

## A Systematic Evaluation of Evidence Based Medicine Tools for Point-of-Care

SCC/MLA 2006

---

---

---

---

---

---

---

### Authors – THSLC Communications Team

- Julie M. Trumble, University of Texas Medical Branch Moody Medical Library
- Margaret J. Anderson, University of Texas Health Science Center Houston School of Public Health Library
- Marlene Caldwell, Texas Health Science Libraries Consortium
- Felicia Chuang, University of Texas Harris County Psychiatric Center UT Psychiatry Library
- Stephanie Fulton, UT M.D. Anderson Cancer Center Research Medical Library
- Anne Howard, University of Texas Medical Branch Moody Medical Library
- Beatriz Varman, Houston Academy of Medicine – Texas Medical Center Library

---

---

---

---

---

---

---

### Background

- Point-of-care EBM tools proliferating
- Deciding on “right” tool is difficult as products vary in
  - Complexity
  - Content
  - Accessibility
  - Intended audience

---

---

---

---

---

---

---

## Purpose

- Systematically compare and contrast EBM point-of-care tools
- Proactively identify and learn about point-of-care products available on the market

---

---

---

---

---

---

---

---

## Methods

- Identify EBM point-of-care tools:
  - Literature search in Medline, CINAHL, LISTA
  - Medlib-L discussions
  - Hand searched journals, including:
    - JMLA
    - Medical Reference Services Quarterly
  - Hall of Exhibits at MLA Annual Meeting 2006 in Phoenix, AZ
  - Open Access Medicine (OAM) – Sources on the Web
  - Evidence-Based Medical Information – Open vs. Closed Access – Dean Giustini –  
<http://www.slais.ubc.ca/courses/libr538l/04-05-wt2/sourcesofevidence.pdf>

---

---

---

---

---

---

---

---

## Inclusion Criteria

- Product must claim to provide evidence based information for direct patient care
- Products not marketed as point-of-care tools are excluded

---

---

---

---

---

---

---

---

## Products Included in the Study

- ACP PIER
- Clinical Evidence\*
- Clinical Resources @ Ovid
- Diseasedex – General Medicine
- DynaMed
- eMedicine
- Evidence Matters
- FirstConsult
- Harrison's Practice: Answers on Demand
- HealthGate\*\*
- InfoPOEMS/InfoRetriever
- Prodigy Knowledge\*
- UpToDate
- Zynx Evidence Evidence

\*United Kingdom  
\*\*excluded from final ranking

---

---

---

---

---

---

---

---

## Products Not Included in the Study

- Bandolier
- Best Treatments
- Cleveland Clinic Disease Management
- Cochrane Database of Systematic Reviews
- Doctor Evidence
- Evidence-Based On-Call Database
- FPIN Clinical Queries
- MD Consult

---

---

---

---

---

---

---

---

## Criteria Studied

- Identified categories and assigned a score
- After reviews completed, categories were weighted by importance to increase relevancy ranking
- Data gathered in 6 main categories
  - General Information – 5 subcategories
  - Content – 4 subcategories
  - Searching – 2 subcategories
  - Results – 4 subcategories
  - Other Features – 4 subcategories

---

---

---

---

---

---

---

---

### Definitions – Evidence-based Medicine

- The conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients. The practice of evidence-based medicine means integrating individual clinical expertise with the best available external clinical evidence from systematic research.

– Sackett DL, Strauss SE, Richardson WS, Rosenberg W, Haynes RB. Evidence-based medicine: how to practice and teach EBM. New York: Churchill-Livingstone; 2000.

---

---

---

---

---

---

---

---

### Definitions – Point-of-Care

- Any location where patient care is provided, including, e.g., the bedside, radiology suite, emergency room, clinic, or ambulance

– Taber CW, Thomas CL. Taber's cyclopedic medical dictionary. Philadelphia: F.A.Davis; 1997.

---

---

---

---

---

---

---

---

### Definitions – Background Questions

- Asks for general knowledge about a disorder
- Who, what, when, where, why, how
  - Example:  
What is diabetes?  
Where is the pancreas?

– Sackett DL, Strauss SE, Richardson WS, Rosenberg W, Haynes RB. Evidence-based medicine: how to practice and teach EBM. New York: Churchill-Livingstone; 2000.

---

---

---

---

---

---

---

---

## Definitions – Foreground Questions

- Ask for specific knowledge about managing patients with a disorder
- PICO – Patient, Intervention, Comparison (if relevant), Outcome
  - Example: In young children, is cefdinir (Omnicef) or Amoxicillin and Clavulanic Acid (Augmentin) more effective in resolving otitis media.
  - Sackett DL, Strauss SE, Richardson WS, Rosenberg W, Haynes RB. Evidence-based medicine: how to practice and teach EBM. New York: Churchill-Livingstone; 2000.

---

---

---

---

---

---

---

---

## Categories – General Information

- Is the product really point-of-care?
- General Information
  - Subscription models (free, individual, institutional)
    - We did not attempt to add cost into our product evaluation as this would vary greatly by type/size of institution
    - When possible, we did gather data on pricing models/structure
  - Access models (IP, password, simultaneous users)
- Target Audience
- Marketing Claims

---

---

---

---

---

---

---

---

## Categories - Content

- Scope
  - Volume (number of documents) –
    - Problematic measure – every vendor counts differently
    - We collected data and tried to “normalize” scores we gave to products
  - Breadth (number of subject areas)
  - Depth (number of levels within subjects)
  - Drug Information
- Patient Handouts
  - availability and languages included
- CE Credits – and for which practitioners

---

---

---

---

---

---

---

---

## Categories - Content

- Practice Guidelines
  - Inclusion
  - Frequency of embedded in topic
  - Access to the guideline provided

---

---

---

---

---

---

---

## Categories – Quality Control

- Authorship
  - Individual(s) identified
  - Credentials
  - Peer review
- Updating
  - How often are new topics added
  - How often are records updated/revised
- Bias

---

---

---

---

---

---

---

## Categories - Searching

- Types of searching
  - keyword, browse, drug, advanced
- Usability
  - Ease of navigation
  - Ease of printing
  - Other output available
  - Help

---

---

---

---

---

---

---

### Categories - Results

- Type of question answered
  - Background, foreground
- Presentation of results
  - Readability and organization
- Evidence grading
  - Frequency, clarity, system used
- Evidence summary

---

---

---

---

---

---

---

### Categories - Results

- References
  - Integrated in text
  - Bibliography
  - OpenURL links
  - PubMed links

---

---

---

---

---

---

---

### Categories – Other Features

- Customization
- Integration with other technologies (PDA, EMR, etc.)
- Unique or useful features
- Coming features

---

---

---

---

---

---

---

## Raw Ranking of Products

1. ACP PIER
2. eMedicine
3. DynaMed
4. Clinical Evidence\*
5. Clinical Resources @ Ovid
6. UpToDate
7. Diseasedex – General Medicine
8. FirstConsult
9. InfoPOEMS/InfoRetriever
10. Zynx Evidence
11. Harrison's Practice: Answers on Demand
12. Prodigy Knowledge\*
13. Evidence Matters

\*United Kingdom

---

---

---

---

---

---

---

---

## Weighting of Categories

- Categories were weighted to allow some areas to be more important than others
- Used 3 different weighting schemes
  - 1 – just weighted “evidence” categories
  - 2 – just indicated some categories as “important”
  - 3 – assigned levels of importance to categories
- Spreadsheet has a place where weighting can be changed to reflect individual institution’s needs

---

---

---

---

---

---

---

---

## Weighting of Categories for Evidence

- Used an important/not as important system
- Important categories were multiplied by 1
- Not as important categories were multiplied by 0.5
- “Important” Categories for Evidence:
  - Does it grade the evidence
  - Summary of evidence
  - Updating
  - Authorship
  - References within text
  - Bib. at the end

---

---

---

---

---

---

---

---



## Ranking of Products by Evidence

1. ACP PIER
2. Clinical Evidence\*
3. DynaMed
4. Clinical Resources @ Ovid
5. eMedicine
6. UpToDate
7. Diseasedex – General Medicine
8. InfoPOEMS/InfoRetriever
9. FirstConsult
10. Zynx Evidence
11. Evidence Matters
12. Harrison's Practice: Answers on Demand
13. Prodigy Knowledge\*

\*United Kingdom

---

---

---

---

---

---

---

---

## Weighting of Categories – Important/Not as Important

- Expanded the important/not as important system used for evidence
- Not as important categories were multiplied by 0.5

---

---

---

---

---

---

---

---

## Weighting of Categories – Important/Not as Important

- Important Categories:
  - Breadth
  - Depth
  - Drug information
  - Individual author listed
  - Peer Review
  - Updating
  - Keyword
  - Browse
  - Drug search
  - Ease of navigation
  - Type of question answered
  - Ease of reading
  - Grading the evidence
  - Summary of evidence
  - Bibliography at the end
  - Links to PubMed
  - PDA
  - EMR integration

---

---

---

---

---

---

---

---

## Ranking of Products by Important/Not as Important

1. ACP PIER
2. Clinical Evidence\*
3. DynaMed
4. eMedicine
5. Diseasedex – General Medicine
6. Clinical Resources @ Ovid
7. UpToDate
8. InfoPOEMS/InfoRetriever
9. FirstConsult
10. Zynx Evidence
11. Harrison's Practice: Answers on Demand
12. Evidence Matters
13. Prodigy Knowledge\*

\*United Kingdom

---

---

---

---

---

---

---

---

## Weighting of Categories – Levels of Importance

- We assigned values to provide gradations of importance to the data collected
- Values assigned
  - 1 – least important
  - 2 – moderately important
  - 3 – most important

---

---

---

---

---

---

---

---

## Weighting of Categories – Levels of Importance

- Categories Weighted as Most Important (3)
  - Breadth
  - Depth
  - Frequency of updating records
  - Keyword searching
  - Ease of navigation
  - Answering foreground (PICO) questions
  - Ease of reading
  - Clarity and organization of results
  - Grading the evidence
  - Summary of evidence

---

---

---

---

---

---

---

---

## Weighting of Categories – Levels of Importance

- Categories Weighted as Moderately Important (2)
  - Drug information
  - Where drug information is available
  - Practice Guidelines- frequency of availability
  - Practice Guidelines – links to online full-text
  - Peer review of entries
  - Frequency of new topics added
  - Searching by browsing
  - Searching by drug name
  - Ease of printing
  - Answering background questions
  - References within text
  - Bibliography available at the end
  - Available on PDA
  - Available within EMR

---

---

---

---

---

---

---

---

## Weighting of Categories – Levels of Importance

- Content – 31%
- Quality Control – 11%
- Searching – 18%
- Results – 32%
- Features – 7%

---

---

---

---

---

---

---

---

## Ranking of Products by Levels of Importance

1. ACP PIER
2. Clinical Evidence
3. Diseasedex – General Medicine
4. DynaMed
5. InfoPOEMS/InfoRetriever
6. Zynx Evidence
7. eMedicine
8. Clinical Resources @ Ovid
9. UpToDate
10. FirstConsult
11. Prodigy Knowledge
12. Harrison's Practice: Answers on Demand
13. Evidence Matters

\*United Kingdom

---

---

---

---

---

---

---

---

## Comparison of Rankings

Raw	Evidence	Important/Not As Important	Levels
ACP PIER	ACP PIER	ACP PIER	ACP PIER
eMedicine	Clinical Evidence*	Clinical Evidence*	Clinical Evidence*
DynaMed	DynaMed	DynaMed	DynaMed - General Medicine
Clinical Evidence*	Clinical Resources @ Ovid	eMedicine	DynaMed
Clinical Resources @ Ovid	eMedicine	DynaMed - General Medicine	InfoPOEMS/InfoRetriever
UpToDate	UpToDate	Clinical Resources @ Ovid	Zynx Evidence
DynaMed - General Medicine	DynaMed - General Medicine	UpToDate	eMedicine
FirstConsult	InfoPOEMS/InfoRetriever	InfoPOEMS/InfoRetriever	Clinical Resources @ Ovid
InfoPOEMS/InfoRetriever	FirstConsult	FirstConsult	UpToDate
Zynx Evidence	Zynx Evidence	Zynx Evidence	FirstConsult
Harrison's Practice: Answers on Demand	Evidence Matters	Harrison's Practice: Answers on Demand	Prodigy Knowledge*
Prodigy Knowledge*	Harrison's Practice: Answers on Demand	Evidence Matters	Harrison's Practice: Answers on Demand
Evidence Matters	Prodigy Knowledge*	Prodigy Knowledge*	Evidence Matters

\*United Kingdom

## Exceptions

- Evidence Matters
  - Analysis showed not a point-of-care tool
  - Useful research tool
  - Unique use of PICO question in formulating queries
  - "On the fly" creation/manipulation of data from journal articles

## Exceptions

- HealthGate
  - Not ranked with other products because so different
  - Purpose is to provide a forum for structured collaboration and provide actionable evidence for groups such as hospital quality control committees working on standard documents such as order entry, discharge planning, etc.
  - Synthesized evidence is available to authors but not to users of the end-products (the final CPOE, for example)
  - Other evidence products purchased by an institution can be integrated into HealthGate

## Exceptions

- Diseasedex General Medicine and Zynx Evidence Evidence
  - Both products are similar to others considered in this study
  - But, both are parts of larger products that are used at the point-of-care that may make them more accessible to health care providers
  - Diseasedex General Medicine is a component of Micromedex which covers a variety of areas including drugs, alternative medicine, toxicology & laboratory information, etc.
  - Zynx Evidence has components for order sets and care plans
  - Both products can be integrated into the EMR so can be accessed along with patient data

---

---

---

---

---

---

---

## Conclusion

- Evaluating products a subjective process
- Standard measures can help show product distinctions
- Individual institution needs important part of consideration

---

---

---

---

---

---

---

## Future Directions

- Consider having practitioners rate which categories on the form are most important
- Consider having practitioners try top resources to get real-life perspective
- Investigate relationships with institutional departments involved in EMR for true point-of-care access for health care providers

---

---

---

---

---

---

---

## Keeping Current

- JMLA -
  - Electronic Resources Reviews
- MLA News
- Medical Reference Services Quarterly

---

---

---

---

---

---

---

## Acknowledgement

- Friedman PW, Ketchum AM. A reusable template for evaluating point-of-care information products. 2004 MLA Annual Meeting; May 21-26, 2004; Washington DC; 2004. Available from:  
<http://www.hslls.pitt.edu/services/instruction/presentations/mla2004/friedman04.ppt>

---

---

---

---

---

---

---

## Questions?

Contact information:  
Julie Trumble – [jtrumble@utmb.edu](mailto:jtrumble@utmb.edu)  
Margaret J. Anderson -  
[Margaret.J.Anderson@uth.tmc.edu](mailto:Margaret.J.Anderson@uth.tmc.edu)  
Marlene Caldwell – [mcaldwe@mdanderson.org](mailto:mcaldwe@mdanderson.org)  
Stephanie Fulton – [sfulton@mdanderson.org](mailto:sfulton@mdanderson.org)  
Anne Howard – [anhoward@utmb.edu](mailto:anhoward@utmb.edu)  
Beatriz Varman - [beatriz.varman@exch.library.tmc.edu](mailto:beatriz.varman@exch.library.tmc.edu)

---

---

---

---

---

---

---

## Presentation Files

<http://ils.mdacc.tmc.edu/papers.html>

- PowerPoint slides
- Excel file with data collected on individual products
- Blank spreadsheet to use on your own

---

---

---

---

---

---

---

Product Evaluation Form

Information	Entry			notes
Vendor:				
Name of product:				
Year it started				
Url:				
Reviewer				
2nd Reviewer		Date		
<b>Inclusion?</b>				
Point of care	Is this a point of care?	Yes or No		
	If no, then enter the strengths of the product?			
<b>General Information</b>				
Subscriptions	Free	Mark an x if this applies		
	Individual subscription	Mark an x if this applies		
	Institutional subscription	Mark an x if this applies		
	If institutional subscription, then what type of access?	enter: Campus only, IP address, password only		
Cost	If pricing info is available, enter here:			
Simultaneous Users	Charge per seat	Mark an x if this applies		
	Unlimited	Mark an x if this applies		
Target Audience of Marketing	Hospital or HC system	Mark an x if this applies		
	Consumers	Mark an x if this applies		
	Health providers	Mark an x if this applies		
	Libraries	Mark an x if this applies		
Marketing	What do they claim?	paste or type in claims		
	Does the product match the marketing claims?	Yes or Somewhat or No		
	If No, how the they differ?	Type in explanation.		



Product Evaluation Form

Content							
Criteria	description	Ranked to be entered	Entry	Notes	Weight - Evidence	Weight- I/NAI	Weight - Levels
Scope	Volume (# of documents)	Very (1.5) if over 3000 documents; High (1) if over 2000; Medium (.5) over 500; Low (0) if under 500 documents			0.5	0.5	1
	Breadth (# of subject areas)	Broad (1) Somewhat (.5) little (0)			0.5	1	3
	Deep (# of levels within subjects)	deep (1) somewhat (.5) very little (0)			0.5	1	3
	Drug information	Yes (1) No (0)			0.5	1	2
	At what level is drug information available	within each topic (1) some topics(.5) as separate area (0)			0.5	0.5	2
	Future expansion	If mentioned, add to notes					
Total for Scope			0		0.5	1	2
Patient Handouts	English	Yes (1) or No (0)			0.5	0.5	1
	Spanish	Yes (1) or No (0)			0.5	0.5	1
	Other	add 1 pt for each additional language, type languages into note field			0.5	0.5	1
Total for Patient Handouts			0		0	0	0
CE Credits	Physicians	Yes (1) No (0)			0.5	0.5	1
	Nurses	Yes (1) No (0)			0.5	0.5	1
	Other	add 1 pt for each additonal professional, type them into note field			0.5	0.5	1
Total for CE Credits			0		0	0	0
Practice guidelines	Are they included?	Yes (1) No (0)			0.5	0.5	1
	Frequency that it is embedded into topic entries	always (1), sometimes (.5), never (0)			0.5	0.5	2
	Can you access the guideline?	Yes (1) No (0) (type source in note field)			0.5	0.5	2
Total for Practice Guidelines			0		0	0	0

Product Evaluation Form

Quality Control							
Criteria	description	Ranked to be entered	Entry	Notes			
Authorship	Transparency (is an individual listed?)	Yes (1), somewhat (.5), no (0)			1	1	1
	Credentials listed	Yes (1) no (0)			1	0.5	1
	Are the entries peer reviewed?	Yes (1) no (0)			1	1	2
Total for Authorship			0		0	0	0
Updating	How often are new topics added?	Monthly+ (0) weekly (.5) daily (1)			1	1	2
	How often are records updated/revised?	less 6 months (1) 6 months-1 yr (.5) Greater(0)			1	1	3
Total for Updating			0		0	0	0
Bias	Did you see a bias(es)?	Yes (0), somewhat (.5), no (1)	0				
	Describe biases here						
Total for Bias			0		0	0	0
Searching							
Criteria	description	Ranked to be entered	Entry	Notes	Weight - Evidence	Weight- I/NAI	Weight - Levels
Types of Searches Available	Keyword	Yes (1) no (0)			0.5	1	3
	Browse	Yes (1) no (0)			0.5	1	2
	Search for drug (in note field type in how you can search: by generic, by brandname, either)	Yes (1) no (0)			0.5	1	2
	Advanced	Yes (1) no (0)			0.5	0.5	1
Total for Types of Searches			0		0	0	0
Usability	Ease of navigation	Yes (1), somewhat (.5), no (0)			0.5	1	3
	Ease of printing	Yes (1), somewhat (.5), no (0)			0.5	0.5	2
	Other output (email, downloading, exporting)?	Yes (1) no (0)			0.5	0.5	1
	Description						
	Help screens	Yes (1), somewhat (.5), no (0)			0.5	0.5	1
Total for Usability			0		0	0	0

Product Evaluation Form

Results							
Criteria	description	Ranked to be entered	Entry	Notes	Weight - Evidence	Weight- I/NAI	Weight - Levels
Type of Question Answered	Does it answer background questions?	Yes (1), somewhat (.5), no (0)			0.5	1	2
	Does it answer foreground (PICO) questions?	Yes (1), somewhat (.5), no (0)			1	1	3
Total for Type of Question Answered			0		0	0	0
Presentation of Results	Ease of reading? (bullets or lengthy paragraphs)	Yes (1), somewhat (.5), no (0)			0.5	1	3
	Clear and organized?	Yes (1), somewhat (.5), no (0)			0.5	0.5	3
Total for Presentation of Results			0		0	0	0
Does it Grade the Evidence?	Frequency	always (1), sometimes (.5), never (0)			1	1	3
	Clarity	Yes (1), somewhat (.5), no (0)			1	1	3
	Type in the levels of evidence used						
Total for Does it Grade the Evidence			0		0	0	0
Summary of Evidence	Summary of evidence provided (narrative)	always (1), sometimes(.5), never (0)			1	1	3
	Summary tables	always (1), sometimes(.5), never (0)			1	1	3
	Clarity	Yes (1), somewhat (.5), no (0)			1	1	3
Total for Summary of Evidence			0		0	0	0
References	Referenced within text	Yes (1) no (0)			1	0.5	2
	Bibliography at end	Yes (1), sometimes (.5), no (0)			1	1	2
	Offers links to open URL	Yes (1), sometimes (.5), no (0)			0.5	0.5	1
	Links out to PubMed	Yes (1), sometimes (.5), no (0)			0.5	1	1
Total for References			0		0	0	0

Product Evaluation Form

Other features							
Criteria	description	Ranked to be entered	Entry	Notes	Weight - Evidence	Weight- I/NAI	Weight - Levels
Customization	Offered?	Yes (1) no (0)			0.5	0.5	1
	Describe the customization(s) available:						
Total for Customization			0		0	0	0
Intergration of Technologies	PDA's	Yes(1) or no (0)			0.5	1	2
	EMRs	Yes(1) or no (0)			0.5	1	2
	Other	Add 1 pt for each additional technology. List these addtions in the note field.			0.5	0.5	1
Total for Integration of Technologies			0		0	0	0
Unique or Useful Features	Enter and describe each feature						
Coming Features	Enter and describe each feature, include when it will be available						
	Raw Total				Weight - Evidence	Weight- I/NAI	Weight - Levels
Totals			0		0.5	1	2