Interoperable Clinical Pathways through Standards and Modeling Tools: Human Trafficking

Credits
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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]

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
Identification of Child Sex Trafficking Victims in ED

**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

<table>
<thead>
<tr>
<th>Flow of Events</th>
<th>Data Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Patient with parent/guardian/companion presents to Emergency Department</td>
<td>1&amp;2. Patient, visit, clinician, facility demographics; reason for visit; consents to treat &amp; information sharing</td>
</tr>
<tr>
<td>2. Patient is registered by registrar and given armband information is entered in the EHR</td>
<td>3. Chief complaint, weight, vital signs, medical/surgical history, allergies, current medications, acuity level; clinician discretion (of possible CST)</td>
</tr>
<tr>
<td>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 &amp; patient registration</td>
<td>4. Room information, notification to clinician</td>
</tr>
<tr>
<td>4. Patient is moved to treatment room, waiting room, or holding area, per facility protocol. Clinician is notified by EHR of patient location</td>
<td>5. If indication for CST based on clinician discretion in triage, EHR activates standing order for Greenbaum tool survey order</td>
</tr>
<tr>
<td>5.1 If indication for CST tool based on present history, clinical discretion, activates alert to clinician to administer Greenbaum tool</td>
<td>5.1 Standing order for CST tool; 5.2 Alert to clinician with CST survey order</td>
</tr>
<tr>
<td>5.2 EHR generates alert to clinician to administer Greenbaum tool</td>
<td>6. Patient, clinician demographics; Greenbaum tool survey data; for failure to screen, eg, refusal</td>
</tr>
<tr>
<td>6. Clinician administer the tool according with organizational policies and enters responses into EHR</td>
<td>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</td>
</tr>
<tr>
<td>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</td>
<td>8. Encounter data, CPOE for labs and procedures, treatment documentation, lab and imaging results, ancillary entity demographics, care plan, medications, referrals, e-signatures</td>
</tr>
<tr>
<td>8. Clinician provides appropriate medical care as indicated based on patient’s chief complaint and enters information into EHR</td>
<td>9. Visit summary, continuity of care document</td>
</tr>
<tr>
<td>9. EHR sends electronically visit summary/care plan to PCP to coordinate care</td>
<td></td>
</tr>
</tbody>
</table>
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)

**FHIR Resources**

- Patient: [https://www.hl7.org/fhir/patient.html](https://www.hl7.org/fhir/patient.html)
- Facility: [https://www.hl7.org/fhir/organization.html](https://www.hl7.org/fhir/organization.html)
- Encounter: [https://www.hl7.org/fhir/encounter.html](https://www.hl7.org/fhir/encounter.html)
- Episode of care: [https://www.hl7.org/fhir/episodeofcare.html](https://www.hl7.org/fhir/episodeofcare.html)
- Care team: [https://www.hl7.org/fhir/careteam.html#9.7](https://www.hl7.org/fhir/careteam.html#9.7)
- Task: [https://www.hl7.org/fhir/task.html#Task](https://www.hl7.org/fhir/task.html#Task)
- Consent: [https://www.hl7.org/fhir/consent.html](https://www.hl7.org/fhir/consent.html)
- Chief complaint: [https://www.hl7.org/fhir/condition.html](https://www.hl7.org/fhir/condition.html)
- Practitioner: [https://www.hl7.org/fhir/practitioner.html](https://www.hl7.org/fhir/practitioner.html)
- Practitioner role: [https://www.hl7.org/fhir/practitionerrole.html#PractitionerRole](https://www.hl7.org/fhir/practitionerrole.html#PractitionerRole)
- Age, weight, vital signs (Observation): [https://www.hl7.org/fhir/observation.html](https://www.hl7.org/fhir/observation.html)
- Questionnaire response: [https://www.hl7.org/fhir/questionnaireresponse.html#QuestionnaireResponse](https://www.hl7.org/fhir/questionnaireresponse.html#QuestionnaireResponse)
- Substance: [https://www.hl7.org/fhir/substance.html](https://www.hl7.org/fhir/substance.html)
- Allergy intolerance: [https://www.hl7.org/fhir/allergyintolerance.html#AllergyIntolerance](https://www.hl7.org/fhir/allergyintolerance.html#AllergyIntolerance)
- Adverse events: [https://www.hl7.org/fhir/adverseevent.html#AdverseEvent](https://www.hl7.org/fhir/adverseevent.html#AdverseEvent)

[https://www.hl7.org/fhir/resourcelist.html](https://www.hl7.org/fhir/resourcelist.html)
How do we capture the Business Case (requirements)?

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**

- **ED Tech**: Patient checks into ED
- **Triage RN**: RN enters patient information in the EHR
- **SW/CN**: Notify community & public agency
- **Clinician/RN**: Conditions of safety and privacy must be met before survey administration

**Business Process (Workflow) Model**

- **Survey & consult SW/CN**
- **CDS ALERT Administer Gynecorensem**
- **Patient triaged and put in room**
- **High Risk CC?**
  - **YES**
  - **PT age 10-18 yrs**
  - **YES**

- **Safe patient ADT planning**

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**Diagram Details**

- **Decision Points**:
  - High Risk CC?
  - Patient age

- **Connections**:
  - Patient checks into ED
  - RN enters patient information in the EHR
  - Notify community & public agency
  - Conditions of safety and privacy must be met before survey administration

- **Survey & consult SW/CN**

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**Legend**

- **Color Codes**:
  - Red: Risk Categories
  - Blue: Patient Actions
  - Green: System Actions

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**Notes**

- **Moving from Concept to BPMN Model**
  - Steps to transform a conceptual diagram into a formal BPMN model.
Live Demonstration … by Michael Cesino

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Disclosure

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:
References

7. 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