Integrating Guidelines into Local Clinical Practice and Policy Using Hospital-based HTA

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Center for Evidence-based Practice, University of Pennsylvania Health System

Penn Medicine Blueprint for Quality and Patient Safety

Chlorhexidine to Reduce Surgical Site Infections

Comparative Effectiveness Research

Center for Evidence-based Practice: Mission and Approach

Disclosure of Interests (last 3 years)

Matthew D. Mitchell, Ph.D.

Employment: Center for Evidence-based Practice, University of Pennsylvania Health System

Funding: Internal, AHRQ Evidence-based Practice, CDC

I certify that, to the best of my knowledge, no other aspects of my current personal or professional situation might reasonably be expected to affect significantly my views on the subject on which I am presenting.
Office of CMO Organizational Chart

CEP Staffing

- Director & Co-director
  - Physicians in hospital practice
  - Expertise in epidemiology

- Physician and nurse liaisons
  - Represent all three hospitals plus outpatient practices
  - Identify topics
  - Disseminate results

- 5.5 FTE

CEP Evidence Report Products

- Evidence Review
  - Systematic review and analysis of primary literature

- Evidence Advisory
  - Summary of evidence, mostly from secondary sources

- Evidence Inventory
  - Annotated literature search: quantity and nature of evidence

- Standalone guideline projects and other custom reports

CEP Evidence in Practice

- Medical practice guidelines
- Nursing practice guidelines
- Purchasing decisions
- Formulary decisions
- Prioritizing practice improvement programs
- Health system policy

Evidence-based Guideline Process

- Identify the issue of concern (clinical department or task force)
- Define the research question (requestor and CEP)
- Systematic review (CEP)
- Decide on practice standard (requestor)
- Disseminate and implement findings (requestor, CEP, CDS, clinical staff)
- Monitor the impact (requestor and CEP)

Evidence Review
Evidence Review Findings:
Predictors of Readmissions

- **Patient characteristics**
  - Comorbidities, living alone, discharged to home, and payor
  - Evidence is mixed regarding other factors, including age and gender

- **Healthcare resource utilization**
  - Length of stay, number of prior admissions, previous ED visits
  - Studies have not consistently identified threshold values for these predictors

Implementation: Readmission Risk Flag

Sample CEP CDS Interventions

- Venous thromboembolism prophylaxis
- Foley catheter removal alert
- Readmission risk flag
- Albumin order set
- Early warning system for sepsis
- Delirium management order set
- Red blood cell transfusion order set

CEP in 2013

- More than 200 reports in our first seven years
- Nearly 40 reports integrated into CDS system
- Local practice guidelines based on CEP reviews
- AHRQ-designated EPC, in partnership with ECRI
- Major guideline projects for CDC

Clients Served

<table>
<thead>
<tr>
<th>Requester of Reports</th>
<th>N=220 reports</th>
</tr>
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<tbody>
<tr>
<td>Clinical Departments</td>
<td>23%</td>
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<tr>
<td>Chief Medical Officers</td>
<td>21%</td>
</tr>
<tr>
<td>Quality/Safety Committees</td>
<td>15%</td>
</tr>
<tr>
<td>Purchasing Committees</td>
<td>14%</td>
</tr>
<tr>
<td>Pharmacy and Therapeutics (P &amp; T) Committees</td>
<td>9%</td>
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<tr>
<td>Administrative Departments</td>
<td>7%</td>
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<tr>
<td>External Organizations</td>
<td>6%</td>
</tr>
<tr>
<td>Nursing</td>
<td>5%</td>
</tr>
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</table>

Report Topics

- Drug                          22%
- Device                        24%
- Diagnostic test               6%
- Process of care               45%
- Policies, other topics        3%
Report topics

- **Drugs**
  - Celecoxib versus other NSAIDs for post-op pain control
- **Devices**
- **Diagnostic tests**
- **Processes of care**
- **Policy, miscellaneous topics**

Report topics

- **Drugs**
- **Devices**
  - Robotic-assisted surgery in OB/GYN
- **Diagnostic tests**
- **Processes of care**
- **Policy, miscellaneous topics**

Report topics

- **Drugs**
  - Screening tests for risk of aspiration
  - Early warning systems for pregnant patients
- **Devices**
- **Diagnostic tests**
- **Processes of care**
- **Policy, miscellaneous topics**

Report topics

- **Drugs**
  - Routine replacement of peripheral IVs versus replacement only “as needed”
  - Post-discharge telephone calls to reduce readmissions
  - Thresholds for blood transfusion
  - Discharge criteria for infants with bronchiolitis
  - Fixed-schedule treatment for alcohol withdrawal
- **Devices**
- **Diagnostic tests**
- **Processes of care**
- **Policy, miscellaneous topics**

Report topics

- **Drugs**
- **Devices**
- **Diagnostic tests**
- **Processes of care**
  - Cognitive and procedural skills of aging physicians
  - Frequently-overused technologies
  - Credentialing of physicians performing robotic surgery
  - Medical care costs associated with smoking
- **Policy, miscellaneous topics**

CEP Reports by Academic Year

![Graph showing CEP Reports by Academic Year]
Rapid turnaround time

• Evidence advisory: 2 to 4 weeks
• Evidence review: 3 to 8 weeks
  • These times exclude external review

• Maintaining sound systematic review and analysis methods
  • Multiple database searches
  • Meta-analysis where appropriate
  • Evaluate quality of studies and GRADE of evidence base

Narrowly focused topics

• Use best available evidence
  • Summarize and update existing guidelines and systematic reviews when possible

Single analyst does study screening and data abstraction

Background and discussion sections are brief

Work quickly and with sharp focus

• Summarize and update existing guidelines and systematic reviews when possible

• Single analyst does study screening and data abstraction

• Background and discussion sections are brief

Localized HTA

• Addressing topics of local concern
• Compare local practice to published guidelines
• Use local utilization and cost data

HUP Surgical Site Infection Data – FY07

<table>
<thead>
<tr>
<th>Type of Cases</th>
<th>Number</th>
<th>Cost per case</th>
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<tbody>
<tr>
<td>Infected</td>
<td>285</td>
<td>$13,537</td>
</tr>
<tr>
<td>Uninfected</td>
<td>21,584</td>
<td>$5,356</td>
</tr>
</tbody>
</table>

Decision Analysis - Assume 25% reduction with chlorhexidine

Which antiseptic should UP HS use

<table>
<thead>
<tr>
<th>Antiseptic</th>
<th>Infection</th>
<th>No infection</th>
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</thead>
<tbody>
<tr>
<td>Chlorhexidine</td>
<td>$13,550; P = 0.009</td>
<td>$5,369; P = 0.991</td>
</tr>
<tr>
<td>Betadine</td>
<td>$13,537</td>
<td>$5,356</td>
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</table>

Analysis estimated annual hospital savings of $415,511 with chlorhexidine

Rewards

Reviewing Guidelines

- CEP “Trustworthy Guideline” Appraisal Tool
  - Based on IOM domains
  - Designed for clinicians to understand and use
  - See our poster at this meeting (board 127)

<table>
<thead>
<tr>
<th>Domain</th>
<th>Sample guideline 1</th>
<th>Sample guideline 2</th>
<th>Sample guideline 3</th>
<th>Sample guideline 4</th>
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<tbody>
<tr>
<td>1. Transparency</td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>2. Conflict of interest</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>NR</td>
</tr>
<tr>
<td>3. Development group</td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>A</td>
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<tr>
<td>4. Systematic review</td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>A</td>
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<tr>
<td>5. Supporting evidence</td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>A</td>
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<td>6. Recommendations</td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>A</td>
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<td>7. External review</td>
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<td>NR</td>
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<td>8. Currency and updates</td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>A</td>
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Dissemination of Reports: UPHS

- CEP intranet site
- Clinical decision support
- In-person presentations to clients and stakeholders
- PROVE (Penn Reviews of Value & Effectiveness) e-mails to clinical staff

Dissemination of Reports: Worldwide

- CEP internet site
- National Guideline Clearinghouse
- Health Technology Assessment database (searchable via Cochrane Library)
- Peer-reviewed publications

Education Activities

- Evidence-based medicine series for med students
- Participation in Clinical Investigator Toolbox and Healthcare Systems Leadership resident programs
- Systematic review and meta-analysis course for residents and fellows (in MSCE program)
- Critical appraisal course for fellows and junior faculty
- Local and national conferences and workshops

Old doctors learning new tricks

Conclusions

- Evidence-based decision making improves the quality, safety, and cost-effectiveness of care.
- Despite this, infrastructure to support such decision making in U.S. hospital & health care systems is not common.
- Penn Medicine’s Center for Evidence Based Practice (CEP) is one of only a few academically-based centers in the US with internal and external funding to support such work.
- CEP is enthusiastic about collaborating in operations, research and education to improve the quality, safety and value of care thru a systems approach to evidence-based practice.
Thank you!

Learn more online, and see a catalog of our reports

www.uphs.upenn.edu/cep