eHEALTHDC

A DISTRICT OF COLUMBIA PRIMARY CARE ASSOCIATION PROGRAM

**Helping Healthcare Providers Adopt
Digital Health Technologies and Achieve
HIE Connectivity in the District**

DCPCA
DISTRICT OF COLUMBIA
PRIMARY CARE ASSOCIATION

ARPA Home and Community Based Services (HCBS) Digital Health
Technical Assistance (TA) Program

I'm Connected to the HIE; Now What?!

February 21st, 2024

Please put your **full name** and the **name of the HCBS organization** you are representing in the webinar chat.

Please Note: We only need the name of one individual from each organization. This should be your organization's designated primary or secondary HIE Champion .

Agenda

- **I'm Connected!**

  - Exploring Encounter data

  - Exploring Clinical data

  - Where Does my Organization's Data Go?

  - How is my Organization's Data Presented to Others?

  - Impact of EHR Documentation on Data Quality

- **…Now What?!**

  - Leveraging Integrations for Care Coordination

  - Data Sharing and CRISP DC Panel Submission

- **CRISP DC Quiz**

Presented by: Ashley Braswell and Ronald Emeni

- **How ADT and CCD Messages are structured**

  o ADT Message Structure vs CCD Message Structure

- **How ADT and CCD messages are generated and transmitted to CRISP DC**

  o Triggers for ADT Transmission

  o Triggers for CCD Transmission

  o Impact on timeliness of data exchange

- **How ADTs and CCDs present in the Health Information Exchange**

- **Implications on how Data can be viewed**

  o Notice of Privacy Practices/Patient Opt-Out

  o Substance Use Disorder Data

    ▪ E-Consent Management

- **Examples on how other treating providers can leverage Encounter and Clinical Data shared by ARPA HCBS Organizations**

- **Benefits of an ADT Integration**

- **Grasp the Fundamentals of HL7 Standards:**
  - Objective: Participants will gain a basic understanding of Health Level 7 (HL7) standards, focusing on the purpose, scope, and structure of HL7 Messages, including ADT (Admission, Discharge, Transfer) and CCDA (Consolidated Clinical Document Architecture) messages.

- **Deciphering the Structure of HL7 ADT Messages:**
  - Objective: Participants will learn how to identify and understand the components and segments of HL7 ADT messages, such as patient identification, encounter details, and event triggers, to better manage patient information during care transitions

- **Understanding CCDA Document Composition:**
  - Objective: Participants will explore the structure of CCD documents, including key elements within a CCD, and how these elements are displayed within the HIE

- **Navigate the Transmission Process of HL7 Messages:**
  - Objective: Participants will comprehend the mechanisms and protocols involved in transmitting HL7 messages between healthcare systems

- **Maximizing the Use of HL7 ADT Messages**
  - Objective: Participants will learn how to effectively utilize HL7 ADT Messages to enhance patient care coordination and response times following the integration with an HIE.

- **Enhancing Communication and Collaboration Among Care Teams:**
  - Objective: Participants will identify the best ways in which HIE Connectivity facilitates better communication and collaboration

- Your organization is currently sharing encounter and clinical data with CRISP DC, but what does this really mean?

- Background: Health Level 7 International (HL7) is an organization developing standards related to the exchange, integration, sharing and retrieval of electronic health information. Consider HL7 as the language healthcare organizations and Certified Electronic Health Record Technologies (CEHRT) use to securely communicate and access the right healthcare data at the right time.
  - Standards include HL7 V2, HL7 V3, CDA and FHIR

- **Your organization is currently sharing HL7 ADTs (Admission, Discharge and Transfer) and HL7 C-CDA (Consolidated Clinical Document Architecture) to the CRISP DC HIE.**

Exploring Encounter Data

- When an organization integrates and starts sharing encounter data (ADTs) from it's Electronic Health Record (EHR), the EHR records a trigger event, such as the admission of a patient, then creates a message and sends this message to a receiving system (Health Information Exchange, Hospital Pharmacy, Hospital Lab, Hospital EHR)

- There are over 50 different types of ADT Messages that are used to communicate patient demographics, visit information, and patient state at a healthcare facility.

- HL7 ADT Messages (Trigger Events)
    - **ADT A01- Patient Admit**
    - ADT A02- Patient Transfer
    - ADT A03- Patient Discharge
    - **ADT A04- Patient Registration**
    - ADT A05- Patient Pre-Admission
    - **ADT A08- Patient Information Update**

- **HL7 A01, A04, and A08s** are commonly used by Outpatient Facilities to communicate that a patient has been admitted or registered at their facility.

- ADT Messages are formatted like a detailed digital form with several sections called segments. Each segment contains specific information related to the event trigger (A01, A04, A08).
- The sample is communicating information about the Patient Registration of test patient Fugene Wade. It consists of information about:
  - **MSH-** Message Header: Defines intent, source, destination
  - **EVN-** Event Type: Communicates necessary trigger event information to receiving systems
  - **PID-** Patient Identification: used by all applications as the primary means of communicating patient identification information. This segment contains permanent patient identifying and demographic information that, for the most part, is not likely to change frequently
  - **PV1-** Patient Visit: used by Registration/Patient Administration applications to communicate information on an account or visit-specific basis.

Messages \ Mappings \

◉ Raw ○ Encoded ○ Sent ○ Response

```
MSH|^~\&|ADT|DC_JOYEALS|CRISP|CRISP|20231004031502||ADT^A04|696444502|P|2.3.1
EVN|A04|20231004031502
PID|1|||11111^^^DC_JOYEALS||Wade^Fugene||19740911|M||UNK|^^^^^USA|USA|||eng^English|S||11111578946136||||UNK
PV1|1|O|Test Clinic||||^^^^^^^^^^NPI|||||||||||||343077
ZMC|DRCLOUD_IB_nonACR_ADT^1|2023-10-31T13:39:32.337|||||false||||
ZOB|1
ZTD|DRCLOUD_IB_nonACR_ADT|202310311339320316^1
```

- The sample is communicating an update to Fugene Wade's patient information. It consists of information from the initial trigger event and the updated patient information.
  - **MSH-** Message Header: Defines intent, source, destination
  - **EVN-** Event Type: Communicates necessary trigger event information to receiving systems
  - **PID-** Patient Identification: used by all applications as the primary means of communicating patient identification information. This segment contains permanent patient identifying and demographic information that, for the most part, is not likely to change frequently
  - **PV1-** Patient Visit: used by Registration/Patient Administration applications to communicate information on an account or visit-specific basis.
  - **GT1-** Guarantor: contains guarantor (person or the organization with financial responsibility for payment of a patient account) for patient and insurance billing applications
  - **IN1**- Insurance: contains insurance policy coverage information necessary to produce properly pro-rated patient and insurance bills

- **Generation of ADT Messages**
  - **HL7 ADT** messages are crucial for **real-time communication** in healthcare settings, signaling important *events* in a patient's care journey across the healthcare continuum. HL7 ADT messages are generated in near real-time by the Electronic Health Record:
    - **Registration in the emergency Department (ED):**
      - When a patient arrives and registers at the ED, an ADT message is created to signal their arrival. This alerts on-call staff and triggers an alert to the HIE.
    - **Admission to a Hospital**
      - When a patient is admitted for inpatient care, whether for surgery, treatment of a medical condition, or after being transferred from the ED to an inpatient bed. The ADT message communicated the admission including date, time, department, reason for admission.
    - **Transfer within the Hospital**
      - If a patient needs to be needs to be moved from one department to another, and ADT transfer message is sent.
    - **Discharge from a Hospital**
      - Upon patient discharge, and ADT message is generated to notify members of the patient's care team about the patient release. It includes discharge date, time, *discharge disposition*, *discharge diagnosis*
    - **Patient Check-in for Outpatient Procedures**
      - For outpatient services like dialysis, post discharge follow up appointment with a primary care provider, referral to a specialty provider, an ADT message is generated when the patient is registered, checks in, or marked as arrived for their appointment.
    - **Update to Patient Demographics**
      - Any changes to a patient's demographic information (address, next of kin, phone number, insurance details) triggers an ADT message to ensure that the patient's information is updated within the HIE.
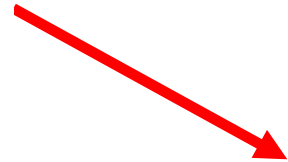
11

Registration

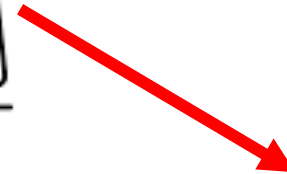**Generation of HL7 Message**

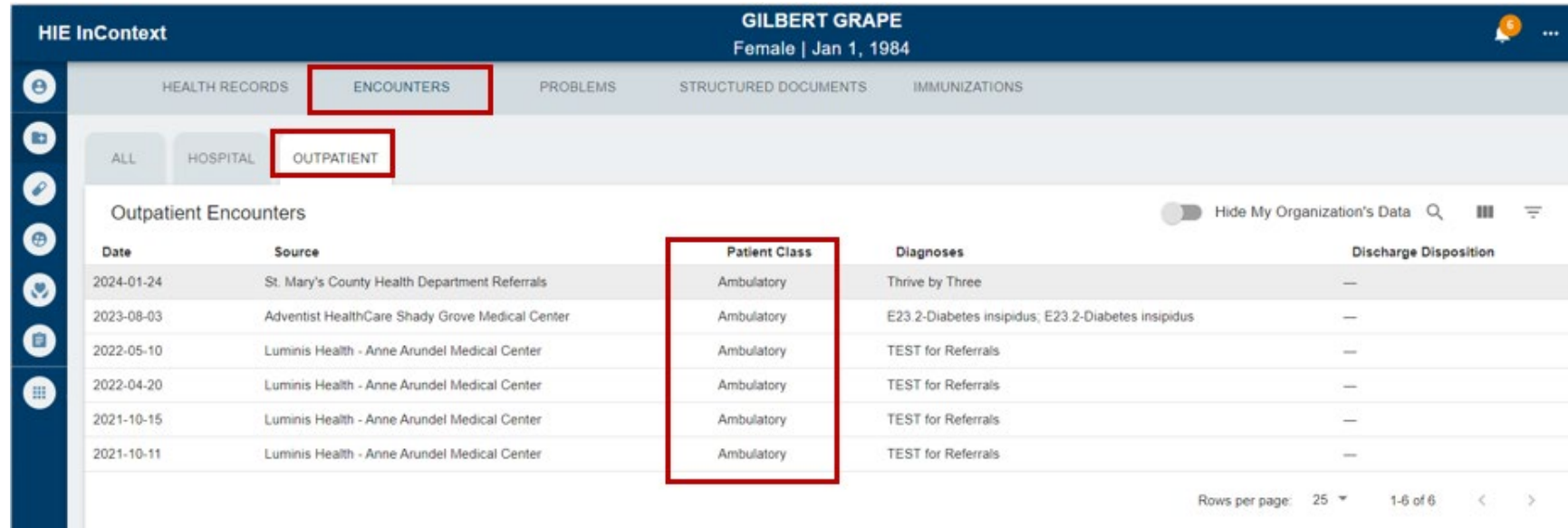**Transmission**

Patient Chart Update

**Generation of HL7
Message**

Transmission

- Encounter (ADT) Messages are processed and sent to downstream applications that users of the Health Information Exchange Interact with. Examples include 'Patient Information' and 'Encounters' within the Clinical Information App or as individual Encounter Notification Alerts within PROMPT*

Presentation of HL7 ADT Messages in CRISP-DC Portal: Patient Information

Exploring Clinical Data

- There are three acronyms commonly used to explain clinical data exchange between systems.
  - CDA- Clinical Data Architecture
  - CCDA- Consolidated Clinical Data Architecture
  - CCD- Continuity of Care Document

- CDA- Clinical Document Architecture was created by Health Level Standard as a broad standard to support the exchange of data between two entities. CDA Has six principles
  - Persistence
  - Stewardship
  - Authentication
  - Context
  - Wholeness-
  - Human readable

- Consolidated Clinical Document Architecture (C-CCDA) is currently the most used standard for exchanging health data within the US. Every patient encounter can be depicted by a singular CDA-formatted document. HL7 worked with entities like Integrating the Health Care Enterprise (IHE) and Health Story Project, to create implementation guides for specific document templates, describing the content and intent of each template.

- ARPA HCBS Organizations are sharing Continuity of Care Documents (CCD) which is a structured Consolidated Document Architecture (CDA) document type, summarizing a patient's clinical event and documenting clinical, demographic and administrative data.

- Examples of structured documents include:
  - **Continuity of Care Document (CCD)**
  - Consultation Note
  - Diagnostic Imaging Report
  - Discharge Summary
  - History and Physical
  - Operative Note
  - Procedure Note
  - Progress Note
  - Care Plan
  - Unstructured Document
  - Summary of Care Record

- Consolidated Clinical Document Architecture provides document templates with a "**header**" describing the scope and intended use of the document. Each document template contains "**section templates**" center around a common clinical concept such as procedures or encounters and can be used across numerous document templates.

- C-CCDA can be labeled with a **structured header** or structured document permitting systems to process (parse) content. C-CCDA's can also be labeled as an **unstructured document** and are used to facilitate the exchange of information that does not have standardized representation.

Structured Document*

Header
Other Sections
H
M
Procedures
H
M
Results
H
M
Plan of Care
H
M
Advance Directives
H
M

Unstructured Document*

Header
<nonXMLBody>
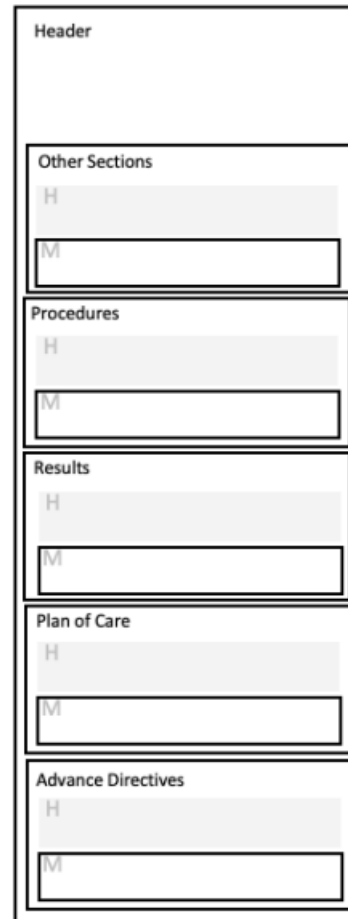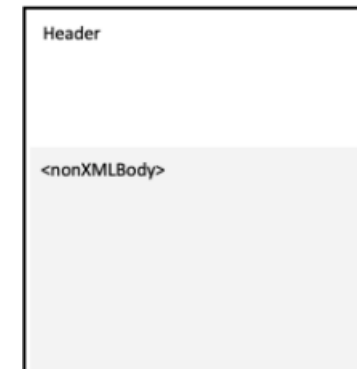
- Problems

```
1    <section>
2            <templateId root="2.16.840.1.113883.10.20.22.2.5.1"/>
3            <templateId root="2.16.840.1.113883.10.20.22.2.5.1" extension="2015-08-01"/>
4            <code code="11450-4" codeSystem="2.16.840.1.113883.6.1" displayName="Problem List"/>
5            <title>Problem List</title>
6            <text>
7                    <table>
8                            <thead>
9                                    <tr>
10                                           <th>Name</th>
11                                           <th>Dates</th>
12                                           <th>Status</th>
13                                   </tr>
14                           </thead>
15                           <tbody>
16                                   <tr ID="Problem1">
17                                           <td>Community Acquired Pneumonia</td>
18                                           <td>
19                                                   <content>Onset: February 27 2014</content>
20                                           </td>
21                                           <td>Active</td>
22                                   </tr>
23                           </tbody>
24                   </table>
```

What do CCDs Look Like?

- Mental Status- Patient Health Questionnaire

```
8     <title>MENTAL STATUS</title>
9     <text>
10        <table>
11            <thead>
12                <tr>
13                    <th>Date</th>
14                    <th>Assessment</th>
15                    <th>Value</th>
16                    <th>Relevant Reference Range</th>
17                    <th>Interpretation</th>
18                </tr>
19            </thead>
20            <tbody>
21                <!-- Note that sending the total score may be adequate for some use cases, although both total and detail responses shown below -->
22                <!-- PHQ-9 Total Score -->
23                <tr>
24                    <td ID="assessment" colspan="5">PHQ-9 Questionnaire (panel)</td>
25                </tr>
26                <tr ID="assessmentTotal">
27                    <td>06/22/2015</td>
28                    <td>PHQ-9 Total Score</td>
29                    <td>12</td>
30                    <td ID="assessmentReferenceRange">0-4</td>
31                    <td>High</td>
32                </tr>
33                <!-- PHQ-9 Component Questions -->
34                <tr ID="assessment1">
35                    <td>06/22/2015</td>
36                    <td>PHQ-9 Question: Little interest or pleasure in doing things?</td>
37                    <td>0 (Not at all)</td>
38                    <td/>
```

22

What do CCDs Look Like?

- Vitals Sign

```
1    <section>
2            <templateId root="2.16.840.1.113883.10.20.22.2.4.1"/>
3            <templateId root="2.16.840.1.113883.10.20.22.2.4.1" extension="2015-08-01"/>
4            <code code="8716-3" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
5                    displayName="Vital signs"/>
6    <title>Vital Signs (Last Filed)</title>
7    <text>
8            <table>
9                    <thead>
10                           <tr>
11                                   <th>Date</th>
12                                   <th>Blood Pressure</th>
13                                   <th>Pulse</th>
14                                   <th>Temperature</th>
15                                   <th>Respiratory Rate</th>
16                                   <th>Height</th>
17                                   <th>Weight</th>
18                                   <th>BMI</th>
19                                   <th>SpO2</th>
20                           </tr>
21                   </thead>
22                   <tbody>
23                           <tr>
24                                   <td>05/20/2014 7:36pm</td>
```

- **Data Collection and Record Creation**
  - Patient Data is collected during outpatient visits, including problems, medical history, social history, assessments, diagnoses, medications and other important information
- **CCD Creation**
  - The EHR complies collected data in **structured** and **unstructured** formats, in a C-CDA standard
- **CCD Generation**
  - The Electronic Health Record generates the CCD either by a manual and/or automated process.
    - Manual: EHRs can be configured to generate a CCD after a provider has locked the patient cart or sign off on a progress note.
    - Automated: EHRs create batched jobs, where CCDs are created in batches during off hours.
- **CCD Transmission to HIE**
  - CCDs are securely transmitted by the sending organization through the HL7 CCD interface, to the receiving system (HIE)
- **Ingestion of Data by HIE**
  - The receiving system ingests and processes the CCDs and makes the data available within downstream applications
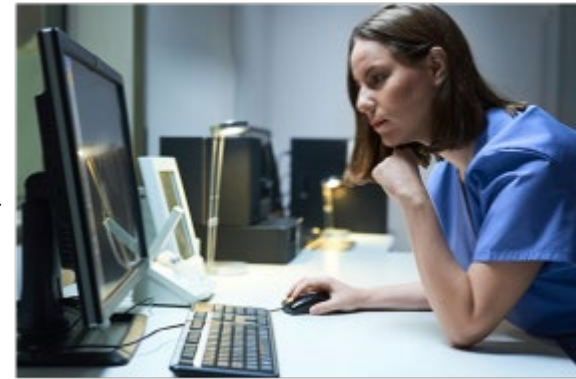
One Week Prior to the Encounter

During the Encounter

24 Hours after the Encounter

30 Days after the Encounter

How are CCDs Displayed in the HIE?

How are CCDs Displayed in the HIE?

Continuity of Care Document (C-CDA) (October 5, 2023, 10:15:02AM)

Patient	Legal: ZEE ZEE **Date of Birth:** April 4, 1987 (36yr)**Gender:** Male **Patient-ID:** 578-94-6136 (2.16.840.1.113883.3.9834.00007), 5788 (1.3.6.1.4.1.1234.13.20.9999.1.3.7.4)
Race	unknown
Ethnicity	unknown
Language Communication	en-US, preferred: yes
Contact Details	Home: 23618 Pomelo Rd Baltimore, MD 21201
Documentation Of	Care provision, **Date/Time:**
Author	, **Authored On:** October 5, 2023, 10:15:02AM

Table of Contents

- Allergies, Adverse Reactions, Alerts
- MENTAL STATUS
- Diagnostic Imaging Report
- Functional Status
- Immunizations
- Medical Devices
- Procedures
- Results
- Medications
- Problems
- Social History
- Vital Signs
- Encounters

Allergies, Adverse Reactions, Alerts

No known allergies

MENTAL STATUS

Allergies, Adverse Reactions, Alerts

No known allergies

MENTAL STATUS

Status	Date
No Information	

Diagnostic Imaging Report

Name	Date	Interpretation
No Information		

Functional Status

No Information

Immunizations

Medical Devices

Name	Description	Device ID	Count	Company Name	Brand Name	Model Number	Lot Number	Serial Number	Expiration Date	Manufacture Date	Issuing Agency	MRI Safety	Contains Natural Rubber Latex	Contains Human Cells, Tissues ect
No Devices Found														

Procedures

Results

Medications

Problems

Condition	Effective Dates (start - stop)	Clinical Status
ICD10:F16.20(Hallucinogen dependence, uncomplicated)	-	Active

Social History

NO Social History Information

Vital Signs

No Vitals Signs

Encounters

Encounter	Performer	Location	Date	Encounter Diagnosis

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Where Does My Organization's Data Go?

- HIE's operate as a receiving system of HL7 Messages that store, process and display encounter data (ADT) and clinical (CCD) data to the appropriate organization.

- A major indication of how data is stored and processed is based on the sending organization's Substance Use Disorder Attestation. Organizations that have attested as a provider of SUD services to CRISP DC, and their Vendor, will have **all** their data stored in a sensitive data repository. Encounter (ADT) and Clinical (CCD) data from SUD Attested organizations can **ONLY** be viewed once the patient has registered consent in ***CRISP DC's eConsent Tool.***

- Organizations who attest to not providing SUD services, are marked as non-SUD and their data flows into our standard repository.

There are other factors to consider with regards to data sharing and how data is made available via the Health Information Exchange.

- **Notice of Privacy Practices**
  - This informs the patient that the organization is participating with CRISP DC and that their information is being shared with the health information exchange. **This does not mean, that the organization is integrated and sharing encounter and clinical in the form of ADT/CCDs with the HIE.** Rather, that the organization's patients' demographic data is shared in the form of a patient panel. This is required of any CRISP participating organization in order to view information about that patient from other data contributors (Hospitals, FQHCs, Outpatient Facilities, Labs, Radiology Centers).

- **Patient Opt Out**
  - Patients have the right to opt out of participating with the Health Information Exchange and can do so by completing the CRISP Opt-Out Form on our website. When a patient outs out, all their data (Patient Demographics on a panel, Clinical Data, Encounter Data) is blocked from being transmitted and viewed by others utilizing the Health Information Exchange.

- **SUD Attestation**
  - Will determine how the organization's data from its patient panel (which attributes treatment relationship to patients), to Encounter and Clinical data (if contributing) is stored and made available to other members of the patient's care team utilizing the Health Information Exchange.

- **CRISP DC eConsent**
  - Patients attributed to SUD organizations will need to register consent via the ***CRISP DC eConsent tool*** in order for their data (Patient Demographics, Care Team Relationship, Encounter and Clinical data from **all** data contributors) to be viewed by other members of the patient's care team utilizing the Health Information Exchange.

Now What?;
Leveraging your Connections for Care Coordination

As a participant of the ARPA HCBS project, your organization promotes interoperability by facilitating secure and seamless exchange of encounter and clinical data with Primary Care Providers, Hospitalists, and other care managers/coordinators.

- **Enhanced Communication**: Admission, Discharge, Transfer (ADT) and Consolidated Clinical Document (CCD) data exchange bridges the communication gap between different care settings, reducing the risk of information loss during transitions and ensures that all providers are working from the same set of data.
- **Informed Care Decisions:** Access to comprehensive patient information supports more accurate diagnoses, tailored treatment plans, and timely interventions, which are crucial for improving patient outcomes.
- **Reduced Redundancies and Errors:** With a complete patient history accessible through CCDs, healthcare providers can avoid unnecessary duplicate testing and reduce the risk of medication errors or adverse interactions.

- **Hospitals:** Access to HCBS-contributed ADT and CCD data allows hospital staff to tailor inpatient and discharge planning services more accurately, reducing readmissions and ensuring appropriate follow-up care
  - When a patient is discharged from the hospital, care coordinators access ADT data indicating the patient's care team relationship. This allows the hospital's discharge planner to collaborate with HCBS organizations to ensure a smooth transition, including any necessary adjustments to the patient's care plan based on hospital treatment
- **Ambulatory Care Organizations:** Access to HCBS contributed ADT and CCD data to enhance patient intake processes, adjust care plans based on patients' needs, and improve overall care coordination, particularly for patients with complex needs requiring multidisciplinary attention.
  - A patient with complex health history, including comorbid conditions managed by an HCBS organization managed by an HCBS organization, is referred to a specialist for evaluation of a new health issue. The specialist, having access to the HIE, reviews CCDs shared by the HCBS organization, gaining better insight into the patient's long-term care management and how it might interact with potential new treatments. This pre-consultation review enables the specialist to approach the patient's care holistically, considering both the new issue and the existing regimen.
- **HCBS Organizations:** Sharing data demonstrates an HCBS Organization's role in the patient's care continuum, advocate for their patients' needs more effectively, and receive timely updates from other care providers, enabling HCBS organizations to adjust care plans in response to hospitalizations, specialist recommendations, or changes in health status.

- Maintain High Data Quality- Continuity of Care Documents (CCDs) and Admit, Discharge, and Transfer Messages (ADTs) should contain up-to-date patient information, treatment details, medication lists, and progress notes.
  - Continuity of Care Documents (CCD)
    - Problems
    - Problem Names
    - Medications
    - Medication Names
  - Admission, Discharge Transfer (ADT)
    - Address
    - Race
    - Ethnicity
    - Admit reason
- Timeliness of Continuity of Care Documents -
  - Since clinical data (CCDs) often requires a human input to be generated and shared with the Health Information exchange, it is critical that the organization and staff
    - Conduct regular chart reviews to ensure progress notes are updated to catch missed or incomplete documentation
    - Conduct regular audits to ensure progress notes are being locked, ensuring generation and transmission of CCDs
    - Leverage Electronic Health Record reporting capabilities to track generation and transmission of CCDs

Now What?;
Data Sharing and
Panel Submission

As your organization has recently begun sharing encounter data (ADTs) with the HIE, our ENS team can now build automated patient panels based on the encounter data sent to us from your organization.

- **So, what does this mean for your organization?**
  - **For Non-SUD Organizations: Manual patient panels will no longer be required of your organization every 90 days.** Enjoy your maintained access to the DC HIE for clinical clarity, without the extra effort of having creating a patient panel.
- **Manual Panel Submissions:**
  - **Non-SUD:** Panels would need to be submitted via MFT (Secure File Transfer) in a Delta Format
- **What we ask of your organization?**
  - When registering or updating patient information within your EHR, document as completely as possible. Your EHR documentation is essentially taking place of a manual panel, meaning whatever information is documented within your EHR will be used to automatically build your panel. This includes but is not limited to:

- Patient ID
- Name
- DOB
- Gender
- Address, City, State, Zip
- Phone Number

- Race and Ethnicity
- Language
- Admit Reason/
- Next of Kin
- Diagnosis/ Diagnosis Description

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As an organization sharing Substance Use Disorder information to the HIE, the encounter (ADTs) and clinical (CCDs) information sent from your organization is stored in a sensitive repository, viewable within the CRISP DC Portal upon consent via the **CRISP DC eConsent Tool**.

- **What does this mean for your organization?**
  - Because your encounter data is stored in a sensitive repository, automated panels cannot be built for your organization at this time. **Manual panels will continue to be required of your organization every 90 days.**
  - CRISP-DC is developing auto-subscription services, and our outreach team will inform your organizations once auto-subscription is available
- **Manual Panel Submissions:**
  - For our SUD provider orgs with an active ADT feed, Panels will need to be submitted via MFT (Secure File Transfer) in overwrite or delta format. Once Auto-subscription is developed, panel updates would need to be submitted in delta format

- **What we ask of your organization?**
  - Using CRISP's eConsent Tool, become an expert in your workflow of capturing client consent. This will ensure that your client's encounter (ADT) and clinical (CCD) data shared from your organization becomes visible within the HIE for other CRISP DC participating providers to view.

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Quiz Time!

1. What is the primary purpose of HL7 Standards in Healthcare?
   a) Billing and Invoicing
   b) Facilitating interoperable data exchange
   c) Scheduling appointments
   d) Staff management
2. Which segment in an HL7 ADT message contains patient identification information?
   a) OBX
   b) PID
   c) MSH
   d) ADT
3. What kind of information can you expect to find in a CCD document?
   a) Only patient medications
   b) Only laboratory test results
   c) A comprehensive patient summary, including medications, allergies, and lab results
   d) Financial information
4. Through what means are HL7 messages commonly transmitted between healthcare systems?
   a) Postal Mail
   b) Fax
   c) Health Information Exchanges (HIEs)
   d) Email
5. True or False: Encounter data (ADTs) is shared to the HIE in *real-time*.

Questions?

Date	Topic
04/23/2024	PopHealth
04/25/2024	Social Determinants of Health