

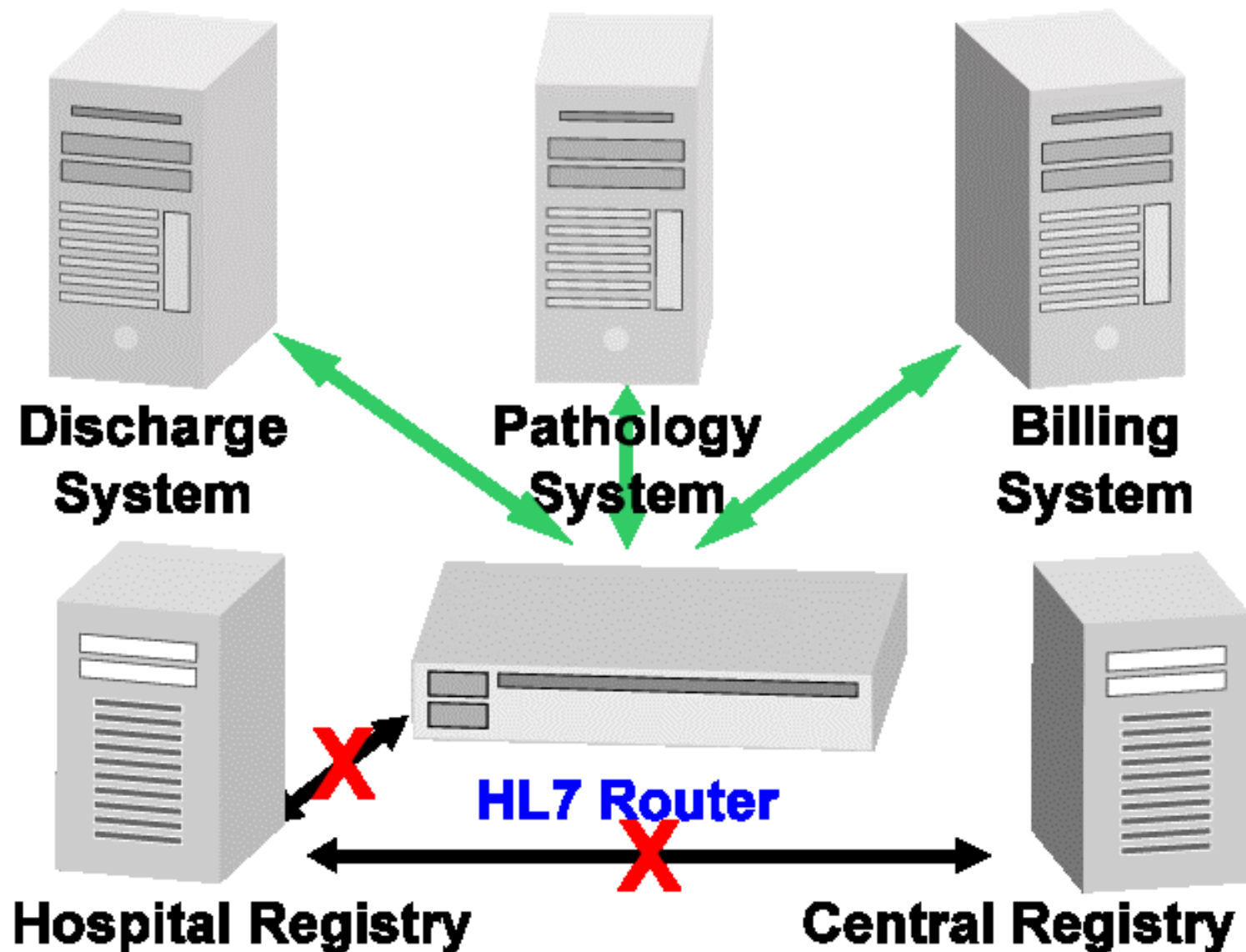
Implementing Automated Pathology Report Case Identification In a Cancer Registry

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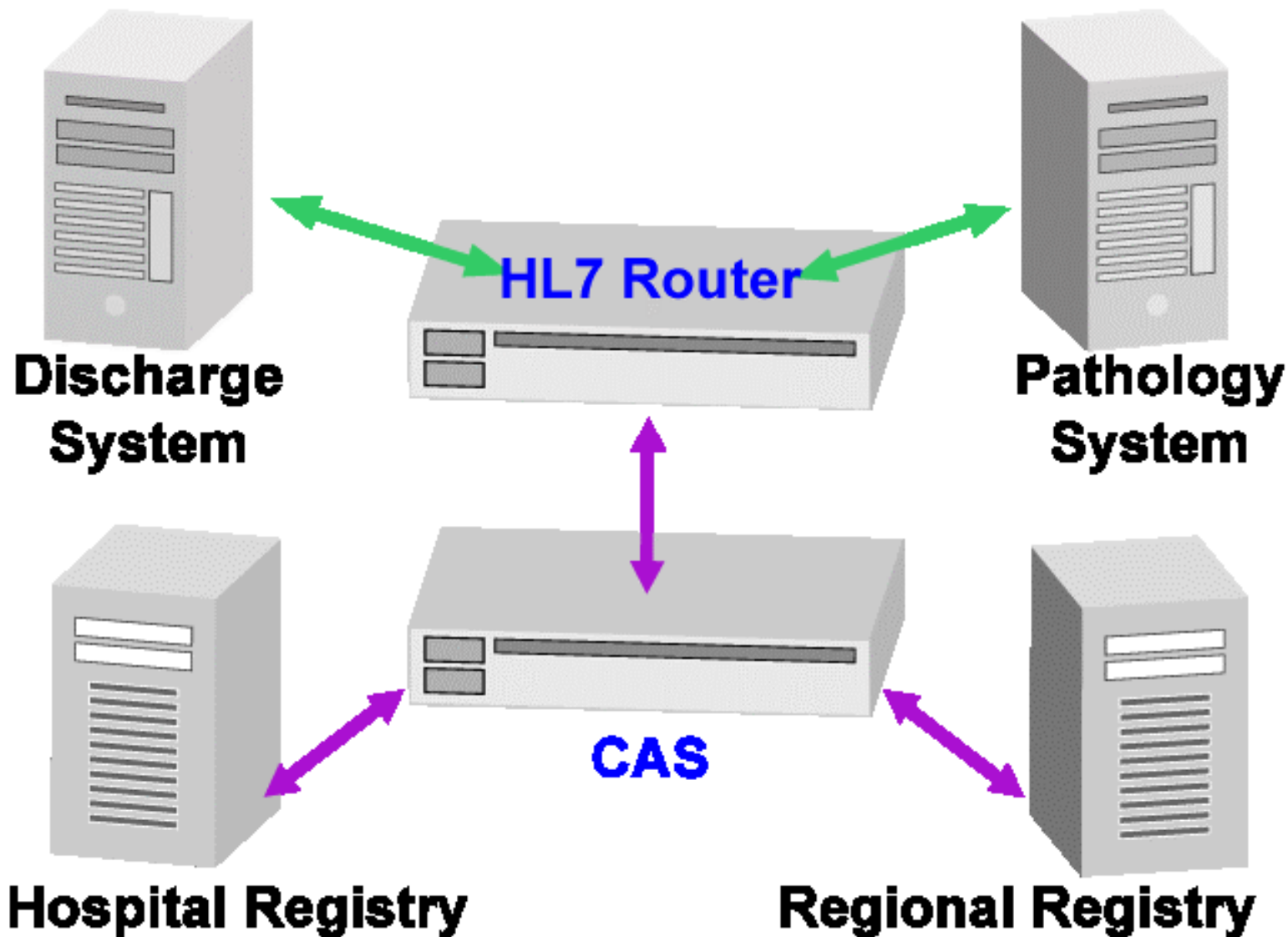
Typical Hospital HL7 Message System



What E-Path Does:

- Listens on hospital networks
- Captures cancer-related messages from billing &/or pathology systems
- Matches messages to existing cases
- Presents potential cases to cancer registrars for decision
- Starts new cancer reports when required
- Forwards E-Path to Central/State Registry

What's Added by Automated E-Path



1. The process of implementing automated pathology casefinding

- I. Source of data: Pathology Reports included within:
 - A. Messages (most commonly)
 - B. Files

- II. Format of data:
 - A. HL7 (most commonly)
 - B. XML
 - C. Other “data” format, comma-delimited (.csv), for example
 - D. Report pages

Sample HL7 message

MSH|^~\&|XPATHPLUS|MedCtr|CAS|DiscountHospital|20050105140200|
|ORU^R01|33001600000120591|T|2.3.1

PID|1||TEST208||AGREEABLE^DEBATE^B||19410202|||123 1st
Street^^Springfield^CA^90000^USA|||||||356666669

PV1|1|||||||||||||1M|3303924|||||||||||||R3|||200206010000

ORC|||MR05-1^XPathPlus||IP|||200206011402|e365^Tech^Lab

OBR|1||MR05-1^XPathPlus
|||20020601|||||20020601|Lung(CR/MR)|||||||SP||

OBX|7|TX|CA04-3963||Requesting Physician: Marcus Welby, MD |||||F

OBX|10|TX|CA04-3963||DIAGNOSIS: |||||F

OBX|11|TX|CA04-3963||1. Bronchial Brush: Negative for
malignancy.|||||F

OBX|13|TX|CA04-3963||Electronically Signed: 6/1/02 13:00|||||F

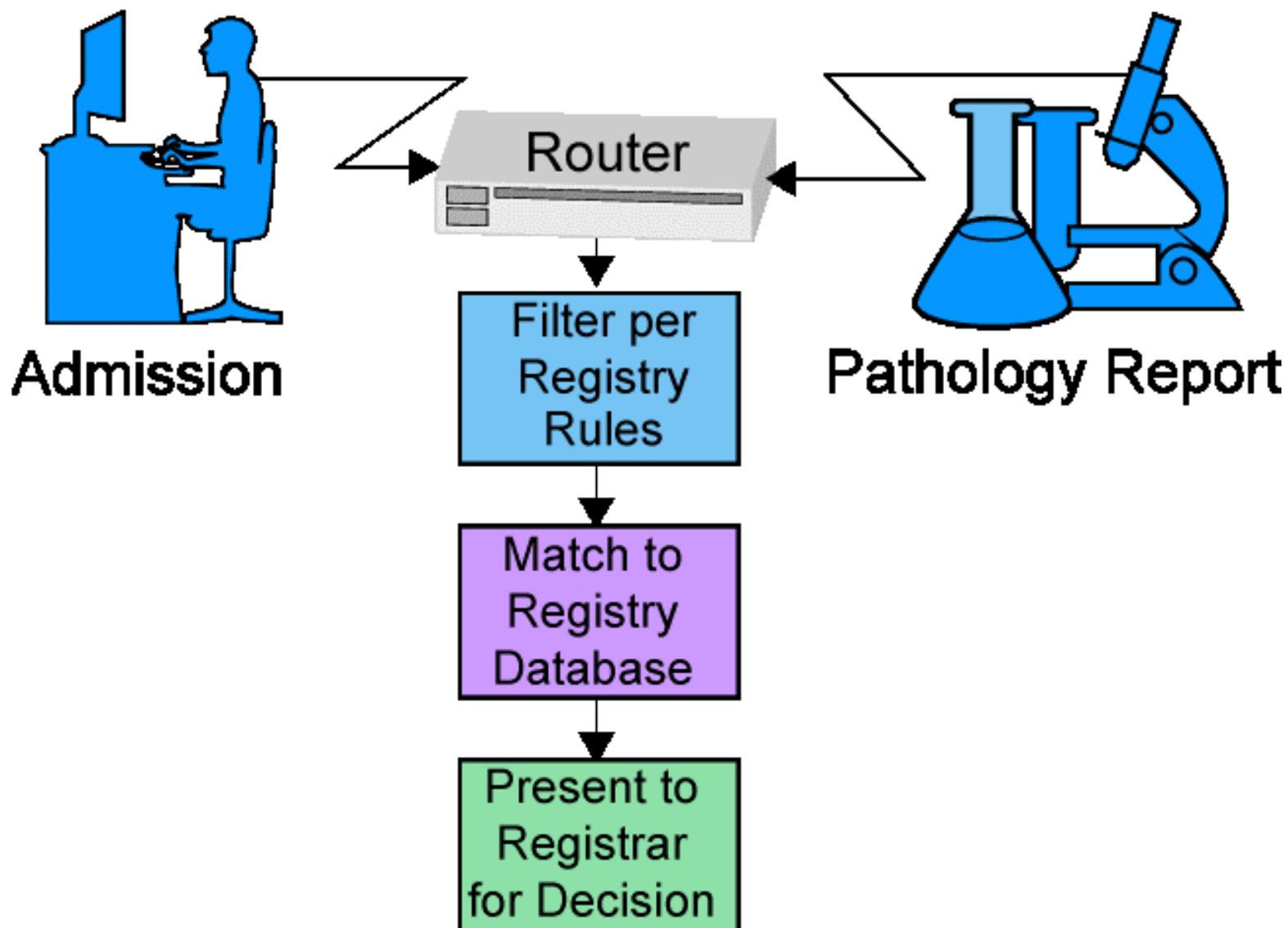
OBX|14|TX|CA04-3963||Reported and Signed By: John Smith, M.D.|||||F

1. The process of implementing automated pathology casefinding-cont'd

III. Ways to identify cancer:

- A. List of words and phrases that indicate Cancer
- B. Supplemented by a list of words and phrases that indicates No Cancer, to prevent false positives for phrases like “Negative for malignancy”
- C. More elaborate artificial intelligence processing
- D. “Synoptic coding”: pathologist creating the data (message) selects phrases from a strictly controlled list (of codes) rather than writing free text

CNExT Casefinding Process

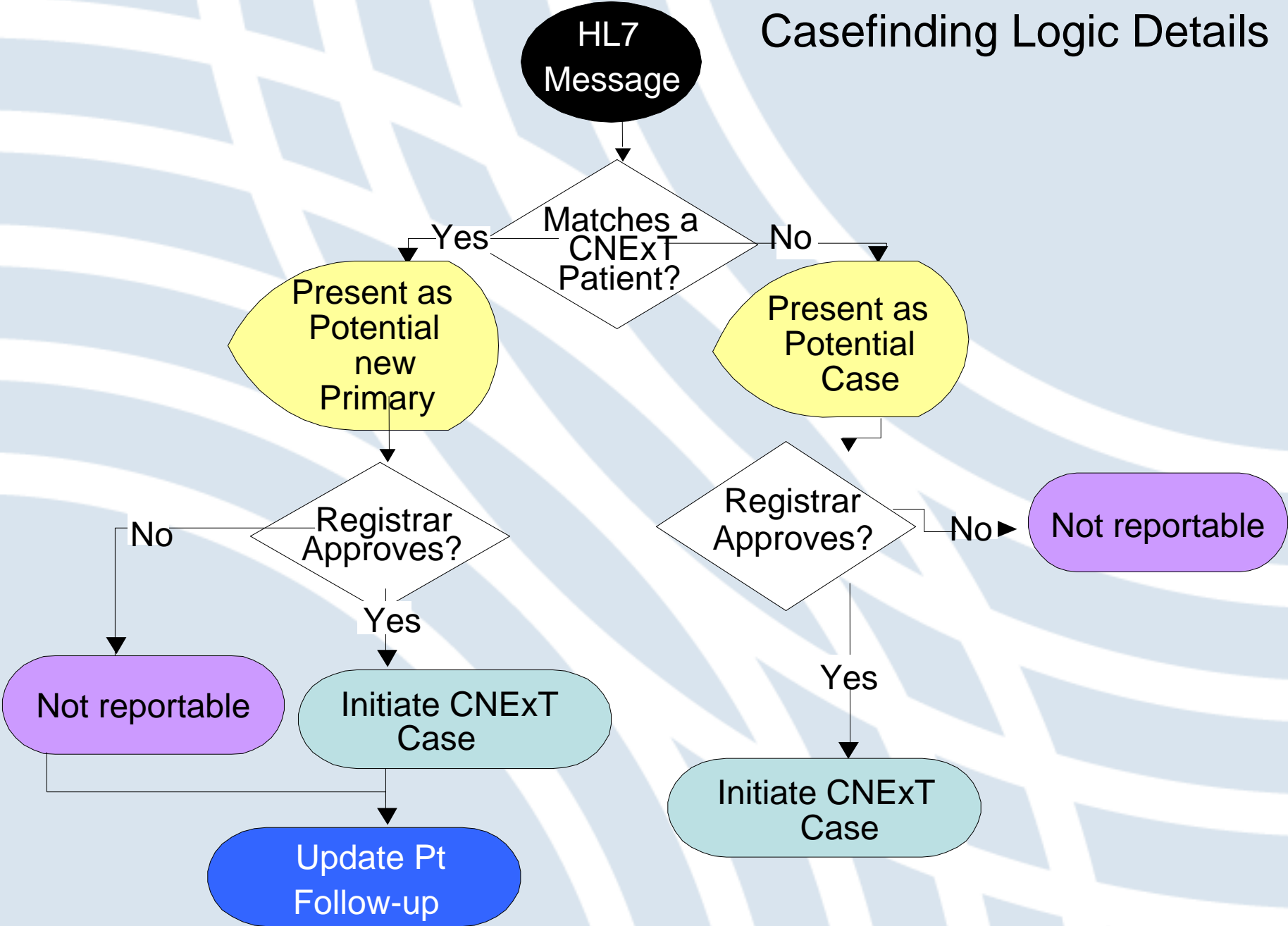


E-Path rules database (ICD-0-3/SNOMED-based)

SearchTerms : Table

	Phrase#	PhraseText	Negative
	759	PAPILLARY TRANSITIONAL CELL NEOPLASM	<input type="checkbox"/>
	760	PARAFOLLICULAR CELL CARCINOMA	<input type="checkbox"/>
	761	PAROTIDECTOMY	<input type="checkbox"/>
	762	PARTIAL MOLE	<input checked="" type="checkbox"/>
	763	PERINEURIOMA	<input type="checkbox"/>
	764	PERIPHERAL NEUROECTODERMAL TUMOR	<input type="checkbox"/>
	765	PHARYNGECTOMY	<input type="checkbox"/>
	766	PHEOCHROMOBLASTOMA	<input type="checkbox"/>

Casefinding Logic Details



1. The process of implementing automated pathology casefinding-cont'd

IV. Set-up requirements:

A. Some hardware to run an application or service on a workstation connected to the facility's network

B. IT staff needed to get the stream of data started into that workstation often need to be experts in "messaging"

C. An application to process the stream of data, identifying cancer and presenting to users in one of the above ways; may need to be customized to the facility

1. The process of implementing automated pathology casefinding-cont'd

V. Ways to present reports to users:

A. Simply tell users Patient X, Medical Record Number 9999, should be a cancer case

B. Display Pathology Report text

C. Display Pathology Report text with Cancer and Non-Cancer phrases highlighted

D. Create Cancer Registry cases from Cancer messages, with whatever data can be drawn from the message



	Incoming Case	Registry Case
Hospital		0000000001
Accession/Seq		199600108/00
Site Code		C716
Histology (ICD-O-3)		8140/3
MedRec	TEST96108	TEST96108
Name	AAVWILLAA, DOUBLER	AAVWILLAA, DOUBLER WW
Birth Date	05/21/1990	05/21/1990
SSN	212-48-1522	667-78-8990
Admit Date		07/30/1996
Spec. Coll Dt	11/10/2006	07/30/1996
Ordering MD State	24109^Houser^Doobie	
Specimen Source	SO^^SLIDES RECEIVED	
	<p>[S06-99999^T^SBD]</p> <ul style="list-style-type: none"> • BM-8-06 9 Slides • Collection date: 5/18/06 • Sign out date: 5/19/06 <p>[S06-13326^T^FD]</p> <ul style="list-style-type: none"> • PERIPHERAL BLOOD AND BONE MARROW, ASPIRATE, CLOT AND TREPINE • BIOPSY (BM-8-06; 05/18/06): • - CHRONIC LYMPHOCYTIC LEUKEMIA/SMALL LYMPHOCYTIC LYMPHOMA 	

Next

New Pat

New Tum

New Adm

Non-Rep

Add Rpt

Tumors

1

2

3

4

5

6

7

Close

24109^Houser^Doobie

SO^SLIDES RECEIVED

[S06-99999^T^SBD]

- BM-8-06 9 Slides
- Collection date: 5/18/06
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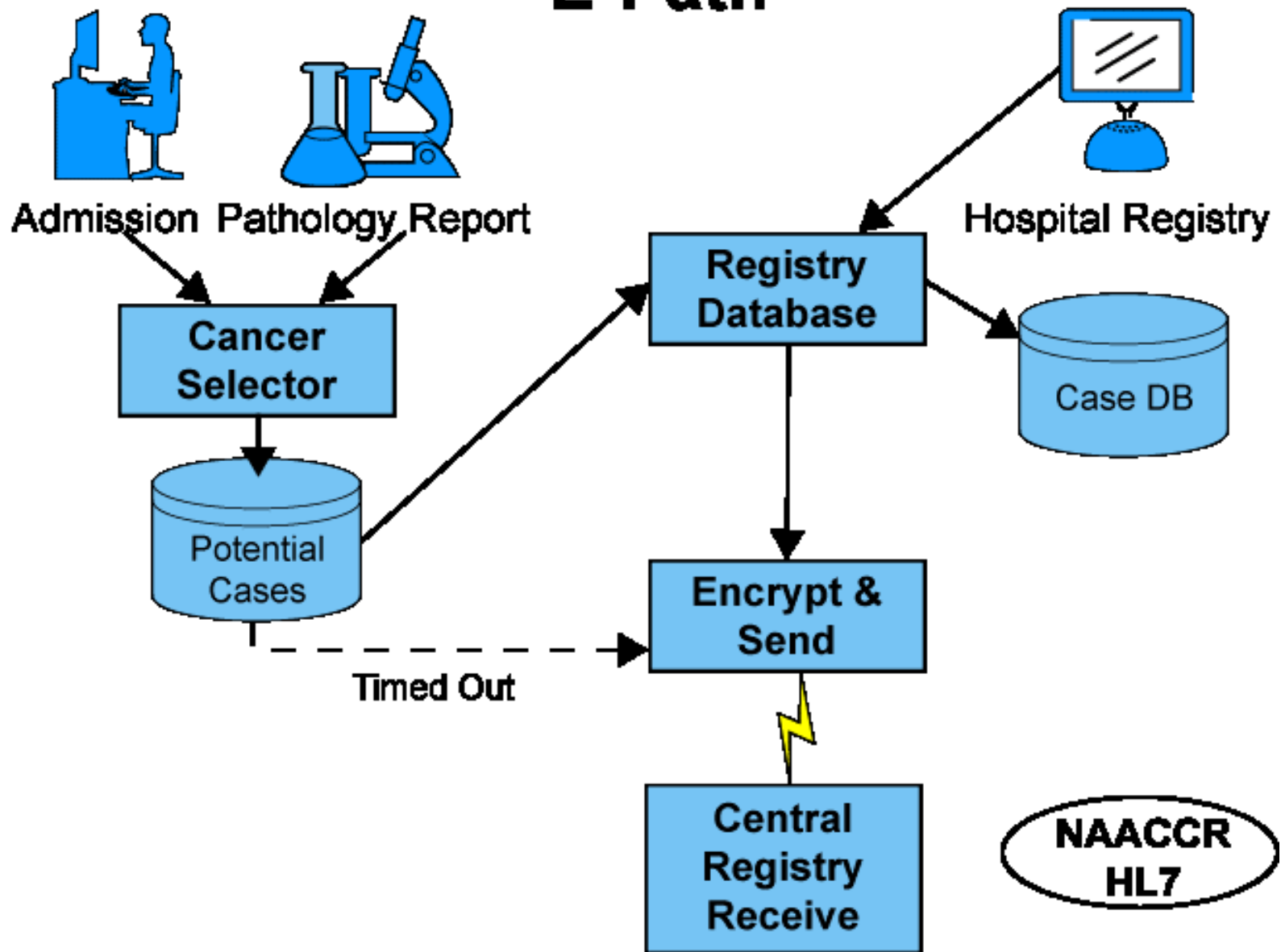
[S06-13326^T^FD]

- PERIPHERAL BLOOD AND BONE MARROW, ASPIRATE, CLOT AND TREPINE
- BIOPSY (BM-8-06; 05/18/06):
- - **CHRONIC LYMPHOCYTIC LEUKEMIA/SMALL LYMPHOCYTIC LYMPHOMA**

E-Path aids to evaluation

- Tracks what information was shown to casefinder, including highlighting of cancer phrases
- Tracks casefinders' decisions
- All in a query-able database

E-Path



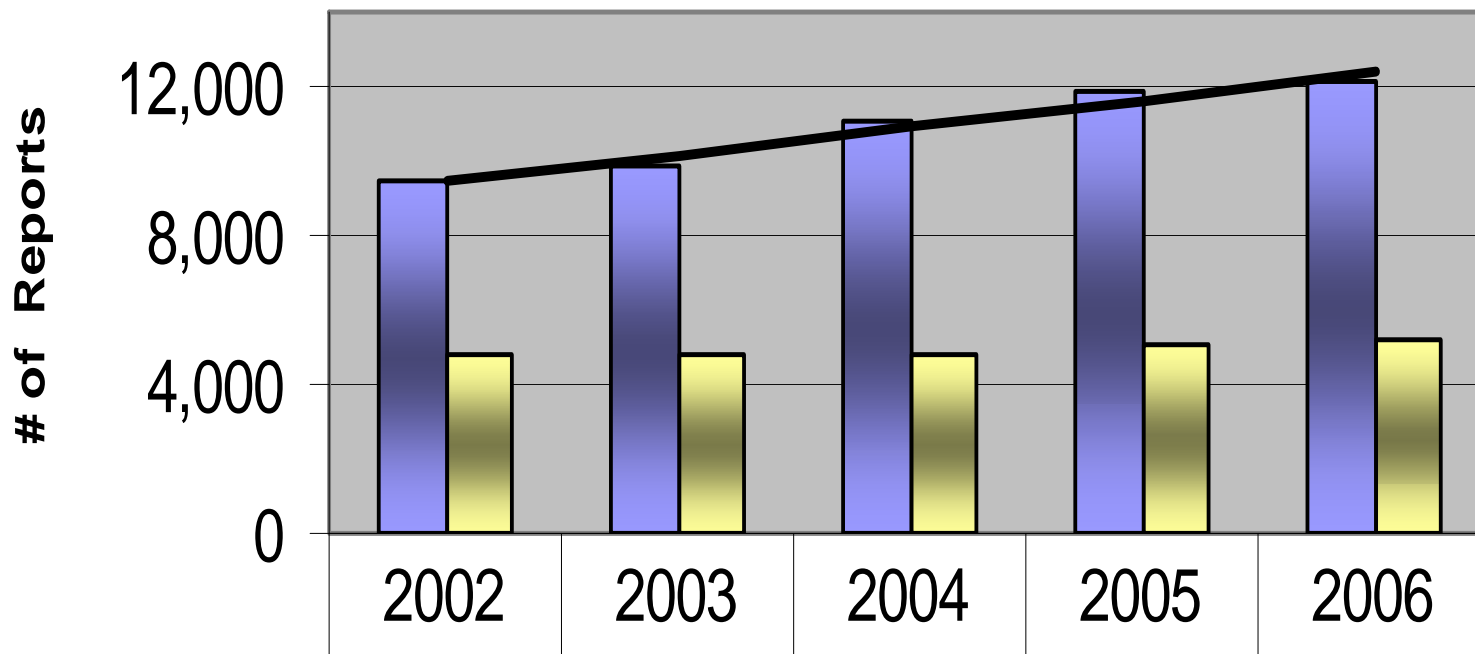
2. The impact of automated pathology report case identification on registry workflow

I. Current Procedure

- A. Manual pathology report review process
- B. Number of reports
- C. Time involved
- D. Cost involved
- E. Impact on Pathology Department
- F. Central Registry



Number of pathology reports reviewed by UCSF Cancer Registry



# reports	9,533	9,808	11,112	11,926	12,116
# cases	4,800	4,858	4,841	5,089	5,200

Accession Year

Manual Path Review	2006	Estimated Costs (Annual)
# Path Reports Reviewed	12,116	30 minutes/week to run & transmit 2 registry reports \$650
# Regular Cases Accessioned	5,200	
# Consult Cases Reported to Central Registry	2,908	Accessioned into separate registry dbase & transmitted to Central Registry
# hrs to review & sort 12,116 cases (average 4 minutes/case)	808 (hours)	1FTE \$20,200
# hrs to enter 5,200 cases into registry database (3 min./case)	260 (hours)	\$6,500
# hrs to enter 2,900 Consult/ROS (3 minutes/case)	145 (hours)	\$3,625
Copying @ \$.10/report + paper (\$2.55/ream), n=12,116	\$1,274	\$1,274

2. The impact of automated pathology report case identification on registry workflow-cont'd

II. New Procedure

- A. Electronic pathology report review process (streamlined)
- B. Number of reports (stay the same)
- C. Time Involved (decreased)
- D. Cost involved (less cost)
- E. Impact on Pathology Department (eliminated)
- F. Central Registry (improved timeliness of reporting)

E-Path features affecting workflow

One-Button entry of new case minimizing hand data entry/errors in:

- First/Last Name
- MRN
- SSN
- DOB
- Date of Contact
- Address at diagnosis
- Path report number
- Ordering Physician

More E-Path features affecting workflow:

- Visual report display w/highlight of cancer and non-cancer terms
- Matches cases for registrar in advance
- Can attach report to case in database
- Applies better follow-up date (even from negative pathology if case already exists in database)

Manual Path Review Vs. E-Path Review	2006	Savings by introducing automated casefinding
# Path Reports Reviewed	12,116	Eliminates Path Dept. staffing, Timeliness & Completeness checked by Central Registry
# Regular Cases Accessioned	5,200	Timeliness & Completeness checked by Central Registry
# Consult Cases Reported to Central Registry	2,908	Electronic reporting direct to Central Registry
#hrs to review & sort (in hours)	808 (404)	Time/\$ Saved- # hrs reduced by almost half (\$10,100 saved)
#hrs to enter 5,200 cases into registry database (in hours)	260	Time/\$ Saved (\$6,500)
#hrs to enter 3,000 Consult/ROS cases	145	Time/\$ Saved (\$3,625)
Copying @ \$.10/report + Paper (\$2.55/ream)	\$1,274	Money Saved (\$1,274)

COMPARISON OF PROCESSING PATHOLOGY REPORTS: Manual vs. Electronic

Review Procedure N=3,615 reports	# CASES PROCESSED PER HOUR	# REPORTS MISSED (OF TOTAL)	Estimated Cost Savings (Annual)
Manual	32.5	3	
Electronically (includes applied follow-up)	67 (106% increase)	2	\$21,500 minimum



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