WASHINGTON STATE UNIVERSITY
World Class. Face to Face.

2008 USTUR Scientific Advisory Committee (SAC) Meeting
May 9, Red Lion Hotel, Pasco,WA

Website and Database Development

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"Learning from Plutonium and Uranium Workers"

Overview

- Website
- The Information Management System (THEMIS)
- Internal Database: Pathology
- Internal Database: Health Physics

Website

- The USTUR website is designed to disseminate information efficiently.
  - Featured Links
  - USTUR De-identified Registrant Data
- www.ustur.wsu.edu

Website – Homepage

Website – Case Narratives

- Intake
- Health Physics
- Autopsy and Pathology
- Tissue Analysis
- Biokinetic Modeling
- References

Washington State University College of Pharmacy
United States Transuranium & Uranium Registries

USTUR Mission | About Us | Registrant Login

What's New?
Contact Us
College of Pharmacy

Home
History of Registries
USTUR De-identified Data
Case Narratives
Radiochemistry
Health Physics
Pathology
NHRTR National Human Radiobiological Tissue Repository
NRA National Radiobiology Archives
Links

Case Narratives

Radiochemistry » | Health Physics » | Pathology »

Whole Body Donations

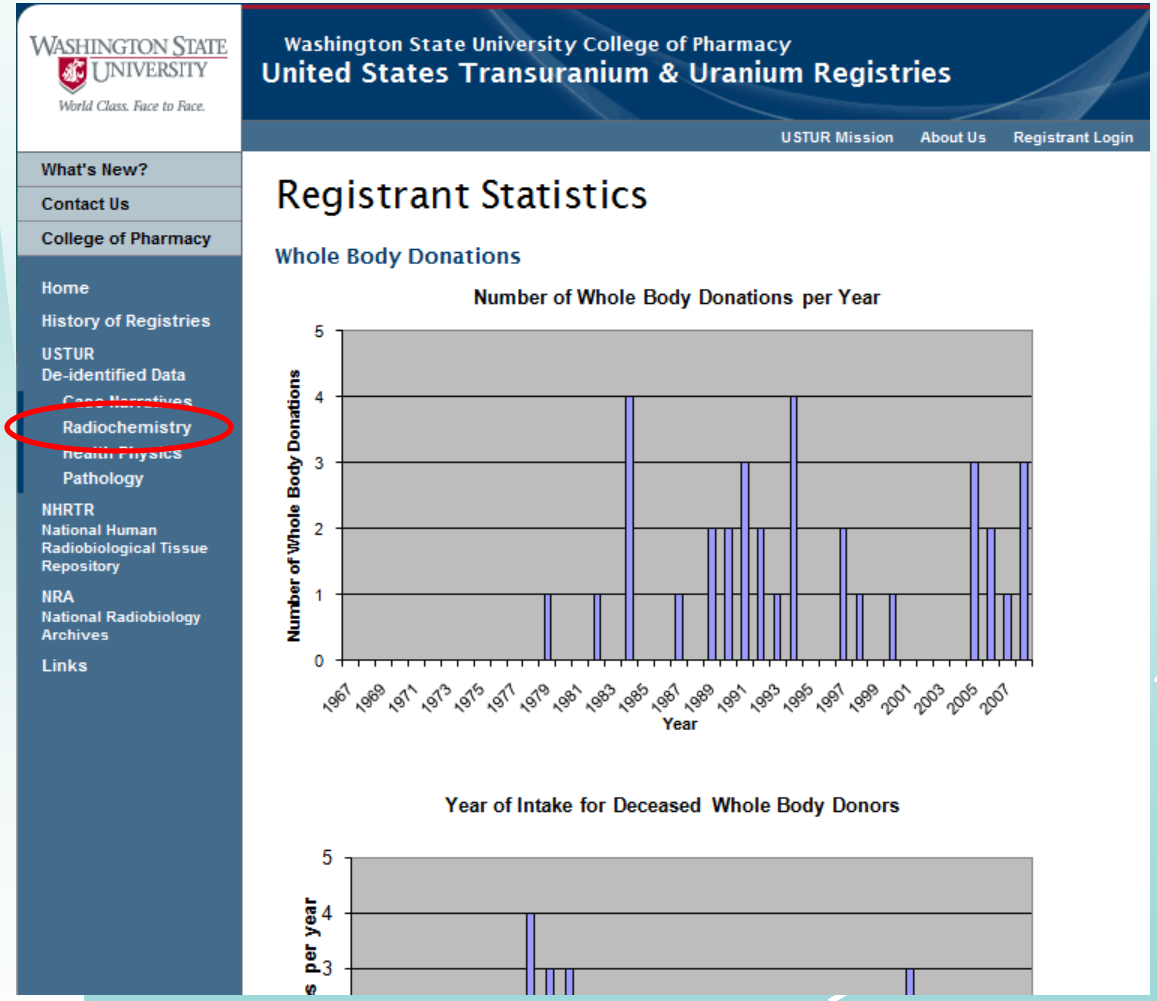
0102 »	0193 »	0205	0208 »
0212 »	0213 »	0242 »	0259 »
0262 »	0269 »	0303	0391
0425	0503	0635	0679
0680	0682	0706	0720
0744 »	0745	0769 »	0834
0846	0990	1001	1002 »
1007	1010 »	1028	1053
1054			

Registrant Statistics: Number of Donations by Year
Year of Intake

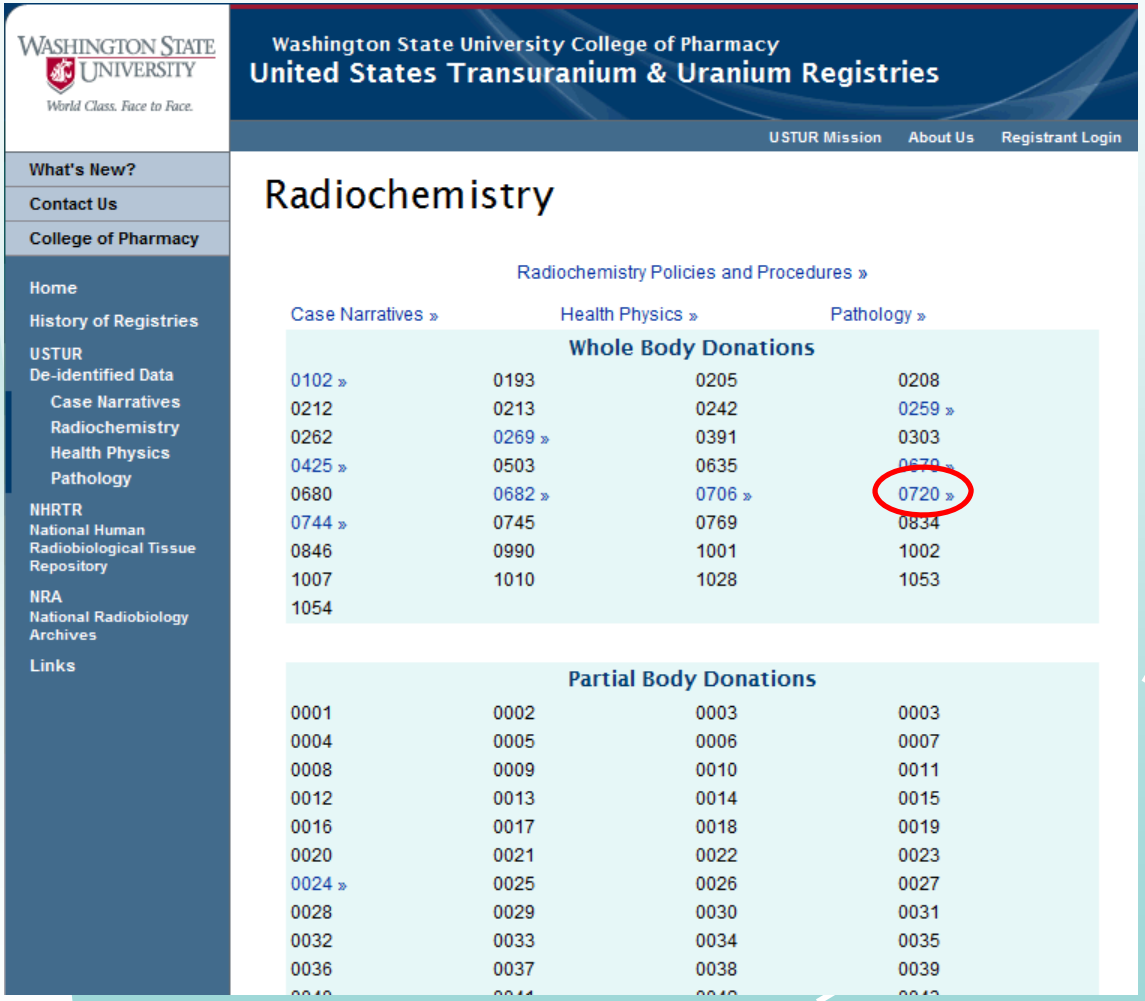
Partial Body Donations

0001	0002	0003	0003
0004	0005	0006	0007
0008	0009	0010	0011
0012	0013	0014	0015
0016	0017	0018	0019
0020	0021	0022	0023
0024 »	0025	0026	0027
0028 »	0029	0030	0031
0032	0033	0034 »	0035

Website – Registrant Statistics



Website – Radiochemistry



Website – Radiochemistry

USTUR Case 0720 - Measured Radionuclide Organ/Tissue Concentrations

Body Weight, kg:	70.3		Age, y:		DOD:				
Body Height, cm:	175				Autopsy:				
IC89 Predicted Skeletal Weight, kg:	10.1								

#	Sample No.	Organ or Tissue	Wet Weight, g	Activity Concentration, Bq/kg of wet tissue					
				$^{239+240}$Pu		^{238}Pu		^{241}Am	
				Meas.	s	Meas.	s	Meas.	s
		Lungs:	1031	1.49E+02	1.59E+00	2.36E+00	1.37E-01	3.10E+01	4.01E-01
		LNTH:	20.1	2.90E+03	9.12E+01	4.84E+01	2.36E+00	5.42E+02	2.08E+01
Note		Liver:	1156	6.51E+01	7.34E-01	9.88E-01	5.98E-02	4.03E+00	8.62E-02
		Skeleton:	11943	8.50E+00	6.84E-02	1.36E-01	2.75E-03	2.92E+00	2.65E-02
		Testes:	59	7.56E-01	4.45E-02	1.99E-02	6.47E-03	1.08E-01	1.36E-02
		Kidneys:	260	7.04E-01	3.20E-02	8.36E-03	4.41E-03	3.44E-01	2.63E-02
		Massive Soft Tissues:	55999	2.17E-01	2.32E-03	3.80E-03	3.18E-04	7.41E-02	1.24E-03
		Axial LN (Right):	1.52	5.06E+01	2.58E+00	8.66E-01	3.47E-01	8.46E+00	1.05E+00
		Axial LN (Left):	1.92	2.91E+01	7.45E-01	4.77E-01	9.79E-02	6.82E+00	3.88E-01
		Cervical LN (Right?):	1.09	1.08E+00	6.09E-01	-2.53E-01	3.16E-01	4.06E-01	6.56E-01
		Total Body:	70471	5.69E+00	3.87E-02	9.08E-02	2.39E-03	1.23E+00	9.62E-03
#4		Pu Isotopic Composition of Intake Material:							
		Soft Tissue Organs	55999						
		Brain:	1003	2.32E-01	4.29E-03	3.98E-03	5.84E-04	3.28E-02	1.46E-03
		Thyroid:	17.9	1.59E+00	1.42E-01	-2.37E-02	1.87E-02	1.53E-01	6.92E-02
		Pancreas:	112	9.53E-01	5.80E-02	1.93E-02	9.66E-03	1.28E-01	2.22E-02
		Prostate:	34.9	2.48E-01	2.53E-02	2.24E-03	2.51E-03	1.00E-01	1.22E-02
		Pituitary:	0.29	6.54E+00	1.11E+00	9.14E-01	4.49E-01	2.13E+00	9.92E-01
		Urinary Bladder:	100	1.93E-01	2.52E-02	5.79E-03	6.48E-03	9.03E-02	2.32E-02
		Heart:	490						
		Aortic Arch:	78.7	7.48E+00	2.13E-01	1.73E-01	2.80E-02	1.44E+00	8.45E-02
		Spleen:	207	1.70E+01	3.15E-01	3.00E-01	2.40E-02	3.56E+00	1.08E-01
		Larynx:	56.9	2.98E+00	1.14E-01	7.25E-02	1.68E-02	1.34E+00	7.48E-02
		Trachea:	42.8	7.83E-01	7.05E-02	1.77E-02	1.45E-02	5.86E-01	6.26E-02

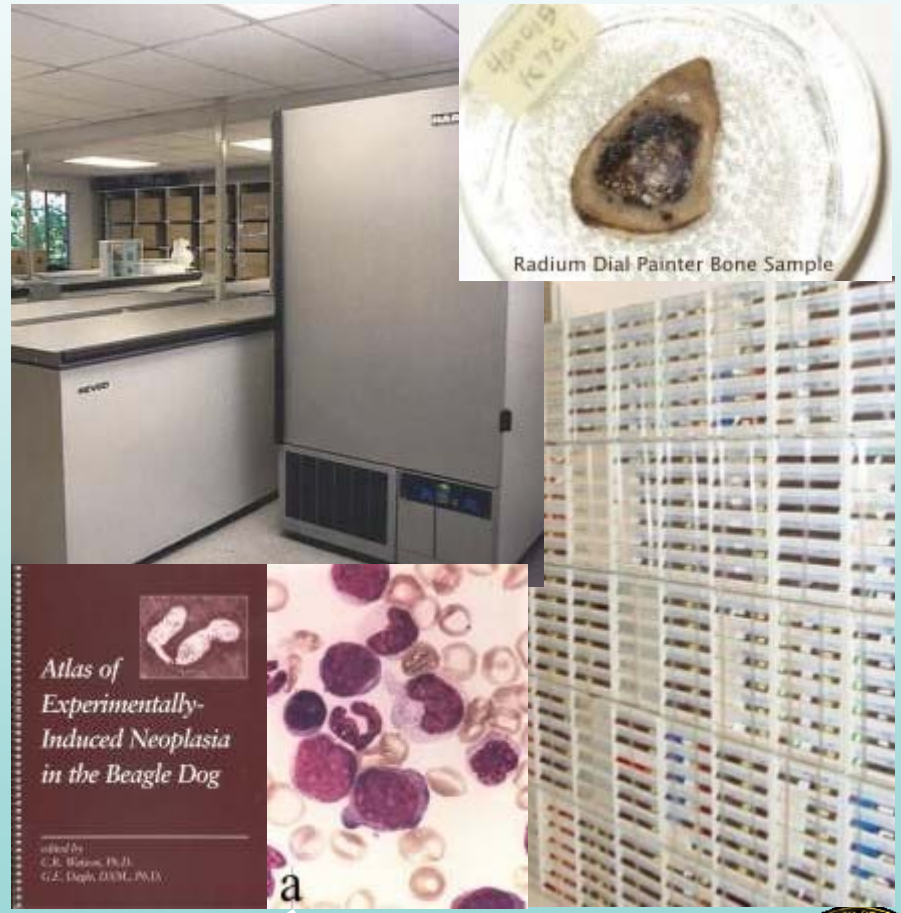
Tissue_Concentrations | WB_Summary | SYT_Compilation | SYT_All_Results | SYT_All_Duplicates

Overview

- Website
- The Information Management System (THEMIS)
- Internal Database: Pathology
- Internal Database: Health Physics

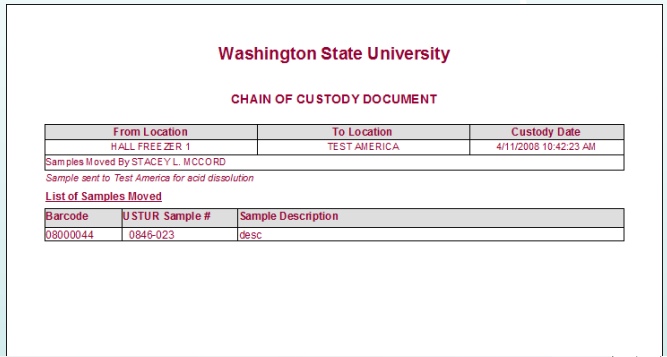
The Management Information System (THEMIS)

- **THEMIS integrates with a barcode scanner to inventory:**
  - **USTUR tissues, histopathologic slides, and acid solutions.**
  - **National Human Tissue Repository (NHRTR) tissues and bone ash.**
  - **National Radiobiology Archives (NRA) histopathologic slides, tissue blocks, and documents.**



The Management Information System (THEMIS)

- **Mr. Tim Burrill of R.J. Lee Solutions LLP, the software developer, is currently adapting the 'off-the-shelf' THEMIS software to meet USTUR's specific sample inventory and 'chain of custody' needs.**



Washington State University

CHAIN OF CUSTODY DOCUMENT

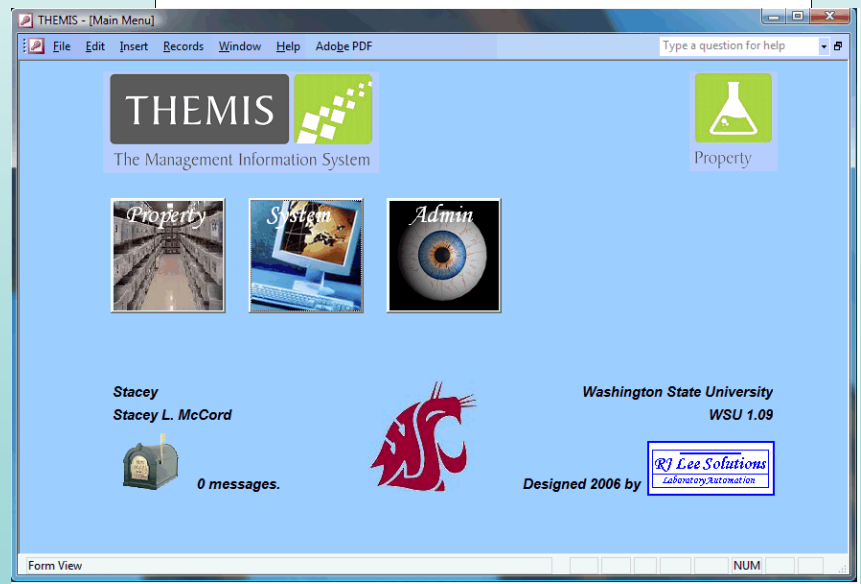
From Location	To Location	Custody Date
HALL FREEZER 1	TEST AMERICA	4/11/2008 10:42:23 AM

Samples Moved By STACEY L. MCCORD

Sample sent to Test America for acid dissolution

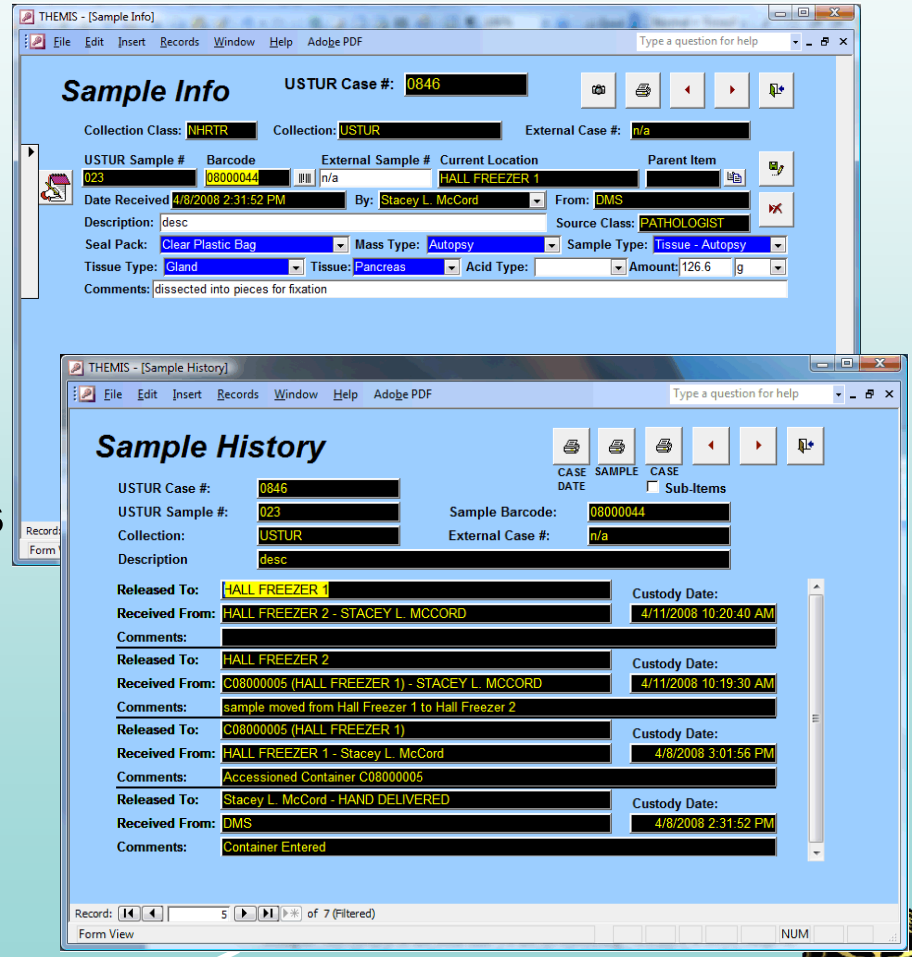
List of Samples Moved

Barcode	USTUR Sample #	Sample Description
08000044	0846-023	desc



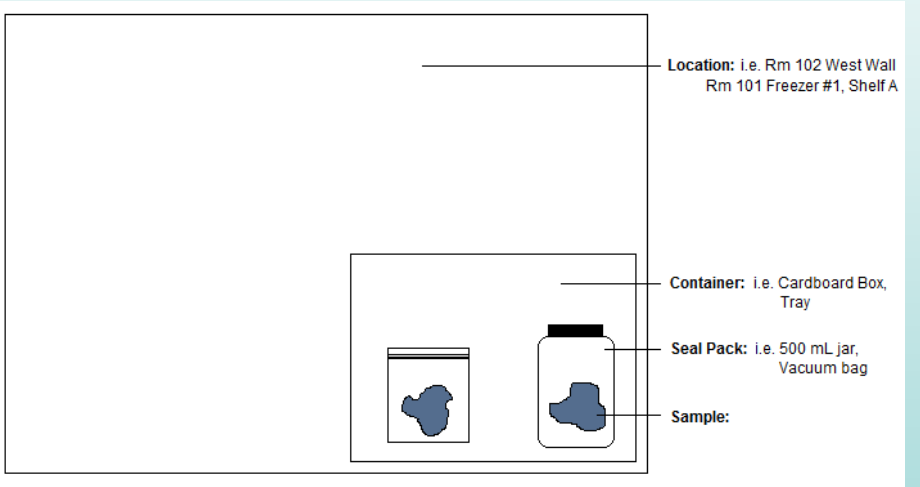
The Management Information System (THEMIS)

- **The software will:**
  - **Assign a unique barcode to each sample.**
  - **Allow us to record a sample's mass or volume.**
  - **Track the sample's current location as it is moved within the NHRTR facility (e.g, from one freezer to another).**
  - **Track the sample's location as it is 'shipped' to an external laboratory for radiochemical analysis.**



The Management Information System (THEMIS)

- **Sample: The *sample* is the item that we are inventorying. We have a broad range of samples including frozen tissue samples, acid solutions, histopathology slides, documents, ash, 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 might be sealed in a vacuum bag. Other Seal Pack types include: planchet, clear plastic bag, and 55 gal drum.**
- **Container: A *container* can hold multiple samples. Samples can be moved out of (or into) a container, or an entire container full of samples can be moved from one location to the next. If a container is moved, individual sample locations will also reflect the move.**
- **Location: The *location* specifies where a sample or container can be found. Locations are broken into three fields: Facility (i.e. NHRTR, Test America, Northern Az. Univ.), Room #, and Other Details (i.e. Shelf A, Freezer #1).**



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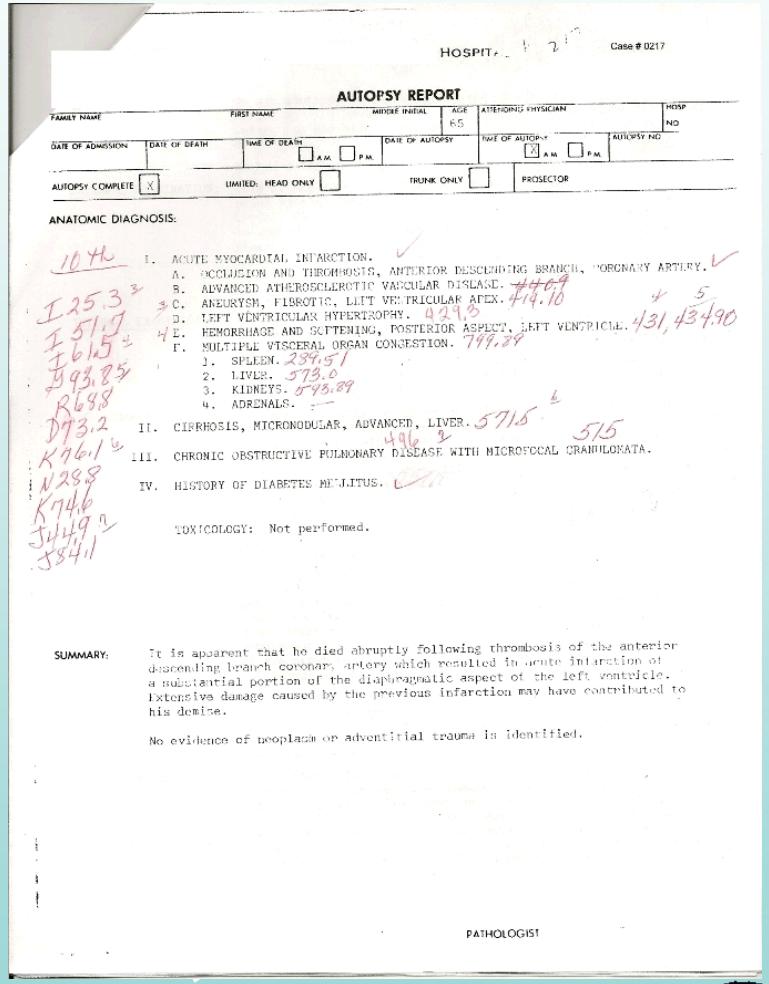
Pathology

- USTUR has sub-contracted a professional nosologist, Carolyn Watkins, to code consistently all death certificates using both Revisions 9 and 10 of the "Post Mortem Observations by International Classification of Diseases" (ICD-9-CM and ICD-10).
- 147 cases out of 320 have been coded.

Pathology – ICD coding

- Causes of death are identified and coded.
- The underlying cause of death is determined.
- The top 7 contributing causes of death are identified and ranked according to severity (1 = most severe, 7 = least severe)
- Upon receipt, ICD-9-CM and ICD-10 codes are imported into the USTUR's internal database.



HOSPIT Case # 0217

AUTOPSY REPORT

FAMILY NAME | FIRST NAME | MIDDLE INITIAL | AGE 65 | ATTENDING PHYSICIAN | HOSP NO

DATE OF ADMISSION | DATE OF DEATH | TIME OF DEATH ☐ A.M. ☐ P.M. | DATE OF AUTOPSY | TIME OF AUTOPSY ☒ A.M. ☐ P.M. | AUTOPSY NO

AUTOPSY COMPLETE [X] | LIMITED: HEAD ONLY ☐ | TRUNK ONLY ☐ | PROSECTOR

ANATOMIC DIAGNOSIS:

I. ACUTE MYOCARDIAL INFARCTION.
A. OCCLUSION AND THROMBOSIS, ANTERIOR DESCENDING BRANCH, CORONARY ARTERY.
B. ADVANCED ATHEROSCLEROTIC VASCULAR DISEASE. 414.09
C. ANEURYSM, FIBROTIC, LEFT VENTRICULAR APEX. 414.10
D. LEFT VENTRICULAR HYPERTROPHY. 429.3
E. HEMORRHAGE AND SOFTENING, POSTERIOR ASPECT, LEFT VENTRICLE. 431, 434.90
F. MULTIPLE VISCERAL ORGAN CONGESTION. 799.89
1. SPLEEN. 289.51
2. LIVER. 573.0
3. KIDNEYS. 593.89
4. ADRENALS.

II. CIRRHOSIS, MICRONODULAR, ADVANCED, LIVER. 5715

III. CHRONIC OBSTRUCTIVE PULMONARY DISEASE WITH MICROFOCAL GRANULOMATA. 496

IV. HISTORY OF DIABETES MELLITUS.

TOXICOLOGY: Not performed.

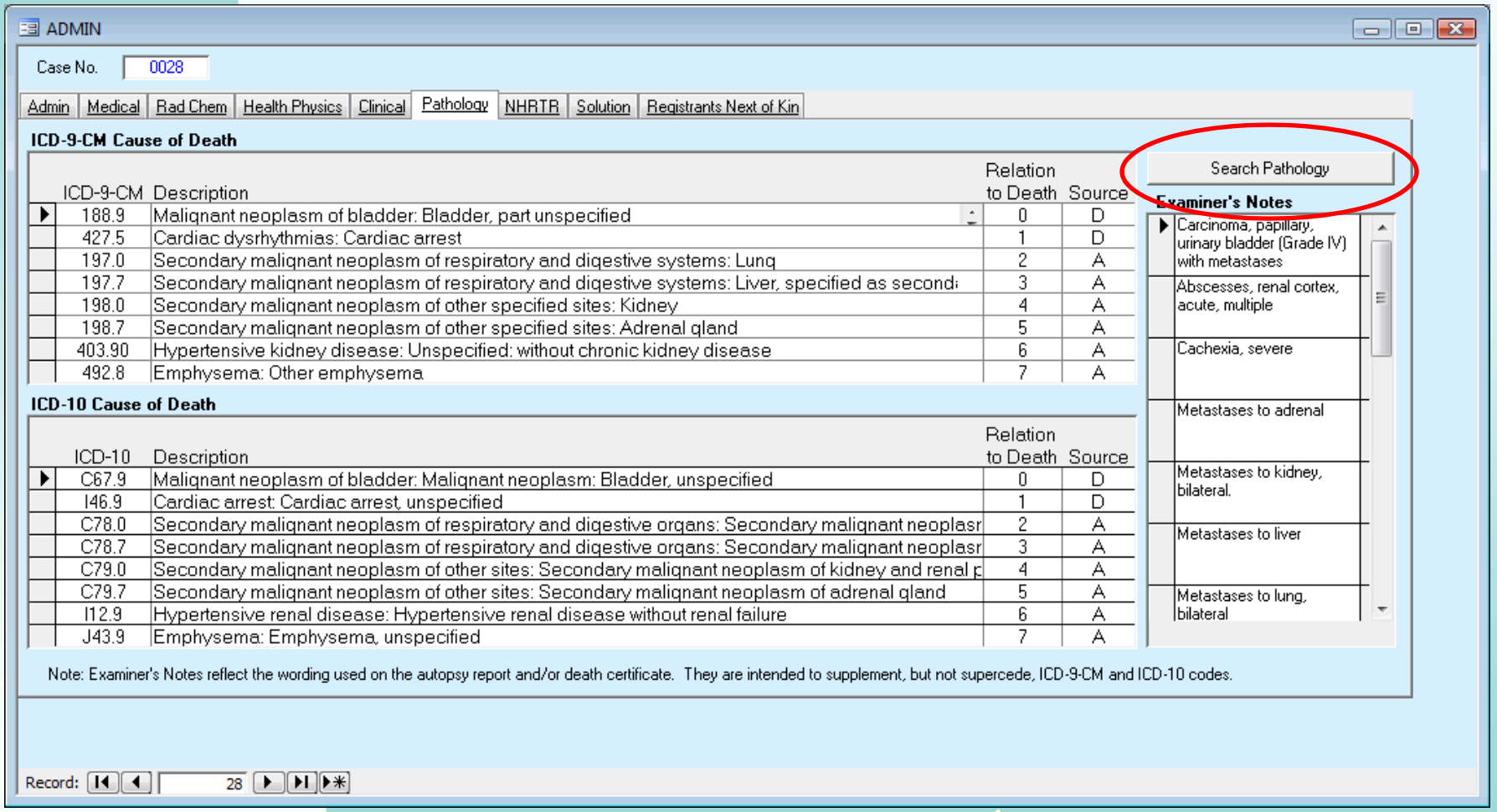
SUMMARY: It is apparent that he died abruptly following thrombosis of the anterior descending branch coronary artery which resulted in acute infarction of a substantial portion of the diaphragmatic aspect of the left ventricle. Extensive damage caused by the previous infarction may have contributed to his demise.

No evidence of neoplasm or adventitial trauma is identified.

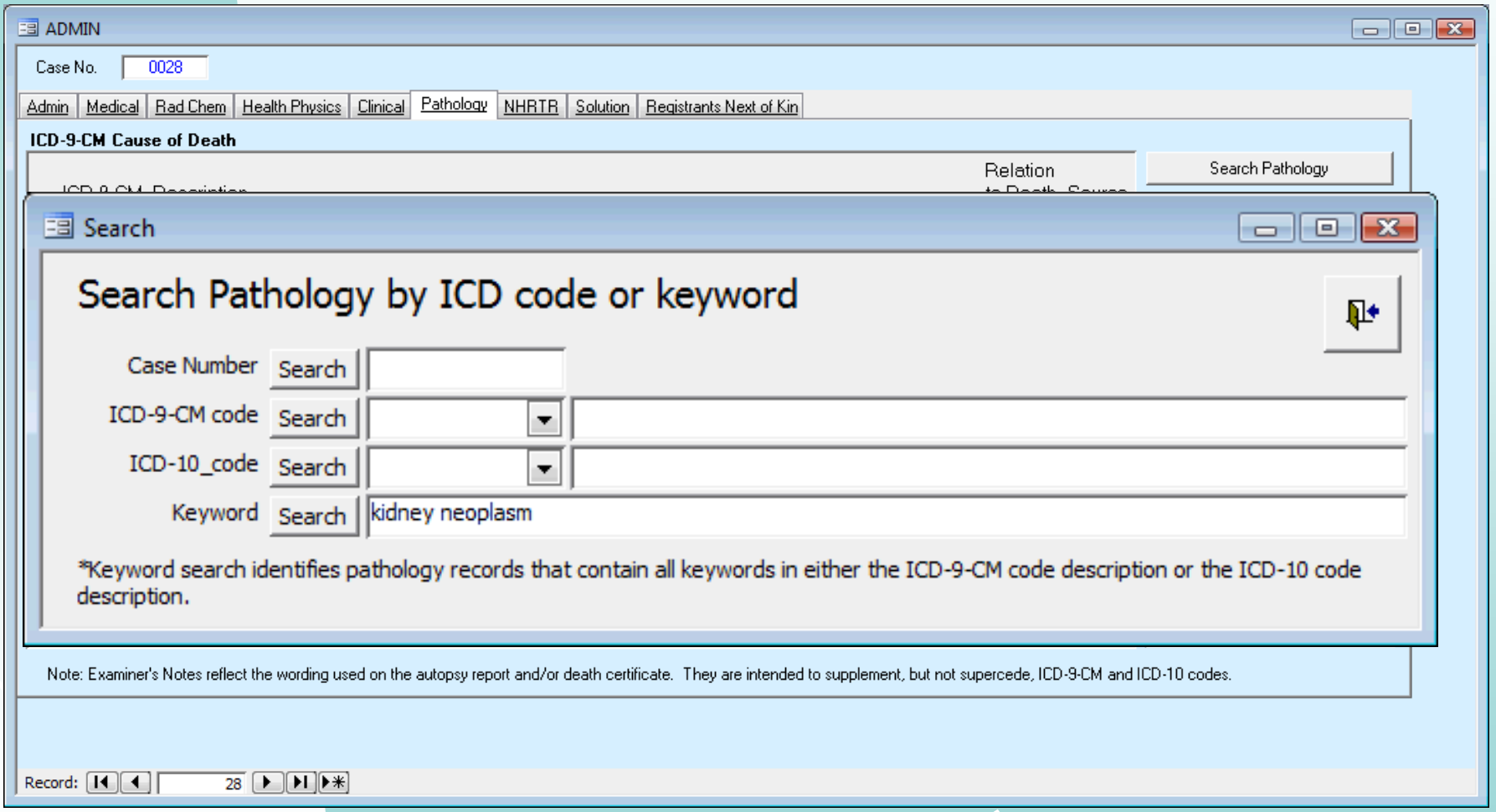
PATHOLOGIST

I10 I25.3 I51.7 I61.5 T93.85 R688 D73.2 K76.1 N288 K746 J449 J841 5715 515

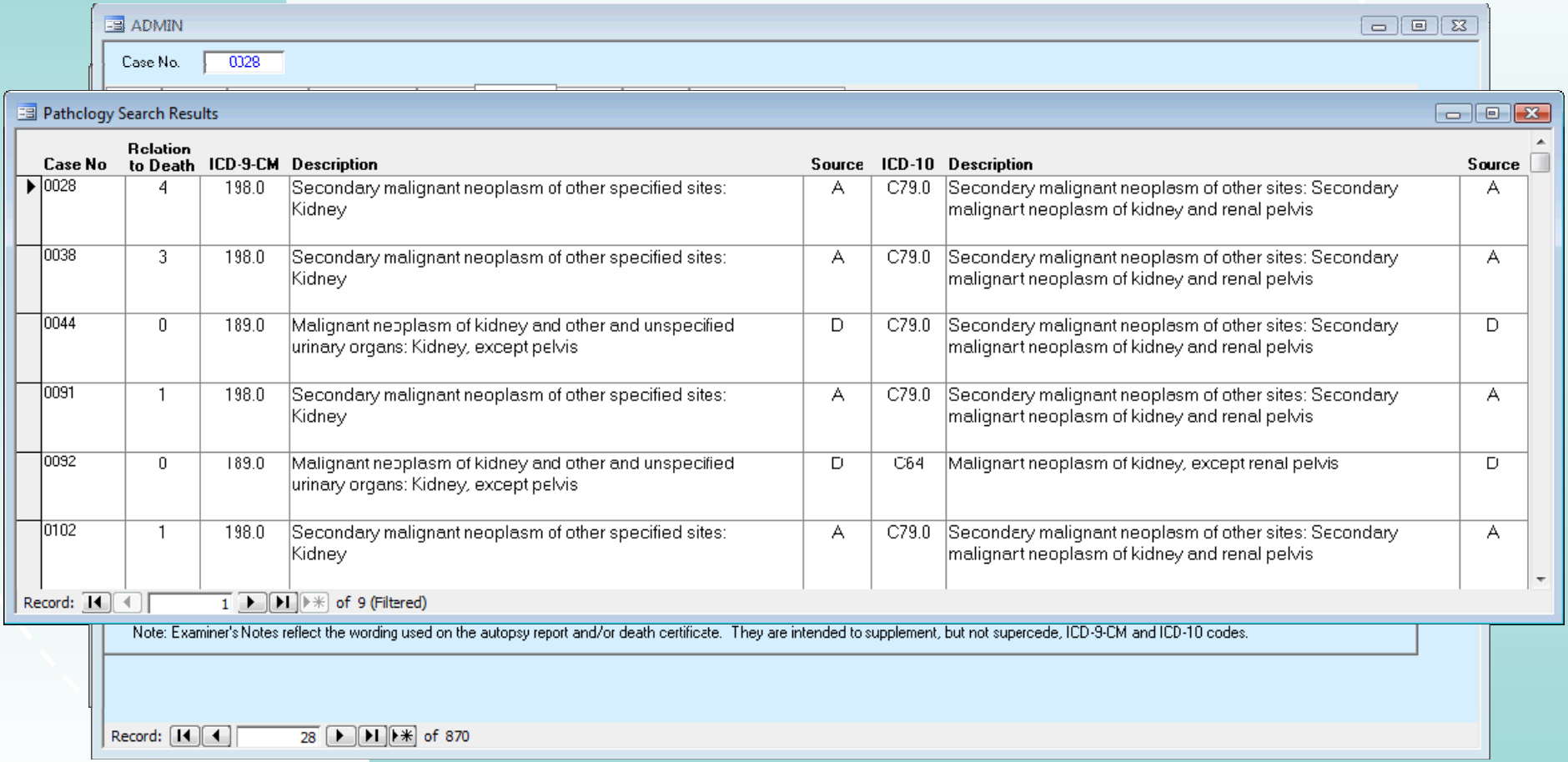
Pathology – Internal Database



Pathology – Search Form



Pathology – Search Results



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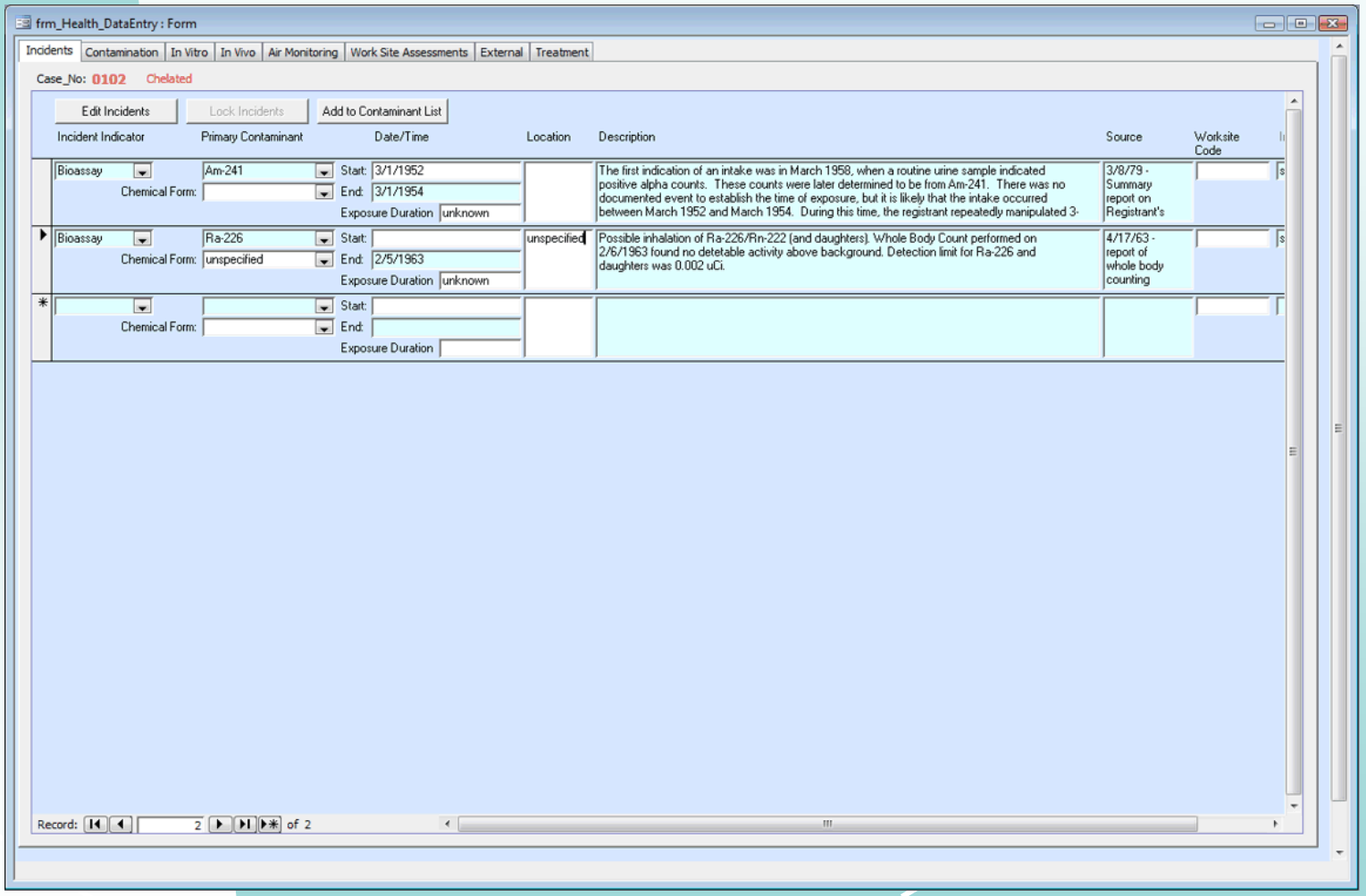
USTUR Health Physics Database

Goals:

- **Searchable - Eight specialized tabs that contain 179 individually searchable fields:**
  - **Incidents**
  - **Contamination**
  - **In Vitro**
  - **In Vivo**
  - **Air Monitoring**
  - **Work Site Assessments**
  - **External**
  - **Treatment**
- **Consistent – Quality Assurance Measures**

Incidents


frm_Health_DataEntry : Form
Incidents
Contamination
In Vitro
In Vivo
Air Monitoring
Work Site Assessments
External
Treatment
Case_No: 0102 Chelated
Edit Incidents
Lock Incidents
Add to Contaminant List
Incident Indicator
Primary Contaminant
Date/Time
Location
Description
Source
Worksite Code
Bioassay
Am-241
Start: 3/1/1952
End: 3/1/1954
Chemical Form:
Exposure Duration unknown
The first indication of an intake was in March 1958, when a routine urine sample indicated positive alpha counts. These counts were later determined to be from Am-241. There was no documented event to establish the time of exposure, but it is likely that the intake occurred between March 1952 and March 1954. During this time, the registrant repeatedly manipulated 3-
3/8/79 - Summary report on Registrant's
Bioassay
Ra-226
Start:
End: 2/5/1963
Chemical Form: unspecified
Exposure Duration unknown
unspecified
Possible inhalation of Ra-226/Rn-222 (and daughters). Whole Body Count performed on 2/6/1963 found no detetable activity above background. Detection limit for Ra-226 and daughters was 0.002 uCi.
4/17/63 - report of whole body counting
Record: 2 of 2

Incidents

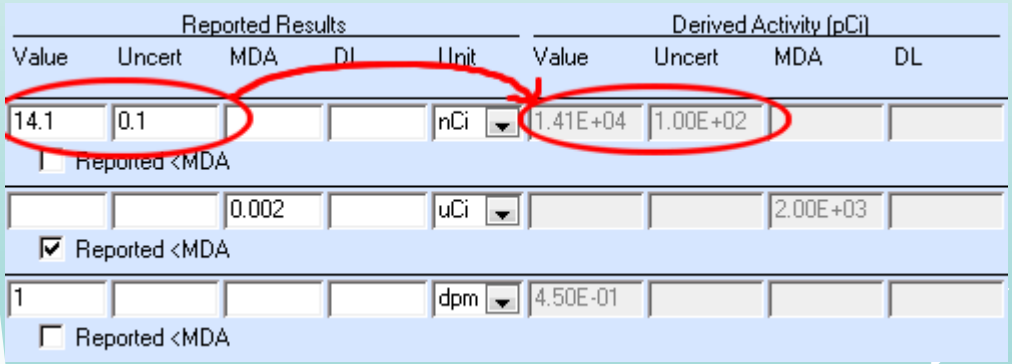
- The 'Incidents' tab provides a ready index of possible intake dates by summarizing all radiological incidents that the worker was involved in.
- Incidents are categorized using 'Incident Indicators':
  - Air Sample
  - Bioassay – Used when a high or 'special request' bioassay is the only indicator of an incident.
  - Contamination
  - Criticality
  - Fire
  - Wound
  - Other

Quality Assurance

- Unit Standardization
- Automatic Calculations
- Dropdown Menus

Unit Standardization

- Eliminates unit conversion errors
- Standardized Units are compatible with IMBA
- Database stores both the original (hard-file based) and the standardized values.



Unit Standardization

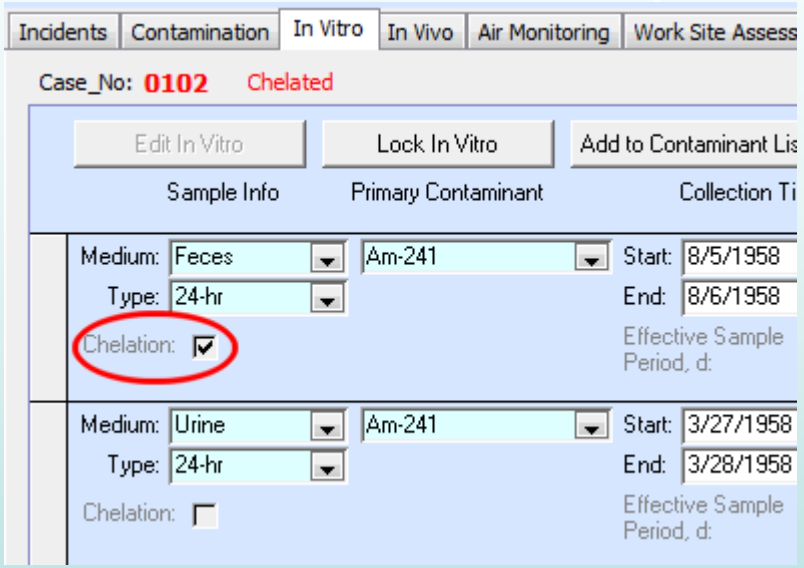
- Incidents
  - No conversions necessary
- Contamination
  - Activity – dpm or cpm
- In Vitro
  - Activity – pCi
  - Excretion Rate – pCi/day
  - Total Blood Activity – pCi
  - Nuclide Mass - µg
  - Sample Period – day
  - Volume – mL
  - Mass (wet) – gram
- In Vivo
  - Activity - pCi
- Air Monitoring
  - Concentration – pCi/cc or MPC
  - Sample Period – day
- Work Site Assessments
  - Absorbed Dose – rad
  - Body/Organ Burdens – pCi
  - Dose Equivalent – rem
- External
  - Absorbed Dose – rad
  - Dose Equivalent – rem
  - Exposure – R
- Treatment
  - Dosage – gram
  - Activity Removed - pCi

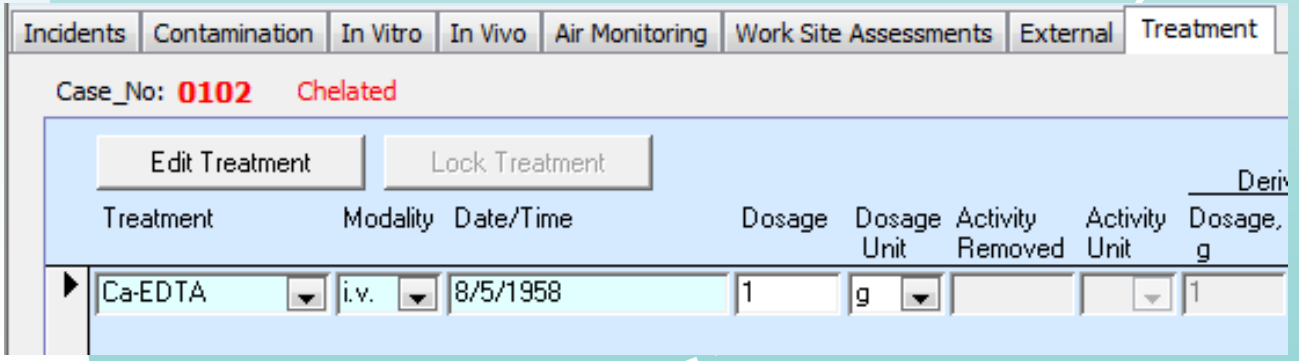
Automatic Caculations

- User-entered hard file data is used to calculate derived quantities
  - Effective Sample Period
    - Effective Sample Period = End Time – Start Time
  - Activity per sample (pCi)
    - Derived Activity = Conc · Volume Collected (when not reported in activity units)
  - Excretion Rate (pCi/day)
    - Excretion Rate = Activity/Sample Period
  - Total Blood Activity
    - Total Blood Activity = Conc · 5300 mL

Automatic Calculations

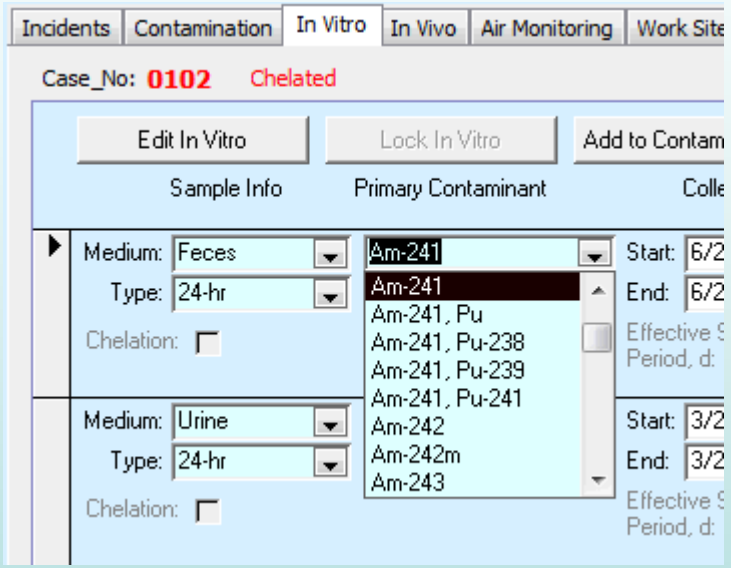
- **Chelation Cases are flagged if the 'Treatment' tab contains a chelation record.**
- **In Vitro records are flagged if the sample was collected within 7 days of chelation treatment.**





Dropdown Menus

- **Consistent nomenclature, abbreviations, and spelling, are vital to a searchable database.**
- **Dropdown menus eliminate 'typos' and ensure consistent nomenclature by forcing the user to select from a finite list of values.**



User Manual

- **A work in progress…**
- **http://www.ustur.wsu.edu/PolicyProcedures/DataEntry_HP/index.html**