

RESOLVING CLINICIANS ON-LINE INFORMATION NEEDS: A SHORT HISTORY OF BUTTONS

James J. Cimino, M.D.
Biomedical Informatics and Medicine
Columbia University
February 11, 2005

Objectives

- Studying clinician information needs
- Evolution of infobuttons
- Research agenda
- Evaluation
- The Coumadin Story
- Methods for integration
- Infobuttons in the real world

Everybody is worried about losing their job to automation. They're afraid they'll be replaced by a button. But I'm smart. I'm going to get a job in the factory where they make the buttons.

- Jackie Gleason, *The Jackie Gleason Show*, circa 1968

Covell et al.
Information Needs



Studying Information Needs

Covell DG, Uman GC, Manning PR. Information needs in office practice: are they being met? *Ann Intern Med.* 1985 Oct;103(4):596-9.

Results of Observational Study

- 47 physicians
- Observed during a half day of typical practice
- Estimated 2-3 questions per physician per day
- 269 questions raised about patient management
- Only 30% were answered during the patient visit
- Usual resource was another physician

Other Observational Studies

The information needs of practicing physicians in northeastern New York State.

Assessment of physicians' information needs in five Texas counties

Information needs of rural health care practitioners in Hawaii.

Knowledge management in clinical practice: a systematic review of information seeking behavior in physicians

Information needs and information-seeking behaviors of on-call radiology residents

Expanding the concept of medical information: an observational study of physicians' information needs

Curbside consultation practices and attitudes among primary care physicians and medical subspecialists

Information needs of health care professionals in an AIDS outpatient clinic as determined by chart review

Methods for assessing information needs of clinicians in ambulatory care.

Real-time information-seeking behavior of residency physicians

Information seeking in primary care: how physicians choose which clinical questions to pursue and which to leave unanswered

Physicians' use of computer software in answering clinical questions.

Residents' medical information needs in clinic: are they being met?

Findings

- Information needs occur often
- They are often unresolved
- Computer-based resources are underused:
 - Lack of knowledge of existence
 - Lack of access
 - Lack of navigational skills
 - Perceived lack of time

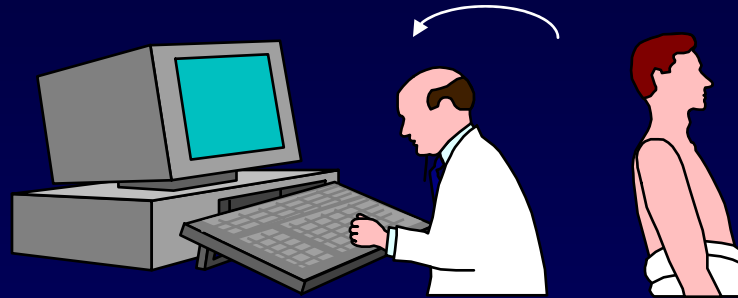
Information Needs of CIS Users

- Stereotypical tasks suggest recurrent needs
- System knows:
 - Who the user is
 - Who the patient is
 - What the user is doing
 - What information the user is looking at
- User is sitting at a computer!

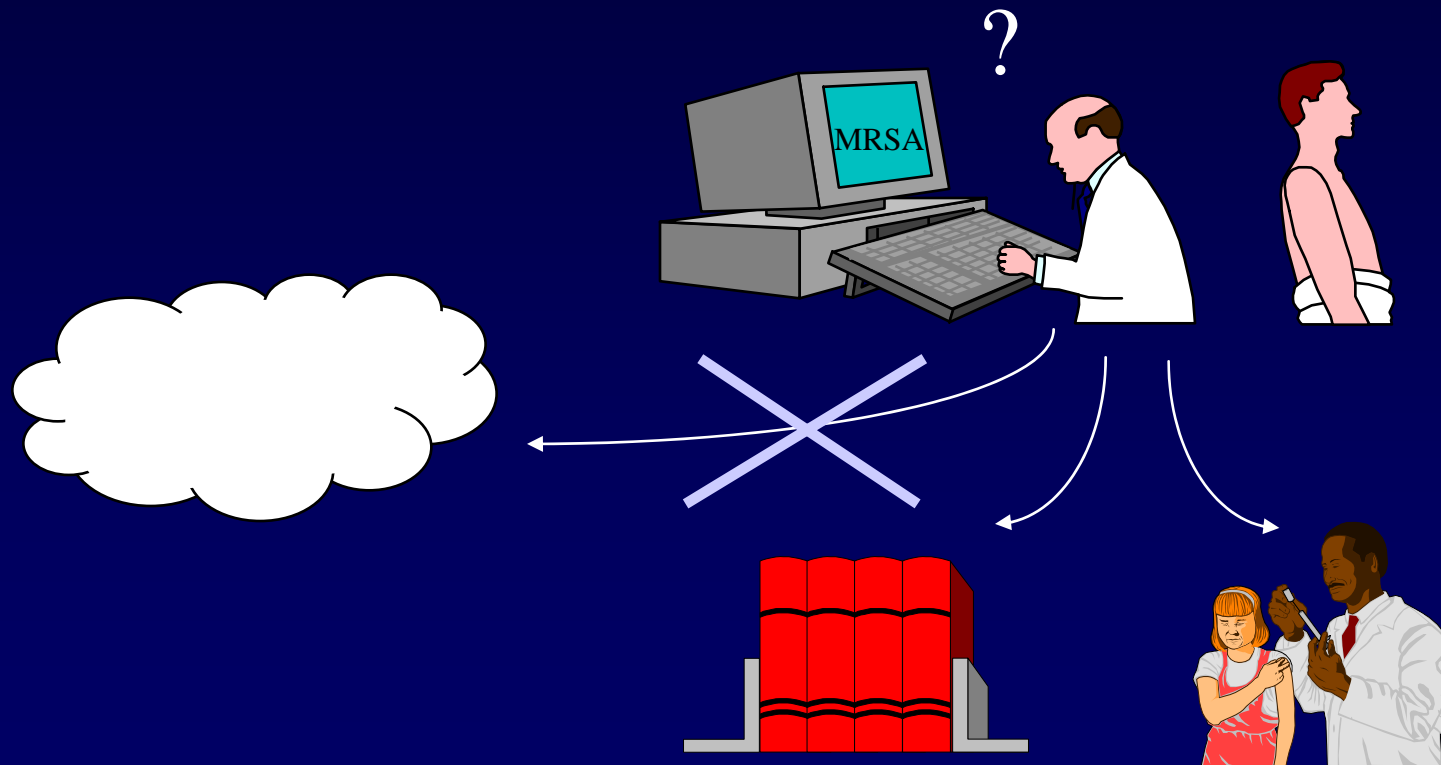
Information for Decision-Making



Information for Decision-Making



Information for Decision-Making



Covel et al.
Information Needs

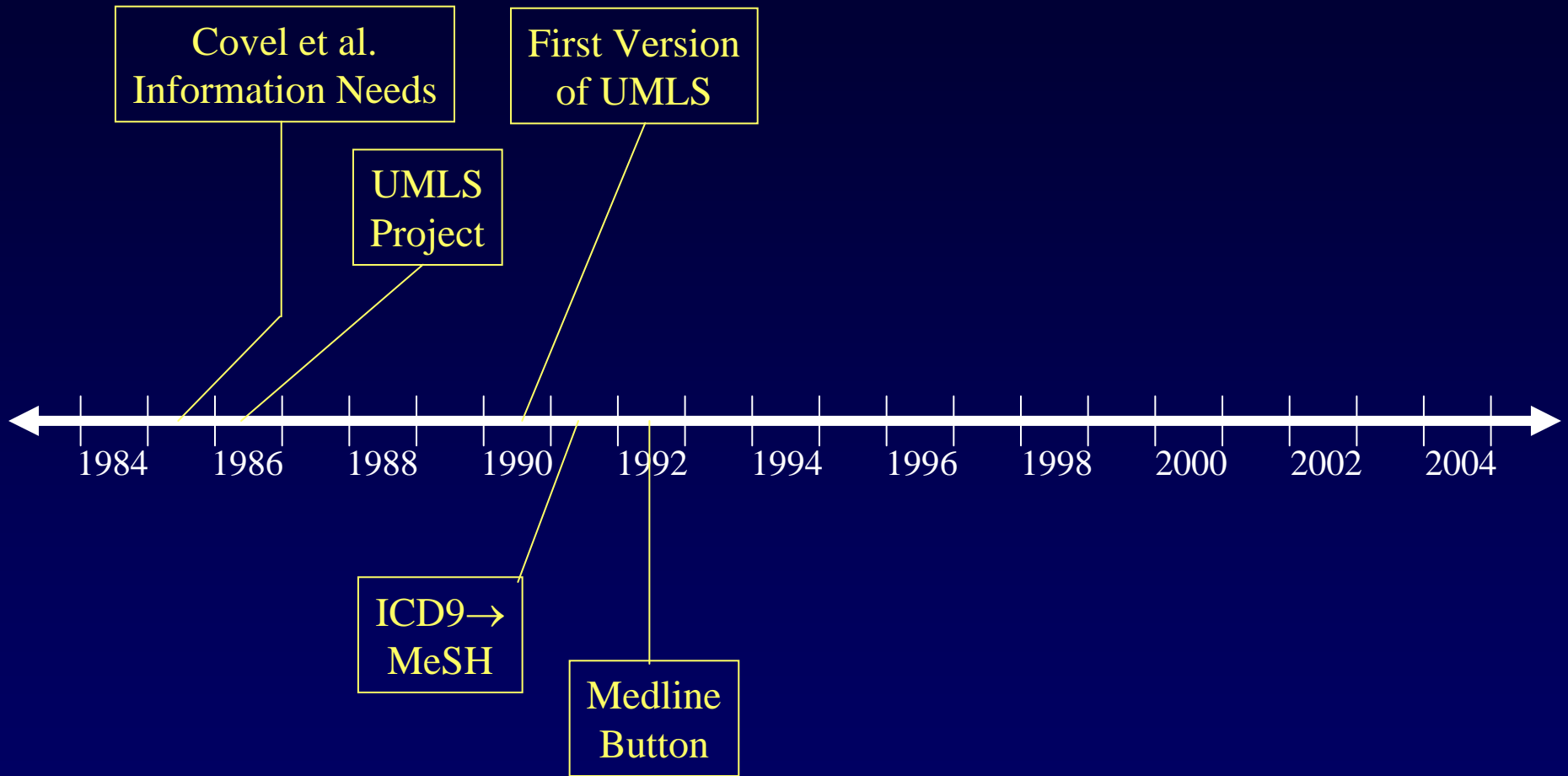
UMLS
Project



Unified Medical Language System

The purpose of the UMLS is to improve the ability of computer programs to “understand” the biomedical meaning in user inquiries and to use this understanding to retrieve and integrate relevant machine-readable information for users.

- Donald A.B. Lindberg 1986/1993



First Attempt: The Medline Button

- CIS (WebCIS's predecessor) on mainframe
- BRS/Colleague (Medline) on same mainframe
- Get them to talk to each other
- Search using patient diagnoses and procedures
- Kludge required

CIS Physician Main Menu

Select One Function.....: 4
-

- 1 Display Results
- 2 Display Selected Results
- 3 Display Demographic Profile
- 4 Admission and Discharge History
- 5 Display Sensitive Results

Enter Patient Medical Record Number....: 1925809
or -----

Enter Patient Name (last, first).....:
or -----

Enter Patient Location.....: -----



Name: WILLIAMS, JOHNNIE Sex: F Birthdate: 02/26/920 MRN: 1925809
Admission Record Detail

Admission Date: 01/03/95 Discharge Date: 02/16/95 Location: M6HS
Doctor: CIMINO, JAMES J Discharge Summary: N
Primary Diagnosis: 410.71 ACUTE MI,SUBENDO INFARC, INITI

Select Terms You Are interested in:

Diseases:

- x 410.71 ACUTE MI,SUBENDO INFARC, INITI
- x 780.3 CONVULSIONS
- 507.0 FOOD/VOMIT PNEUMONITIS
- 426.0 ATRIOVENT BLOCK COMPLETE
- 415.1 PULMON EMBOLISM/INFARCT
- 453.8 VENOUS THROMBOSIS NEC
- 428.0 CONGESTIVE HEART FAILURE

F8 = for more information

Name: WILLIAMS, JOHNNIE

Sex: F Birthdate: 02/26/920

MRN: 1925809

MEDLINE Queries from Admission Profile

Select a question:

1. Does Myocardial Infarction cause Convulsions?
2. Is Myocardial Infarction caused by Convulsions?
3. Does Myocardial Infarction occur with Convulsions?

Help-F1

Search MEDLINE-Enter

Name: WILLIAMS, JOHNNIE Sex: F Birthdate: 02/26/920 MRN: 1923009

BRS Query from Admission Profile

(Myocardial Infarction WITH (ET OR SC)) AND (Convulsions WITH CO)



Help=F1

MEDLINE Queries=Enter/F3

1

myocardial infarction/et,sc and convulsions/co

1

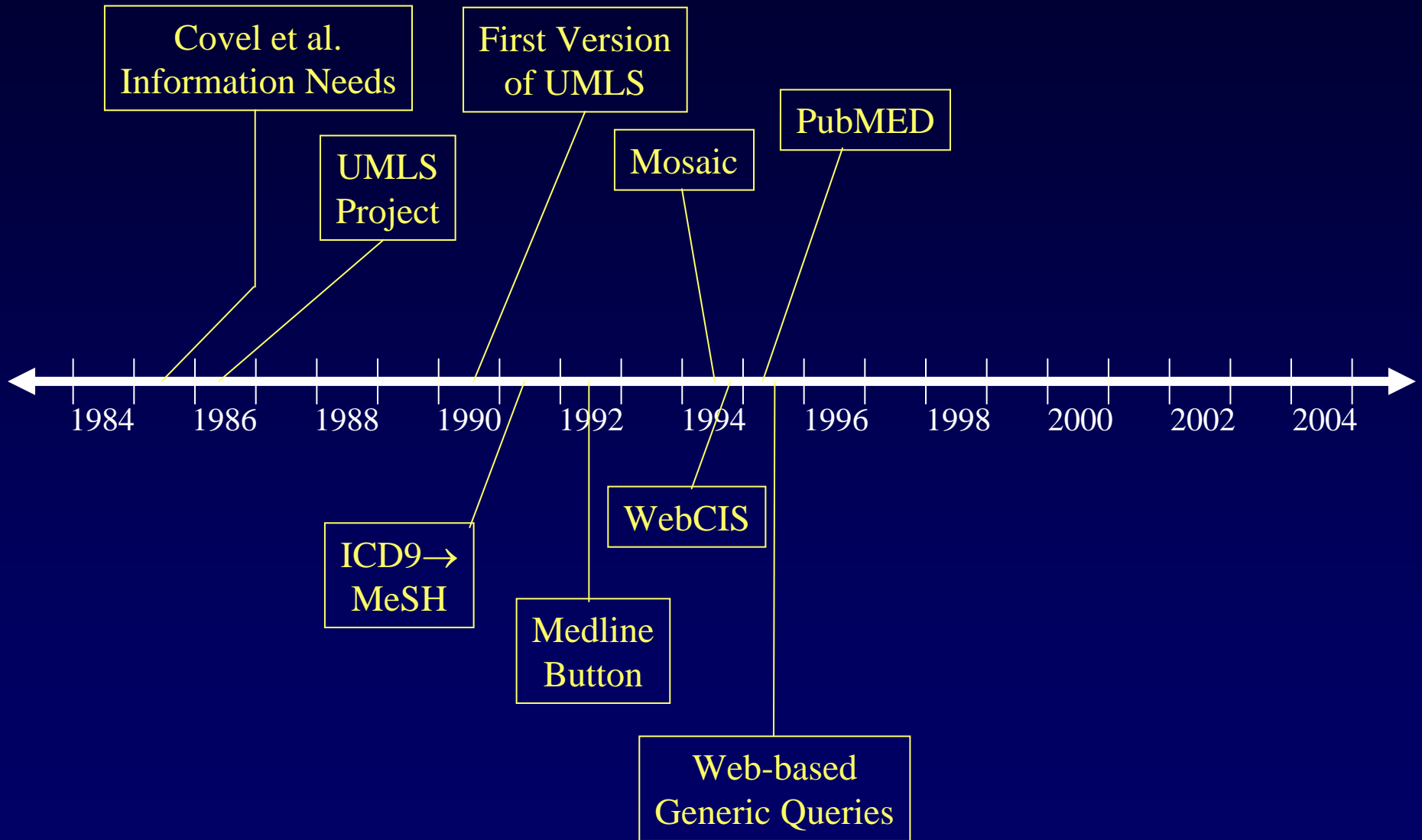
Ovid - Medline <1973 to 1983>

[To select option hold Ctrl and letter indicated. Press ^Y for Help.]
Enter subject, then press <Enter>

-: _

First Attempt: The Medline Button

- CIS (WebCIS's predecessor) on mainframe
- BRS/Colleague (Medline) on same mainframe
- Get them to talk to each other
- Search using patient diagnoses and procedures
- Kludge required
- Technical success
- Practical failure

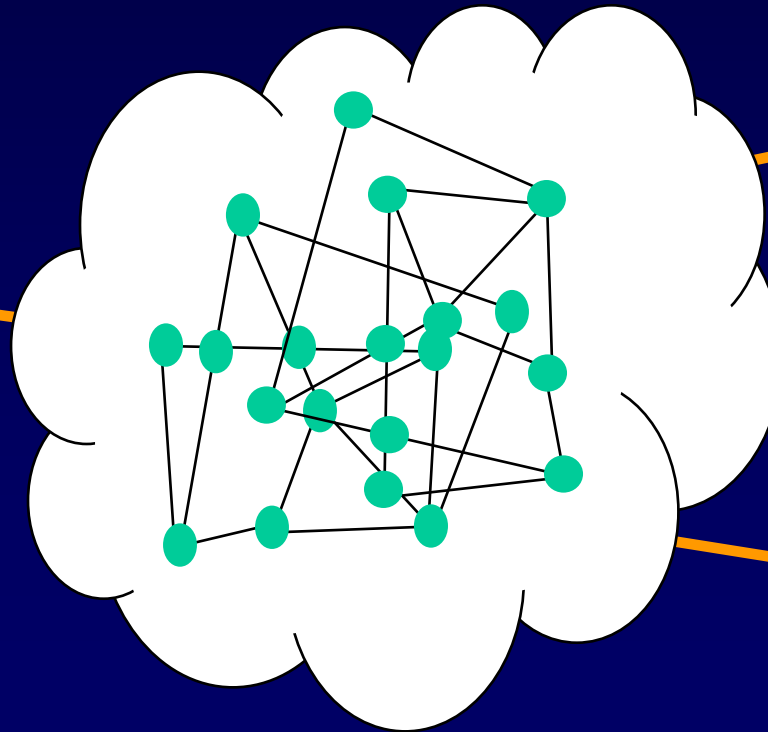


One-Stop Information Shopping?

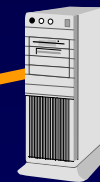
Health
Practitioner



World Wide Web
(The Hyperdocument)



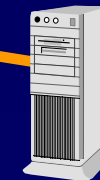
Information
Resources



Biblio-
graphic
Database



Textbook



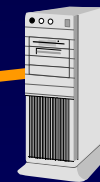
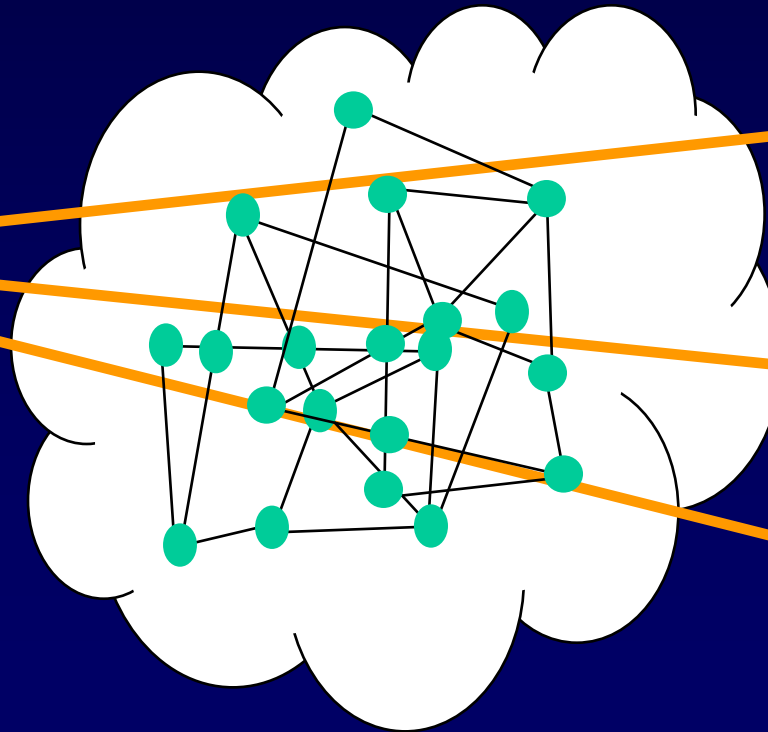
Expert
System

One-Touch Information Shopping

Health
Practitioner

World Wide Web
(The Facilitator)

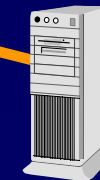
Information
Resources



Biblio-
graphic
Database



Textbook



Expert
System

Or do you want to look at all ecg reports of this patient?

submit

How to treat CARDIOMEGALY?

submit

How to diagnose CARDIOMEGALY?

submit

Everything about CARDIOMEGALY from the Medline?

submit

This search may take some time, please wait....

Connected to Medline Server, please wait.....

Query submitted, please wait...

95 documents might be available.

If you are not satisfied with the search, you may either go back and change the search criteria, or go to [Health Gate](#) for free Medline search

39 documents might be available after first filter process. Please wait for further filtering and loading...

Thank you for your patience, search about CARDIOMEGALY will be shown below ...

<1> [Mineralocorticoids, salt, hypertension: effects on the heart. \[Review\] \[16 refs\]](#)

<2> [Congenital giant aneurysms of the left atrial appendage: diagnosis and management. \[Review\] \[17 refs\]](#)

<3> [Lipomatous hypertrophy of the atrial septum presenting as a right atrial mass.](#)

<4> [Heart disease in acromegaly.](#)

<5> [Aldosterone and heart failure. \[Review\] \[33 refs\]](#)

<6> [Neurohormonal modulation in heart failure: ACE inhibition and beyond. \[Review\] \[36 refs\]](#)

Would you like to see some pathology image of PULMONARY EDEMA?

submit

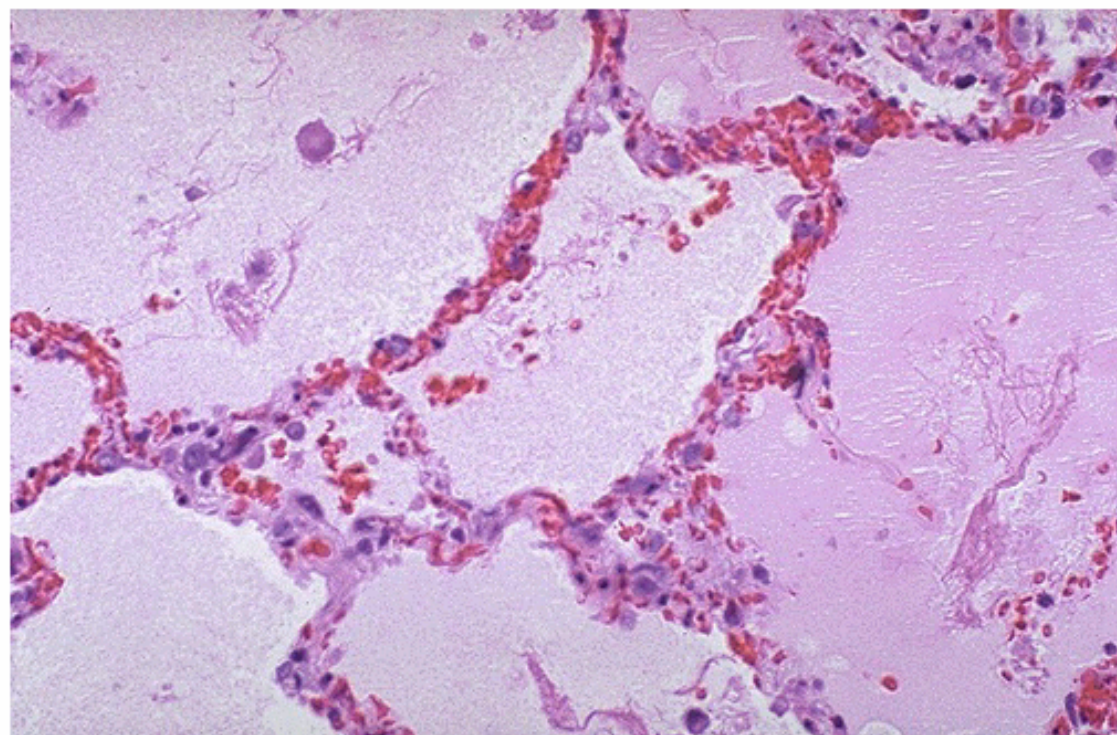
What's the pathology explanation of PULMONARY EDEMA?

submit

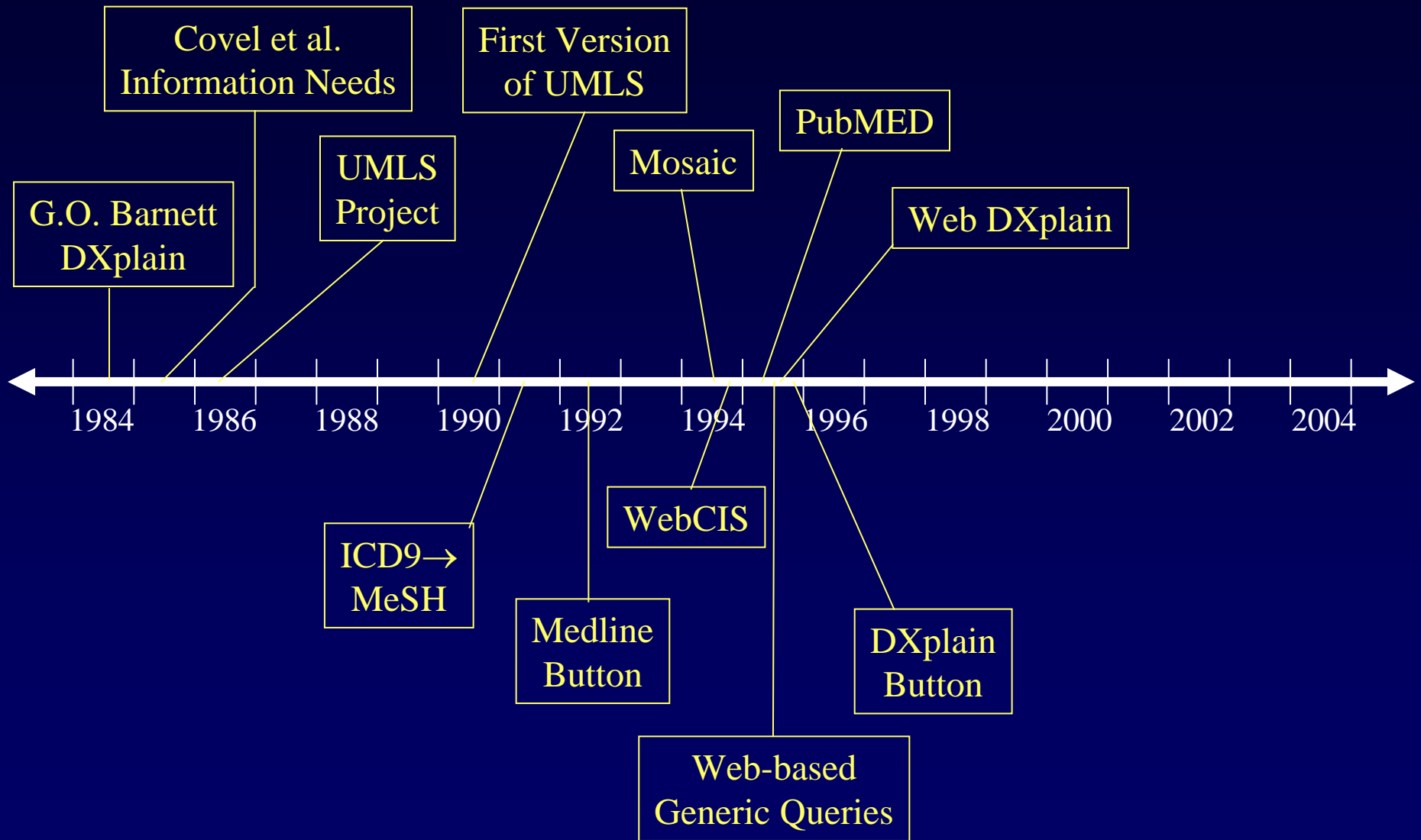
What's the differential diagnosis of PULMONARY EDEMA?

submit

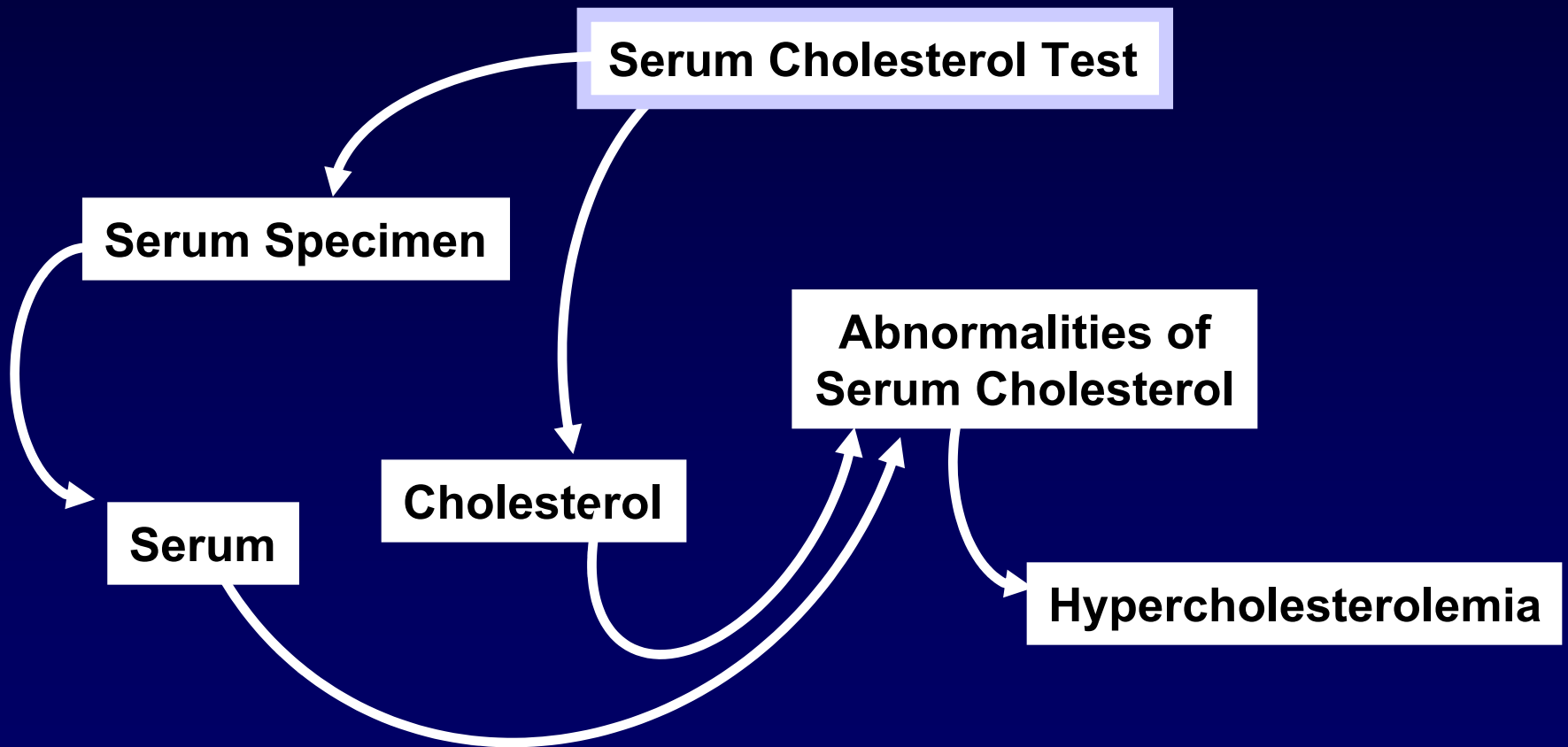
Pulmonary Pathology



At high magnification, the alveoli in this lung are filled with a smooth to slightly floccular pink material characteristic for pulmonary edema. Note also that the capillaries in the alveolar walls are congested with many red blood cells. Congestion and edema of the lungs is common in patients with heart failure and in areas of inflammation of the lung.



From Data to Findings



Guidelines

DXPLAIN

Differential Diagnosis

Lab test: 1996-02-29

SUMMARY

	NAME	VALUE		RANGE	UNITS	MEDLINE
1. <input type="radio"/>	NA	141		135-146	mM/l	MEDLINE
2. <input type="radio"/>	K	5.2		3.2-4.6	mM/l	MEDLINE
3. <input type="radio"/>	CL	109		96-108	mM/l	MEDLINE
4. <input type="radio"/>	CO2	26		23-29	mM/l	MEDLINE
5. <input type="radio"/>	BUN	26		6-19	mg/dl	MEDLINE

Below is the list of laboratory tests and findings ALREADY included in DXplain's search request:

- | | | |
|---|--|--|
| <input checked="" type="checkbox"/> ELDERLY (>65 YRS) | <input checked="" type="checkbox"/> MALE | |
| <input checked="" type="checkbox"/> Hyponatremia | <input checked="" type="checkbox"/> Hyperkalemia | <input checked="" type="checkbox"/> Hyperglycemia |
| <input checked="" type="checkbox"/> Creatinine, Elevated | <input checked="" type="checkbox"/> Hypocalcemia | <input checked="" type="checkbox"/> Hypoalbuminemia |
| <input checked="" type="checkbox"/> Serum Total Bilirubin Elevated | <input checked="" type="checkbox"/> Serum Conjugated Bilirubin Elevated | <input checked="" type="checkbox"/> Alkaline Phosphatase, Elevated |
| <input checked="" type="checkbox"/> Sgot (Ast), Elevated | <input checked="" type="checkbox"/> Sgpt (Alt), Elevated | <input checked="" type="checkbox"/> no Hyperchloremia |
| <input checked="" type="checkbox"/> no Hypochloremia | <input checked="" type="checkbox"/> no Bicarbonate, Increased | <input checked="" type="checkbox"/> no Bicarbonate, Decreased |
| <input checked="" type="checkbox"/> no Blood Urea Nitrogen Decreased | <input checked="" type="checkbox"/> no Blood Urea Nitrogen Elevated | <input checked="" type="checkbox"/> no Serum Phosphate Decreased |
| <input checked="" type="checkbox"/> no Serum Phosphate Elevated | <input checked="" type="checkbox"/> no Hypouricemia | <input checked="" type="checkbox"/> no Hyperuricemia |
| <input checked="" type="checkbox"/> no Serum Lactic Acid Dehydrogenase Elevated | <input checked="" type="checkbox"/> no Serum Creatine Phosphokinase Elevated | |

CHECK OUT the terms you don't want to include in the search.

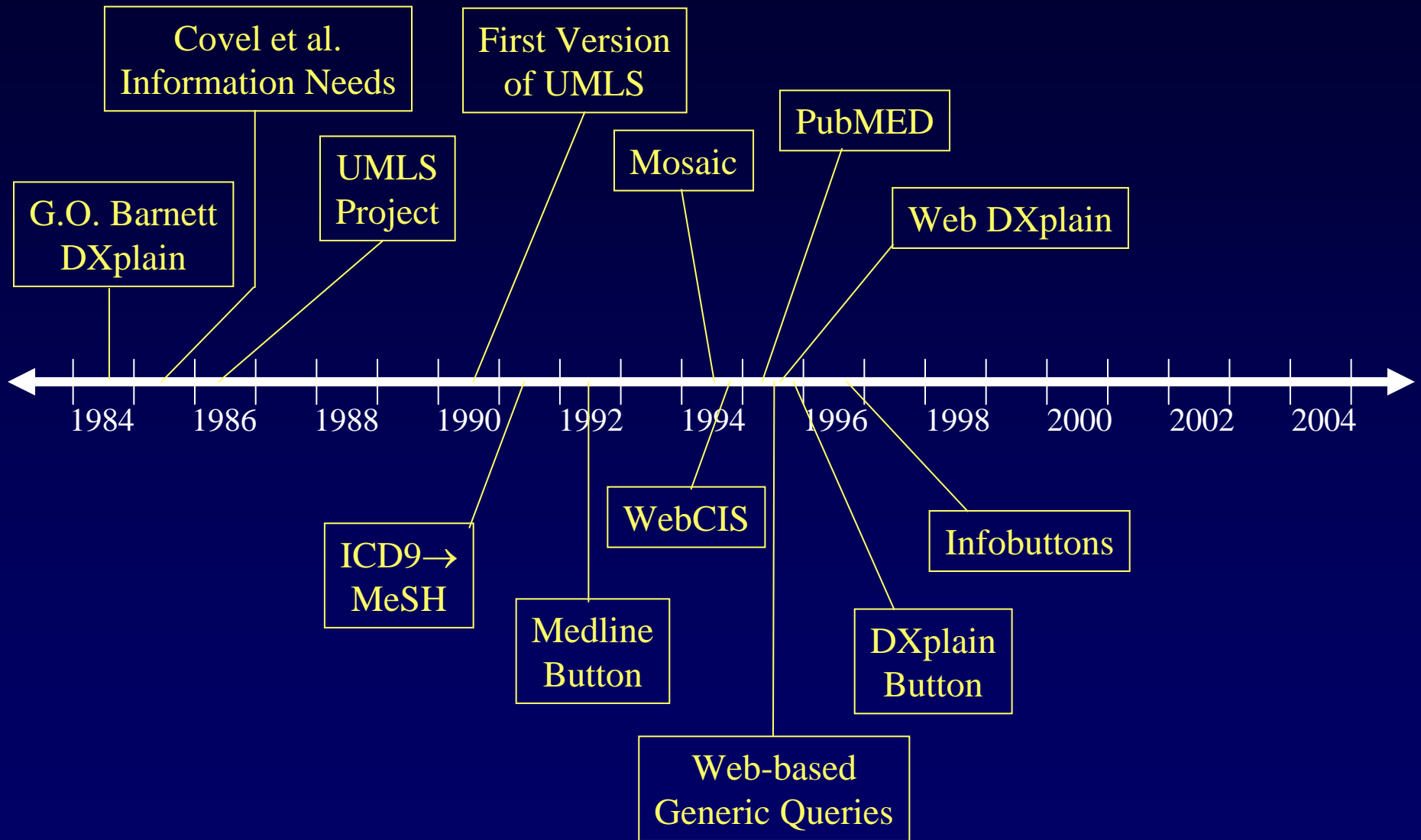
NOTE - the following labtests were NOT included in the request: CHOLESTEROL

If you wish to add terms to the search - Please type them into the following line (separated by ' + ' !!):

Free-text search string:

To see the text associated with each diagnosis hit the button on the left, when you are done hit [back]

DXplain's Diagnoses		
<input checked="" type="radio"/> Disease Information <input type="radio"/> Explain Disease		Interp.
1	ALCOHOLISM	+
2	DIABETES MELLITUS, NON-INSULIN DEPENDENT	+
3	MAGNESIUM DEFICIENCY SYNDROME	+
4	COLITIS, ULCERATIVE	+
5	NON-KETOTIC HYPEROSMOLAR COMA	+
6	RENAL CELL CARCINOMA	+
7	NEPHROTIC SYNDROME	
8	CHOLECYSTITIS, ACUTE	
9	ENTERITIS, REGIONAL (CROHNS DISEASE)	
10	HEART FAILURE, CONGESTIVE	
<input type="radio"/> Disease Information <input type="radio"/> Explain Disease		
11	SPRUE, TROPICAL	
12	POLYMYALGIA RHEUMATICA	
13	SCLERODERMA, RENAL DISEASE	
14	HYPOVOLEMIC SHOCK	
15	CELIAC DISEASE, ADULT	
16	KIDNEY, POLYCYSTIC DISEASE	
17	MALNUTRITION	
18	MYELOMA, MULTIPLE	
19	RECTUM, ADENOCARCINOMA	
20	GLOMERULONEPHRITIS, MEMBRANO PROLIFERATIVE	



[Logout](#)

[Lab Summary](#)

Lab Update

[12](#) | [36](#) | [72](#) hr

All results

Before date

[Laboratory](#) [May 08](#)

[Radiology](#) [Apr 13](#)

[Pathology](#) [Mar 29](#)

[Disch Sum](#) [1997](#)

[Op/Clinical](#) [1997](#)

[Neurophys](#) [1995](#)

[Ob/Gyn](#) [1997](#)

[GI Endo](#) [1995](#)

[Cardiology](#) [Mar 18](#)

[Pharmacy](#) [Mar 23](#)

[PFT](#) [1997](#)

Non-chart

[Alerts](#) [Apr 19](#)

[Signout](#) [Apr 22](#)

[Notes](#) [Apr 27](#)

[Refresh data](#)

Pharmacy · (1998-12-27 to 1994-05-05) · [Newer](#) · [Older](#)

UD TYLENOL 325 MG TAB	1998-12-27 10:00	D	i
ACETAMINOPHEN 120 MG SUPP	1997-06-27 00:00	D	i
ACETAMINOPHEN 120 MG SUPP	1997-06-24 00:00	D	i
ACETAMINOPHEN 120 MG SUPP	1997-06-24 00:00	D	i
UD PRILOSEC 20 MG CAP	1997-04-17 10:00	C	i
UD PRILOSEC 20 MG CAP	1997-04-17 10:00	C	i
DEXAMETHASONE 0.5 MG/5 ML ELIX	1996-08-30 00:00	D	i


UD PRILOSEC 20 MG CAP

Date	1997-04-17 10:00
Status	C
Route	PO
Dose	20.000000 MG
Drug Strength	20.000000 MG
Final Concentration	20.000000 MG
Effective Time	1997-04-16 00:00
Patient Name	SANDIEGO, CARMEN

MDX options menu - Netscape

Back Forward Reload Home Search Netscape Print Security Stop

Micromedex Health-Care Series (HCS)



Search with Trade-name:

- [PRIOSEC](#)

Search by drug component:

- [Omeprazole](#)

MEDLINE (Last 2 Years)

Omeprazole

- [Adverse effects](#)
- [Toxicity](#)
- [Therapy](#)

Notes Apr 27

Document: Done

Health Care Series Vol. 100 - (C)Micromedex Inc. 1999 - Netscape

Back Forward Reload Home Search Netscape Print Security Stop

Help Main Search Search Results

DrugPoints™ System

OMEPRAZOLE

- **Common Tradenames** (*See Complete Tradename Listing*)
 - PRILOSEC
- **Class**
 - antiulcer, proton pump inhibitor
- **Dosage, Adult (usual)**
 - gastric/duodenal ulcer 20mg/day for 4-8 weeks
 - hypersecretory conditions 60mg QD, up to 120mg TID
 - H pylori 20mg BID or 40mg QD
- **Dosage, Pediatric, (usual)**
 - limited data; dosage ranges reported: 0.3-3.3mg/kg/day
- **Administration**
 - give before meals
- **How Supplied**
 - 10 MG, 20 MG DELAYED-RELEASE CAPSULE
- **Indications**
 - GERD
 - gastric/duodenal ulcer
 - pathological hypersecretory conditions
 - severe erosive esophagitis
 - adjunct to H pylori disease
- **Contraindications**
 - hypersensitivity to omeprazole products


Notes Apr 27

Document: Done

MDX options menu - Netscape

Back Forward Reload Home Search Netscape Print Security Stop

Micromedex Health-Care Series (HCS)



Search with Trade-name:

- [PRIOSEC](#)

Search by drug component:

- [Omeprazole](#)

MEDLINE (Last 2 Years)

Omeprazole

- [Adverse effects](#)
- [Toxicity](#)
- [Therapy](#)

Notes Apr 27

Document: Done

PubMed medline query - Netscape

Back Forward Reload Home Search Netscape Print Security Stop

NCBI PubMed PubMed QUERY PubMed ?

(past 2 Years only)

Details Search Clear

Docs Per Page: Entrez Date limit:

citations 1-20 displayed (out of 174 found), page 1 of 9

Display for the articles selected (default all).

Order documents on this page through Loansome Doc

- [Jacobson SH, et al](#) [\[See Related Articles\]](#)
[Losec was probably the cause of interstitial nephritis].
Lakartidningen. 1999 Apr 7;96(14):1717-8. Swedish. No abstract available.
PMID: 10222687; UI: 99239193.
- [Freeman HJ](#) [\[See Related Articles\]](#)
Therapy for ulcers and erosions associated with nonsteroidal anti-inflammatory drugs.
Can J Gastroenterol. 1998 Nov-Dec;12(8):537-9. Review. No abstract available.
PMID: 10206732; UI: 99217414.
- [Romero-Gomez M. et al](#) [\[See Related Articles\]](#)

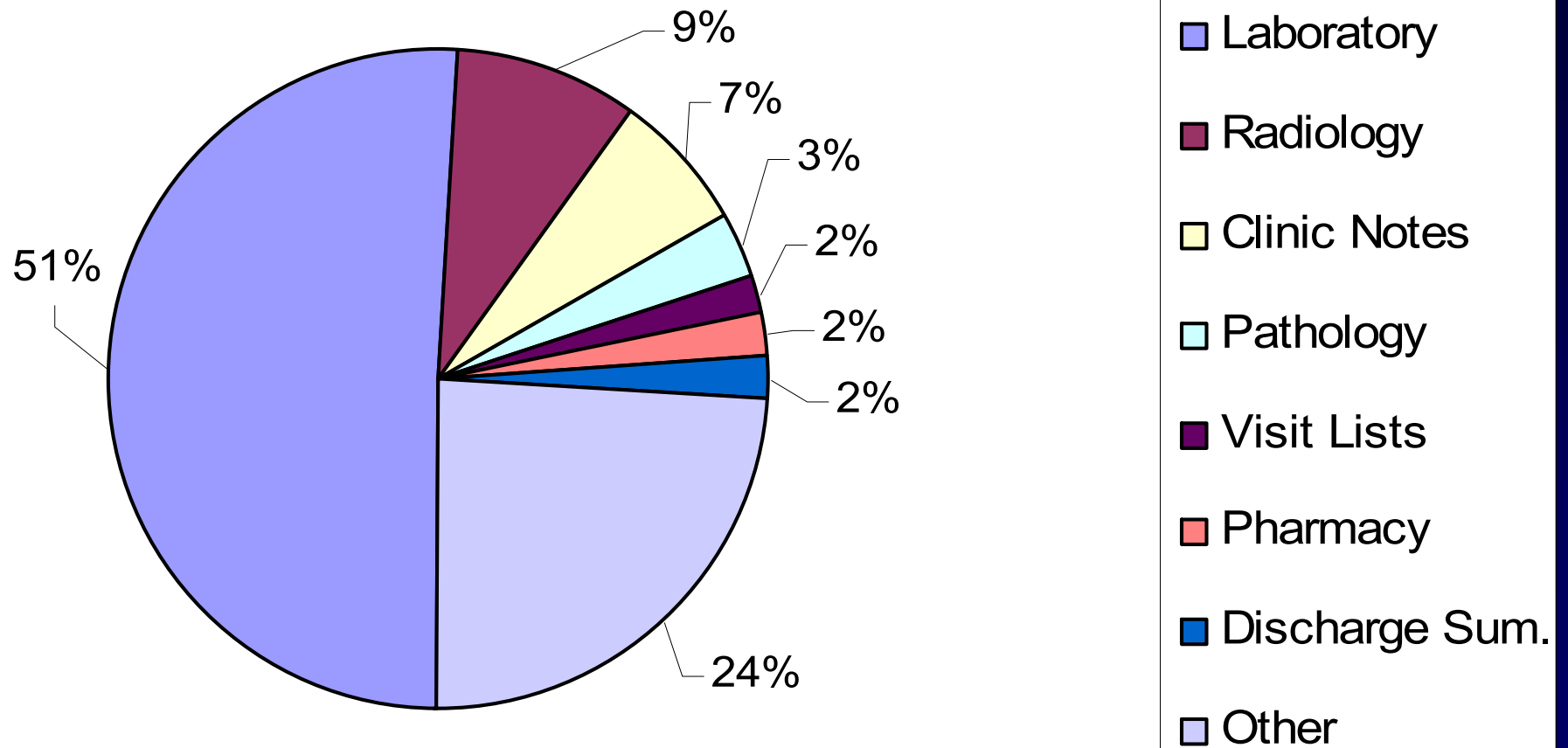
Notes Apr 27

Document: Done

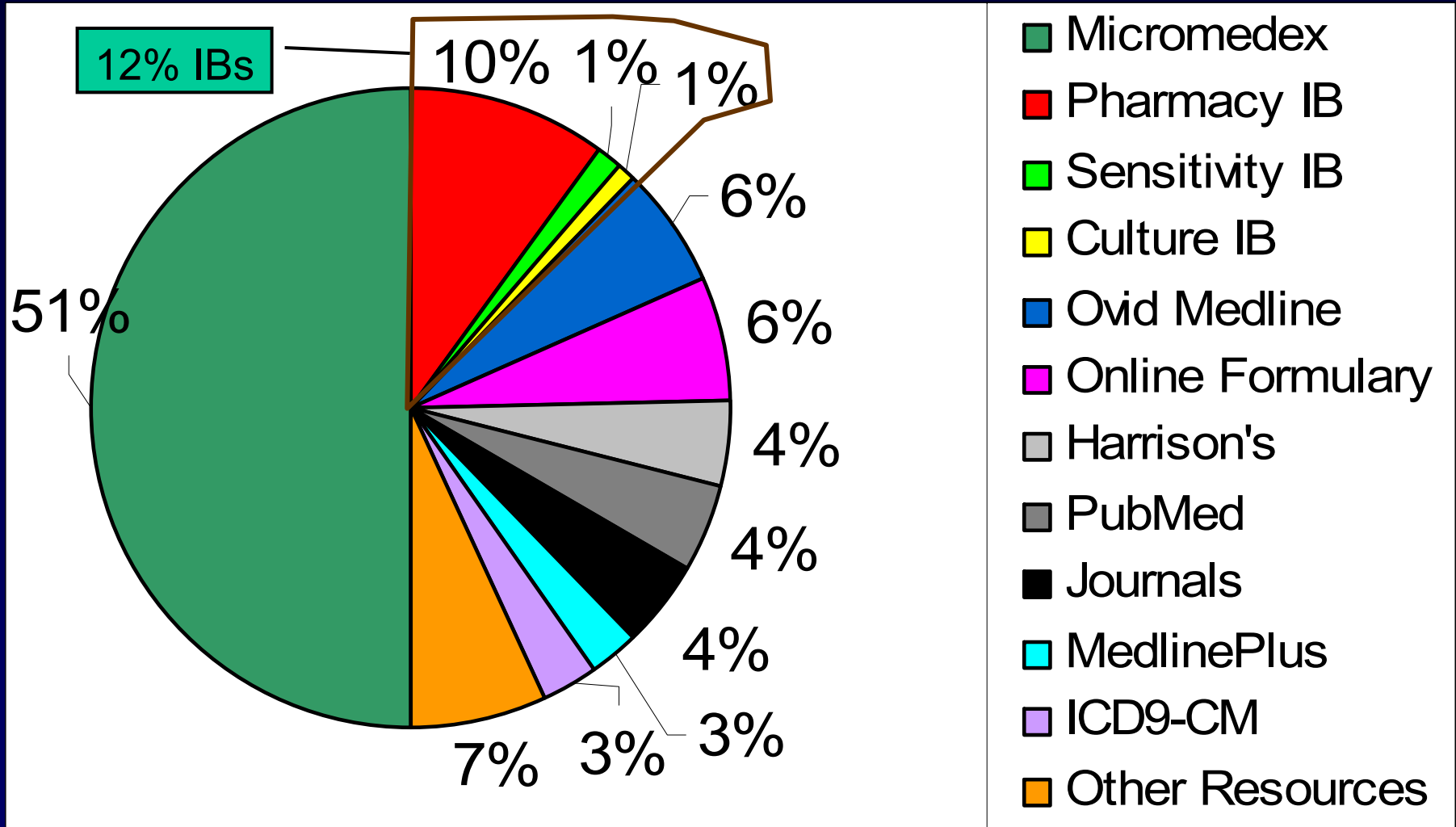
Infobutton Use vs. Other Resources

- Six months of log files
- 38,763 health resources
 - 14,036 anonymous health resources
 - 19,913 health resources from WebCIS
 - 4,814 infobuttons
- 2,607 users
 - 51% resident physicians
 - 34% attending physicians
 - 5% nurses
 - 10% other (pharmacists, administrators, etc.)

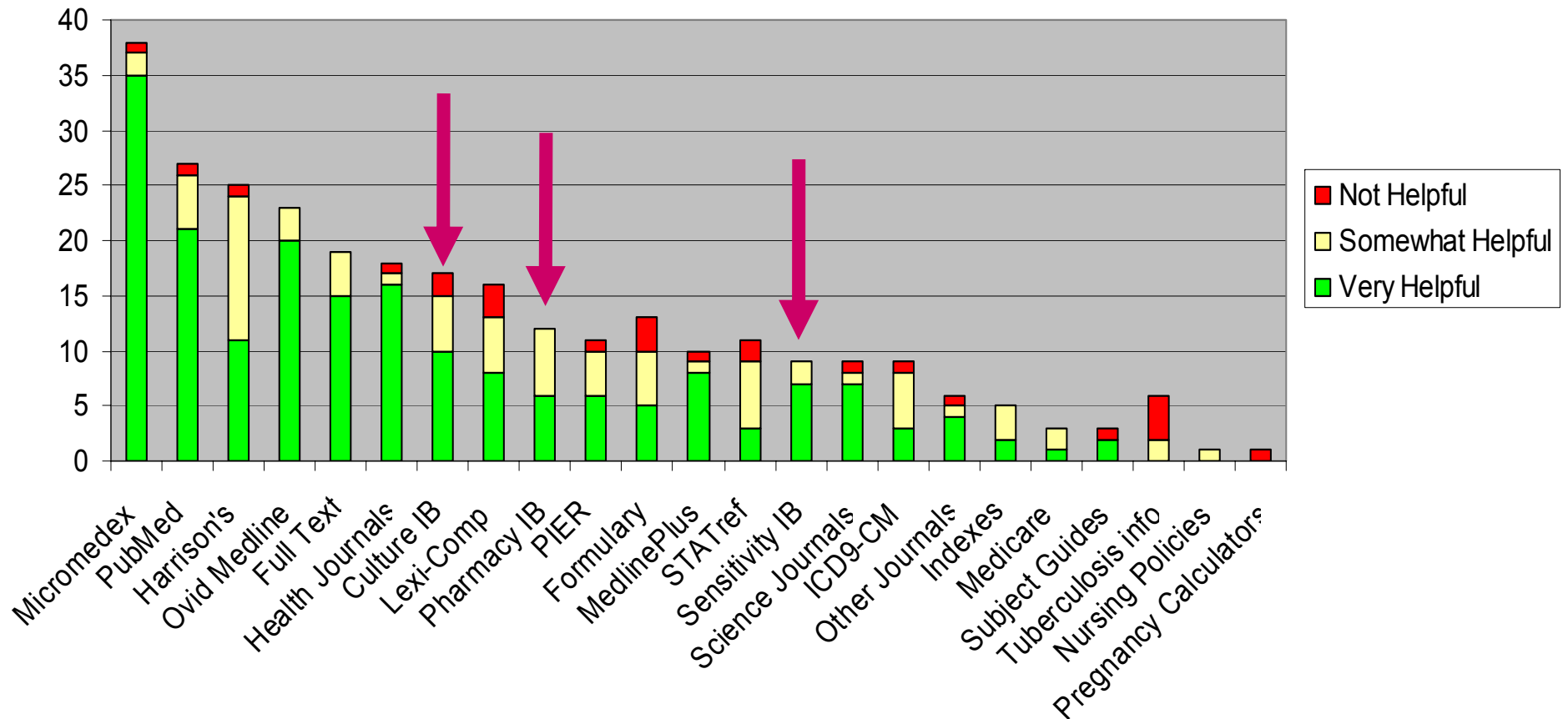
Information Use Contexts



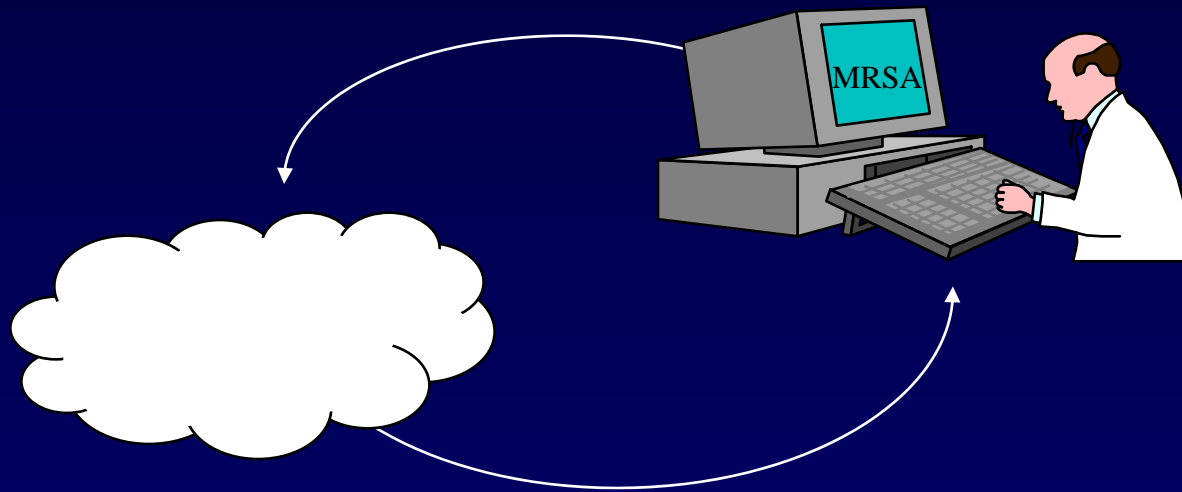
Information Resource Usage



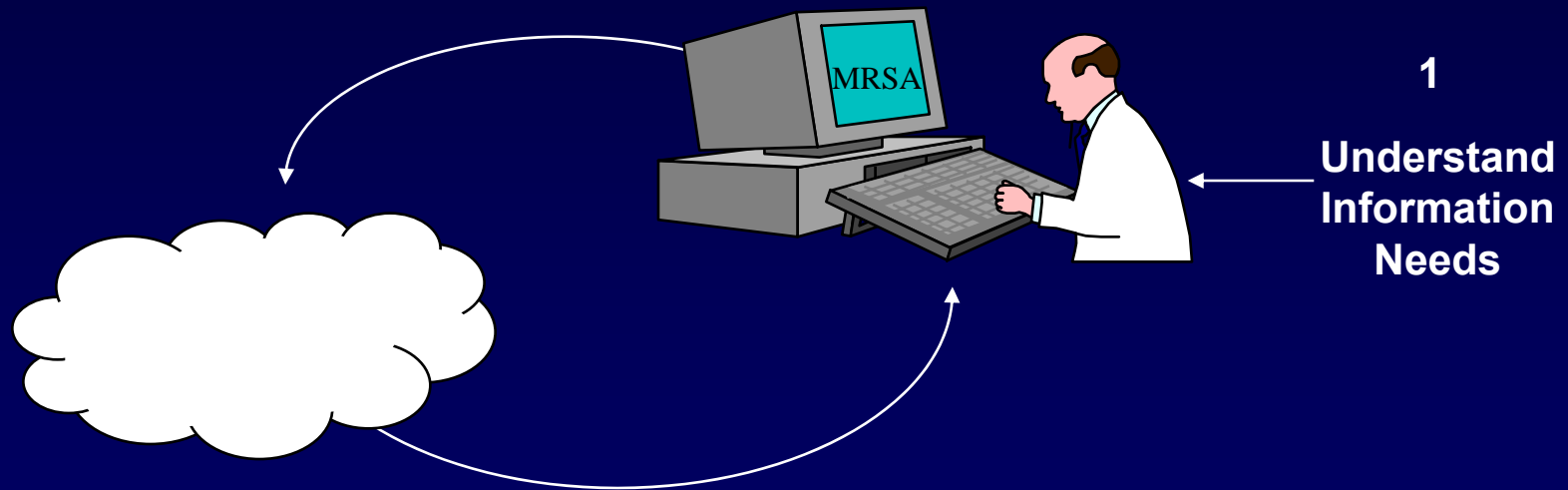
What resources do they like?



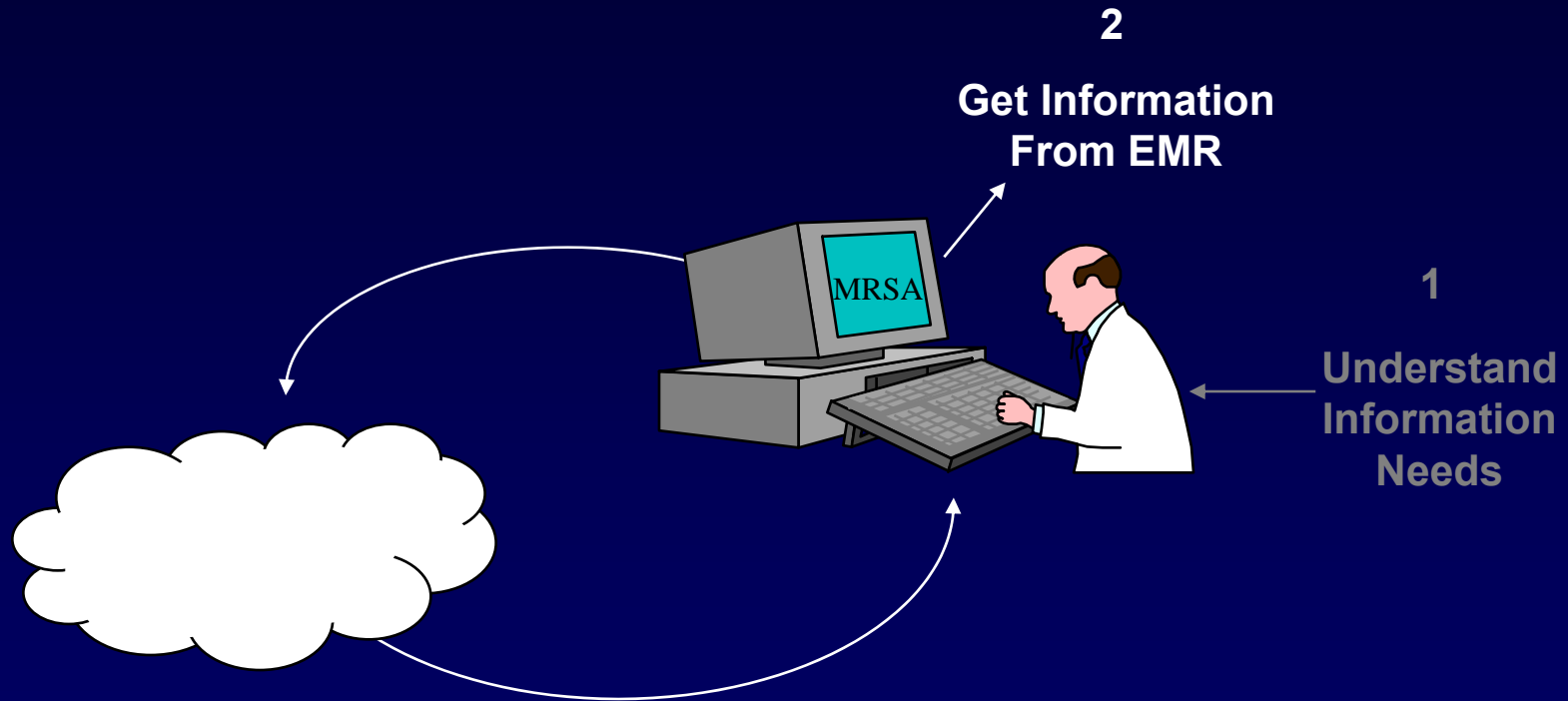
Education at the Moment of Need



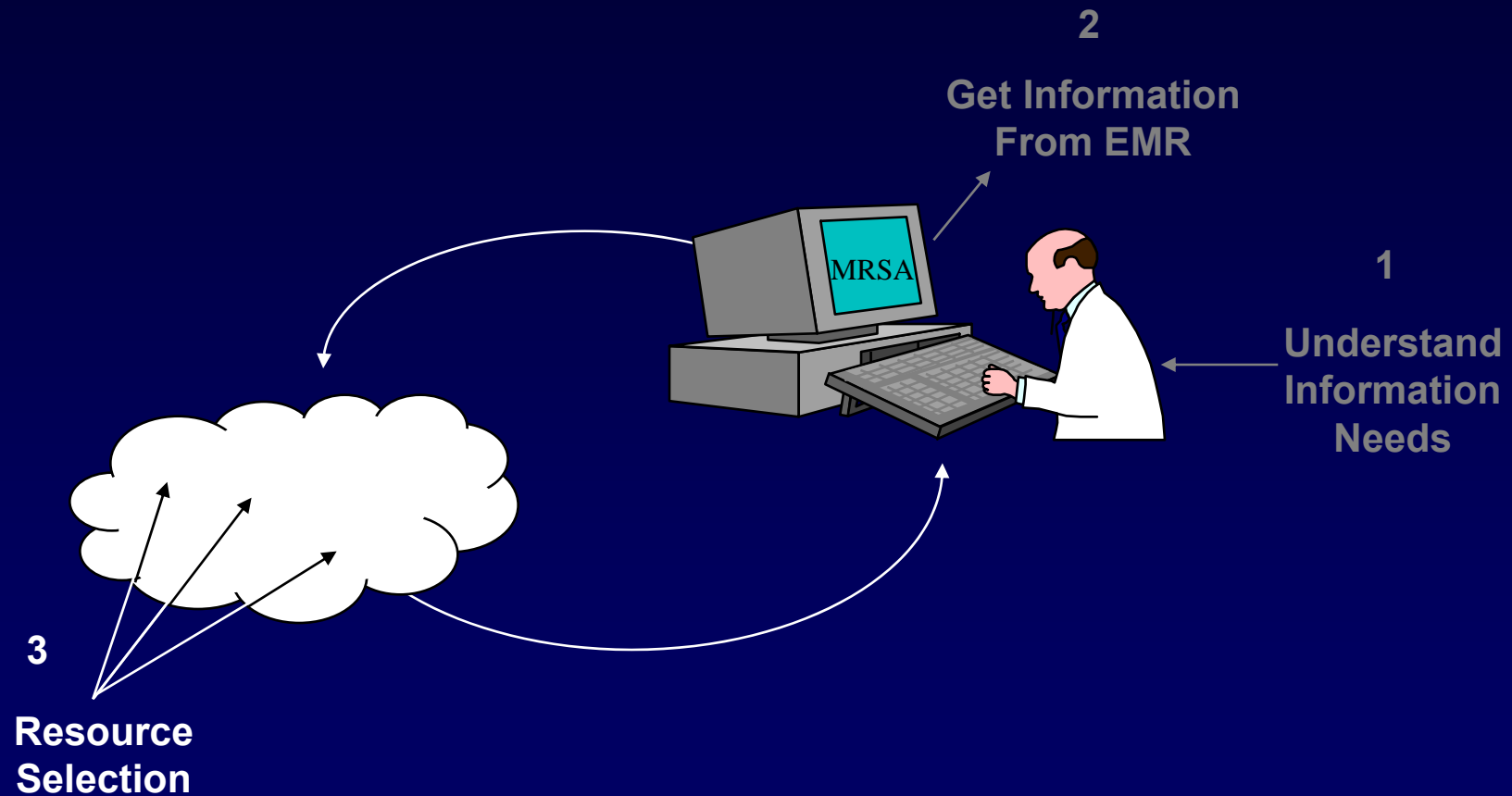
Education at the Moment of Need



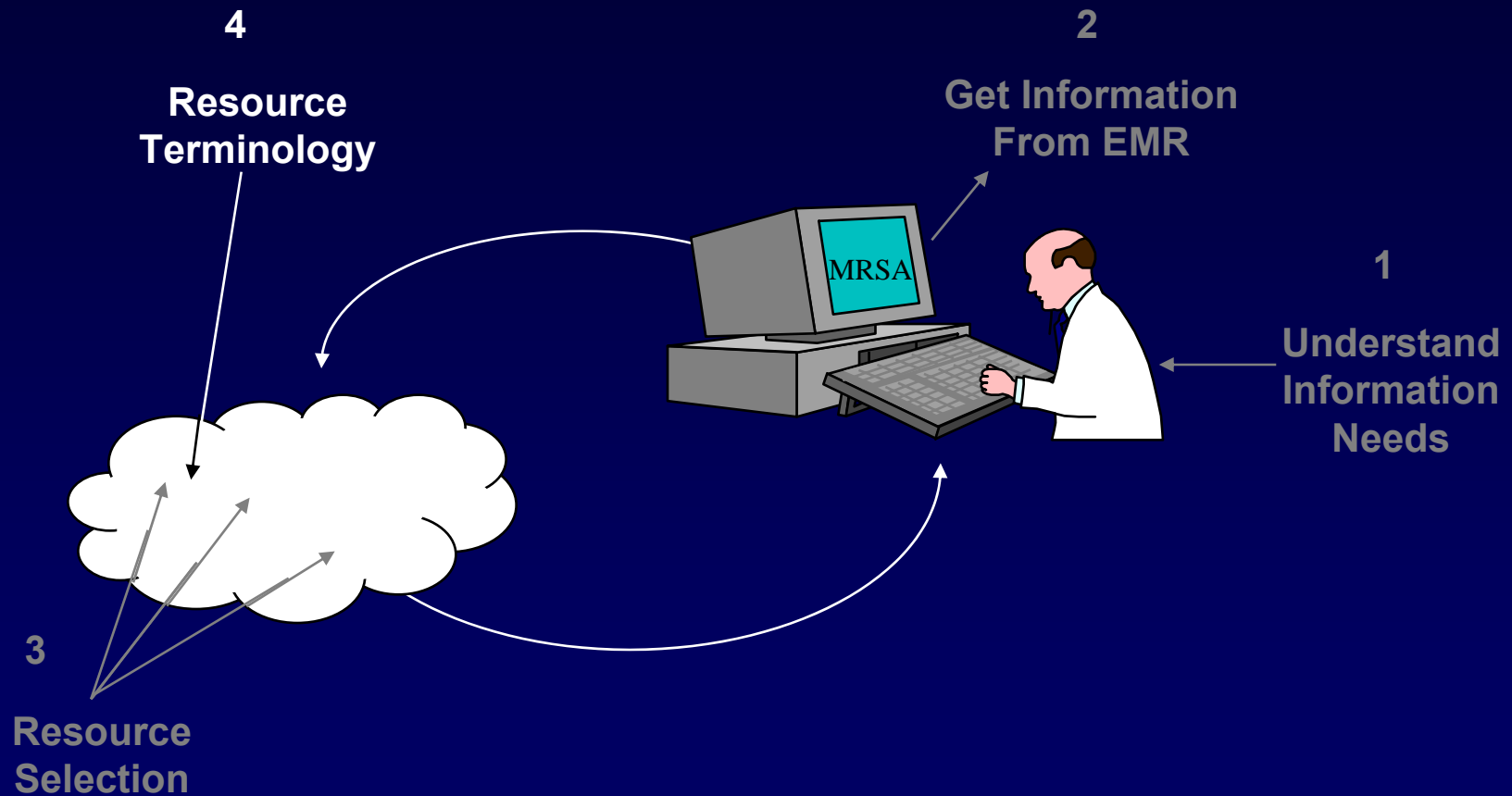
Education at the Moment of Need



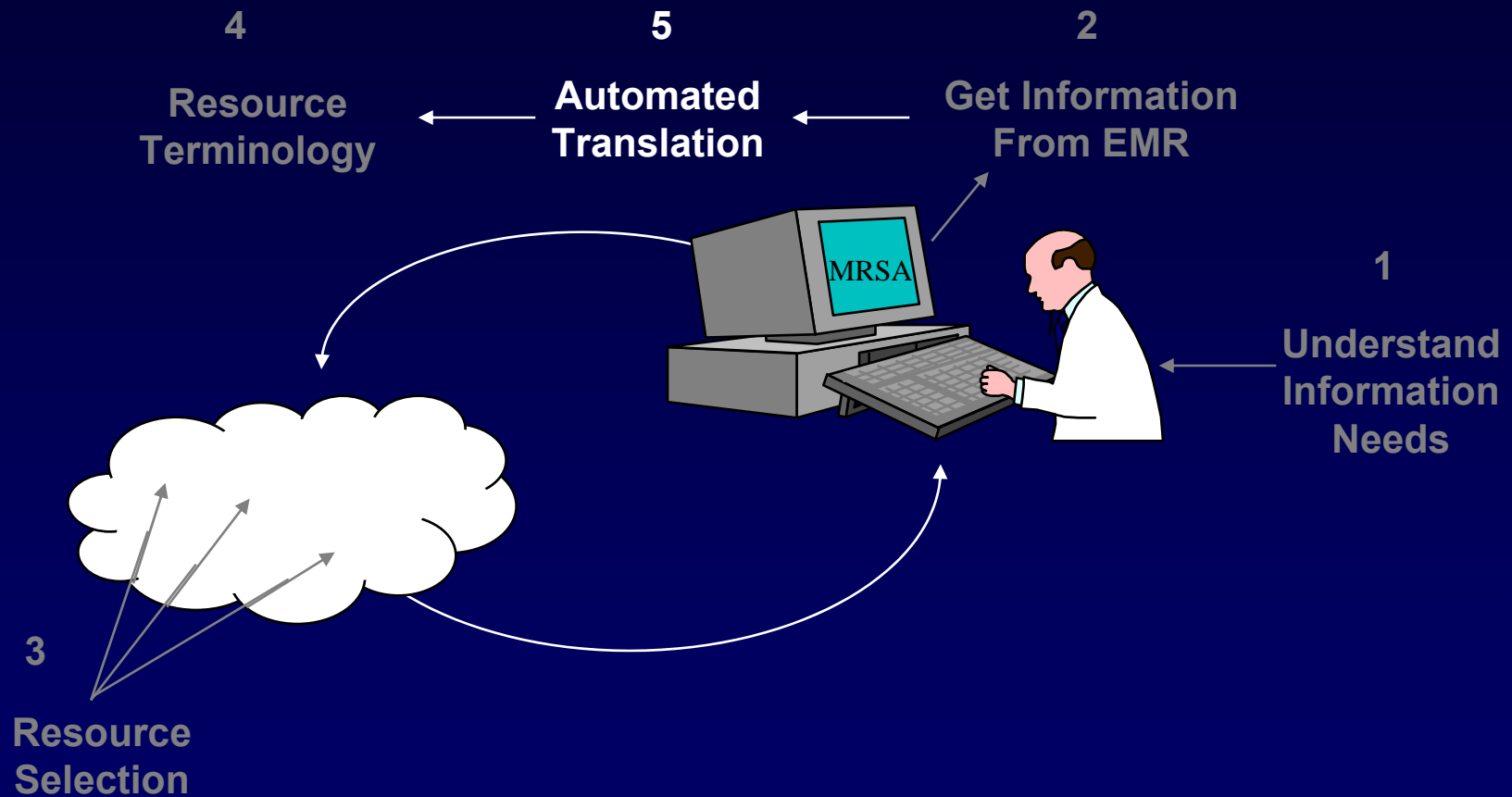
Education at the Moment of Need



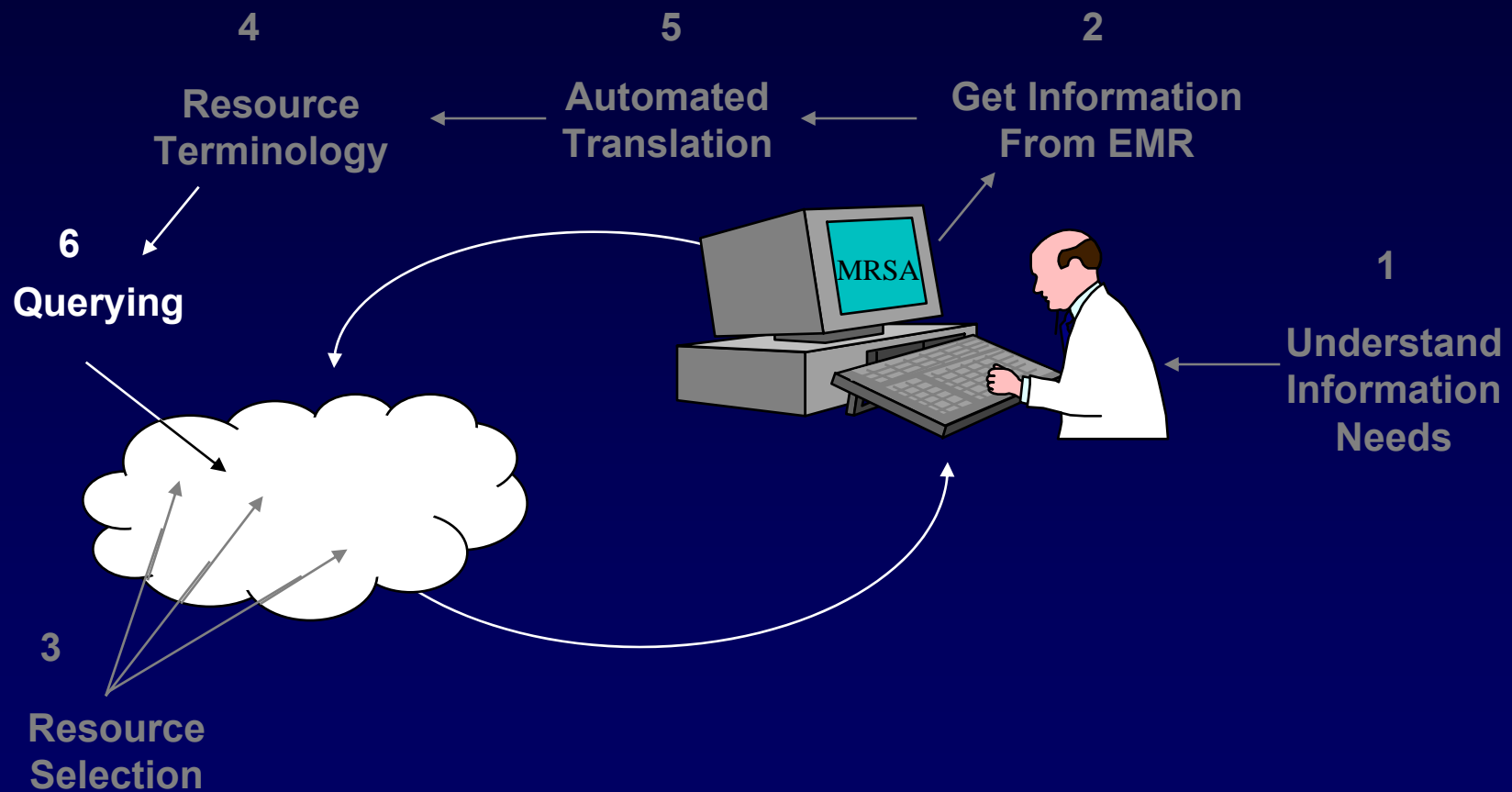
Education at the Moment of Need



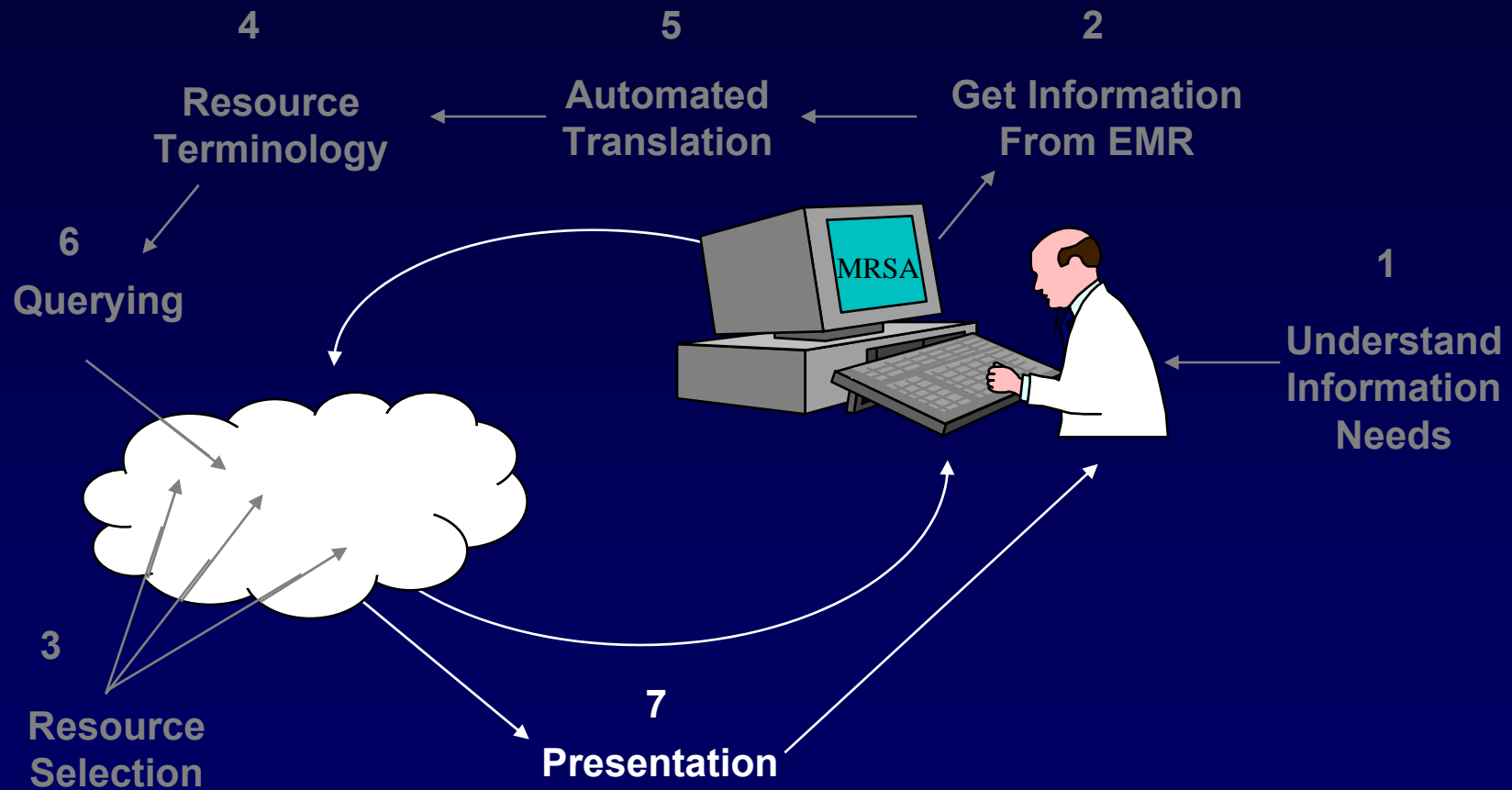
Education at the Moment of Need



Education at the Moment of Need

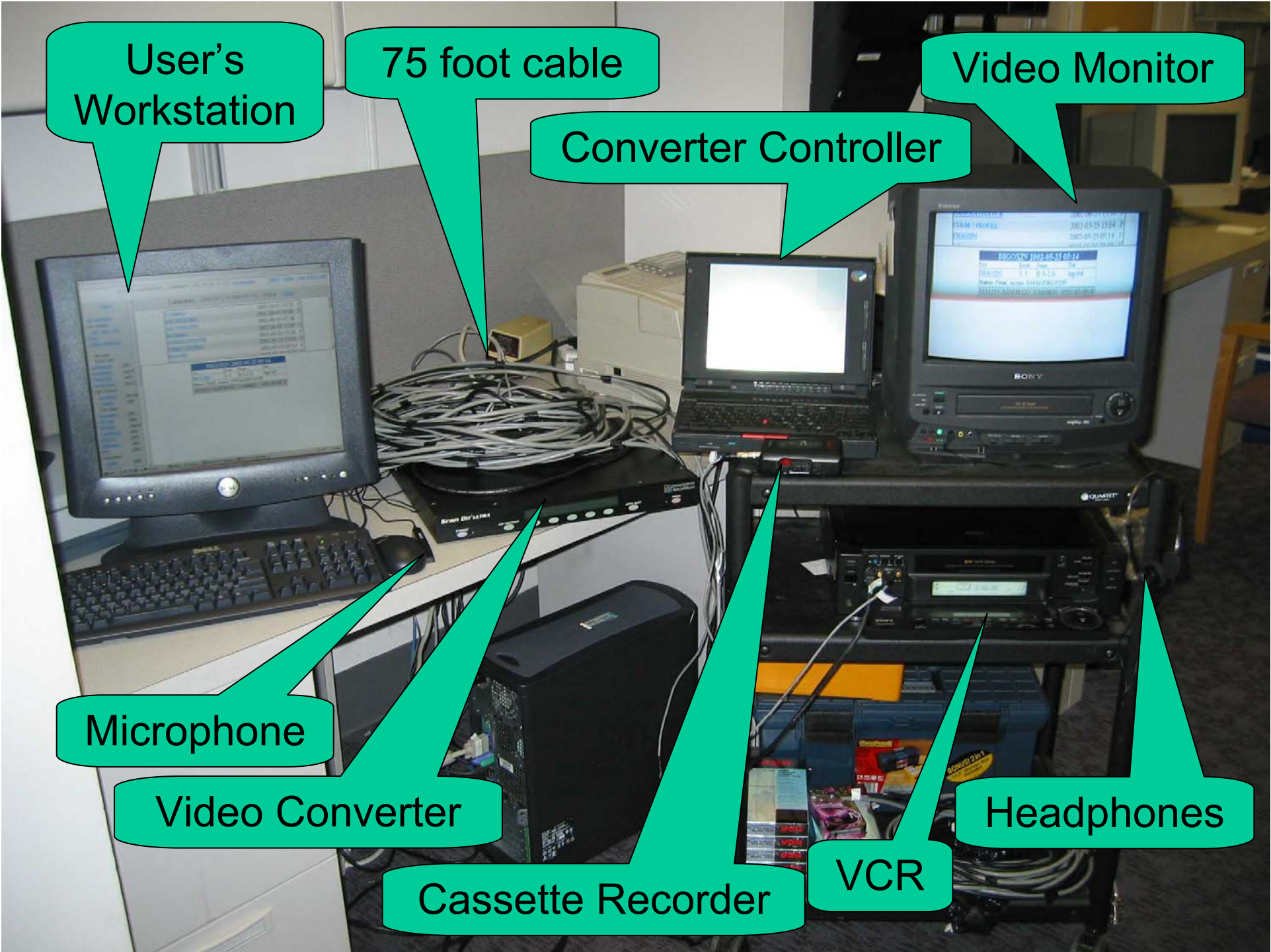


Education at the Moment of Need



Research Issues

- What are the information needs?



User's Workstation

75 foot cable

Video Monitor

Converter Controller

Microphone

Video Converter

Cassette Recorder

VCR

Headphones

111111 SANDIEGO, CARMEN - 1951-05-26 - F - (1-1) (No attached) MRN: 7006 - List - Adm Dis

Laboratory (2003-10-12 to 2001-07-02) - Newest - Older

Est Habits	2003-10-12 14:26	F
ABC WITH DIF	2002-08-05 09:08	F
ABC WITH DIF	2002-08-05 07:38	C
Est Habits	2002-06-28 12:09	F
HAEMAS DNA PCR	2002-06-24 15:34	F
CHEM 7 PROFILE	2002-05-25 13:04	P
DIGOXIN	2002-05-25 05:14	F

DIGOXIN 2002-05-25 05:14

Time	Result	Range	Unit
08:00:00	1.5	0.5-2.0	ng/ml

Status: Final, Access: 359164000.023P
111111 SANDIEGO, CARMEN - 1951-05-26 - F



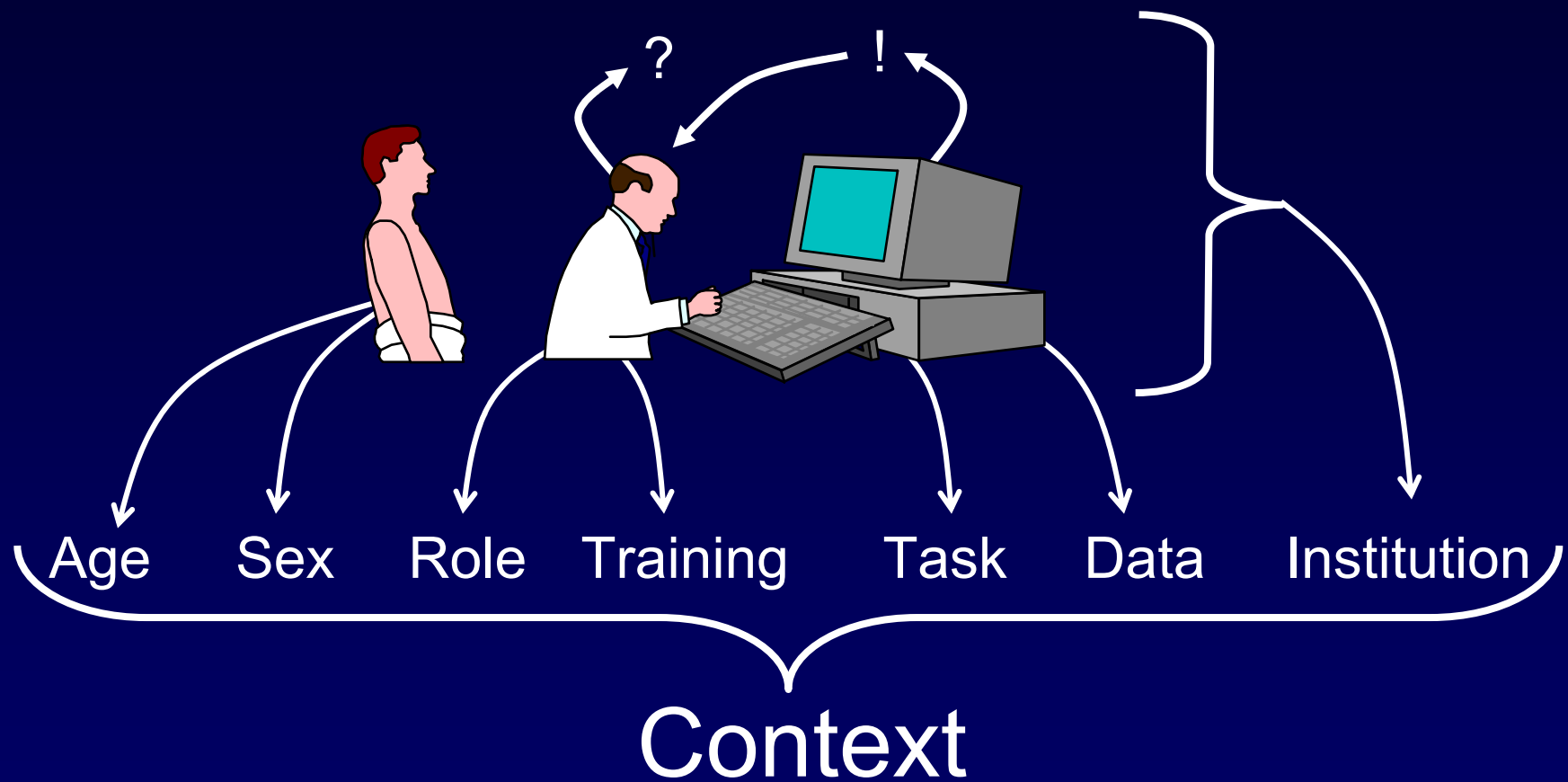
What are the Information Needs?

- Observations:
 - Four days, three sites, 159 minutes of videotape
 - 154 information needs
- 1/3 information about the patient
 - Abdominal CT was abnormal, what are LFTs?
- 1/3 institutional information
 - What specimen do I collect for this test?
- 1/3 health information
 - What does this pill look like?
 - What are the patient instructions?
- Computers used 50% of the time
- 81/154 needs not satisfied

Research Issues

- What are the information needs?
- Which context information is important?

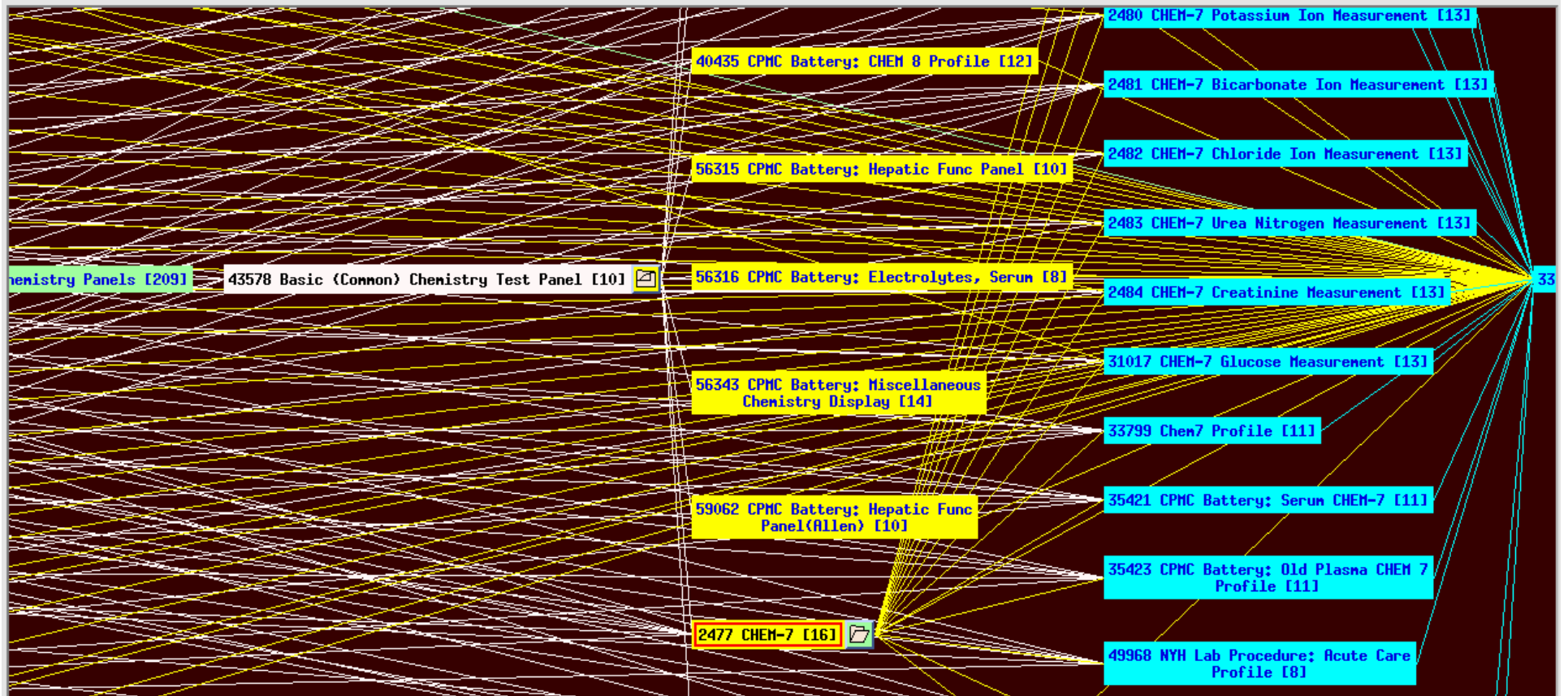
Context-Dependent Information Needs



Research Issues

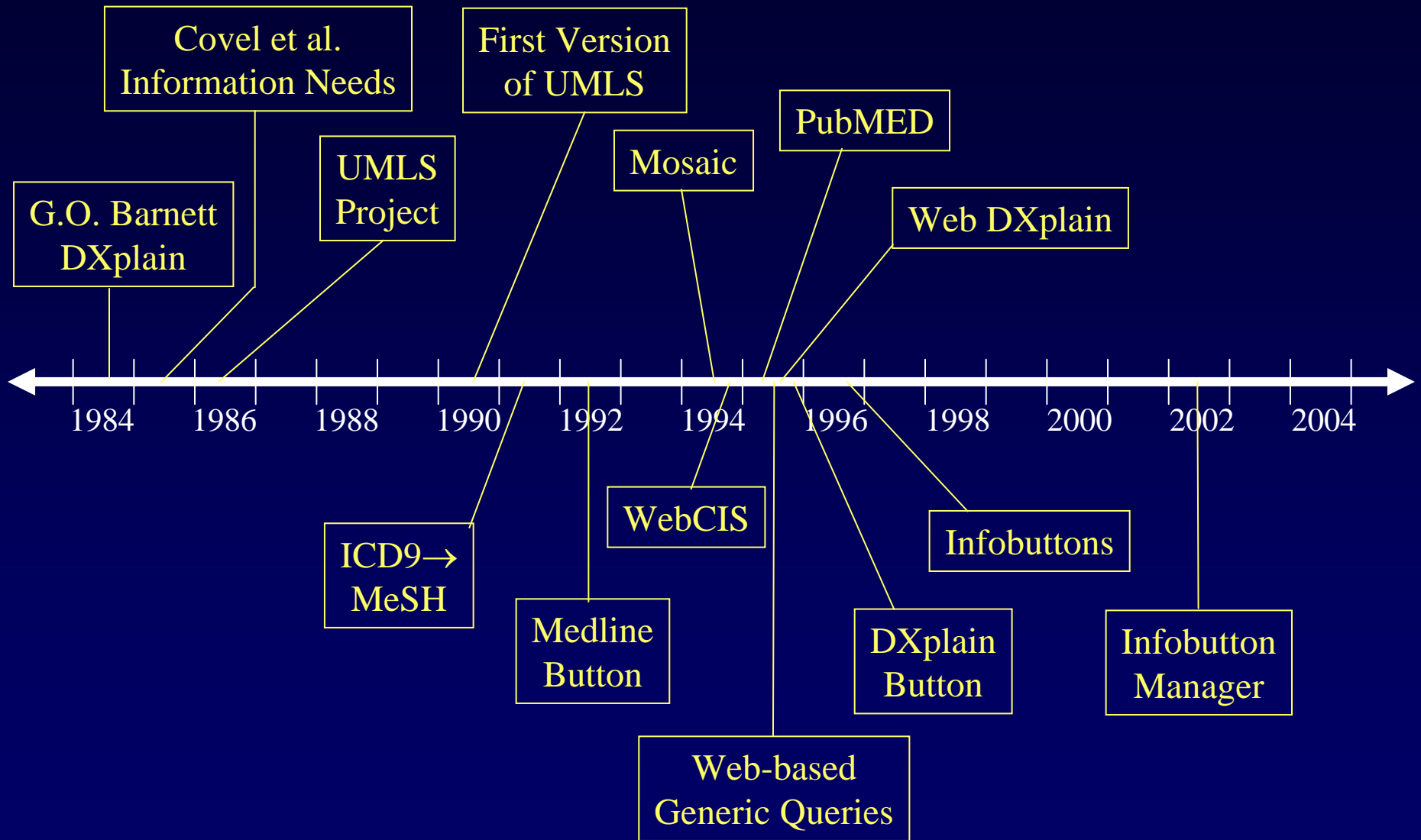
- What are the information needs?
- Which context information is important?
- What resources can satisfy needs?
- How can retrieval be automated?
 - What context data are used?
 - How are the data translated?

The Medical Entities Dictionary (MED)

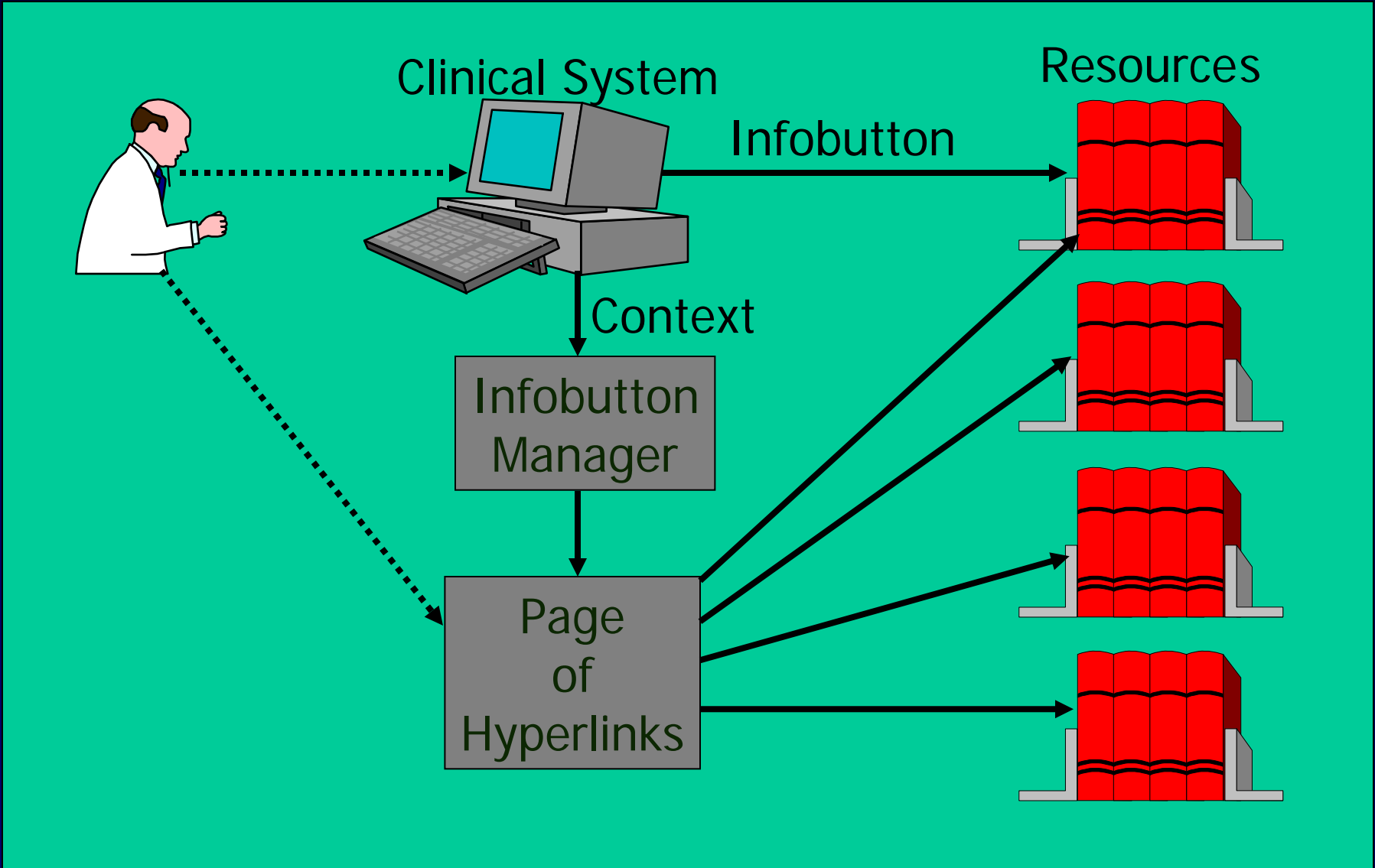


Research Issues

- What are the information needs?
- Which context information is important?
- What resources can satisfy needs?
- How can retrieval be automated?
 - What context data are used?
 - How are the data translated?
 - How are the data transmitted?



Infobuttons vs. Infobutton Manager



Heuristic Evaluation

- Expert evaluation
- Used to identify potential problems
- Principled system analysis
- Problems ranked by severity
- Evaluation with limited heuristic set
- Paper-based evaluation

Evaluation Methodology

Heuristic	Reviewer 1	Reviewer 2	Reviewer 3
1. Consistency	√	√	√
2. Visibility			
3. Match	√	√	√
4. Minimalist	√	√	√
5. Memory	√	√	√
6. Feedback			
7. Flexibility and Efficiency			
8. Error Message			
9. Prevent Errors			√
10. Closure		√	
11. Reversible Actions		√	
12. Language	√	√	√
13. Control		√	
14. Document		√	

Definitions

Heuristic	
Consistency	The users should not have to wonder whether different words, situations or actions mean the same thing
Match	The image of the system perceived by the users should match the model the users have about the system
Minimalist	This involves judging whether any extraneous information is a distraction and a slow-down
Memory	Users should not have to memorize a lot of information to carry out tasks.
Language	The language should be presented in a form, easily understandable by the intended user.

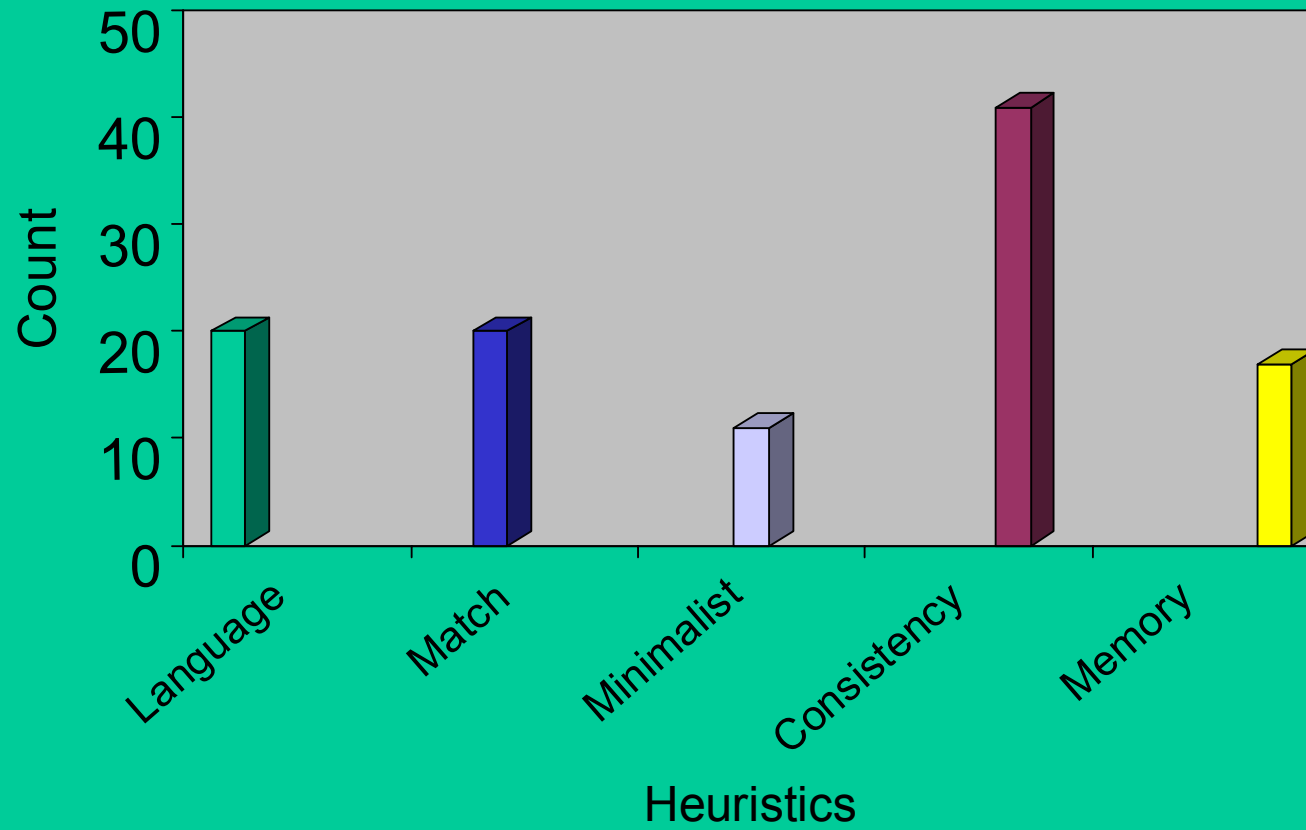
Paper-based Evaluation

- Evaluators given narrative of a scenario
- Screen shots of scenario included
- Heuristics applied to screen shots

Results

- 18 screen shots
- 4 evaluators
 - clinical
 - sociology
- 108 comments on design and layout

Frequency of Usability Problems



WebCIS - 3131313 (user: ciminoj) - Netscape

File Edit View Go Communicator Help

Back Forward Reload Home Search Netscape Print Security Shop Stop

Bookmarks Netsite: https://flux.cpmc.columbia.edu/webcisdev13/wc_wwwcis.cgi

3131313 SANDIEGO, CARMEN 1951-05-26 F (-) (CIMINO, JAMES J) MRN Name List Add to list

Logout

Lab summary
Lab update
12h | 36h | 72h | Days
Admin summary

All results
Before date

Laboratory Oct
Radiology 2002
Pathology Apr 04
Disch Sum 2002
Op/Clinical
Operative May 19
Consult 1997
Clin Sum
Neurophys 1995
Ob/Gyn 2000
GI Endo 2002
Cardiology Feb 24

Laboratory (2003-10-12 to 2001-07-07)

LH
FSH
DIGOXIN
ABC
BASIC METABOLIC PANEL 2002-05-25 02:46 F
MEASLES_IGG 2002-05-10 14:59 C
CHOLESTERYL ESTERS 2002-05-10 14:59 C
C1 ESTERASE INHIBITOR_PLASMA 2002-04-05 11:18 F

FSH 2002-05-25 03:52

Test	Result	Range	Unit	Info
FSH	22.0		mIU/ml	
FSH	NOTIFIED DR HEMBREE ON 5/25@03:27AM			
FSH				
FSH	FSH REFERENCE RANGE:			
FSH	PRE-PUBERTY: <5.0 mIU/ml			
FSH	POST-PUBERTY: <15.0 mIU/ml			
FSH	POST-MENOPAUSAL: >20.0 mIU/ml			
FSH	MODIFIED RESULT 05/25 AT 0400: ,PREVIOUSLY REPORTED AS:			
FSH	20.0			
FSH	FSH REFERENCE RANGE: PRE PUBERTY: <5.0 mIU/ml POST			
FSH	PUBERTY: <15.0 mIU/ml POST MENOPAUSAL: >20.0			
FSH	mIU/ml			

Status: Final, Accno: S59200FSH 025P

Heuristics:
-Match
-Minimalist

FSH 2002-05-25 03:52

Test	Result	Range	Unit	Info
FSH	22.0		mIU/ml	
FSH	NOTIFIED DR HEMBREE ON 5/25@03:27AM			
FSH				
FSH	FSH REFERENCE RANGE:			
FSH	PRE-PUBERTY: <5.0 mIU/ml			
FSH	POST-PUBERTY: <15.0 mIU/ml			
FSH	POST-MENOPAUSAL: >20.0 mIU/ml			
FSH	MODIFIED RESULT 05/25 AT 0400: ,PREVIOUSLY REPORTED AS:			
FSH	20.0			
FSH	FSH REFERENCE RANGE: PRE PUBERTY: <5.0 mIU/ml POST			
FSH	PUBERTY: <15.0 mIU/ml POST MENOPAUSAL: >20.0			
FSH	mIU/ml			

Status: Final, Accno: S59200FSH 025P



3131313 • SANDIEGO, CARMEN • 1951-05-26 • 52y F • (-) • (No attending)

[MRN](#) • [Name](#) • [List](#) • [Add to list](#)

[Logout](#)

[Lab summary](#)

Lab update

[12h](#) | [36h](#) | [72h](#) | [Days](#)

[Admin summary](#)

All results

Before date

[Laboratory](#) Feb 12

[Radiology](#) Nov 12

[Pathology](#) Nov 14

[Disch Sum](#) 2002

Op/Clinical

[Operative](#) Oct 30

[Consult](#) 1997

Clin Sum

[Neurophys](#) 1995

[Ob/Gyn](#) Nov 17

[GI Endo](#) 2002

[Cardiology](#) 2003

[HEENT](#) 1997

[Pharmacy](#) 2001

[PFT](#) Nov 18

Non-chart

[Alerts](#) Oct 20

[Signout](#) Jan 26

[Notes](#) Feb 24

[DOP notes](#) 1999

[Self Rep Lab](#) Nov 16

[Self Rep VS](#) Nov 08

[Refresh dates](#)

[Sensitive](#)

Laboratory • (2004-02-12 to 2002-02-01) • [Newer](#) • [Older](#)

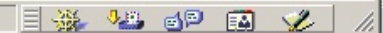
Ext Hgbalc	2002-12-06 00:00	F
ABC WITH DIFF	2002-08-05 09:08	F
ABC WITH DIFF	2002-08-05 07:38	C
Ext Hgbalc	2002-06-28 12:09	F
BABESIA DNA PCR	2002-06-24 15:34	F
CHEM 7 PROFILE	2002-05-25 13:04	P
DIGOXIN	2002-05-25 05:14	F
LH	2002-05-25 03:52	F
FSH	2002-05-25 03:52	F
DIGOXIN	2002-05-25 03:52	F
LH	2002-05-25 03:52	F

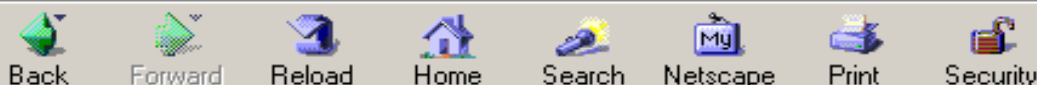
FSH 2002-05-25 03:52

Test	Result	Range	Unit
FSH	22.0		mIU/ml
	NOTIFIED DR HEMBREE ON 5/25@03:27AM		
	FSH REFERENCE RANGE:		
	PRE-PUBERTY: <5.0 mIU/ml		
	POST-PUBERTY: <15.0 mIU/ml		
	POST-MENOPAUSAL: >20.0 mIU/ml		
	MODIFIED RESULT 05/25 AT 0400: ,PREVIOUSLY REPORTED AS: 20.0		
	FSH REFERENCE RANGE: PRE PUBERTY: <5.0 mIU/ml POST		
	PUBERTY: <15.0 mIU/ml POST MENOPAUSAL: >20.0		
	mIU/ml		

Status: Final, Accno: S59200FSH 025P

3131313 • SANDIEGO, CARMEN • 1951-05-26 • F





Bookmarks Netsite: https://flux.cpmc.columbia.edu/webcisdev13/wc_wwwcis.cgi

3131313 • SANDIEGO, CARMEN • 1951-05-26 • F • (-) • (CIMINO)

[Logout](#)

[Lab summary](#)

Lab update

[12h](#) | [36h](#) | [72h](#) |

[Days](#)

[Admin summary](#)

All results

Before date

[Laboratory](#) Oct
12

[Radiology](#) 2002

[Pathology](#) Apr
04

[Disch Sum](#) 2002

Op/Clinical

[Operative](#) May
19

[Consult](#) 1997

Clin Sum

[Neurophys](#) 1995

[Ob/Gyn](#) 2000

[GI Endo](#) 2002

[Cardiology](#) Feb
24

Laboratory • (2003-10-12 to 2001-0

- [LH](#)
- [FSH](#)
- [DIGOXIN](#)
- [ABC](#)
- [BASIC METABOLIC PANEL](#)
- [MEASLES_IGG](#)
- [CHOLESTERYL ESTERS](#)
- [C1 ESTERASE INHIBITOR_PLASMA](#) 2002-04-05 11:18 F

HOMOCYSTEINE	2002-02-01 09:00 F
THYROID PANEL	2002-02-01 09:00 F

BASIC METABOLIC PANEL 2002-05-25 02:46			
Test	Result	Range	Unit
NA	135	136-146	mM/l
K	3.9	3.6-5.0	mM/l
CL	105	102-109	mM/l
CO2	19	25-33	mM/l
BUN	18	7-20	mg/dl
GLUCOSE	110	70-105	mg/dl
CREATININE	1.1	0.5-0.9	mg/dl
CALCIUM	8.4	8.4-9.8	mg/dl

Status: Final, Accno: S59157BMET 025P
3131313 • SANDIEGO, CARMEN • 1951-05-26 • F

BASIC METABOLIC PANEL 2002-05-25 02:46				
Test	Result	Range	Unit	Info
NA	135	136-146	mM/l	i
K	3.9	3.6-5.0	mM/l	i
CL	105	102-109	mM/l	i
CO2	19	25-33	mM/l	i
BUN	18	7-20	mg/dl	i
GLUCOSE	110	70-105	mg/dl	i
CREATININE	1.1	0.5-0.9	mg/dl	i
CALCIUM	8.4	8.4-9.8	mg/dl	i

Status: Final, Accno: S59157BMET 025P
3131313 • SANDIEGO, CARMEN • 1951-05-26 • F





Questions of Interest



From the Columbia University [Infobutton Manager](#)[®]

Frequently Asked Questions:

[What information does the lab have about FOLLITROPIN?](#)

[What container should I use for FOLLITROPIN?](#)

Other Common Questions:

[Tell me about the laboratory test for FOLLITROPIN.](#)

General Questions:

[What does UpToDate say about FOLLITROPIN?](#)

[What does Harrison's say about FOLLITROPIN?](#)

[What is the differential diagnosis of abnormalities of FOLLITROPIN?](#)

[Search PubMed for FOLLITROPIN.](#)

[Show me national guidelines about FOLLITROPIN.](#)

[About Our Resources](#)

Sponsored by:



The Department of Medical Informatics



Columbia University College of Physicians and Surgeons



A Grant from the National Library of Medicine

Send comments to: [James J. Cimino, MD](#)



Heuristics:

- Consistency
- Language
- Match
- Minimalist

Infobutton Manager - Netscape

File Edit View Go Communicator Help

Bookmarks Netsite: c.columbia.edu/webcisdev13/wc_infomanage.cgi What's Related

 **Questions of Interest** 

From the Columbia University [Infobutton Manager](#)[®]

Concept of Interest: **FSH**
Preferred Name for Searching: **FOLLITROPIN**
Date of Patient Data: **2002-05-25 03:52**

Frequently Asked Questions:

- [What does the CPMC Lab Manual say about this test?](#)
- [How does the CPMC Lab Manual say I should collect a specimen for this test?](#)




Other Common Questions:

- [What is the differential diagnosis of abnormalities of FOLLITROPIN?](#)

Search Other [Resources](#):

- [Lab Tests Online](#)
- [UpToDate](#)
- [Harrisons Principles of Internal Medicine](#)
- [PubMed](#)
- [National Guidelines Clearinghouse](#)

Sponsored by:

   The Department of Biomedical Informatics
Columbia University College of Physicians and Surgeons
A Grant from the National Library of Medicine

Send comments to: [James J. Cimino, MD](#)

Document: Done

- [Logout](#)

- [Lab summary](#)
- Lab update
 - [12h](#) | [36h](#) | [72h](#) | [Days](#)
- [Admin summary](#)

- All results
- Before date
- [Laboratory](#) Feb 12
- [Radiology](#) Nov 12
- [Pathology](#) Nov 14
- [Disch Sum](#) 2002
- Op/Clinical
 - [Operative](#) Oct 30
 - [Consult](#) 1997
- Clin Sum
- [Neurophys](#) 1995
- [Ob/Gyn](#) Nov 17
- [GI Endo](#) 2002
- [Cardiology](#) 2003
- [HEENT](#) 1997
- [Pharmacy](#) 2001
- [PFT](#) Nov 18
- Non-chart
 - [Alerts](#) Oct 20
 - [Signout](#) Mar 12
 - [Notes](#) Mar 16
 - [DOP notes](#) 1999
 - [Self Rep Lab](#) Nov 16

Laboratory • (2004-02-12 to 2002-02-01) • [Newer](#) • [Older](#)

CHEM 7 PROFILE	2002-05-25 13:04	P
DIGOXIN	2002-05-25 05:14	F
LH	2002-05-25 03:52	F
FSH	2002-05-25 03:52	F
DIGOXIN	2002-05-25 03:52	F
ABC	2002-05-25 02:46	F
BASIC METABOLIC PANEL	2002-05-25 02:46	F
MEASLES,IGG	2002-05-10 14:59	C
CHOLESTERYL ESTERS	2002-05-10 14:59	C
CHOLESTERASE (MURKIN) PLASMA	2002-04-05 11:19	F

DIGOXIN 2002-05-25 03:52			
Test	Result	Range	Unit
DIGOXIN	2.9	0.5-2.0	ng/ml
Status: Final, Accno: S39200DIG 025P			
3131313 • SANDIEGO , CARMEN • 1951-05-26 • F			



Questions of Interest



From the Columbia University [Infobutton Manager](#) ©

Concept of Interest: **DIGOXIN**

Date of Patient Data: **2002-05-25 03:52**

Frequently Asked Questions:

- [What does the CPMC Lab Manual say about this test?](#)
- [What is its toxicity?](#)
- [How does the CPMC Lab Manual say I should collect a specimen for this test?](#)
- [What are the adverse reactions according to Micromedex?](#)

Other Common Questions:

- [What is the differential diagnosis when it is abnormal?](#)

Search Other Resources:

- [Lab Tests Online](#)
- [UpToDate](#)
- [Harrisons Principles of Internal Medicine](#)
- [Micromedex](#)
- [PubMed](#)
- [National Guidelines Clearinghouse](#)

Sponsored by:



The Department of Biomedical Informatics
Columbia University College of Physicians and Surgeons
A Grant from the National Library of Medicine

Send comments to: [James J. Cimino, MD](#)

(-) • [\(No attending\)](#) [MRN](#) • [Name](#) • [List](#) • [Add to list](#)

002-02-01) • [Newer](#) • [Older](#)

2002-05-25 13:04	P
2002-05-25 05:14	F
2002-05-25 03:52	F
2002-05-25 03:52	F
2002-05-25 03:52	F
2002-05-25 02:46	F
2002-05-25 02:46	F
2002-05-10 14:59	C
2002-05-10 14:59	C
2002-04-05 11:19	F

2002-05-25 03:52

Range	Unit
0.5-2.0	ng/ml
ODIG 025P	
RMEN • 1951-05-26 • F	



Questions

From the Columbia Univ

Concept of Interest: DIGOXIN

Date of Patient Data: 2002-05-25 03:52

Frequently Asked Questions:

- [What does the CPMC Lab Manual s](#)
- [What is its toxicity?](#)
- [How does the CPMC Lab Manual sa](#)
- [What are the adverse reactions accor](#)

Other Common Questions:

- [What is the differential diagnosis wher](#)

Search Other Resources:

- [Lab Tests Online](#)
- [UpToDate](#)
- [Harrisons Principles of Internal Medic](#)
- [Micromedex](#)
- [PubMed](#)
- [National Guidelines Clearinghouse](#)

Sponsored by:



The Department of E
Columbia University College of Physicians and Surgeons
A Grant from the National Library of Medicine

Send comments to: [James J. Cimino, MD](#)



Bookmarks Location: GOXIN[MeSH+Terms]+AND+toxicity[MeSH+Subheading]&doptcmdl=DocSum What's Related



Entrez PubMed Nucleotide Protein Genome Structure OMIM PMC Journals Books

Search PubMed for DIGOXIN[MeSH Terms] AND toxicity[MeSH Subhead] Go Clear

Limits Preview/Index History Clipboard Details

- About Entrez
- Text Version
- Entrez PubMed
 - Overview
 - Help | FAQ
 - Tutorial
 - New/Noteworthy
 - E-Utilities
- PubMed Services
 - Journals Database
 - MeSH Database
 - Single Citation Matcher
 - Batch Citation Matcher
 - Clinical Queries
 - LinkOut
 - Cubby
- Related Resources
 - Order Documents

Display Summary Show: 20 Sort Send to Text

Items 1-20 of 343 Page 1 of 18 Next

- 1: [Wang YH, Chao PD, Hsiu SL, Wen KC, Hou YC.](#) Related Articles, Links
Lethal quercetin-digoxin interaction in pigs. Life Sci. 2004 Jan 23;74(10):1191-7. PMID: 14697403 [PubMed - indexed for MEDLINE]
- 2: [Rocchetti M, Besana A, Mostacciuolo G, Ferrari P, Micheletti R, Zaza A.](#) Related Articles, Links
Diverse toxicity associated with cardiac Na+/K+ pump inhibition: evaluation of electrophysiological mechanisms. J Pharmacol Exp Ther. 2003 May;305(2):765-71. Epub 2003 Feb 20. PMID: 12606646 [PubMed - indexed for MEDLINE]
- 3: [Micheletti R, Mattera GG, Rocchetti M, Schiavone A, Loi MF, Zaza A, Gagnol RJ, De Munari S, Melloni P, Carminati P, Bianchi G, Ferrari P.](#) Related Articles, Links
Pharmacological profile of the novel inotropic agent (E,Z)-3-((2-aminoethoxy)imino)androstane-6,17-dione hydrochloride (PST2744).

[Logout](#)

[Lab summary](#)

Lab update

[12h](#) | [36h](#) | [72h](#) | [Days](#)

[Admin summary](#)

All results

Before date

[Laboratory](#) Feb 12

[Radiology](#) Nov 12

[Pathology](#) Nov 14

[Disch Sum](#) 2002

Op/Clinical

[Operative](#) Oct 30

[Consult](#) 1997

Clin Sum

[Neurophys](#) 1995

[Ob/Gyn](#) Nov 17

[GI Endo](#) 2002

[Cardiology](#) 2003

[HEENT](#) 1997

[Pharmacy](#) 2001

[PFT](#) Nov 18

Non-chart

[Alerts](#) Oct 20

[Signout](#) Mar 12

[Notes](#) Mar 16

[DOP notes](#) 1999

[Self Rep Lab](#) Nov 16

Pharmacy · (2001-09-21 to 2000-12-02) · [Newer](#) · [Older](#)

Ordered on	Order	Dose	Freq	Route	Status
2001-09-21 09:27	ERYTHROPOIETIN INJ 40000 U/ML CF ⓘ	40000 U	TODAY	SC	DC
2001-09-21 09:27	ERYTHROPOIETIN INJ 40000 U/ML CF ⓘ	40000 U	TODAY	SC	DC
2001-09-21 09:26	POTASSIUM CL IVPB-PMIX 10 MEQ/100ML ⓘ	10 MEQ	1DOSE	IV	DC
2001-05-22 22:03	CAPTOPRIL TAB 12.5 MG ⓘ	6.25 MG	1DOSE	ORAL	DC
2000-12-02 15:00	COLYTE SOLN 4000 ML ⓘ	1 EA	SXDAY	ORAL	DC
2000-12-02 15:00	COLYTE SOLN 4000 ML ⓘ	1 EA	SXDAY	ORAL	DC

Infobutton Manager - Netscape
File Edit View Go Communicator Help

Back Forward Reload Home Search Netscape Print Security Shop Stop

Bookmarks Netsite: x.cpmc.columbia.edu/webcisdev13/wc_infomanage2.cgi

Questions of Interest

From the Columbia University [Infobutton Manager](#)

Concept of Interest: **CAPTOPRIL TAB 12.5 MG**
Preferred Name for Searching: **Captopril**
Date of Patient Data: **2001-05-22-22.03**

Frequently Asked Questions:

- [What is the patient information from Lexi-Comp?](#)
- [What is the Spanish patient information from Lexi-Comp?](#)
- [What does it look like? \(from Lexi-Comp\)](#)
- [What are the forms and strengths according to Micromedex?](#)
- [What is the dosing and administration information from Micromedex?](#)
- [How do I treat overdosage according to Micromedex?](#)
- [What does this drug interact with according to Micromedex?](#)
- [What are the contraindications according to Micromedex?](#)
- [What are the adverse reactions according to Micromedex?](#)

Other Common Questions:

- [What does RxList say?](#)

Search Other [Resources](#):

- [UpToDate](#)
- [Harrisons Principles of Internal Medicine](#)

Document: Done

Lexi Online Patient Education Leaflet...

Back Forward Reload Home Search Netscape

Bookmarks Location: 800.htm What's Related

LEXI-PALS™

Adult Patient Advisory Leaflet System



Captopril (KAP toe pril)

Marcas estadounidenses Capoten®

Marcas canadienses Alti-Captopril; Apo®-Capto; Capoten®; Gen-Captopril; Novo-Captopril; Nu-Capto®; PMS-Captopril®

Marcas mexicanas Capital®; Capoten®; Capotena; Captral®; Cardipril®; Cryopril®; Ecapresan; Ecaten®; Kenolan®; Lenpryl®; Precaptil; Romir®

Categoría terapéutica Inhibidor de la enzima convertora de la angiotensina (ECA)

¿Qué advertencias debo tener en cuenta antes de tomar este medicamento?

- No tome este medicamento si está embarazada. El consumo de este medicamento durante el segundo y tercer trimestre puede causar defectos de nacimiento. Si queda embarazada mientras está tomando este medicamento.

[Logout](#)

[Lab summary](#)

Lab update

[12h](#) | [36h](#) | [72h](#) | [Days](#)

[Admin summary](#)

All results

Before date

[Laboratory](#) 2000

[Radiology](#) 2000

Pathology

[Disch Sum](#) 1999

Op/Clinical

Operative

Consult

Clin Sum

Neurophys

Ob/Gyn

GI Endo

Cardiology

HEENT

Pharmacy

PFT

Non-chart

Alerts

Signout

Notes

DOP notes

Self Rep Lab

Radiology • (2000-01-23 to 1999-10-22) • [Newer](#) • [Older](#)

X-Ray of Chest, 2 Views	2000-01-23 10:00
Diagnostic Ultrasound of Lower Extremity Veins, Doppler, Unilateral	1999-12-27 09:43
X-Ray of Chest, Portable	1999-12-22 15:52
X-Ray of Chest, Portable	1999-12-15 15:29
X-Ray of Chest, Portable	1999-12-14 02:27
X-Ray of Chest, Portable	1999-12-13 17:31
X-Ray of Chest, Portable	1999-12-13 02:07
X-Ray of Chest, Portable	1999-12-12 15:55
X-Ray of Chest, 2 Views	1999-12-01 14:06
Diagnostic Ultrasound of Kidney	1999-11-08 09:06

Instructions: Click on a highlighted term for more information.

Diagnostic Ultrasound of Kidney 1999-11-8 9:6

Document Number TX

Examination Type RENAL

Clinical Information [CHECK](#) KIDNEY

Impression

1. No evidence of [hydronephrosis](#). If vascular [occlusion](#) is a clinical concern further evaluation with [angiography](#) or [MRA](#) is recommended.

A limited renal [ultrasound](#) was performed. There are no prior ultrasounds available for comparison.

The right kidney measures 13 cm. The left kidney measures 13 cm. There is no evidence of a focal renal [mass](#), [calculi](#) or [hydronephrosis](#).

Arterial flow is identified within both renal arteries. There was pulsatility of flow within both renal veins, possibly due to [cardiac disease](#). If the clinical suspicion is [occlusion](#) of the renal arteries or renal veins, further evaluation with digital [angiography](#) or [MRA](#) is recommended.

The bladder is collapsed. The prostate measures 4.5 cm x 2.7 cm x 3.4 cm.

Infobutton Manager - Netscape
File Edit View Go Communicator Help

Back Forward Reload Home Search Netscape Print Security

Bookmarks Netsite: logyReport&info_usertype=MD&info_age=22&info_sex=F

Questions of Interest

From the Columbia University [Infobutton Manager](#)

Concept of Interest: **hydronephrosis**


Frequently Asked Questions:

- [OneLook \(definition\)?](#)
- [Merriam-Webster \(definition\)](#)
- [Cancerweb \(definition\)](#)
- [Medicine on the Net \(definition\)](#)

Search Other [Resources](#):

- [UpToDate](#)
- [Harrisons Principles of Internal Medicine](#)
- [PubMed](#)
- [National Guidelines Clearinghouse](#)

Sponsored by:

 The Department of Biomedical Informatics
Columbia University College of Physicians and Surgeons
A Grant from the National Library of Medicine

Send comments to: [James J. Cimino, MD](#)

Hydronephrosis - Medical Dictionary definitions of popula... - [] [] [X]

Back Forward Reload Home Search Netscape Print Security Sh

Bookmarks Location: com/script/main/art.asp?articlekey=3828 What's Related



MedicineNet.com

Find your topic in our A - Z lists:

Home Diseases & Conditions Symptoms & Signs Procedures & Tests Medications MedTerm Dictionary

> [MedTerms medical dictionary A-Z List](#) > Hydronephrosis

[Printer-Friendly Format](#) | [Add to Favorites](#) | [Email to a Friend](#)

1 [Hydronephrosis Index](#) | [Next page](#)

Search MedTerms

Hydronephrosis: Distention of the kidney with urine. Due to obstruction of urine outflow (for example, by a stone blocking the ureter, the tube going from the kidney to the bladder).

1 [Hydronephrosis Index](#) | [Next page](#)

[Printer-Friendly Format](#) | [Add to Favorites](#) | [Email to a Friend](#)

[Back to MedTerms online medical dictionary A-Z List](#)

Last Editorial Review: 3/26/98 2:25:00 PM

If the clinical suspicion is [occlusion](#) of the renal arteries or digital [angiography](#) or [MRA](#) is recommended.

measures 4.5 cm x 2.7 cm x 3.4 cm.

The Coumadin Story

- Chair of Medicine wants link to Coumadin protocol
- First, I have to find the guidelines

Search Results - Netscape
File Edit View Go Communicator Help
Bookmarks Location: http://infonet.nyp.org/wfsearch/WebWork.exe What's Related

Search Results

Found: 31
match(es)

- 1 [Discharge review questions 4 Central](#) 

Updated 29-Mar-2004
on:
Location: [Infonet Home / Patient Education / Cardiology & Cardiothoracic \(CUMC & Approved Resource List](#) 
- 2 [Biopsy/excisional biopsy in ambulatory care](#) 

Updated 04-Mar-2004
on:
Location: [Infonet Home / Patient Education](#)
- 3 [Axillary lymph node surgery \(CUMC\)](#) 

Updated 02-Mar-2004
on:
Location: [Infonet Home / Patient Education / Health Matters: Fact Sheets / B](#)
- 4 [Secondary prevention for heart disease](#) 

Updated 02-Mar-2004
on:
Location: [Infonet Home / Patient Education / Health Matters: Fact Sheets / A](#)

Document: Done

The Coumadin Story

- Chair of Medicine wants link to Coumadin protocol
- First, I have to find the guidelines
- Then I have to add the question to the IM table

WebCIS Manage Tools Page - Netscape

File Edit View Go Communicator Help

Bookmarks Netsite: https://flux.cpmc.columbia.edu/webcisdev13/webcis_managetools.cgi What's Related

	Lexi-Comp?	
<a href="http://www.rxdist.com/cgi/rxdist.cgi?drug=<>">http://www.rxdist.com/cgi/rxdist.cgi?drug=<>	What does RxList say?	genta
<a href="http://www.utdol.com/application/vocab.asp?search=<>&submit=Go">http://www.utdol.com/application/vocab.asp?search=<>&submit=Go	UpToDate	anion
<a href="http://harrisons.cgi?search_name=<>">harrisons.cgi?search_name=<>	Harrisons Principles of Internal Medicine	penic:
http://infonet.nyp.org/Pharmacy/Forms/Medication/INR-policy-final-adult.pdf	What is the NYYPH guideline for managing adult patients with elevated INR due to warfarin?	
http://infonet.nyp.org/Pharmacy/Forms/Medication/INR-policy-pediatric.pdf	What is the NYYPH guideline for managing pediatric patients with elevated INR due to warfarin?	
http://infonet.nyp.org/Pharmacy/Pharmacy-M/HeparinGuidelinesWeb.pdf	What is the NYYPH guideline for prescribing intravenous unfractionated heparin in adults?	
http://infonet.nyp.org/Pharmacy/Pharmacy-M/Pediatrics/PEDguideFinal4WEB.pdf	What is the NYYPH guideline for prescribing intravenous unfractionated heparin in pediatric patients?	
<a href="http://healthcare.micromedex.com/mdxcgi/cgiidict.exe?SRCHTERM=<>">http://healthcare.micromedex.com/mdxcgi/cgiidict.exe?SRCHTERM=<>	What does Micromedex say?	DIGC
<a href="http://micromedex_omh.cgi?search_name=<>&anchor=PDRSUP01&topic=What+are+the+forms+and+strengths+of">micromedex_omh.cgi?search_name=<>&anchor=PDRSUP01&topic=What+are+the+forms+and+strengths+of	What are the forms and strengths according to	HAL

Document: Done

The Coumadin Story

- Chair of Medicine wants link to Coumadin protocol
- First, I have to find the guidelines
- Then I have to add the question to the IM table
- Finally, I link the question to the context

WebCIS Manage Tools Page - Netscape					
File Edit View Go Communicator Help					
Bookmarks Netsite: https://flux.cpmc.columbia.edu/webcisdev13/webcis_managetools.cgi What's Related					
LabDetail,LabSummary	MD,Others	Y,M,E	M,F	32863	INTERNATIONAL NORMALIZED RATIO (INR) CALCULATION
InPatientDrugs,OutPatientDrugs,OutPatDrugOrd	MD,Others	Y,M,E	M,F	31433	WARFARIN PREPARATION:
LabDetail,LabSummary	MD,Others	Y,M,E	M,F	32163	PLASMA PROTHROMBIN TESTS
LabDetail,LabSummary	MD,Others	I,C,A,N	M,F	32863	INTERNATIONAL NORMALIZED RATIO (INR) CALCULATION
LabDetail,LabSummary	MD,Others	I,C,A,N	M,F	32163	PLASMA PROTHROMBIN TESTS
InPatientDrugs,OutPatientDrugs,OutPatDrugOrd	MD,Others	I,C,A,N	M,F	31433	WARFARIN PREPARATION:
LabDetail,LabSummary	MD,Others	Y,M,E	M,F	32162	PLASMA THROMBOPLA TESTS
InPatientDrugs,OutPatientDrugs,OutPatDrugOrd	MD,Others	Y,M,E	M,F	31206	HEPARIN

The Coumadin Story

- Chair of Medicine wants link to Coumadin protocol
- First, I have to find the guidelines
- Then I have to add the question to the IM table
- Finally, I link the question to the context
- Voilà!

3131313 · SANDIEGO, CARMEN · 1951-05-26 · 52y F · (-) · (No attending)

[MRN](#) · [Name](#) · [List](#) · [Add to list](#)

[Logout](#)

[Lab summary](#)

Lab update

[12h](#) | [36h](#) | [72h](#) | [Days](#)

[Admin summary](#)

All results

Before date

[Laboratory](#) Apr 02

[Radiology](#) Nov 12

[Pathology](#) Apr 23

[Disch Sum](#) 2002

Op/Clinical

[Operative](#) May 07

[Consult](#) 1997

Clin Sum

[Eclipsys](#) Apr 07

[Neurophys](#) 1995

[Ob/Gyn](#) Nov 17

[GI Endo](#) 2002

[Cardiology](#) Apr 15

[HEENT](#) 1997

[Pharmacy](#) Nov 20

[PFT](#) Nov 14

Non-chart

[Alerts](#) May 11

[Signout](#) Apr 23

[Notes](#) May 11

[DOP notes](#) 1999

Laboratory · (1999-06-21 to 1998-03-27) · [Newer](#) · [Older](#)

CULTURE & SMEAR SITE	1999-01-25 18:24	F
ABC	1999-01-25 17:00	F
CHEM 7 PROFILE	1999-01-25 07:30	F
PT/INR STAT LAB	1999-01-16 17:00	F
MISCELLANEOUS CHEMISTRY DISPLAY	1998-12-31 09:15	F
ELECTROLYTES, SERUM	1998-12-31 09:15	F
ABC	1998-12-31 09:15	F
HEPATIC FUNC PANEL	1998-12-31 09:15	F
ESTRADIOL	1998-09-13 19:48	C

PT/INR STAT LAB 1999-01-16 17:00

Test	Result	Range	Unit
PROTHROMBIN	12.9	10.8-13.6	sec
INR	1.17		

Status: Final, Accno: M36016SLPT 990T

3131313 · SANDIEGO, CARMEN · 1951-05-26 · F

WebCIS - 3131313 (user: ciminoj) - Netscape

Infobutton Manager - Netscape

Back Forward Reload Home Search Netscape Print Security Shop Stop

Bookmarks Netsite: https://flux.cpmc.columbia.edu/webcisdev13/wc_infomanage.cgi

Questions of Interest

From the Columbia University [Infobutton Manager](#)®

Concept of Interest: **PROTHROMBIN**
Preferred Name for Searching: **COAGULATION TISSUE FACTOR INDUCED.INR**
Date of Patient Data: **1999-01-16 17:00**

Frequently Asked Questions:

- [What is the NYPH guideline for managing adult patients with elevated INR due to warfarin?](#)
- [What does the CPMC Lab Manual say about this test?](#)
- [How does the CPMC Lab Manual say I should collect a specimen for this test?](#)

Other Common Questions:

- [What is the differential diagnosis when it is abnormal?](#)

Search Other Resources:

- [Lab Tests Online](#)
- [UpToDate](#)
- [Harrisons Principles of Internal Medicine](#)
- [PubMed](#)
- [National Guidelines Clearinghouse](#)

Sponsored by:

Document: Done

1999

Document: Done

MRN · Name · List · Add to list

Folder

F
F
F
F
F
F
F
F
F
C

WebCIS Netscape

File Edit Back Forward Reload Home Search Netscape Print Security Shop Stop

Bookmarks Location: <http://inonet.nyp.org/Pharmacy/Forms/Medication/INR-policy-final-adult.pdf> What's Related

105%

MRN · Name · List · Add to list

Older

Lab su
Lab up
12h |
Admin

All
Bef

Labora
Radiol
Pathol
Disch
Op/Cli
Oper
Cons
Clin S
Eclips
Neuro
Ob/Gy
GI Enc
Cardio
HEEN
Pharm
PFT

Non-C

Alerts
Signout
Notes
DOP notes

1999

Document: Done

Document: Done

TABLE 1: Recommendations for the Medical Management of ADULT Patients with an Elevated INR Value Secondary to Chronic Warfarin Administration

INR value	Clinical Presentation	Recommended Intervention(s)
INR >3 but ≤5 (assuming target INR is 2-3*)	No significant bleeding Low bleeding risk based on INR value	INR 3.1-3.9 Day 1: subtract 5-10% of total weekly dose (TWD) Weekly: reduce TWD by 5-10% Re-Check INR in 72 hours** INR 4.0-5.0 Day 1: no warfarin Weekly: reduce TWD by 10-20% Re-check INR in 72 hours**
INR >5 but <9	No significant bleeding At risk for bleeding based on elevated INR value (No additional risk for bleeding based on Appendix A)	<ul style="list-style-type: none"> Hold warfarin** Monitor INR daily until it reaches upper limit of the therapeutic range* Weekly: reduce TWD by 20-50% Re-check an INR in 72 hours***
INR > 9	No significant bleeding At risk for bleeding based on elevated INR value (No additional risk for bleeding based on Appendix A)	<ul style="list-style-type: none"> Hold warfarin** Give vitamin K 0.5 mg IV or approximately 1 mg PO (one quarter of a commercially available 5 mg tablet)** Admit the patient to the hospital Monitor INR frequently over the next 24-48 hrs (at least daily) until it reaches the upper limit of the therapeutic range* Re-institute warfarin after decreasing the TWD by 20-50% Re-check INR daily until re-stabilized, then weekly
INR > 5	Significant risk for bleeding At risk for bleeding based on elevated INR value And At risk for bleeding based on characteristics outlined in Appendix A	<ul style="list-style-type: none"> Hold warfarin Give vitamin K 0.5 mg IV or approximately 1 mg PO (one quarter of a commercially available 5 mg tablet)** Monitor INR frequently over the next 24-48 hrs (at least daily) until it reaches the upper limit of the therapeutic range* Re-institute warfarin after decreasing the TWD by 20-50% Re-check INR daily until re-stabilized, then weekly
INR >3*	Bleeding	<ul style="list-style-type: none"> Hold warfarin Give vitamin K by IV infusion ^{a, b} ADULT DOSE: 1-5 mg Give FFP^c

2 of 8 8.5 x 11 in

Sponsored by:

Document: Done

Interactions With On-line Resources

- Simple link
- Concept-based link
- Simple search
- Concept-based search
- Intelligent agent
- Calculator

- Question has “hardcoded” URL
e.g.:
“www.columbia.edu/potassium.pdf”

Interactions

- Simple link
- Concept-based link
- Simple search
- Concept-based search
- Intelligent agent
- Calculator

Infobutton Manager - Netscape
File Edit View Go Communicator Help

Questions of Interest
From the Columbia University [Infobutton Manager](#)®

Concept of Interest: **K**
Preferred Name for Searching: **POTASSIUM**
Date of Patient Data: **2004-08-19 11:44**

Frequently Asked Questions:

- [What are the NYPH Guidelines for potassium replacement in adults?](#)
- [What does the CPMC Lab Manual say about this test?](#)
- [What is its toxicity?](#)
- [How does the CPMC Lab Manual say I should collect a specimen for this test?](#)
- [What is the anion gap for this \(and other related results\)?](#)
- [What are the adverse reactions according to Micromedex?](#)


Other Common Questions:

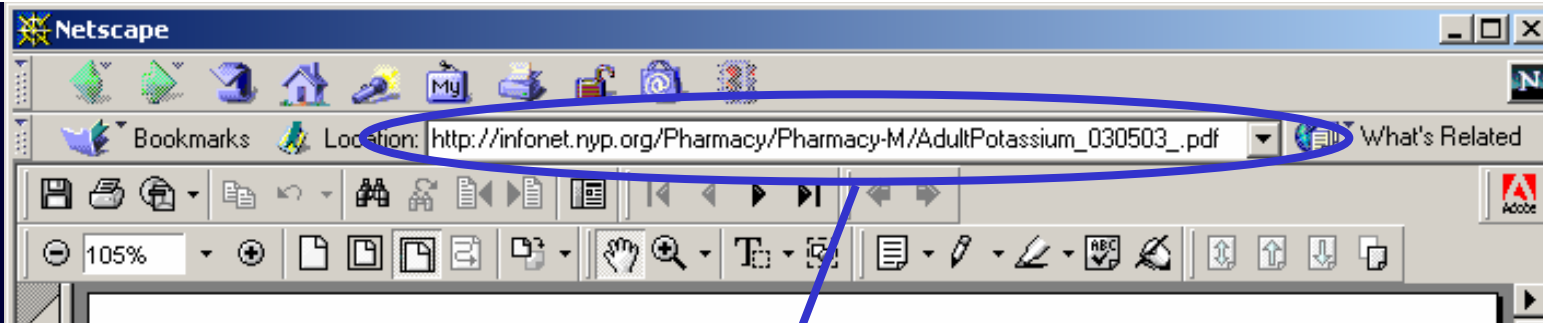
- [What is the differential diagnosis when it is abnormal?](#)

Search Other [Resources](#):

- [Lab Tests Online](#)
- [UpToDate](#)
- [Harrisons Principles of Internal Medicine](#)
- [Micromedex](#)
- [PubMed](#)
- [National Guidelines Clearinghouse](#)

Sponsored by:

 The Department of Biomedical Informatics
Columbia University College of Physicians and Surgeons
A Grant from the National Library of Medicine



http://infonet.nyp.org/Pharmacy/Pharmacy-M/AdultPotassium_030503_.pdf

Adult Potassium Replacement Policy

AVAILABLE PRODUCTS on NYPH FORMULARY

Intravenous		
Small volume parenterals (for intermittent piggyback infusion)		Large volume parenterals (for continuous maintenance infusion)
10 mEq in 50 mL Sterile Water for Injection		20 mEq in 0.9 % NaCl 1000 mL
10 mEq in 100 mL Sterile Water for Injection		40 mEq in Dextrose 5%, 1000 mL
20 mEq in 50 mL Sterile Water for Injection		20 mEq in Dextrose 5% and Sodium Chloride 0.45%, 1000 mL
20 mEq in 100 mL Sterile Water for Injection		40 mEq in 0.9% NaCl 1000 mL
		40 mEq in Dextrose 5% and Sodium Chloride 0.45%, 1000 mL
Oral		
20 mEq/15 mL unit dose	40 mEq/30 mL unit dose	Tablet, extended release 10 mEq/tablet
30 mEq/22.5 mL unit dose	6.7 mEq/5 mL, Sugar Free (bulk bottle)	Tablet, extended release 20 mEq/tablet

DOSING RECOMMENDATIONS

- Deviations from dosing parameters outlined in this policy **MUST** be approved by an ICU attending or fellow
- Replacement by oral or enteral route is preferred for non-critical potassium replacement. Use intravenous intermittent piggyback infusion only when rapid correction is necessary or the patient is unable to take oral medication.
- **Standing** orders of intermittent intravenous infusions on general care areas are not acceptable (eg. KCl 20mEq IV BID)

Serum K+	Total Replacement Dose (consider lower dose for renal insufficiency)
≤ 3 mEq/L	40 - 80 mEq
3.1 - 3.4 mEq/L	40 - 60 mEq
3.5 - 3.9 mEq/L	20 - 40 mEq
4 - 4.2 mEq/L cardiac patient	10 mEq

- To accomplish an appropriate intermittent piggyback infusion dose utilizing the potassium chloride small volume parenterals available, "runs" are acceptable, providing the order adheres to administration rate and concentration parameters for the unit and IV access respectively. (e.g. KCl 20 mEq/50 ml over 1 hour x3)
- Generally, serum potassium rises 0.1 mEq/L for every 10 mEq of potassium administered.
- Patients taking digitalis should be maintained at a serum potassium > 4 mEq/L.

Interactions With On-line Resources

- Simple link
- Concept-based link
- Simple search
- Concept-based search
- Intelligent agent
- Calculator

- Translate concept of interest to controlled term
- Find controlled term in data dictionary
- Obtain term attribute for constructing URL from data dictionary
- Construct URL, e.g.:
 www.columbia.edu/lab/<>.html
 + cl001900
 _____.
 www.columbia.edu/lab/cl001900.html

Interactions

- Simple link
- **Concept-based link**
- Simple search
- Concept-based search
- Intelligent agent
- Calculator

Infobutton Manager - Netscape
File Edit View Go Communicator Help

Questions of Interest
From the Columbia University [Infobutton Manager](#)®

Concept of Interest: **K**
Preferred Name for Searching: **POTASSIUM**
Date of Patient Data: **2004-08-19 11:44**

Frequently Asked Questions:

- [What are the NYPH Guidelines for potassium replacement in adults?](#)
- [What does the CPMC Lab Manual say about this test?](#)
- [What is its toxicity?](#)
- [How does the CPMC Lab Manual say I should collect a specimen for this test?](#)
- [What is the anion gap for this \(and other related results\)?](#)
- [What are the adverse reactions according to Micromedex?](#)


Other Common Questions:

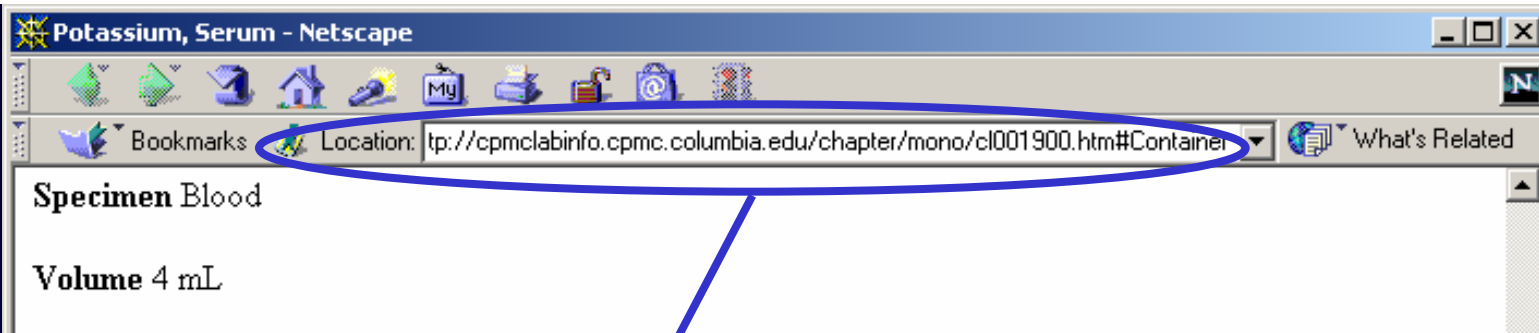
- [What is the differential diagnosis when it is abnormal?](#)

Search Other [Resources](#):

- [Lab Tests Online](#)
- [UpToDate](#)
- [Harrisons Principles of Internal Medicine](#)
- [Micromedex](#)
- [PubMed](#)
- [National Guidelines Clearinghouse](#)

Sponsored by:

 The Department of Biomedical Informatics
Columbia University College of Physicians and Surgeons
A Grant from the National Library of Medicine



<http://cpmclabinfo.cpmc.columbia.edu/chapter/mono/cl001900.htm#Container>

Container Gold top tube or gold top Microtainer™

Collection Avoid very small needles if possible. Avoid stasis, use of tourniquet, hand-clenching, if possible, and potassium-containing tubes such as potassium oxalate.

Reference Range Adults: 3.6-5.0 mmol/L

Critical Values High: >6.0 mmol/L; low: <2.9 mmol/L

Use Evaluate electrolyte balance; potassium level should be followed especially in elderly patients, those on intravenous hyperalimentation, in patients on diuretic therapy, and in cases of renal disease, particularly renal failure, patients on hemodialysis, and those with interstitial nephritis or nephropathy; evaluate hypertension; potassium should be monitored during treatment of acidosis, including ketoacidosis in diabetes mellitus; evaluate muscular weakness and irritability, mental confusion, weakness; manage leukemia, diseases of gastrointestinal tract; evaluate and prevent cardiac arrhythmias; evaluate alcoholism with delirium tremens; detect, diagnose, and manage mineralocorticoid excess (primary aldosteronism, Cushing's syndrome, tumor with ectopic ACTH production, some cases of congenital adrenal hyperplasia)

Methodology Ion-selective electrode (ISE)



Copyright © 1978-2002 Lexi-Comp Inc. All Rights Reserved

Interactions With On-line Resources

- Simple link
- Concept-based link
- Simple search
- Concept-based search
- Intelligent agent
- Calculator

Insert concept of interest into CGI function call as a parameter

e.g.:

`www.Uptodate.com/search.cgi?term=<>
+ POTASSIUM`

`www.Uptodate.com/search.cgi?term=POTASSIUM`

Interactions

- Simple link
- Concept-based link
- Simple search
- Concept-based search
- Intelligent agent
- Calculator

Infobutton Manager - Netscape
File Edit View Go Communicator Help

Questions of Interest

From the Columbia University [Infobutton Manager](#)®

Concept of Interest: **K**
Preferred Name for Searching: **POTASSIUM**
Date of Patient Data: **2004-08-19 11:44**

Frequently Asked Questions:

- [What are the NYPH Guidelines for potassium replacement in adults?](#)
- [What does the CPMC Lab Manual say about this test?](#)
- [What is its toxicity?](#)
- [How does the CPMC Lab Manual say I should collect a specimen for this test?](#)
- [What is the anion gap for this \(and other related results\)?](#)
- [What are the adverse reactions according to Micromedex?](#)


Other Common Questions:

- [What is the differential diagnosis when it is abnormal?](#)

Search Other [Resources](#):

- [Lab Tests Online](#)
- [UpToDate](#)
- [Harrisons Principles of Internal Medicine](#)
- [Micromedex](#)
- [PubMed](#)
- [National Guidelines Clearinghouse](#)

Sponsored by:

 The Department of Biomedical Informatics
Columbia University College of Physicians and Surgeons
A Grant from the National Library of Medicine

UpToDate® on 'potassium' - Netscape

UpToDate® Titles on 'Potassium intake' - Netscape

UpToDate®: 'Prudent diet' - Netscape

Location: ol.com/application/topic.asp?file=genr_med/17230&type=A&selectedTitle=10~13

What's Related

printer-friendly format
print this for a colleague
e-mail this to a colleague

©2004 UpToDate®

New Search Table of Contents Feedback Help

Prudent diet

[Graham A Colditz, MD, DrPH](#)

UpToDate performs a continuous review of over 330 journals and other resources. Updates are added as important new information is published. The literature review for version 12.2 is current through April 2004; this topic was last changed on March 18, 2004. The next version of UpToDate (12.3) will be released in October 2004.

INTRODUCTION — The clinical encounter often includes questions from patients about the proper diet. Much of the advice has historically been disease-specific or ephemeral, with little basis in sound research. Early dietary guidelines were based upon clinical deficiencies; these have more recently been extended to include concerns regarding over-nutrition and recommendations to reduce the intake of fat and cholesterol.

An explosion of prospective epidemiologic studies of diet and chronic diseases has facilitated major advances in our understanding of the contribution of diet to the pathogenesis of disease [1]. These studies are complemented by randomized trials and studies of nutrient action in animal models. Building on international correlation studies and retrospective case-control studies, the prospective cohorts offer the potential to evaluate diet-disease relationships using validated measures of diet; they are free from recall bias and allow investigators to correct for measurement error. Advances have been observed in cancer, cardiovascular disease, and a range of other major chronic conditions.

Adult Medicine

Most Relevant

- [Chapter 12B: Nutrition](#)
- [Pathophysiology of Hypertension](#)
- [Potassium and Blood Pressure](#)
- [Potassium and Heart Failure](#)
- [Chapter 12A: Nutrition](#)
- [Sympathetic Nervous System](#)

Related Topics

- [Chapter 5B: Nutrition](#)
- [Chapter 6C: Nutrition](#)
- [Nocturnal Hypertension](#)
- [Prudent diet](#)
- [Treatment of Hypertension](#)

Pediatric Medicine

- [Enteral Nutrition](#)

Adult Medicine

Most Relevant

- [Introduction](#)
- [Fruits and Vegetables](#)
 - [Cardiovascular diseases](#)
 - [Cancer](#)
- [Fiber](#)
 - [Cardiovascular disease](#)
 - [Diabetes mellitus](#)
 - [Cancer](#)
- [Glycemic Load](#)
- [Fat Intake](#)
 - [Cardiovascular disease](#)
 - [Cancer](#)
- [Folate](#)
- [Antioxidant Vitamins](#)
- [Calcium and Vitamin D](#)
 - [Osteoporosis](#)
 - [Cancer](#)
 - [Prostate cancer](#)
 - [Colon cancer](#)
 - [Lipids](#)
- [Alcohol](#)
 - [Cardiovascular disease](#)
- [Summary](#)
 - [Patient instructions](#)
- [References](#)

Graphics

- [Figures](#)
 - [Lipid intake and CHD women](#)
- [Tables](#)
 - [Glycemic index of foods](#)
 - [Sources and effects of fat](#)

Related Topics

- [Overview of the risk factors for](#)

Interactions With On-line Resources

- Simple link
- Concept-based link
- Simple search
- **Concept-based search**
- Intelligent agent
- Calculator

- Translate concept of interest to controlled term
- Obtain term translation from data dictionary
- Insert translated term into CGI function call as a parameter

e.g.:

```
pubmed.gov/search.cgi?term=<>[MeSH+Terms]  
+ Potassium
```

```
pubmed.gov/search.cgi?term=Potassium[MeSH+  
Terms]
```

Interactions

- Simple link
- Concept-based link
- Simple search
- **Concept-based search**
- Intelligent agent
- Calculator

Infobutton Manager - Netscape
File Edit View Go Communicator Help

Questions of Interest

From the Columbia University [Infobutton Manager](#)®

Concept of Interest: **K**
Preferred Name for Searching: **POTASSIUM**
Date of Patient Data: **2004-08-19 11:44**

Frequently Asked Questions:

- [What are the NYPH Guidelines for potassium replacement in adults?](#)
- [What does the CPMC Lab Manual say about this test?](#)
- [What is its toxicity?](#)
- [How does the CPMC Lab Manual say I should collect a specimen for this test?](#)
- [What is the anion gap for this \(and other related results\)?](#)
- [What are the adverse reactions according to Micromedex?](#)


Other Common Questions:

- [What is the differential diagnosis when it is abnormal?](#)

Search Other [Resources](#):

- [Lab Tests Online](#)
- [UpToDate](#)
- [Harrisons Principles of Internal Medicine](#)
- [Micromedex](#)
- [PubMed](#)
- [National Guidelines Clearinghouse](#)

Sponsored by:

 The Department of Biomedical Informatics
Columbia University College of Physicians and Surgeons
A Grant from the National Library of Medicine

Entrez PubMed - Netscape

Location: POTASSIUM[MeSH+Terms]+AND+toxicity[MeSH+Subheading]&doptcmdl=DocSum

NCBI PubMed National Library of Medicine NLM

[http://.../entrez/query.fcgi?...POTASSIUM\[MeSH+Terms\]+toxicity\[MeSH+...](http://.../entrez/query.fcgi?...POTASSIUM[MeSH+Terms]+toxicity[MeSH+...)

About Entrez

Text Version

Entrez PubMed

Overview

Help | FAQ

Tutorial

New/Noteworthy

E-Utilities

PubMed Services

Journals Database

MeSH Database

Single Citation

Matcher

Batch Citation

Matcher

Clinical Queries

LinkOut

Cubby

Related

Resources

Order Documents

Limits

Preview/Index

History

Clipboard

Details

Display

Summary

Show: 20

Sort

Send to

Text

Items 1-20 of 1210

Page

1

of 61

Next

- 1: [Corona JC, Tapia R.](#) [Related Articles, Links](#)
AMPA receptor activation, but not the accumulation of endogenous extracellular glutamate, induces paralysis and motor neuron death in rat spinal cord in vivo. *J Neurochem.* 2004 May;89(4):988-97.
PMID: 15140197 [PubMed - indexed for MEDLINE]
- 2: [Garcia Dopico J, Perdomo Diaz J, Alonso TJ, Gonzalez Hernandez T, Castro Fuentes R, Rodriguez Diaz M.](#) [Related Articles, Links](#)
Extracellular taurine in the substantia nigra: taurine-glutamate interaction. *J Neurosci Res.* 2004 May 15;76(4):528-38.
PMID: 15114625 [PubMed - indexed for MEDLINE]
- 3: [Miyoshi K, Nishio T, Yasuhara A, Morita M, Shibamoto T.](#) [Related Articles, Links](#)
Detoxification of hexachlorobenzene by dechlorination with potassium-sodium alloy. *Chemosphere.* 2004 Jun;55(11):1439-46.
PMID: 15099723 [PubMed - indexed for MEDLINE]
- 4: [Lang PA, Kaiser S, Myssina S, Birka C, Weinstock C, Northoff H, Wieder T, Lang F, Huber SM.](#) [Related Articles, Links](#)

Interactions With On-line Resources

- Simple link
- Concept-based link
- Simple search
- Concept-based search
- Intelligent agent
- Calculator

- Resource is not a simple document or search CGI
- Log-on, navigation or other interaction required
- Multiple context parameters used
- Agent:
 - parses context parameters
 - interacts with resource
 - parses results
 - presents summary
 - may modify links

Interactions

- Simple link
- Concept-based link
- Simple search
- Concept-based search
- **Intelligent agent**
- Calculator

Infobutton Manager - Netscape
File Edit View Go Communicator Help

Questions of Interest

From the Columbia University [Infobutton Manager](#)®

Concept of Interest: **K**
Preferred Name for Searching: **POTASSIUM**
Date of Patient Data: **2004-08-19 11:44**

Frequently Asked Questions:

- [What are the NYPH Guidelines for potassium replacement in adults?](#)
- [What does the CPMC Lab Manual say about this test?](#)
- [What is its toxicity?](#)
- [How does the CPMC Lab Manual say I should collect a specimen for this test?](#)
- [What is the ~~urion~~ gap for this \(and other related results\)?](#)
- [What are the adverse reactions according to Micromedex?](#)


Other Common Questions:

- [What is the differential diagnosis when it is abnormal?](#)

Search Other [Resources](#):

- [Lab Tests Online](#)
- [UpToDate](#)
- [Harrisons Principles of Internal Medicine](#)
- [Micromedex](#)
- [PubMed](#)
- [National Guidelines Clearinghouse](#)

Sponsored by:

 The Department of Biomedical Informatics
Columbia University College of Physicians and Surgeons
A Grant from the National Library of Medicine

Micromedex - Netscape

MICROMEDEX(R) Healthcare Series - Netscape

Bookmarks Netsite: &SET=80F9A570412A3CB2E07350&SYS=3&T=0028&D=1&O=18#PDRADR01

- What are the adverse reactions to potassium supplements?
 - ALAN
 - AUGM
 - AUGM
 - AUGM
 - AUGM
 - CATA
 - CEO-
 - CHLO
 - COLY
 - COZA
 - HYZA
 - K-LO
 - K-PH
 - K-PH
 - K-TA
 - KLO
 - MASS
 - MICR
 - NULY
 - PFIZ
 - POT
 - SENS
 - TIME
 - TIME
 - TIME
 - TIME
 - UROC

ADVERSE REACTIONS

One of the most severe adverse effects is hyperkalemia (see CONTRAINDICATIONS , WARNINGS , and OVERDOSAGE). There also have been reports of upper and lower gastrointestinal conditions including obstruction, bleeding, ...#PDRADR01 (see CONTRAINDICATIONS and WARNINGS).

The most common adverse reactions to oral potassium salts are nausea, vomiting, flatulence, abdominal pain/discomfort, and diarrhea. These symptoms are due to irritation of the gastrointestinal tract and are best managed by taking the dose with meals, or reducing the amount taken at one time.

Skin rash has been reported rarely.

OVERDOSAGE

The administration of oral potassium salts to persons with normal excretory mechanisms for potassium rarely causes serious hyperkalemia. However, if excretory mechanisms are impaired or if intravenous administration is too rapid, potentially fatal hyperkalemia can result (see CONTRAINDICATIONS and WARNINGS). It is important to recognize that hyperkalemia is usually asymptomatic and may be manifested only by an increased serum potassium concentration (6.5-8.0 mEq/L) and characteristic electrocardiographic changes (peaking of T-waves, loss P-waves, depression of S-T segments, and prolongation of QT intervals). Late manifestations include muscle paralysis and cardiovascular collapse from cardiac arrest (9-12 mEq/L).

Treatment measures for hyperkalemia include the following:

1. Elimination of foods and medications containing potassium and of any agents with potassium-sparing properties;

Interactions With On-line Resources

- Simple link
- Concept-based link
- Simple search
- Concept-based search
- Intelligent agent
- Calculator

- No resource available
- Interaction too complex
- Create self-contained agent:
 - parses context parameters
 - constructs Web page
 - presents results
 - may have Infobuttons of its own

Interactions

- Simple link
- Concept-based link
- Simple search
- Concept-based search
- Intelligent agent
- **Calculator**

Infobutton Manager - Netscape
File Edit View Go Communicator Help

Questions of Interest

From the Columbia University [Infobutton Manager](#)®

Concept of Interest: **K**
Preferred Name for Searching: **POTASSIUM**
Date of Patient Data: **2004-08-19 11:44**

Frequently Asked Questions:

- [What are the NYPH Guidelines for potassium replacement in adults?](#)
- [What does the CPMC Lab Manual say about this test?](#)
- [What is its toxicity?](#)
- [How does the CPMC Lab Manual say I should collect a specimen for this test?](#)
- [What is the anion gap for this \(and other related results\)?](#)
- [What are the adverse reactions according to Micromedex?](#)


Other Common Questions:

- [What is the differential diagnosis when it is abnormal?](#)

Search Other [Resources](#):

- [Lab Tests Online](#)
- [UpToDate](#)
- [Harrisons Principles of Internal Medicine](#)
- [Micromedex](#)
- [PubMed](#)
- [National Guidelines Clearinghouse](#)

Sponsored by:

 The Department of Biomedical Informatics
Columbia University College of Physicians and Surgeons
A Grant from the National Library of Medicine

Instructions:

To reuse this calculator enter the appropriate values for the electrolytes below.
If the value for potassium is omitted, the calculator will use 4mmol/l, then display the results.

Anion Gap Calculator

Date of Patient Data: 2004-07-29 14:50

Sodium (Na):	<input type="text" value="136"/> mmol/l
Potassium (K):	<input type="text" value="4.5"/> mmol/l
Chloride (Cl):	<input type="text" value="102"/> mmol/l
Bicarbonate (HCO₃):	<input type="text" value="25"/> mmol/l
The anion gap is:	13.5 mmol/l
The normal anion gap is:	16 ± 4 mmol/l
<input type="button" value="Reset to Original Values"/> <input type="button" value="Calculate"/>	

Search [UpToDate](#) for Anion Gap

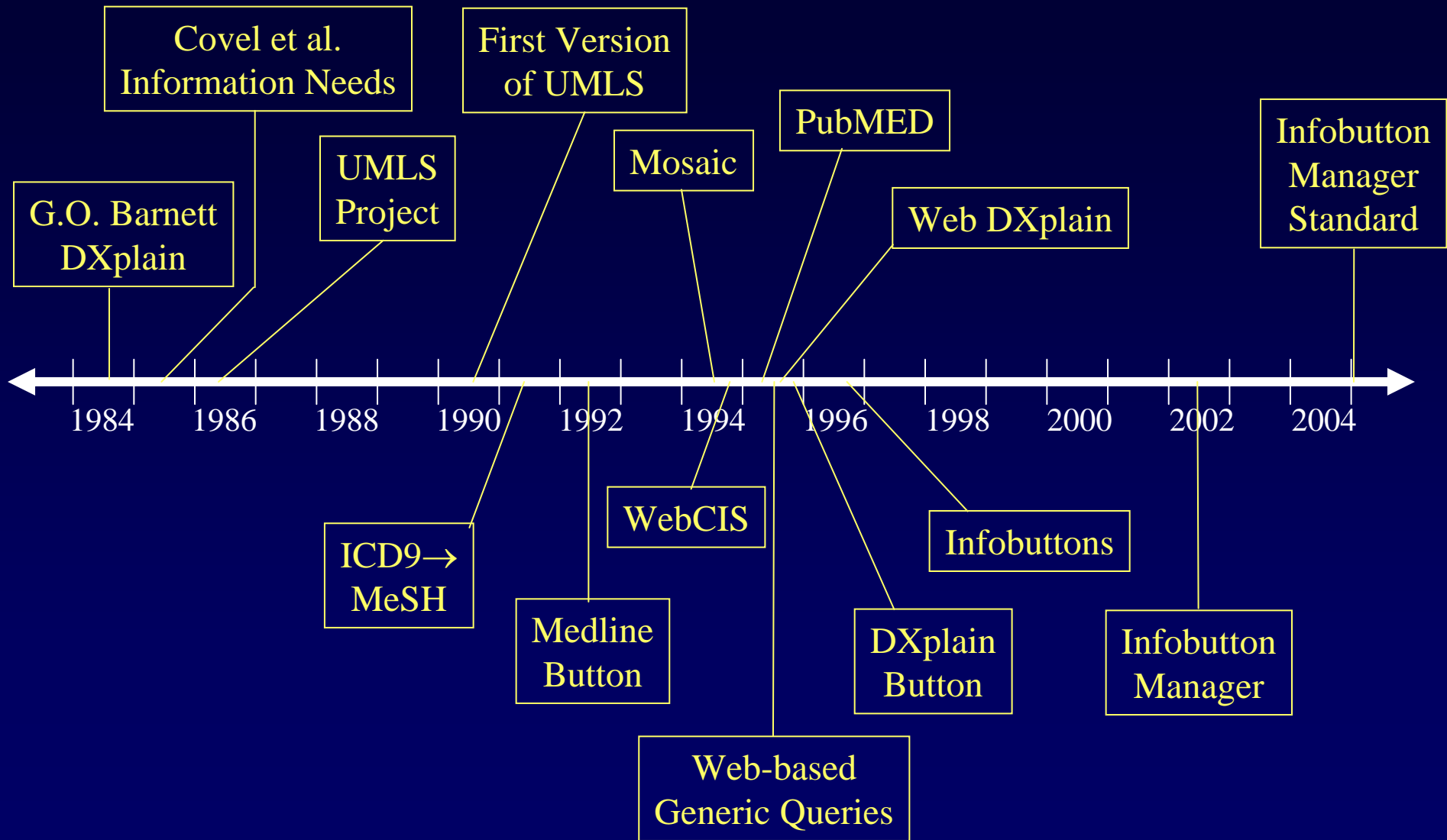
Sponsored by:



The Department of Biomedical Informatics
Columbia University College of Physicians and Surgeons
A Grant from the National Library of Medicine

Discussion


- Resources are available
- Simple interactions are usually possible
- Interaction method (format) issues:
 - “Give me a page” vs. “Give me the answer”
 - Standards needed for asking questions
 - Standards needed for passing parameters
- Representation (terminology) issues:
 - Clinical systems use homegrown “standards”
 - Resources (except PubMed) don’t use *any* standards (i.e., they are indexed by text word)









am InfoButton Access *powered by*



You know it, and  know it – fast access to clinical knowledge is a must when it comes to improving patient care. That's why InfoButton Access gives physicians, nurses, and pharmacists an amazingly simplified way to get decision support. But beyond being relevant and reliable, InfoButton Access will put what they need to know right in their workflow applications. Talk about maximizing efficiencies!

But there are lots of ways InfoButton Access will optimize patient outcomes...

- ◆  **will...** stop clinicians from searching high and low by putting patient- and context-specific information directly into their workflow – with one click.
- ◆  **will...** add value to your existing investments by partnering with your CPOE, EMR, and HIS applications and maximize your Micromedex subscriptions.
- ◆  **will...** make care consistent across your entire organization by increasing user satisfaction, which means more clinicians using evidence-based resources.
- ◆  **will...** set new standards for efficiency by combining two systems into one integrated solution – *that's the power of knowledge applied!*

Interested in learning more?  will tell you more, just [click here](#).

 am available through our partners...



www.micromedex.com

Next Steps

- Repeat the observational study
- Look at system logs to see if:
 - Infobutton use is rising (1000/month in first 8 months)
 - Use of other resources is falling (not yet; 8000/month)
- Order entry Infobuttons
- Collaborations: LDS/IHC, Regenstrief and NYSPI
- Infobutton Manager to be an ANSI standard

Conclusions

- Information needs arise while using CIS
- Infobuttons are easy to build
- Build it and they may not come
- Can retrievals be standardized?
- Will information needs be satisfied?
- Will care improve?
- Resources exist
- Creative solutions required
- Need to engage resource providers
- Infobutton manager provides a platform for exploration

Button.

- Jimmy Cimino, 1956

Acknowledgments

- The Columbia team:
 - Jianhua Li
 - Sue Bakken
 - Vimla Patel
 - Mureen Allen
 - Leanne Currie
 - Mark Graham
- LDS/IHC: Guilherme del Fiol, Stan Huff
- Regenstrief: Marc Overhage
- NYSPI: Tom White
- National Library of Medicine research grant
- National Library of Medicine training grant
- National Institute of Nursing Research