

# Medical Informatics Needs Assessment

I. Name \_\_\_\_\_

Date \_\_\_\_\_

## I. Demographics

a. Your age: \_\_\_\_\_

b. Your gender:  
Female   
Male

c. Training level:  
R1  
R2  
R3  
MD Faculty  
Other Faculty  
FPC Staff  
FHC Staff

d. Please list the most recent formal school you attended (highest level, e.g. Washington HS, Kirkwood Community College, Iowa State, Harvard Medical School, etc.)  
\_\_\_\_\_

## II. Computer Experiences

a. How frequently do you use a computer (choose one)?

Daily  
Weekly  
Monthly  
Rarely  
Never

b. What training or experience with computers have you had? (check all that apply)

- Formal course(s) in computer science or related field
- Formal medical school training in computers
- Formal residency or fellowship training in computers
- Formal workshops or conferences on computers for which I received CME credit
- Workshops or conferences on computers for which I did not receive CME credit
- Self-guided learning about computers
- None

c. On the whole, how sophisticated a computer user do you consider yourself? (choose only one)

- Very sophisticated
- Sophisticated
- Neither sophisticated nor unsophisticated
- Unsophisticated
- Very unsophisticated

d. On the whole, how interested are you in learning more about computers? (choose only one)

- Eager to learn more
- I'd like to learn more
- I'll learn more if I have to, to do my job
- I'd just as soon avoid the subject.
- I feel hostile when I hear the word "computer".

e. On the whole, how interested are you in learning more about the noncomputer aspects of medical informatics (e.g. evidence based medicine, Problem oriented medical record, etc.) (choose only one)

- Eager to learn more
- I'd like to learn more
- I'll learn more if I have to, to do my job
- I'd just as soon avoid the subject.
- I feel hostile when I hear the words "medical informatics".

f. Please complete the following table.

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1. Where do you have access to a computer or terminal? Complete <i>all</i> rows that apply	What type of machine?	Other features does this computer have? Check <i>all</i> that apply: (AMOS is the FPC billing system. Meditech is Mercy's system, PHAMIS is St. Lukes'.	How often do you use this computer, and how comfortable you are using it?	
__ No access anywhere				
__ At work, on my desk	__ PC, WINDOWS __ PC, DOS only __ Mac __ PC or Terminal connected to a mainframe __ Other, which? _____	__ CD-ROM __ Sound __ Printer __ Modem, speed? _____ __ AMOS __ Meditech __ Phamis __ Local Area Network __ Internet connection __ Medline search	<u>Frequency</u> __ Never __ Rarely __ Monthly __ Weekly __ Daily	<u>Comfort Level</u> __ <b>Very comfortable</b> __ <b>Somewhat comfortable</b> __ <b>Neutral</b> __ <b>Somewhat uncomfortable</b> __ <b>Very uncomfortable</b>
__ At work, NOT on my desk	__ PC, WINDOWS __ PC, DOS only __ Mac __ PC or Terminal connected to a mainframe __ Other, which? _____	__ CD-ROM __ Sound __ Printer __ Modem, speed? _____ __ AMOS __ Meditech __ Phamis __ Local Area Network __ Internet connection __ Medline search	<u>Frequency</u> __ Never __ Rarely __ Monthly __ Weekly __ Daily	<u>Comfort Level</u> __ <b>Very comfortable</b> __ <b>Somewhat comfortable</b> __ <b>Neutral</b> __ <b>Somewhat uncomfortable</b> __ <b>Very uncomfortable</b>
__ Laptop computer	__ PC, WINDOWS __ PC, DOS only __ Mac __ PC or Terminal connected to a mainframe __ Other, which? _____	__ CD-ROM __ Sound __ Printer __ Modem, speed? _____ __ AMOS __ Meditech __ Phamis __ Local Area Network __ Internet connection __ Medline search	<u>Frequency</u> __ Never __ Rarely __ Monthly __ Weekly __ Daily	<u>Comfort Level</u> __ <b>Very comfortable</b> __ <b>Somewhat comfortable</b> __ <b>Neutral</b> __ <b>Somewhat uncomfortable</b> __ <b>Very uncomfortable</b>
__ In a hospital teaching area, which hospital? _____ _____	__ PC, WINDOWS __ PC, DOS only __ Mac __ PC or Terminal connected to a mainframe __ Other, which? _____	__ CD-ROM __ Sound __ Printer __ Modem, speed? _____ __ AMOS __ Meditech __ Phamis __ Local Area Network __ Internet connection __ Medline search	<u>Frequency</u> __ Never __ Rarely __ Monthly __ Weekly __ Daily	<u>Comfort Level</u> __ <b>Very comfortable</b> __ <b>Somewhat comfortable</b> __ <b>Neutral</b> __ <b>Somewhat uncomfortable</b> __ <b>Very uncomfortable</b>
__ In my ambulatory clinical teaching area	__ PC, WINDOWS __ PC, DOS only __ Mac __ PC or Terminal	__ CD-ROM __ Sound __ Printer __ Modem, speed? _____	<u>Frequency</u> __ Never __ Rarely __ Monthly	<u>Comfort Level</u> __ <b>Very comfortable</b> __ <b>Somewhat</b>

	connected to a mainframe _Other, which? _____	__ AMOS __ Meditech __ Phamis __ Local Area Network __ Internet connection __ Medline search	__ Weekly __ Daily	<b>comfortable</b> <b>Neutral</b> <b>Somewhat uncomfortable</b> <b>Very uncomfortable</b>
__ At home	__ PC, WINDOWS __ PC, DOS only __ Mac __ PC or Terminal connected to a mainframe _Other, which? _____	__ CD-ROM __ Sound __ Printer __ Modem, speed? _____ __ AMOS __ Meditech __ Phamis __ Local Area Network __ Internet connection __ Medline search	<u>Frequency</u> __ Never __ Rarely __ Monthly __ Weekly __ Daily	<u>Comfort Level</u>  <b>Very comfortable</b> <b>Somewhat comfortable</b> <b>Neutral</b> <b>Somewhat uncomfortable</b> <b>Very uncomfortable</b>

g. Where do you have access for conducting MEDLINE searches? (Check all that apply)	How do you connect to the information? (Check one) NLM = National Library of Medicine	
__ No access		
__ At work	__ Grateful Med to NLM __ CD-ROM on site __ Physicians On Line	__ Modem to library, which? _____ __ Other, how?
__ In my clinic	__ Grateful Med to NLM __ CD-ROM on site __ Physicians On Line	__ Modem to library, which? _____ __ Other, how?
__ In the hospital library, which hospital? _____	__ Grateful Med to NLM __ CD-ROM on site	__ I search __ Someone else searches for me
__ At home	__ Grateful Med to NLM __ CD-ROM on site __ Physicians On Line	__ Modem to library, which? _____ __ Other, how?

h. To what extent do you personally use a computer for each of the following professional tasks? Please circle your answer.

1. *Never perform this task*  
 /  
 |  
 |  
 v
2. *Perform this task but never use a computer*  
 |  
 |  
 v
3. *Sometimes use a computer*  
 |  
 |  
 v
4. *Often use a computer*  
 |  
 |  
 v
5. *Always use a computer*  
 |  
 |  
 v

Documenting patient information (e.g., history & physicals, progress notes)	1	2	3	4	5
Accessing clinical data (e.g., laboratory data, EKGs, radiology reports)	1	2	3	4	5
Communicating with colleagues	1	2	3	4	5
Obtaining advice on a specific patient's diagnosis or therapy	1	2	3	4	5
Scheduling patient appointments	1	2	3	4	5
Writing (e.g., grants, research papers, teaching material)	1	2	3	4	5
Prepping presentation slides or overheads	1	2	3	4	5
Performing statistical analysis on clinical or research data	1	2	3	4	5
Searching the medical literature (e.g., MEDLINE)	1	2	3	4	5
Teaching students and residents	1	2	3	4	5
Financial tools: accounting and analysis	1	2	3	4	5
Internet search and research on topic	1	2	3	4	5
E-mail	1	2	3	4	5
Generating reports from a database	1	2	3	4	5
Patient education	1	2	3	4	5

i. Does your current hardware access meet your work needs?  Yes  No If no, why not?

j. Does your current software meet your work needs?  Yes  No If no, why not?

k. Rate the quality of computer/informatics training provided to residents in your program?  
 Excellent  Very good  Good  Fair  Poor  None

la. (Faculty only) Rate the quality of computer/informatics training provided to faculty in your program?  
 Excellent  Very good  Good  Fair  Poor  None

lb. Rate the quality of computer/informatics training provided to staff in your program?  
 Excellent  Very good  Good  Fair  Poor  None

m. For each skill below, we want you to enter ONE code number which reflects both (a) whether or not you can perform the skill, and (b) your attitude about learning the skill. Example: Enter "4" if you can't do the skill right now, but are excited about learning to do it.

CODE	Can you do this skill?	How do you feel about learning this skill?
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1	NO	-- I really don't want to learn this skill
2	NO	- I'd just as soon not learn this skill, but will if I need to for the job
3	NO	= Neutral about learning this skill
4	NO	++ I'm eager to learn this skill
5	YES	- No, I know more than I want to already
6	YES	+ Yes, I'd like to learn more about it
7	YES	++ Yes, I'm feeling a real need to learn a lot more about it.

**Basic Electronic Mail (Email) Skills**

- Log in to the system
- Send messages
- Read messages
- Reply to messages
- Forward messages
- Delete messages
- Print messages
- Use a lookup or address book feature
- Save messages into appropriate folders
- Create folders or mail boxes
- Change password
- Attach files for shipment
- Read or save attachments
- Use online help
- Log out or shut down

**Advanced Email Skills:**

- Create personal mail groups
- Create/use a signature
- Use/customize button bars
- Create/use rules
- Handle trash (undelete messages, empty trash)

**Basic Word Processing Skills**

- Create a new document
- Open an existing document
- Save a document
- Save a document to a floppy disk
- Print a document
- Spell check a document
- Simple formatting (bold, underline, center, margins, fonts)
- Cut, copy, or paste text
- Use online help

**Advanced Word Processing Skills**

- Use page numbers
- Use headers/footers
- Use the thesaurus
- Create a table
- Use hanging indent and user-defined tabs
- Save a file in a different format (ASCII, other format)

**Operating System Skills**

- Format or initialize floppies
- Copy/move files to other locations
- Create directories/folders
- Delete files
- Switch among open applications
- Cut, copy, or paste text
- Log in to a network
- Log out of a network
- Change passwords
- Access files on a shared network
- Use the public folders to share network files
- Remove/delete folders/directories
- Back up files
- Find files
- Undelete erased files
- Customize the desktop

**Calendar/Scheduling**

- Read calendar information
- Add/delete items in personal calendar
- Print calendars
- Accept/decline appointment requests
- Schedule appointments
- Schedule resources (rooms, department car)
- View other calendars (with permission)

**Medline Searches**

- Log into the Medline computer
- Select a bibliographic database
- Select the type of search (keyword, author, etc.)
- Perform a search
- Review search results on screen
- Print search results
- Download results onto to a disk
- Disconnect from the system

**Clinical Computing Skills**

- Use a clinical business billing system
- Use electronic medical records
- Access patient information in a clinical information system
- Use a decision-support program (eg, QMR)
- Use a CD-ROM (such as Stat-Ref or SAM) to access information
- Use a drug interaction program (eg, AskRx)
- Use Problem Knowledge Couplers
- Use Clinical Reference Systems (CRSWin handouts on disk)
- Use Instant Medical History
- Use PATIENTED® (patient education templates)

**Analysis Skills**

- Use a spreadsheet (like Excel) for financial analysis
- Use a spreadsheet for statistical analysis
- Generate reports from a database (AMOS, Access, etc.)

**Programming Skills**

- Write or record a Macro
- Write a simple program, in \_\_\_\_\_ language(s)
- Write a complex program in \_\_\_\_\_ language(s)
- Build a Web Page

**Other Skills**

- Use presentation software (eg, PowerPoint) for transparencies, slides, etc.
- Use a web browser (Netscape or MIE) to access the World Wide Web (WWW)
- Use a browser to search for information on WWW
- Use a WWW search engine (Yahoo, Altavista, Excite, etc.)
- Access Usenet discussion groups (NEWS://)
- Use an Internet Gopher
- Telnet into a remote computer
- Subscribe to and unsubscribe from a Listserv (email discussion group)
- Use File Transfer Protocol (FTP) to download files
- Use a personal data base (eg, article file, document procedures)
- Participate in distance education by phone, TV, etc

k. What computer training would you most like to receive? \_\_\_\_\_

n. What software program(s) do you use for:

email? \_\_\_\_\_

word processing? \_\_\_\_\_

data base? \_\_\_\_\_

communications (modem)? \_\_\_\_\_

spreadsheet? \_\_\_\_\_

statistics? \_\_\_\_\_

presentation graphics? \_\_\_\_\_

medical information? \_\_\_\_\_

### III. Computer Knowledge

Below are a set of paired terms that relate to computers in medicine. Please score your knowledge of the distinction between the terms in each pair, using the following scale:

1 I don't understand the distinction at all.

2 I have a general appreciation of the distinction but I couldn't define it.

3 I can define the distinction precisely

V

V

V

	1	2	3
Hardware ↔ Software	1	2	3
Images ↔ Graphics	1	2	3
Forward chaining ↔ Backward chaining □	1	2	3
Free text ↔ Coded data □	1	2	3
Field ↔ Record □	1	2	3
Relational database ↔ Flat-file database □	1	2	3
Data in memory ↔ Data on disk □	1	2	3
Sensitivity ↔ Positive predictive value □	1	2	3
ICD9-CM ↔ SNOMED □	1	2	3
Entities ↔ Relationships □	1	2	3
Floppy disk ↔ Hard disk □	1	2	3
Full-text database ↔ Bibliographic database □	1	2	3
Interpreter ↔ Compiler □	1	2	3
Mainframe computer ↔ Personal computer □	1	2	3
Electronic mail ↔ Electronic bulletin board □	1	2	3
Client ↔ Server □	1	2	3
Digital ↔ Analog □	1	2	3
Database ↔ Knowledge base □	1	2	3
	Don't Understand distinction	General understanding, can't define	Could define distinction precisely
RAM ↔ ROM	1	2	3
Data ↔ Information	1	2	3
Privacy ↔ Confidentiality	1	2	3
Identification ↔ Authentication	1	2	3
Algorithm ↔ Flowchart	1	2	3

Problem Oriented Record ⇔ SOAP Charting	1	2	3
Internet ⇔ World Wide Web	1	2	3
Java ⇔ HTML	1	2	3
Backup ⇔ Archive	1	2	3
Rule Based System ⇔ Neural Network	1	2	3
In Statistics: Type 1 Error ⇔ Type 2 Error	1	2	3
Standard Deviation ⇔ Standard Error	1	2	3
Evidence Based Medicine(EBM) ⇔ Your unsubstantiated clinical knowledge (YUCK)	1	2	3
Disease Oriented Evidence(DOE) ⇔ Patient Oriented Evidence that Matters (POEM)	1	2	3
Recall based systems ⇔ “Just-in-time” systems	1	2	3
Patient instructions ⇔ Patient education	1	2	3
Computer Literacy ⇔ Punishment	1	2	3

#### IV. Applications of Computers in Medicine

A. Priorities for future development. Listed below are 18 potential functions of computers in medicine. First, circle six functions that you consider to be of highest priority for future development. Then, circle six functions you consider to be of lowest priority for future development.

	Priority for future development	
	Highest (Choose 6)	Lowest (Choose 6)
Creating electronic medical record systems to replace the paper record	Highest	Lowest
Taking a medical history from a patient	Highest	Lowest
Entering physician orders such as laboratory tests or prescriptions	Highest	Lowest
Controlling of machine tools that assist in surgical procedures	Highest	Lowest
Performing automated interpretations of diagnostic tests (e.g., X-rays, EKGs, and pulmonary function tests)	Highest	Lowest
Assisting in the development of treatment plans for patients with complex problems	Highest	Lowest
Computer assisted patient education	Highest	Lowest
Providing reminders to patients and clinicians of overdue visits, tests, or preventive care	Highest	Lowest
Collecting directly from patients information that is useful for screening or triage	Highest	Lowest
Augmenting medical care in geographic areas where trained personnel are not readily available	Highest	Lowest
Monitoring and adjusting life support systems in intensive-care units	Highest	Lowest
Offering advice in the diagnosis of the patient with an unknown illness	Highest	Lowest
Substituting for cadavers in the teaching of anatomy	Highest	Lowest
Simulating patient encounters to teach clinical skills	Highest	Lowest
Administering a medical licensure examination using simulations	Highest	Lowest
Identifying patients eligible for clinical trials	Highest	Lowest
Assisting in collecting and reporting clinical trials data	Highest	Lowest
Auditing the quality of care provided by hospitals and physicians	Highest	Lowest
Reviewing the utilization of medical resources	Highest	Lowest

B. **Capabilities of future computer systems.** If you were considering the use of a computer-based system in medical care, how necessary would the following capabilities be? Circle your response using the scale below.

1. **Vitally necessary:** Any system I would use must have this capability. I would not use a system that lacked it.
2. **Generally necessary:** I would be much more likely to use a system having this capability, but I might use a system that lacked it.
3. **Somewhat necessary:** I would be somewhat more likely to use a system because it had this capability.
4. **Not necessary:** My decision to use a system would be unaffected by the presence of this capability.
5. **Unable to respond:** The meaning or implications of this capability are not clear to me.

	Vitally Necessary	Generally Necessary	Somewhat necessary	Not necessary	Unable to respond
I can enter information in my own words and not need to know any special codes	1	2	3	4	5
I can learn to use the system in less than two hours.	1	2	3	4	5
I can access the system at any place in the clinical setting	1	2	3	4	5
The system always responds to my queries in less than five seconds	1	2	3	4	5
The system always displays X-rays and other images in less than 30 seconds	1	2	3	4	5
I can interact with the computer without using a keyboard	1	2	3	4	5
The system is always functioning. There is never any "down time."	1	2	3	4	5
The system can be implemented with no changes whatsoever to existing clinic routines	1	2	3	4	5
When a system provides medical advice on the care of specific patients, it always provides multiple alternative recommendations	1	2	3	4	5
When a system provides medical advice on the care of specific patients, it can quantify the level of certainty inherent in its recommendations	1	2	3	4	5
The system takes a patient's own preferences into account when giving advice to clinicians	1	2	3	4	5
The system can clearly explain the rationale for advice it gives on the care of patients	1	2	3	4	5
Users can browse the information in a system as well as asking it to provide advice about care of specific patients	1	2	3	4	5
The system has been demonstrated in research studies to make <i>diagnoses</i> at least as accurate as human consultants	1	2	3	4	5
The system has been demonstrated in research studies to provide <i>treatment recommendations</i> at least as accurate as human consultants	1	2	3	4	5
Help on how to use the program is available on-line	1	2	3	4	5
Level of confidentiality and security must be better than the paper record	1	2	3	4	5
	1	2	3	4	5

**C. Potential effects of computers.** Given below are some effects that computers may have on medicine and health care. For each, indicate whether you believe the effect will be beneficial or detrimental using the scale below:

Effect of computers on:	Highly detrimental	Detrimental on the whole	Neither detrimental nor beneficial	Beneficial on the whole	Highly beneficial
Costs of health care	1	2	3	4	5
Clinician autonomy	1	2	3	4	5
Quality of health care	1	2	3	4	5
Interactions within the health care team	1	2	3	4	5
Role of the government in health care	1	2	3	4	5

Access to health care in remote or rural areas	1	2	3	4	5
Management of medical/ethical dilemmas	1	2	3	4	5
Enjoyment of the practice of medicine	1	2	3	4	5
Status of medicine as a profession	1	2	3	4	5
Continuing medical education	1	2	3	4	5
Physicians' stress levels	1	2	3	4	5
The self-image of clinicians	1	2	3	4	5
Humaneness of the practice of medicine	1	2	3	4	5
The rapport between clinicians and patients	1	2	3	4	5
Personal and professional privacy	1	2	3	4	5
Clinicians' access to up-to-date-knowledge	1	2	3	4	5
Patients' satisfaction with the quality of care they receive	1	2	3	4	5
Generalists' ability to manage more complex problems	1	2	3	4	5

**V. Open Response Area (Use back of page if necessary)**

1. Regarding medical information in general, is there anything you might like to do or be able to do that you can't do right now.

2. What barriers or problems do you see us encountering and needing to overcome. What can we do to better address these barriers.

3. What anxieties or worries do you in relation to changes in the way we deal with medical information?

4. What else do you think we should know?

Page 9 Acknowledgments: This survey was adapted and modified from the work of Craig Gjerde, Univ. of Wisconsin who provided the sections on computer access and computer skills. The sections on computer use, knowledge, priorities, capabilities and effects are derived from the Computers in Medical Care Survey, © 1993 William Detmer M.D., MSc and Charles Friedman, Ph.D.. (<http://www.med.virginia.edu/~wmd4n/medsurvey.html>, or email: [bdetmer@virginia.edu](mailto:bdetmer@virginia.edu).) Synthesis and expansion of this work accomplished by Charles Zelnick M.D. Many thanks to the above authors.