PUBLIC HEALTH – EHR VENDORS COLLABORATION INITIATIVE WEBINAR

INTEGRATION OF CDC ZIKA GUIDANCE INTO CLINICAL WORKFLOW USING OPENINFOBUTTON

SEPTEMBER 19, 2017
Submit or Ask Questions

- Submit your text question and comments using the Question Panel

- Please raise your hand to be unmuted for verbal questions.
INTEGRATION OF CDC ZIKA GUIDANCE INTO CLINICAL WORKFLOW USING OPENINFOBUTTON

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JEAN FREDI LOUIS, MIM
CATHERINE STAES, BSN, MPH, PHD
1 question out of every 2 patients seen

>60% of questions left unanswered

Resources: answer >90% of questions

Del Fiol G, Workman TE, Gorman PN. Questions raised by clinicians at the point of care. JAMA Int Med. 2014.
WHAT ARE "INFO BUTTONS"

https://www.powtoon.com/presentoons/fh5lSK1UWO8/
DrupPoint® Summary
Donepezil Hydrochloride

Topics

• Adult Dose
• Adverse Effects
• Contraindications
• Drug Interaction
• Pregnancy Category
• Precautions
• How Supplied

Dosing & Indications

Adult Dosing

- Alzheimer's disease - Dementia (Mild to Moderate): tablets/solution, 5 or 10 mg ORALLY once daily at bedtime, with or without food
- Alzheimer's disease - Dementia (Mild to Moderate): orally disintegrating tablets, 5 or 10 mg dissolve ORALLY on the tongue once daily
- Alzheimer's disease - Dementia (Severe): tablets, 10 mg ORALLY once daily at bedtime, with or without food
- Alzheimer's disease - Dementia (Severe): orally disintegrating tablets, 10 mg dissolve ORALLY on the tongue once daily

More topics...

Choose a resource:

• Micromedex
• UpToDate
• MDConsult
• Medline Plus

Resources

BID PRN
Diabetes Mellitus: Type 2

What is type 2 diabetes mellitus?

Type 2 diabetes is a disorder that happens when your body does not make enough insulin or is unable to use insulin properly. The inability to use your insulin is called insulin resistance. This problem with insulin causes the level of sugar in your blood to become abnormally high.

When you digest food, your body breaks down much of the food into sugar (glucose). Your blood carries the sugar to the cells of your body for energy. The pancreas gland makes insulin, which helps move the sugar from the bloodstream into the cells.

When your body does not have enough insulin or cannot use insulin properly, sugar cannot get into your cells. Sugar builds up in your blood. Too much sugar in your blood can cause many problems. These problems can be life-threatening if they are not treated. However, proper treatment can control your blood-sugar level.
Context-sensitive decision support (infobuttons) in electronic health records: a systematic review

David A Cook,1,2,3 Miguel T Teixeira,3 Bret SE Heale,4 James J Cimino,5 and Guilherme Del Fiol4

ABSTRACT

Objective Infobuttons appear as small icons adjacent to electronic health record (EHR) data (e.g., medications, diagnoses, or test results) that, when clicked, access online knowledge resources tailored to the patient, care setting, or task. Infobuttons are required for “Meaningful Use” certification of US EHRs. We sought to evaluate infobuttons’ impact on clinical practice and identify features associated with improved outcomes.

Methods We conducted a systematic review, searching MEDLINE, EMBASE, and other databases from inception to July 6, 2015. We included and cataloged all original research in any language describing implementation of infobuttons or other context-sensitive links. Studies evaluating clinical implementations with outcomes of usage or impact were reviewed in greater detail. Reviewers worked in duplicate to select articles, evaluate quality, and abstract information.

Results Of 599 potential articles, 77 described infobutton implementation. The 17 studies merits detailed review, including 3 randomized trials, yielded the following findings. Infobutton usage frequency ranged from 0.3 to 7.4 uses per month per potential user. Usage appeared to be influenced by EHR task. Five studies found that infobuttons are used less often than non-context-sensitive links (proportionate usage 0.20–0.34). In 3 studies, users answered their clinical question in > 69% of infobutton sessions. Seven studies evaluated alternative approaches to infobutton design and implementation. No studies isolated the impact of infobuttons on objectively measured patient outcomes.

Conclusions Weak evidence suggests that infobuttons can help providers answer clinical questions. Research on optimal infobutton design and implementation, and on the impact on patient outcomes and provider behaviors, is needed.
IMPACT OF INFOBUTTONS

<table>
<thead>
<tr>
<th></th>
<th>Infobuttons</th>
<th>Unaided Search</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median Session Time</td>
<td>35 seconds</td>
<td>2 to 8 minutes</td>
</tr>
<tr>
<td>Questions Answered</td>
<td>85%</td>
<td>78%</td>
</tr>
</tbody>
</table>

- **Decision enhancement or learning**
  - Over 62% of sessions
- **Slow usage uptake**
  - Partners Healthcare: ~100,000 sessions / month
  - Intermountain: ~20,000 sessions / month
WHY DID WE NEED A STANDARD?

Azithromycin in Female
75 years old
Medication order
entry
Chronic kidney
disease
Setting: ED

Resource 1
Resource 2
Resource 3

Electronic Health Record
Infobutton Manager

http://resource1.com/
search = “azithromycin AND dose

http://resource2.com/quer
y = “azithromycin” [MeSH Terms] AND dose [All Fields]

http://resource3.com/
searchConcept = 3333 ^ azithromycin
filter = 11 ^ dosage
## CONTEXT DIMENSIONS

<table>
<thead>
<tr>
<th>Patient</th>
<th>User</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Patient vs. provider</td>
</tr>
<tr>
<td>Age group</td>
<td>Discipline / specialty</td>
</tr>
<tr>
<td>Concept of interest</td>
<td></td>
</tr>
<tr>
<td>Secondary observations</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EHR</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task (e.g., order entry, problem list entry, lab results review)</td>
<td>Care setting</td>
</tr>
<tr>
<td></td>
<td>Service delivery location</td>
</tr>
<tr>
<td></td>
<td><strong>Location of interest</strong></td>
</tr>
</tbody>
</table>
STANDARDS-BASED APPROACH

EHR

Infobutton Manager

Resource 1

Resource 2

Resource 3
Female
25 years old
Problem list review
Zika
User: MD
Setting: ED

Infobutton Manager

Tailoring tool (LITE)

Infobutton Responder

Medline Plus

Dynamed

UpToDate

Intranet

Any online document
Female
25 years old
Medication order entry
Zika
User: MD
Setting: ED
Dose
INFO BUTTONS FOR PUBLIC HEALTH CDS

• Proof-of-concept - Zika as a use case
  – Patient: Pregnant woman from Florida
  – Setting: outpatient prenatal care clinic

• Scenarios
  1. Nurse seeks educational materials relevant to the patient’s pregnancy
  2. Physician seeks guidelines about Zika testing and management
  3. Physician seeks guidelines about interpretation of Zika test results
SCENARIO 1- EDUCATIONAL MATERIALS

Clinic nurse seeks patient educational materials relevant to the patient’s pregnancy

- Nurse opens the patient’s problem list and clicks on the infobutton next to “Pregnancy”
- Nurse reviews educational materials from various resources
- Nurse prints a set of handouts and gives them to the patient

http://lite.bmi.utah.edu/OpenInfobuttonDemo_CDC1.html
**SCENARIO 1**

Open info button

<table>
<thead>
<tr>
<th><strong>Electronic Health Record</strong></th>
<th><strong>Veterans Administration</strong></th>
<th><strong>Information audience</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td>27</td>
<td></td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td>F</td>
<td></td>
</tr>
<tr>
<td><strong>Problem list</strong></td>
<td>Pregnancy</td>
<td></td>
</tr>
<tr>
<td><strong>Medications</strong></td>
<td>Hydrochlorothiazide (Amitriptyline), 12.5 Mg, Tablet, Oral</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Folic Acid 1.24 Mg, Tablet, Oral</td>
<td></td>
</tr>
<tr>
<td><strong>Lab results</strong></td>
<td>Beta-hCG, Serum Qualitative Positive</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hematocrit H</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Serum Glucose L</td>
<td></td>
</tr>
</tbody>
</table>
SCENARIO 1 - RESOURCE DISPLAY
SCENARIO 1 - RESOURCE DISPLAY
SCENARIO 2 – CLINICAL GUIDANCE

• Pregnant patient diagnosed with Zika
• Zika on her problem list
• Physician wants information about Zika testing and management
• Physician clicks on the infobutton next to Zika in the patient’s problem list and finds relevant CDC guidelines

http://lite.bmi.utah.edu/OpenInfobuttonDemo_CDC2.html
## Scenario 2

### Electronic Health Record

<table>
<thead>
<tr>
<th>Field</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>27</td>
</tr>
<tr>
<td>Gender</td>
<td>Female</td>
</tr>
<tr>
<td>Problem list</td>
<td>Pregnancy, Zika Virus Disease</td>
</tr>
<tr>
<td>Medications</td>
<td>Hydrochlorothiazide (Amlotild), 12.5 Mg, Tablet, Oral, Folic Acid 1.24 Mg, Tablet, Oral</td>
</tr>
<tr>
<td>Lab results</td>
<td>Beta-hCG, Serum Qualitative Positive, Hematocrit H, Serum Glucose L, Zika Fever Virus Antibody Positive</td>
</tr>
</tbody>
</table>
SCENARIO 2 - RESOURCE DISPLAY
SCENARIO 2 - RESOURCE DISPLAY
SCENARIO 3 – LAB RESULT GUIDANCE

• Physician reviews lab results for a pregnant woman with Zika symptoms
• Physician clicks on the infobutton next to the results to retrieve CDC guidelines about the interpretation of the results

http://lite.bmi.utah.edu/OpenInfobuttonDemo_CDC3.html
# Scenario 3

**Open Info button**

<table>
<thead>
<tr>
<th>Electronic Health Record</th>
<th>Veterans Administration</th>
<th>Information audience</th>
<th>Healthcare provider</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Problem list</td>
<td>Pregnancy (i)</td>
<td>Zika Virus Disease (i)</td>
<td></td>
</tr>
<tr>
<td>Medications</td>
<td>Hydrochlorothiazide (Amturnide), 12.5 Mg, Tablet, Oral (i)</td>
<td>Folic Acid 1.24 Mg, Tablet, Oral (i)</td>
<td></td>
</tr>
<tr>
<td>Lab results</td>
<td>Beta-hCG, Serum Qualitative Positive (i)</td>
<td>Hematocrit H (i)</td>
<td>Serum Glucose L (i)</td>
</tr>
</tbody>
</table>
**SCENARIO 3 - RESOURCE DISPLAY**

**Understanding Zika Virus Test Results**

**Reporting Test Results**

When CDC performs testing, results will typically be sent to the state or local health department within 3 weeks after specimen receipt. Reporting times for test results may be longer during summer months or when arbovirus activity increases. Turnaround time on tissue specimens will vary, depending on testing volume and type of testing required.

- CDC sends all test results to the appropriate state or local health department.
- State or local health departments report test results to doctors.
- Doctors report test results to patients.

**Interpreting Test Results**

- [Interim Guidance for Interpretation of Zika Virus Antibody Test Results](https://www.cdc.gov/2016-week51-conference/cdc-conference-reporter/0028-infodiem.html)
- [Interpreting Zika MAC-ELISA Results](https://www.cdc.gov/2016-week51-conference/cdc-conference-reporter/0028-infodiem.html)
- [Interpreting Triplex Real-Time RT-PCR Assay Results](https://www.cdc.gov/2016-week51-conference/cdc-conference-reporter/0028-infodiem.html)
LOCATION-SPECIFIC INFO BUTTONS
ZIKA INFORMATION ON PUBLIC HEALTH WEBSITES, BY JURISDICTIONAL LEVEL, RELEVANT FOR FLORIDA

CDC:
- Clinical presentation & epidemiology of zika
- Guidance for clinicians
- Prevention
- Traveler info
- Reporting & surveillance
- Transmission risk: world, US, Texas, Florida

Florida DOH:
- General info: links to CDC
- Traveler info for Florida
- FL surveillance data by county
- Transmission risk, Florida

Miami Dade DOH:
- General info: links to CDC and Florida website

CDC = Centers for Disease Control and Prevention; DOH = Department of Health
NATIONAL SCALABILITY: OPPORTUNITY

- National solution
  - Centralized hosting
  - Decentralized content indexing
  - Support for various use cases
    - Infectious disease outbreaks
    - Opioid management

- Infobutton standard
  - Over 500 EHR vendors certified against Infobutton criteria in Meaningful Use
  - Supports location-specific context
ARCHITECTURE FOR NATIONAL SOLUTION

Step 1: hosting (IT)

Step 2: content indexing (public health entities)

Step 3: configure to access CDC infobutton responder (health care organizations)

EHR

Infobutton Responder

Tailoring tool (LITE)
NATIONAL SCALABILITY: GAPS & QUESTIONS

• Content indexing/management
  – Roles & responsibilities of different public health entities
  – Link permanence

• Hosting and technical support

• Location of interest
  – Supported by HL7 Infobutton standard
  – OpenInfobutton: support to be implemented
  – EHR systems: no/little support
Questions?

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