Clinical Decision Support Maintenance and Optimization: A Systematic Review

ANISHA ABDUL-ALI, RN, BSN, MPH[1]; MARISA L WILSON DNSC, MHSC, RN-BC, CPHIMS[2]

[1]JOHNS HOPKINS UNIVERSITY SCHOOL OF NURSING, BALTIMORE, MARYLAND; [2]THE UNIVERSITY OF ALABAMA AT BIRMINGHAM SCHOOL OF NURSING, BIRMINGHAM, ALABAMA

Introduction

A lack of process and governance for creating or maintaining Clinical Decision Support (CDS) in an Electronic Health Record (EHR)

- Out-of-date content that is not evidence based.
- No organized way to manage the creation, maintenance and optimization of clinical content
- No standard intake process. Requests for changes and new content comes from many directions without one group being responsible for the oversight and approval

Objectives

To ensure clinicians have access to current evidence based clinical decision support tools to provide effective and safe care to patients by providing a standard process and structure for CDS maintenance and optimization

Background

- In 2013, nearly six in ten (59%) of hospitals had adopted at least a basic EHR system, up from 9.4 in 2008 (healthit.gov, 2014).
- As electronic health record (EHR) technology spreads quickly across the healthcare industry, providers are developing a broad range of clinical decision support (CDS) tools, such as automated alerts, order-sets, protocols, and smart documentation forms, to improve and standardize clinical care and help providers meet metrics (Butcher, L., 2012)
- There is widespread agreement about the importance of CDS in improving patient outcomes by standardizing care.
- As more hospitals and physicians incorporate CDS into their practice, it is expected to eventually develop formalized knowledge so that the CDS language and process can be uniform and have clear meaning (Castillo, R. and Kelemen, A. 2013)

- Wu et al. (2012) note that decision support is only as good as its underlying foundation and should be continually re-evaluated and fine-tuned after implementation.
  - A governance structure plays a significant role in the maintenance and optimization of CDS after installation.
- Wright et al. (2011) note that the absence of effective governance practices has an adverse effect on the benefits of an EMR CDS system.

Methods

Literature Search

A literature review was conducted to survey best practice recommendations for management and optimization of Clinical Decision Support knowledge management. This was conducted in PubMed, Google Scholar, EMBASE, and by snowball technique from January 1, 2007 through the current year 2015.

Inclusion Criteria
- Full text articles with abstracts
- In English
- Published: 2007-2015
- Search terms:
  - governance,
  - clinical decision support optimization
  - knowledge management

Exclusion Criteria
- publication greater than 8 years
- from non-westernized countries
- non-English language text

Summary of Evidence

- Major Search 5500
- Inclusion & Exclusion 386
- Refinements 80
- Keepers 29

Results

- Search yielded 5500 articles
- 29 articles remained for final analysis.
- Level III-V evidence:
  - Themes around people, process and technology for optimization of knowledge management and clinical decision support.
  - Adequate knowledge management (KM) processes and resources are necessary to develop CDS content.
  - CDS has been developed and implemented rapidly making tracking difficult
  - Need for CDS to be continually evaluated and fine-tuned after implementation.
  - Governance and intake processes helps with review
  - Lack of governance practices cause a reverse benefit of CDS.
  - High quality collaborative for knowledge management are needed
  - Organizations must have processes in place to handle requests for new CDS interventions

---

Discussion

Limitations/Gaps

Limitations:
- sample size
- population of organizations who are already doing clinical decision support well.

Gaps:
- optimization recommendations and strategies.
- The importance of governance and knowledge management processes are discussed and its need to continue after implementation, but details of the make-up, or the tasks are not well outlined.

Conclusions

- Evidence supports further investigation of CDS maintenance and optimization. Including:
  1. People- those responsible for review
  2. Process- logistics and flow of requests received and dissemination of information related to these requests
  3. Technology- order-set design
  4. Organization - development of policies to support process and governance.
- The positive impact of an EHR on patient outcomes has been established.
- Robust systems that integrate clinical decision support assist clinicians in doing the best thing for the patient at time of care.
- It is imperative that CDS remains up-to-date by being reviewed on a consistent basis, by the right people.
- Establishing guidelines for governance and for the maintenance and optimization process of CDS will help to ensure that the information that clinicians rely on to treat patients is correct.

References

Ash, J. et al. (2010) Identifying Best Practices for clinical decision support and knowledge management in the field. Stud. Health technol inform. 160; 806-810

Butcher, L. (2012) Embracing the power of EDR technology, leading providers are using clinical decision support to standardize care, improve compliance with evidence based protocols, reduce length of stay and save lives. Retrieved from http://www.hfma.org/Content.aspx?id=14019

Collins SA, Bavuso, K., Zuccotti, G., Rocha, RA. (2013) Lessons learned for collaborative clinical content development. Appl Clin Inf. 4: 304-316

Sittig, D et al (2010) The state of the art in clinical knowledge management: An inventory of tools and techniques. Int. journ of med inf. 79; 44-57.

Sirajuddin, A. et al (2009) Implementation Pearls from a New Guidelook on Improving Medication Use and Outcomes with Clinical Decision Support. J Healthc Inf Manag. 23 (4): 38-45

Wright, A. et al. (2011) Governance for clinical decision support: case studies and recommended practices from leading institutions. Journal of the American Medical Informatics Association: JAMIA, 18(2) 187-194.

Wu et al (2012). BMC Medical Informatics and Decision Making. 12: 90.

JOHNS HOPKINS UNIVERSITY SCHOOL OF NURSING