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

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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/libr538f/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.

  – Sacket 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?

  – Sacket 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 – **P**atient, **I**ntervention, **C**omparison (if relevant), **O**utcome

  - Example: In young children, is cefdinir (Omnicef) or Amoxicillin and Clavulanic Acid (Augmentin) more effective in resolving otitis media.

    - Sacket 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
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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
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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
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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	Diseasedex – General Medicine
Clinical Evidence*	Clinical Resources @ Ovid	eMedicine	DynaMed
Clinical Resources @ Ovid	eMedicine	Diseasedex – General Medicine	InfoPOEMS/InfoRetriever
UpToDate	UpToDate	Clinical Resources @ Ovid	Zynx Evidence
Diseasedex – General Medicine	Diseasedex – 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.hsls.pitt.edu/services/instruction/presentations/mla2004/friedman04.ppt

Questions?

Contact information:

Julie Trumble – jtrumble@utmb.edu

Margaret J. Anderson - Margaret.J.Anderson@uth.tmc.edu

Marlene Caldwell – mcaldwe@mdanderson.org

Stephanie Fulton – sfulton@mdanderson.org

Anne Howard – anhoward@utmb.edu

Beatriz Varman - 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