

LESSONS LEARNED IN
IMPLEMENTING E-PATH
REPORTING IN LOS ANGELES

Cancer Informatics Workshop
NAACCR Annual Meeting
Toronto, Ontario
June 9, 2002

WHAT'S E-PATH?

Computerized selection of cancer-related pathology reports from among electronic files of all pathology reports.

WHY E-PATH?

- Cancer surveillance
 - Completeness
 - Efficiency (time and content)
 - Confidentiality
- Research
 - Rapid patient contact
 - Minimize recall loss
 - Minimize loss to morbidity/ mortality
 - Increasingly required by funding agencies

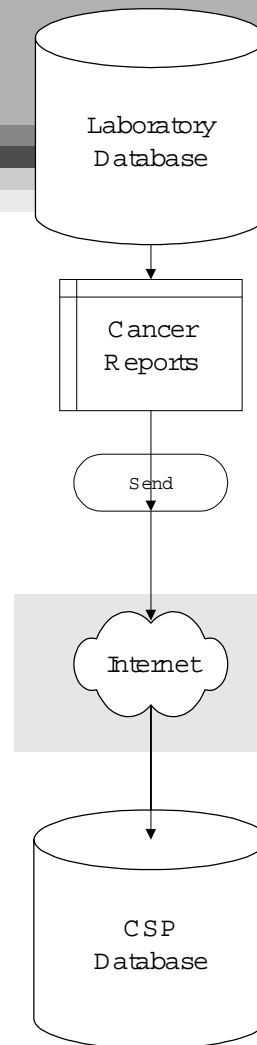
HOW DOES IT WORK?

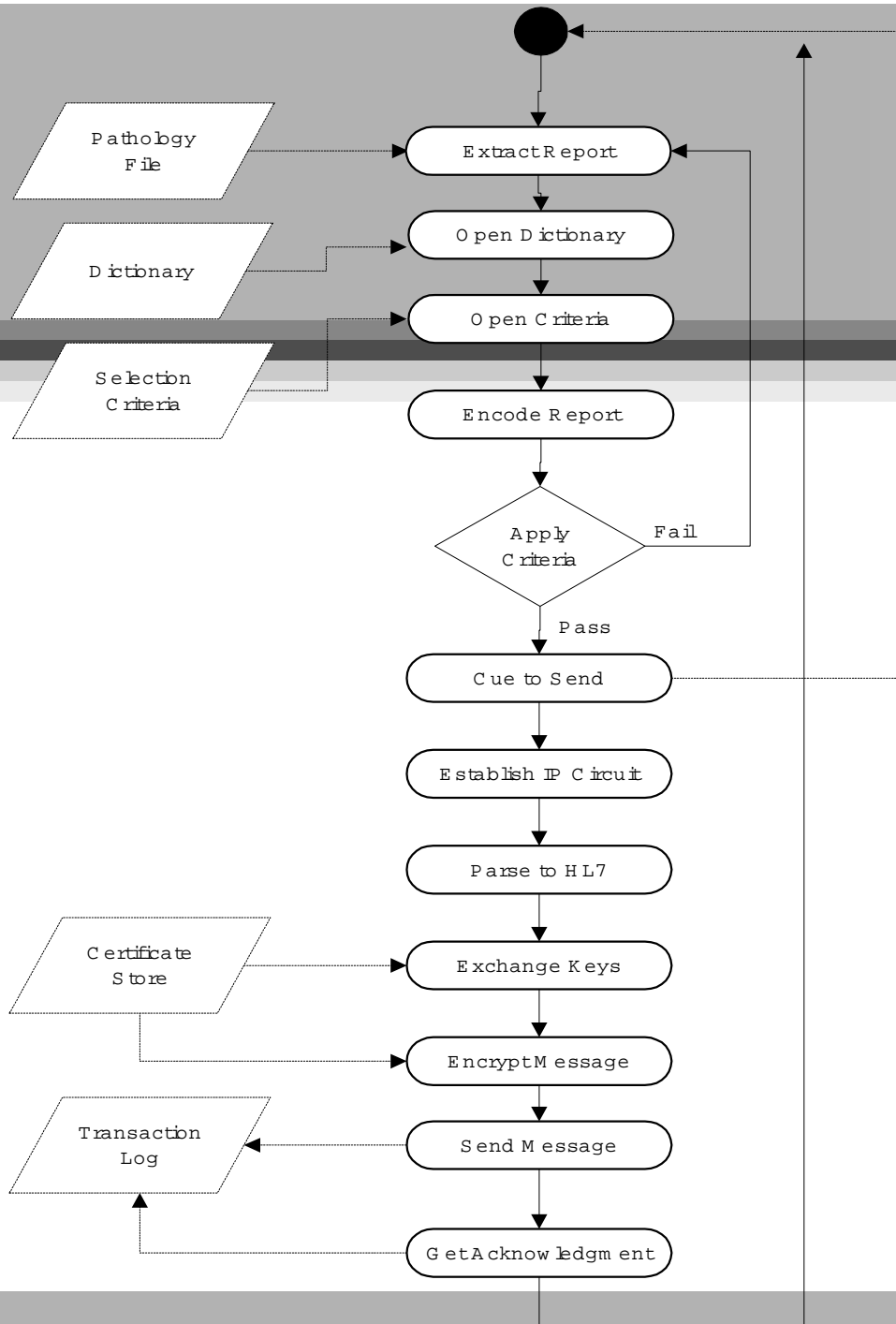
Pretty much like a human ...

- Text string search
- Comparison with "dictionary" of reportable terms
- Select or not

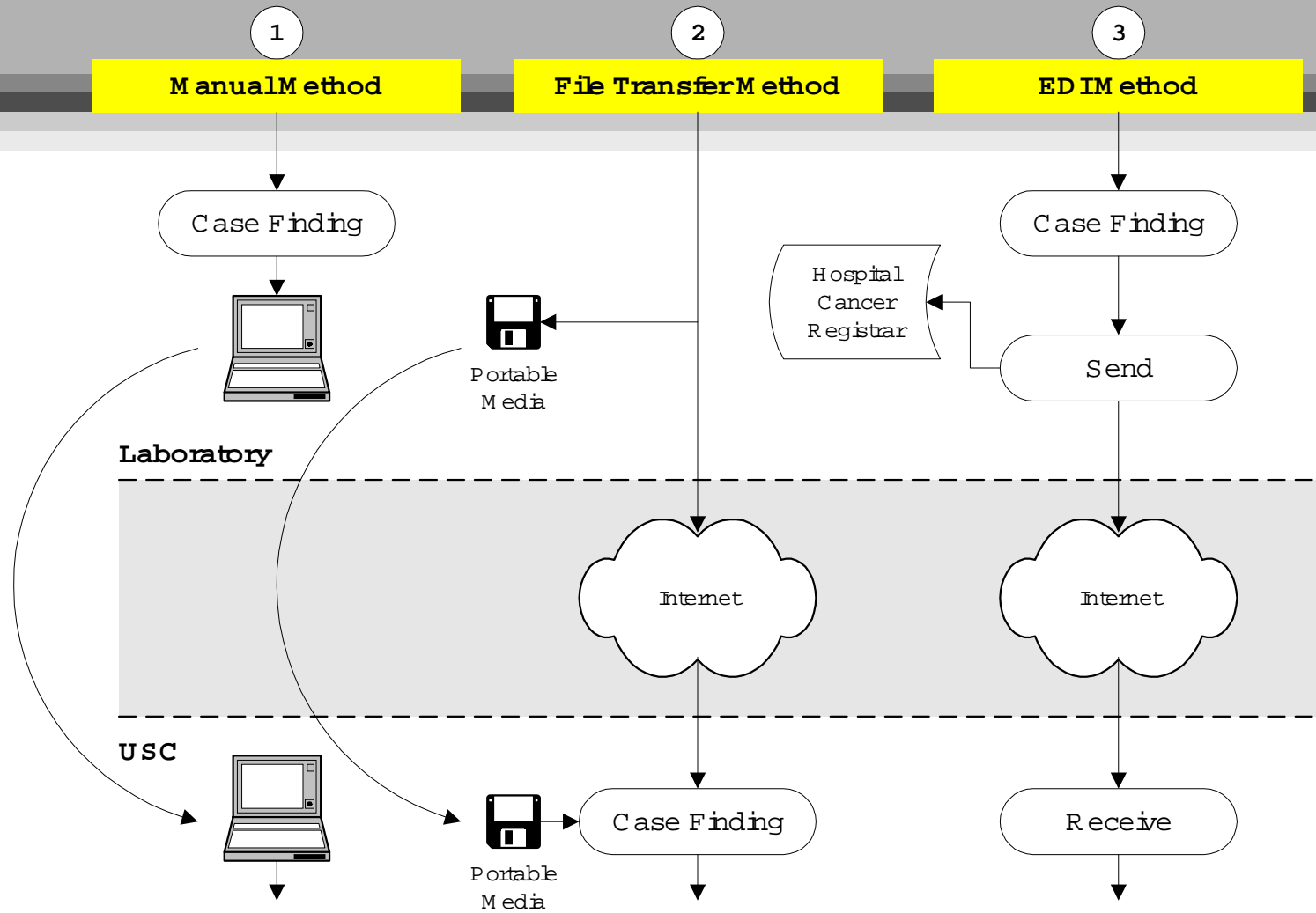
E-PATH CONCEPTIAL DIAGRAM

- a) Data extraction and formatting.
- b) Automatic determining which reports to send.
- c) Automatic transferring data from the laboratory to the CSP.
- d) Recording submitted reports in a database.
- e) Performing a QA review of submitted reports.
- f) Consolidating data into the Cancer Registry.





TRANSMISSION OPTIONS



THE LOS ANGELES EXPERIENCE

- Selecting a reporting facility
 - Large volume
 - Variety of path reports
 - Bang-for-the-buck
 - IT capacity
 - Commitment to cancer registry

THE LOS ANGELES EXPERIENCE

- City of Hope National Medical Center
 - Research institution with cancer focus; rare and referral cases
 - Large volume
 - Dr. Joyce Niland, Chair, Information Sciences
 - Ina Ervin, CTR, senior cancer registrar

THE LOS ANGELES EXPERIENCE

- Initial meeting between CSP and COH
 - Cancer reporting regulations
 - Historical casefinding process
 - Technical process
 - Security issues

THE LOS ANGELES EXPERIENCE

- IRB approval to release entire COH pathology file to CSP for performance evaluation

THE LOS ANGELES EXPERIENCE

- Subsequent meeting with CSP, COH and technical partners Artificial Intelligence in Medicine, Inc. (AIM)

The Big Test: Manual Casefinding vs. E-path

Manual Review

ISIS E-Path

		Cancer	No Cancer	Total
Cancer	1,771	2	1,773	
No Cancer		856	4,072	4,928
Total	2,627	4,074	6,701	

Reportable selection rate = $1,771 / 6,701 \times 100 = 26.4\%$

Sensitivity = $1,771 / 1,773 \times 100 = 99.9\%$

Specificity = $4,072 / 4,928 \times 100 = 82.6\%$

ISSUES

- Time
 - Calendar
 - Approvals
 - Cancer committee
 - Pathology committee
 - Legal
 - IT
 - Work

ISSUES

- False negatives
 - Nearly zero

ISSUES

- False positives
 - Impossible to avoid?
 - Some are valuable for registry follow-up

ISSUES

- Cost/benefits
 - Costs
 - Software
 - Installation
 - Support
 - Contractor
 - Registry
 - \$10,000–20,000 first year?
 - \$4,000–10,000 subsequent years?

ISSUES

- Cost/benefits
 - Cost benefits
 - Elimination of human screener
 - In LA, both CSP and hospital personnel
 - Large hospital, CSP tech 50 % effort
 - ~\$20,000 salary, fringe, travel
 - Hospital similar?

ISSUES

- Non-pathologic diagnoses
 - 4 % of LA cases are not pathologically confirmed

ISSUES

- Confidentiality/security
 - No transportation of hard copies
 - Vastly reduced visualization of non-cancer
 - Non-hospital staff not at facility

ISSUES

- Speed
 - Current RCA 40 days
 - Overnight!

ISSUES

- Updates/audits
 - How often?
 - How?

ISIS-Registrar™

- Component of the E-Path™ system of computerized case finding and electronic pathology reporting.
- Allows hospital registrars to review selected pathology and control the exchange of data with cancer registries or other systems.

ISIS-Registrar™

ISIS-Registrar 1.0.1

File Report Window Help

Main

- Pathology Reports
Alt+F2
- Cancer Abstracts
Alt+F3
- Statistics
Alt+F4
- Follow-up
Alt+F5
- Setup

Chart/MRN	Patient Surname/Name	Sex	Pathology No.	Report Date	Date Rec'd	Status	Abstracted	Discarded	Submitted	Date Submitted
8529837570	TAVCHAR Sample	F	200070CJ050385	2001-09-21	2001-09-21	<Final>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5513733773	LEGER Sample	F	200070CJ050441	2001-09-21	2001-09-21	<Final>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
9130860050	LILLIE Sample	M	200070CK081939	2001-09-21	2001-09-21	<Final>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2172471233	MCNEIL-THOMAS Sample	F	200070CJ240595	2001-09-21	2001-09-21	<Final>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
9992373754	CATERINA Sample	M	200070CJ231508	2001-09-21	2001-09-21	<Final>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
9669422710	REBELO Sample	M	200070CJ230541	2001-09-21	2001-09-21	<Final>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
6977335212	BREUER Sample	F	200070CJ040706	2001-09-21	2001-09-21	<Final>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
9515201714	LERANBAUM Sample	M	200070CJ060795	2001-09-21	2001-09-21	<Final>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
8101068230	RAMLOCKAN Sample	F	200070CJ061003	2001-09-21	2001-09-21	<Final>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2240185856	CLEMENSI Sample	F	200070CJ270574	2001-09-21	2001-09-21	<Final>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
6502049692	ALLOSSERY-BUTLEI Sample						<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5761440857	LEDOCHOWSKI Sample						<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6512947315	LIDDLE Sample						<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
7947672692	LAZOREN Sample						<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2692386416	AGYEKUM ADDAI Sample						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3959920210	MAHONEY-LEE Sample						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
7512792271	SRISATGUNARAJA Sample						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4885313967	GUAN Sample						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3775476330	ROWED Sample						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
7700145514	PORICELLI Sample						<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
5705112398	NAKASHIMA Sample						<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
5532283339	NORQUM Sample						<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
6924433136	LOCKIE Sample						<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
7795386379	ROY Sample	M	2000H99181822	2001-09-21	2001-09-21	<Final>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
5923273378	CARPINO Sample	F	2000S89291003	2001-09-21	2001-09-21	<Final>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
6749145436	SANTAGUIDA Sample	F	200070CJ061083	2001-09-21	2001-09-21	<Final>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
1396971374	SCHEMBRI Sample	M	200070CJ042009	2001-09-21	2001-09-21	<Final>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
8982634936	DELIRNA Sample	F	200070CJ051223	2001-09-21	2001-09-21	<Final>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2859461390	JAIT Sample	F	200070CJ051255	2001-09-21	2001-09-21	<Final>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3602411047	DE SILVA Sample	M	200070CJ061712	2001-09-21	2001-09-21	<Final>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
7499586522	SKLYAR Sample	M	200070CJ100635	2001-09-21	2001-09-21	<Final>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
9406083023	SKWIERCZYNSKI Sample	M	200070CJ241646	2001-09-21	2001-09-21	<Final>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6908438606	LATVAARO Sample	F	2000S99041218	2001-09-21	2001-09-21	<Final>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5112446744	LIANG Sample	F	2000S99060480	2001-09-21	2001-09-21	<Final>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6038509136	TURPELLA Sample	F	2000S99350728	2001-09-21	2001-09-21	<Final>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Search Pathology Reports

Load New Reports

Pathology No.:

Chart/MRN:

Surname/Alias:

Report Date: through:
(yyyy-mm-dd) (yyyy-mm-dd)

NT Login: Jack ADMIN [SYS] AIM Head Office 188 MB Pagefile available

ISIS-Registrar™

ISIS-Registrar 1.0.1
File Edit Window Help

Main

- Pathology Reports Alt+F2
- Cancer Abstracts Alt+F3
- Statistics Alt+F4
- Follow-up Alt+F5
- Setup

View Report

Pathology Report	Patient Identification	Coded Content
Pathology No.: 200H991827 Report Date: 2001-Sep-12 Report Type: Final Procedure Date: 2001-Sep-10 Pathologist: 192871 SMITH, John Requester: 182777 DOE, John	Chart/MRN: 01-2839 Surname: SANTIAGO Given Name: Sample Sex: Male Date of Birth: 1956-May Age: 45 yrs Insurer: ABC Insurance No. 1827-1119-1928	Tumor M-8000/1 NOS Adenocarcinoma M-8140/6 NOS, Metastatic M-8480/3 Mucinous, NOS Brain C71.9 NOS C71.0 Cortex, Cerebral Cerebral Cortex
Clinical Information: Right brain tumor - history of lung carcinoma		
Tissue Submitted: A) Right brain tumor biopsy B) Right brain tumor biopsy		
DIAGNOSIS: NODULAR MASS OF BRAIN TUMOR (DESIGNATED RIGHT SIDE) METASTATIC MUCINOUS ADENOCARCINOMA.		
Gross Pathology: A single nodular wedge of firm tan/yellow tissue measuring 2.0 cm x 1.2 cm Representative sections submitted as A and B.		
Microscopic: Sections indicate a sharply demarcated neoplastic mass composed of infiltrating neoplastic cells in a very myxoid or mucinous background. There is incomplete surrounding layer of cerebral cortex and fibrous tissue exhibiting chronic inflammation and hemorrhage. Tumor exhibits focal necrosis and is composed of unorganized islands of crowded epitheloid cells with variable quantities of vacuolated cytoplasm.		

NT Login: Jack ADMIN [SYS] AIM Head Office 156 MB Pagefile available

ISIS-Registrar™

- Automatically alerts registrar about new cancer findings.
- Displays cancer pathology reports for review.
- Controls the release of data to cancer registries.
- Allows registrar to discard reports selected in error.
- Integrates with external cancer abstracting systems.

The screenshot displays the ISIS-Registrar 1.0.1 software interface. The main window shows a list of pathology reports with columns for Chart/MRN, Patient Surname/Name, Sex, Pathology No., Report Date, Date Rec'd, Status, Abstracted, Discarded, Submitted, and Date Submitted. A 'Search Pathology Reports' dialog box is open, allowing users to filter reports by Pathology No., Chart/MRN, Surname/Name, and Report Date. Below the main window, a 'View Report' window displays detailed information for a specific report, including patient identification, clinical information, tissue submitted, diagnosis, gross pathology, and microscopic findings.

Chart/MRN	Patient Surname/Name	Sex	Pathology No.	Report Date	Date Rec'd	Status	Abstracted	Discarded	Submitted	Date Submitted
20030201	AVOCHA Sample	F	200070C25049	2001-09-21	2001-09-21	Final				
521372172	LESLIE Sample	F	200070C25049	2001-09-21	2001-09-21	Final				
913080050	LILLIE Sample	M	200070C001939	2001-09-21	2001-09-21	Final				
217247123	MONTEL THOMAS Sample	F	200070C240595	2001-09-21	2001-09-21	Final				
8892273754	CATERINA Sample	M	200070C231508	2001-09-21	2001-09-21	Final				
869492710	REBELLO Sample	M	200070C23541	2001-09-21	2001-09-21	Final				
927726212	BREUER Sample	F	200070C040706	2001-09-21	2001-09-21	Final				
9515201714	LERANBALM Sample	M	200070C060795	2001-09-21	2001-09-21	Final				
810108220	RAMLOCKAN Sample	F	200070C061003	2001-09-21	2001-09-21	Final				
2240105856	CLEMENSI Sample	F	200070C220574	2001-09-21	2001-09-21	Final				
6502049802	ALLOISIERI-BUTLEI Sample									
9701448057	LEOCHOTVYSKI Sample									
6512947915	LIDDELE Sample									
7947678502	LAZOREN Sample									
2842386416	ADYEXIM ADOM Sample									
2992950210	MAHONEY LEE Sample									
7912792271	SRIKAT GUNARAJAN Sample									
4895712967	GUAN Sample									
3778476330	ROAED Sample									
7700149514	POPICELLI Sample									
5700112200	NARADANNA Sample									
9532203100	NORDIM Sample									
602443136	LOCKIE Sample	M	2000R9918122	2001-09-21	2001-09-21	Final				
7795386279	ROY Sample	F	2000580291003	2001-09-21	2001-09-21	Final				
5523273270	CAPPINO Sample	F	2000580291003	2001-09-21	2001-09-21	Final				
6749145426	SANTIAGO Sample	F	200070C061003	2001-09-21	2001-09-21	Final				
1266571274	SCHEMERI Sample	M	200070C042009	2001-09-21	2001-09-21	Final				
8862634936	DELURNA Sample	F	200070C0951223	2001-09-21	2001-09-21	Final				
2093461390	JAIT Sample	F	200070C0951225	2001-09-21	2001-09-21	Final				
3602411047	DE SILVA Sample									
7406958522	SILVER Sample									
9406200303	SKWIERCZY									
680843806	LATVARD									
5112440744	LIANG Sample									
6036959136	TURPELLA									

Search Pathology Reports

Load New Reports

Pathology No.:

Chart/MRN:

Surname/Name:

Report Date: 0000-00-00 through 0000-00-00
 (yyyy-mm-dd) (yyyy-mm-dd)

Search Cancel

View Report

Pathology Report

Pathology No.: 2000R9918122
 Report Date: 2001 Sep 12
 Report Type: Final
 Procedure Code: 2001 Sep 18
 Pathologist: 192871 SMITH, John
 Requester: 182777 ODE, John

Patient Identification

Chart/MRN: 81-2829
 Surname: SANTIAGO
 Given Name: Sample
 Sex: Male
 Date of Birth: 1956 May
 Age: 45 yrs
 Race: ABC
 Insurance No: 1827 1119-1328

Clinical Information: Right brain tumor - history of lung carcinoma

Tissue Submitted: A) Right brain tumor biopsy
 B) Right brain tumor biopsy

DIAGNOSIS: NODULAR MASS OF BRAIN TUMOR (DESIGNATED RIGHT SIDE)
 METASTATIC MUCINOUS ADENOCARCINOMA.

Gross Pathology: A single nodular wedge of firm tan/yellow tissue measuring 2.0 cm x 1.2 cm. Representative sections submitted as A and B.

Microscopic: Sections indicate a sharply demarcated neoplastic mass composed of infiltrating neoplastic cells in a very myxoid or mucinous background. There is incomplete surrounding layer of cerebral cortex and fibrous tissue exhibiting chronic inflammation and hemorrhage. Tumor exhibits focal necrosis and is composed of unorganized islands of crowded epithelial cells with variable quantities of vacuolated cytoplasm.

ISIS-Registrar™

Workstation Requirements:

- Intel PC 233 MHz (or better)
- 32 MB RAM (or better)
- Windows 98, NT, 2000 or XP
- 1024 x 768 color display
- TCP/IP Networking

ISIS-Registrar Includes:

- Online Help
- User Manuals
- Comprehensive Technical Support
- Upgrade Warranty

The screenshot displays the ISIS-Registrar software interface. The top window shows a list of pathology reports with columns for Chart/MRN, Patient Surname/Name, Sex, Pathology No., Report Date, Date Rec'd, Status, Abstracted, Discarded, Submitted, and Date Submitted. A search dialog box is open over this list, allowing for filtering by Pathology No., Chart/MRN, Surname/Name, and Report Date.

The bottom window shows a detailed view of a pathology report for patient 182777 DOE, John. The report includes patient identification, clinical information, tissue submitted, diagnosis, gross pathology, and microscopic findings.

Chart/MRN	Patient Surname/Name	Sex	Pathology No.	Report Date	Date Rec'd	Status	Abstracted	Discarded	Submitted	Date Submitted
20030220	[AVOHA] Sample	F	200070C125029	2001-09-21	2001-09-21	Final				
151372772	LESLIE Sample	F	200070C125041	2001-09-21	2001-09-21	Final				
913080500	LILLIE Sample	M	200070C1001939	2001-09-21	2001-09-21	Final				
217247123	MONTEIL THOMAS Sample	F	200070C1240596	2001-09-21	2001-09-21	Final				
898227354	CATERINA Sample	M	200070C1231508	2001-09-21	2001-09-21	Final				
869422710	RIEBELO Sample	M	200070C123541	2001-09-21	2001-09-21	Final				
697728212	BREUER Sample	F	200070C1040706	2001-09-21	2001-09-21	Final				
951520174	LERANGALM Sample	M	200070C1007095	2001-09-21	2001-09-21	Final				
810108228	RAMLOCKAN Sample	F	200070C1061003	2001-09-21	2001-09-21	Final				
124010586	CLEMENSI Sample	F	200070C1210574	2001-09-21	2001-09-21	Final				
650204982	ALLOSERY-BUTLEI Sample									
970144887	LEDOCHIVSKI Sample									
6512947915	LIDDLE Sample									
794767802	LAZOREN Sample									
282386416	ADYEXIM ADOM Sample									
299950210	MARINET LEE Sample									
7912792271	SRIATGUNARAJA Sample									
489527397	GUAN Sample									
3778476300	ROAED Sample									
7700149514	POPICELLI Sample									
570011298	NARADANA Sample									
9532083300	NORDIM Sample									
602433136	LOCKE Sample									
7795386379	ROY Sample	M	2000R99181822	2001-09-21	2001-09-21	Final				
552327320	CAPPINO Sample	F	2000580291003	2001-09-21	2001-09-21	Final				
674914548	SANTAGUIDA Sample	F	200070C1001003	2001-09-21	2001-09-21	Final				
126657124	SCHEMERRI Sample	M	200070C1042009	2001-09-21	2001-09-21	Final				
886263498	DELURNA Sample	F	200070C1091223	2001-09-21	2001-09-21	Final				
2093461390	JAIT Sample	F	200070C1091225	2001-09-21	2001-09-21	Final				
360411047	DE SILVA Sample									
740958522	SILVER Sample									
940030023	SKWIERCZYNSKI Sample									
630843806	LATWARD Sample									
5112446744	LIANG Sample									
6038509136	TURPELLA Sample									

Pathology Report

Pathology No.: 2000R991827
 Report Date: 2001 Sep 12
 Report Type: Final
 Procedure Code: 2001 Sep 18
 Pathologist: 182871 SMITH, John
 Requester: 182777 DOE, John

Patient Identification

Chart/MRN: 81 2829
 Surname: SANTAGO
 Given Name: Sample
 Sex: Male
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Funded by:

- Centers for Disease Control and Prevention
- National Cancer Institute
- California Department of Health Services: California Cancer Registry
- Los Angeles Cancer Surveillance Program