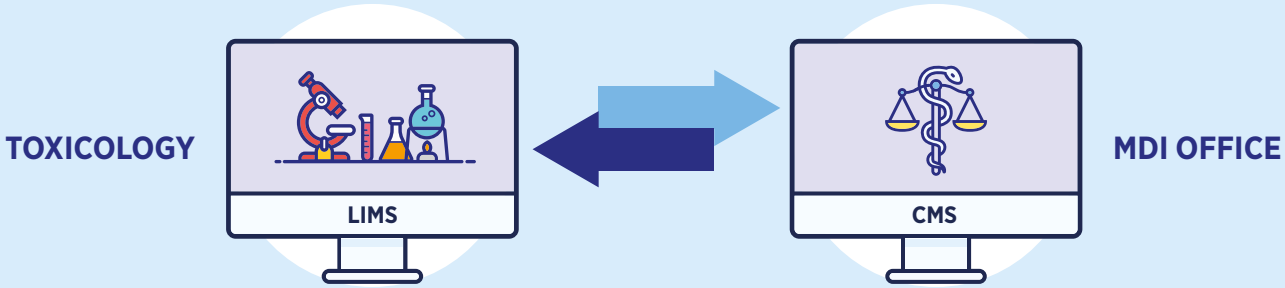
WORKFLOW IMPLEMENTATION TOOL:

TOXICOLOGY

Guidance: The purpose is to assist Medical Examiners and Coroners (MECs) working in Medicolegal Death Investigation (MDI) offices, data sharing partners, case management system (CMS) and IT vendors in mapping a workplan and timeline for workflow implementation. This template aligns with HL7® MDI FHIR® IG (Health Level Seven Medicolegal Death Investigation Fast Healthcare Interoperability Resources Implementation Guide) and contains embedded links to content referenced in the IG for developer use. Use this template to build an action plan with your project team. Plans may evolve over the course of the project, so feel free to revisit this document and update as needed.

WORKFLOW:
TRANSMISSION OF FORENSIC TOXICOLOGY DIAGNOSTIC FINDINGS FROM LIMS TO MDI CMS

The MDI office is populating their CMS with the postmortem toxicology results directly from the Laboratory Information Management System (LIMS)



Toxicology Lab Reporting: In many MDI offices forensic toxicology lab results are reported in PDF or paper format. To modernize the toxicology reporting workflow, these offices collaborate with their case management system (CMS) vendors, laboratory/laboratory information management system (LIMS) vendors, and the MDI technical support team to implement FHIR.

Toxicology Lab Reporting Use Case: The toxicology lab reporting workflow begins when the MDI offices send lab orders during the death investigation. At a high level, the workflow follows these key processes.

1. Once the case is initiated and toxicology tests are deemed necessary, the MDI office sends lab orders to the lab.
2. Specimens are collected according to guidelines and transported to the lab.
3. The lab receives the orders and analyzes the samples for drugs, substances, and other relevant factors.
4. A toxicology report is generated, detailing the substances found, their concentrations, and potential implications.
5. The toxicology report is sent to the MDI office that requested the lab tests.
6. The MDI office receives the report and stores it to the MDI CMS for further investigation.

Implementation includes steps **4 to 6 of the Use Case.**

Objective 1: Data Domain Identification: Toxicology/laboratory data elements to be exchanged between LIMS and CMS are identified.

TASKS

TASK	RESOURCES NEEDED	TIMELINE	PERSON(S) RESPONSIBLE	NOTE
1.1 Define use case data Create synthetic data or use existing synthetic data available in Raven that includes decendent, death information, death certification review, etc.	Data elements for forensic toxicology profiles Forensic Toxicology Profiles	2 weeks	LIMS vendor	*MEC/Partners can use this column for their internal tasks (if needed)*
1.2 *Add your own site-specific tasks to get to completion*				

Progress Measure/Evaluation:

- LIMS data element document (in Excel) for the use case that includes
  - A set of named fields
  - Category/Subdomain
  - Description of the field
  - Data type/format

Objective 2: FHIR mapping of data fields from LIMS, including identification of site/jurisdiction specific custom profiles. This is an enhancement of the Excel file created in Objective 1 using the data domain but describing the data elements as FHIR resource and terminology.

- Create FHIR data from vendor's system data (from task 1.1). FHIR data must conform to existing MDI FHIR IG / US-Core Profiles
- Create custom profiles or terminologies for data elements when the data elements are not captured in existing profiles.

TASKS

TASK	RESOURCES NEEDED	TIMELINE	PERSON(S) RESPONSIBLE	NOTE
2.1 FHIR Forensic Toxicology profile review Review the MDI FHIR Forensic Toxicology profile and do the data analysis with the data elements obtained from 1.1	MDI FHIR IG Forensic Toxicology Profiles	1 week	LIMS vendor with TA provider or SME assistance	MDI-defined Resource Examples for Forensic Toxicology
2.2 Raw vendor system data mapping to MDI FHIR IG profiles	MDI FHIR IG	2 weeks	LIMS vendor	Refer to directory of published versions and use (current) version due to ballot cycle updates
2.3 *Add your own site-specific tasks to get to completion*				

Progress Measure/Evaluation:

- Data Domain Excel sheet with the following additions:
  - FHIR Resource fields
  - FHIR Path
  - Terminology
  - Open discussion points- for further technical assistance
  - Review by TA provider

Objective 3: (OPTIONAL) Implementation Guide (IG) Authorship- The majority of these data elements are fully defined in the existing MDI FHIR IG. This objective is only for data elements that have not been previously identified.

- Develop a local implementation guide using tooling, such as FSH (FHIR Shorthand).
- Write FSH files for each profile.
- Generate a local FHIR IG using bash script from project.

TASKS

TASK	RESOURCES NEEDED	TIMELINE	PERSON(S) RESPONSIBLE	NOTE
3.1 Local IG Authorship Custom FHIR profile development for the data that are not captured in existing profiles	• Data Mapping Template • FSH for IG development	2-3 weeks	• TA provider for the authorship • MDI office and LIMS vendor for the data descriptions	GTRI, MITRE, Lantana are suggested providers of technical assistance for MDI FHIR IG authorship questions
3.2 FHIR Data Development Produce the forensic toxicology data that conforms to the forensic toxicology profiles	MDI FHIR IG Local IG for new data (if needed)	2 weeks	LIMS vendor	Refer to directory of published versions and use (current) version due to ballot cycle updates
3.3 *Add your own site-specific tasks to get to completion*				

Progress Measure/Evaluation:

- FSH and IG hosted on Github for review

Objective 4: Interoperability Testing-*(Refer to a Test Plan document, if available)* Validation ensures that FHIR resources can be reliably exchanged between FHIR enabled systems, conforming to the MDI FHIR IG standard.

- Create sample test case(s) or use synthetic data provided in Raven
- Load sample data into local system
- Export as FHIR from local system
- Validate using Raven Validator and complete Validation Report

TASKS

TASK	RESOURCES NEEDED	TIMELINE	PERSON(S) RESPONSIBLE	NOTE
4.1 Validation of the produced FHIR data	• MDI FHIR IG • Local IG for data mapping	2-3 weeks	GTRI, LIMS vendor and/or system implementor	Collaborative process where GTRI can provide assistance on common errors and resolutions Correction(s) and re-test of Step 4, as needed. Documentation of errors that are non-resolvable for future iteration; issues that are out-of-scope.
4.2 *Add your own site-specific tasks to get to completion*				

Progress Measure/Evaluation:

- Completed Validation Report from Raven
- Review of results and feedback from TA provider

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