The Management Information System (THEMIS) Inventory Database

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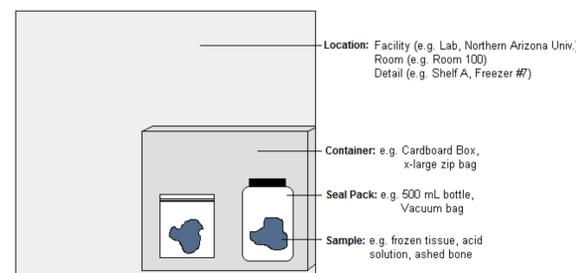
Overview

Initiated in the 1960's with the mission of acquiring and providing precise information about the effects of plutonium and other transuranic elements in man, the United States Transuranium Registries (USTUR) have followed up to 'old age' 334 volunteer Registrants who worked at weapons sites and received measurable internal doses. An autopsy has been performed on each of these deceased Registrants and tissue samples obtained, preserved, and made available for radiochemical analysis and future research. The Management Information System (THEMIS) database integrates with a barcode scanner to inventory USTUR and National Human Radiobiological Tissue Repository (NHRTR) frozen and formalin-fixed tissues, as well as histopathologic slides, tissue blocks, and acid-dissolved tissues from previously analyzed samples. The software developer at RJ Lee Group has adapted their 'off-the-shelf' THEMIS software to meet USTUR's specific sample inventory and chain-of-custody needs.

The THEMIS system: computer, barcode printer, barcoded sample, portable scanner, USB scanner.

Sample Report Generator

THEMIS efficiently builds customized sample reports. It allows the user to specify multiple search criteria and up to seven output fields.

For Example

Search Criteria
USTUR Case #:
 "0000"
Tissue Type:
 "Respiratory"

Output Fields
Sample #
Tissue

This report would display the sample number and tissue name for all of case 0000's respiratory tract samples.

Defining Sample Locations

The THEMIS software specifies how and where a sample is stored using four parameters: sample, seal pack, container, and location.

Sample: The *sample* is the inventoried item. We have a broad range of samples including frozen tissues, formalin fixed tissues, acid solutions, histopathology slides, and dried bones.

Seal Pack: The *seal pack* refers to how the sample is packaged. For example, an acid solution may be packaged in a 500 mL bottle or a tissue sample may be sealed in a vacuum bag.

Container: A *container* can hold multiple samples. Samples can be moved into or out of a container, or an entire container of samples can be moved from one location to the next.

Location: The *location* specifies where a sample or container can be found. Locations are broken into three components: *Facility*, *Room #*, and *Other Details*.

Sample Number Template

A template was created by assigning a unique sample number to each tissue that is collected at autopsy. This increased the speed and accuracy of data entry by correlating specific tissues with standardized sample numbers. When a sample number is entered, THEMIS automatically populates the tissue fields, and *vice versa*. For example, when sample number "001" is entered, THEMIS automatically 'knows' that the specimen is a right lung.

001 = Right Lung
002 = Paratracheal LN
017 = Cerebellum
020 = Thyroid
189 = Rt. Humerus PS
191 = Rt. Humerus DE

Structured Query Language (SQL)

THEMIS data is stored in a SQL database on the "THEMIS server." The THEMIS server is dedicated exclusively to the THEMIS data files and is located at the laboratory. This setup is beneficial because:

Stability: SQL is more stable than M.S. Access given USTUR requirements.

Data Backup: THEMIS data is automatically backed up daily by the server.

Speed: Laboratory staff can access THEMIS through a direct link to the server. This connection is very fast.
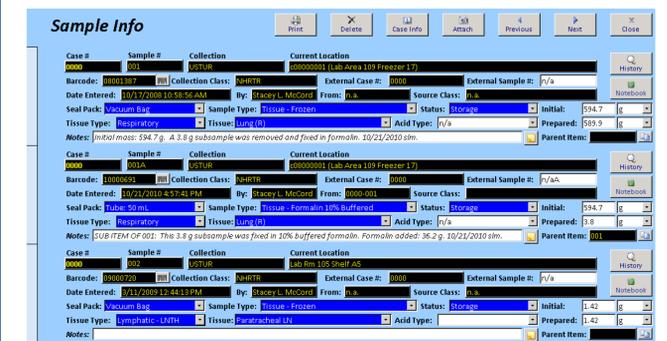
Remote Access: Office staff can access THEMIS data remotely.

Data is entered into and retrieved from the SQL database using an MS Access 'front-end' user-interface that utilizes linked tables.

THEMIS
The Management Information System

Retrievable Chain of Custody

A chain-of-custody form is automatically generated whenever samples are moved. It documents the following:

• Case and sample numbers.

• Sample descriptions.

• Custody date.

• 'To' and 'From' custody locations.

• USTUR staff member who moved the sample.

• A description of the shipping container.

The chain-of-custody form also provides three signature lines for relinquishing and receiving samples.
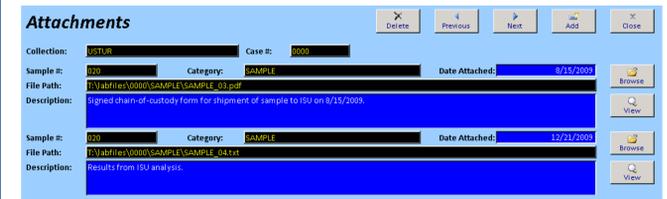

Sample Information Screen

The 'Sample Info' screen displays details such as the type of sample, its mass, where the specimen is located, how it is stored, and who logged it in.

Attach Documents and Images

Files such as signed chain-of-custody forms and photographs can be attached to sample and container records.

Two files have been attached to a thyroid sample (#020) record.

Acknowledgement/Disclaimer