role Design ENDS = Condition MEANS = Action
<b>Detailed Representations Subcontractor</b>	e.g., Data Definition ENTITY = Field RELATION = Address	e.g., Program I/O = Control Block PROCESS = Language Statement	e.g., Network Architecture NODE = Addresses LINK = Protocols	e.g., Security Architecture PEOPLE = Identity WORK = Job	e.g., Timing Definition TIME = Interrupt CYCLE = Machine Cycle	e.g., Rule Specification ENDS = Sub-condition MEANS = Step

## Discussion

Insights inform strategy. That is to say you are able to understand how effective of a strategy you have, based on the data returned from a query (insight).

type your message here

[Send](#)

# Disclosure

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Foundation of material herein was presented during the following conferences.

1. BPM+ Health Meeting, June & September 2020. URL:
2. Mobilizing Computable Biomedical Knowledge (MCBK) Annual Meeting, June 30, 2020. URL:
3. American Health Information Management Association (AHIMA) 2020 Annual Convention, October 20, 2020. URL:



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8. Greenbaum V, Dodd M, McCracken C. A short screening tool to identify victims of child sex trafficking in the health care setting. *Pediatric Emergency Care*. 2018b; 34(1): 33-37
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