

## Decision Support for Quality Improvement

### Unit 6c: Alerts and Clinical Reminders

This material was developed by Johns Hopkins University, funded by the Department of Health and Human Services, Office of the National Coordinator for Health Information Technology under Award Number 1U24OC000013.

---

---

---

---

---

---

---

---

## Objectives

- Analyze the benefits and shortfalls of alerts and clinical reminders

Component 12/ Unit 6

Health IT Workforce Curriculum  
Version 2.0/Spring 2011

2

---

---

---

---

---

---

---

---

## Reminders and Alerts

“...the burden of reminders and alerts must not be too high...or alert fatigue may cause clinicians to override both important and unimportant alerts, in a manner that compromises the desired safety effect of integrating decision support into CPOE.”

Van der Sijs, et. al., 2006.

Component 12/ Unit 6

Health IT Workforce Curriculum  
Version 2.0/Spring 2011

3

---

---

---

---

---

---

---

---

## Alerts and Reminders

### Nuisance Alert

- "...provides little perceived benefit to the prescriber at the time of the alert"

### Alert Fatigue

- "...arise when clinicians, either consciously or unconsciously, begin to systematically bypass CDS alerts without regard to their importance, enabling the possibility that a clinically important alert is missed"

Chaffee, BW (2010)

Component 12/ Unit 6
Health IT Workforce Curriculum  
Version 2.0/Spring 2011
4

---

---

---

---

---

---

---

---

---

---

## Responses to Clinical Reminders

Compliance

- Tendency to perform an action when a warning system instructs the user to do so

Reliance

- Tendency to refrain from performing an action when the warning system does not indicate that it is necessary

Component 12/ Unit 6
Health IT Workforce Curriculum  
Version 2.0/Spring 2011
5

---

---

---

---

---

---

---

---

---

---

## Responses to Clinical Reminders

Spillover

- Clinician performs an action even when not prompted by the reminder system

Reactance

- Clinician refrains from performing an action due to a perceived threat to professional autonomy

Component 12/ Unit 6
Health IT Workforce Curriculum  
Version 2.0/Spring 2011
6

---

---

---

---

---

---

---

---

---

---

## Four Types of Alerts/Reminders



Component 12/ Unit 6

Health IT Workforce Curriculum  
Version 2.0/Spring 2011

7

---

---

---

---

---

---

---

---

## Basic Drug Alerts

- Drug allergy warnings
- Drug-drug interactions
- Duplicate medication or therapeutic duplication alert
- Basic medication order guidance

Component 12/ Unit 6

Health IT Workforce Curriculum  
Version 2.0/Spring 2011

8

---

---

---

---

---

---

---

---

## Advanced Drug Alerts

- Drug-Lab alerts
- Drug-Condition interactions
- Drug-Disease Contraindication alerts
- Drug-condition alerts aimed at appropriate prescribing

Component 12/ Unit 6

Health IT Workforce Curriculum  
Version 2.0/Spring 2011

9

---

---

---

---

---

---

---

---

## Advanced Drug Alerts

- Drug-age alerts
- Drug-formulary alerts
- Dosing guidelines
- Complex prescribing alerts

Component 12/ Unit 6 Health IT Workforce Curriculum  
Version 2.0/Spring 2011 10

---

---

---

---

---

---

---

---

## Evidence to Support Drug Alerts

- Systematic review examined 20 studies that evaluated the impact of efficacy of computerized drug alerts and prompts
  - 23 of 27 alert types identified demonstrated benefit
    - Improving prescribing behavior
    - Reducing error rates
  - Greatest potential for affecting prescribing
    - Drug-drug interaction alerts
    - Drug-disease contraindication alerts
    - Dosing guidelines based on age

Component 12/ Unit 6 Health IT Workforce Curriculum  
Version 2.0/Spring 2011 11

---

---

---

---

---

---

---

---

## Improving Adoption of Drug Alerts

- Shah & colleagues studied improving clinician acceptance of drug alerts in ambulatory care
  - Designed a selective set of drug alerts for the ambulatory care setting using a criticality leveling system
  - Minimized workflow disruptions by designating only critical to high-severity alerts to be interruptive to clinician workflow
- Alert levels:
  - 1: clinician could not proceed with the prescription without eliminating the contraindication;
  - 2: clinicians could proceed if provided an over-ride reason
  - 3: alert displayed at top of screen in red; did not hinder workflow

Component 12/ Unit 6 Health IT Workforce Curriculum  
Version 2.0/Spring 2011 12

---

---

---

---

---

---

---

---

## Basic Laboratory Alerts

Drug-laboratory alerts

Duplicate laboratory testing alert

Basic laboratory test order guidance

Public health situational awareness

Component 12/ Unit 6 Health IT Workforce Curriculum  
Version 2.0/Spring 2011 13

---

---

---

---

---

---

---

---

## Evidence to Support Lab Alerts

- Research examined the impact of a CDDS that generated reminders of previous lab test results
- Found that the proportion of unnecessarily repeated tests dropped significantly
- Features of the Alert
  - Alert was automatically prompted and was part of the clinician workflow
  - User could not deactivate the alert output
  - Most recent laboratory result for viral serology test on its date was automatically retrieved from the patient's EHR
  - Alert was displayed at the time and location of decision making (before the user ordered an unnecessarily repeated test)

Component 12/ Unit 6 Health IT Workforce Curriculum  
Version 2.0/Spring 2011 14

---

---

---

---

---

---

---

---

## Practice Reminders

Guiding

• Provides recommended treatment

Critiquing

• Checks prescriptions against clinical practice guidelines

Monitoring

• Helps provider follow the patient

Component 12/ Unit 6 Health IT Workforce Curriculum  
Version 2.0/Spring 2011 15

---

---

---

---

---

---

---

---

### Practice Reminders Challenges

- Incorrect guidelines
- Too generic guideline
- Patient data inconsistency
- Inappropriate action
- Potential Risk

Component 12/ Unit 6 Health IT Workforce Curriculum  
Version 2.0/Spring 2011 16

---

---

---

---

---

---

---

---

### Administrative Reminders

Medical Coding

→

- Guides prescribers to document to support appropriate medical coding

Quality Improvement

→

- Guides the collection of QI indicator data

Component 12/ Unit 6 Health IT Workforce Curriculum  
Version 2.0/Spring 2011 17

---

---

---

---

---

---

---

---

### Success Factors: Alerts

Specificity

- Alert clinically important for the patient

Sensitivity

- Alert generated in all dangerous cases

van der Sijs, et. al., 2006

Component 12/ Unit 6 Health IT Workforce Curriculum  
Version 2.0/Spring 2011 18

---

---

---

---

---

---

---

---

## Success Factors: Alerts

### Information Content

- Clear, concise, unambiguous
- Justification noted
- Further information accessible
- Alternative actions presented

van der Sijs, et. al., 2006

Component 12/ Unit 6
Health IT Workforce Curriculum  
Version 2.0/Spring 2011
19

---

---

---

---

---

---

---

---

## Success Factors: Alerts

### Workflow

- Directed to right person at right time
- Specialty-specific; Knowledge-specific
- Avoid repetition

### Safe, efficient handling

- High threshold
- Reasons for non-compliance
- Promotes action
- Speed; Screen design; minimize work

van der Sijs, et. al., 2006

Component 12/ Unit 6
Health IT Workforce Curriculum  
Version 2.0/Spring 2011
20

---

---

---

---

---

---

---

---

## Summary

- Alerts/reminders have the potential to improve patient safety
- Types include: drug and lab test alerts, practice reminders, and administrative reminders
- Nuisance alerts provide little perceived benefit to the prescriber at the time of the alert, causing clinician frustration and alert fatigue
- Successful alerts are specific, sensitive, clear, concise and support clinical workflow, allowing for safe, efficient responses.

Component 12/ Unit 6
Health IT Workforce Curriculum  
Version 2.0/Spring 2011
21

---

---

---

---

---

---

---

---