Systematic Assessment of Electronic Health Record Interventions on Clinician Performance

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Framework

- Goal: providing the right information at the right time ➔ action
- Implementation vs. outcome
- Assessment strategies
- Which outcomes?
SPECIAL ARTICLE

PROTOCOL-BASED COMPUTER REMINDERS, THE QUALITY OF CARE AND THE NON-PERFECTABILITY OF MAN

Clement J. McDonald, M.D.

Abstract To determine whether clinical errors can be reduced by prospective computer suggestions about the management of simple clinical events, I studied the responses of nine physicians to computer suggestions generated by 390 protocols in a controlled crossover design. These protocols dealt primarily with conditions managed (e.g., elevated blood pressure) or caused (e.g., liver toxicity) by drugs. Physicians responded to 51 per cent of 327 events when given, and 22 per cent of 385 events when not given computer suggestions. Neither level of postgraduate training (first-year postgraduate or third-year postgraduate) nor the order in which physicians served as study and control subjects had statistically significant overall effect on the results. It appears that the prospective reminders do reduce errors, and that many of these errors are probably due to man’s limitations as a data processor rather than to correctable human deficiencies. (N Engl J Med 295:1351-1355, 1976)
Review

March 9, 2005

Effects of Computerized Clinical Decision Support Systems on Practitioner Performance and Patient Outcomes
A Systematic Review

Amit X. Garg, MD; Neill K. J. Adhikari, MD; Heather McDonald, MSc; et al

*JAMA*. 2005;293(10):1223-1238. doi:10.1001/jama.293.10.1223
JAMA - 2005

- 100 studies of computer-assisted ...
  - Diagnosis (N = 10; **no improvement in patient outcomes**; some positive effect on waste)
  - Reminders for preventive care (N = 21; majority showed benefit in **rates of intervention**)
  - Disease management (N = 40; **only 18% showed improvements in health outcomes**)

- Increasing methodologic rigor over time
  - Typically cluster randomization
  - Majority not fully incorporated into the EHR
257 studies that addressed decision support systems demonstrated...

- Three major benefits on quality:
  - Increased **adherence** to guideline-based care
  - Enhanced **surveillance** and monitoring
  - Decreased medication errors
The major efficiency benefit has been **decreased utilization of care**

- Primary and secondary preventive care
- Empirically measured cost data are limited and inconclusive
- Effect on time utilization is mixed
- Major limitation of the literature is its **generalizability**
  - 4 benchmark research institutions
Effect of Clinical Decision-Support Systems
A Systematic Review

Tiffani J. Bright, PhD; Anthony Wong, MTech; Ravi Dhurjati, PhD; Erin Bristow, BA; Lori Bastian, MD, MS; Remy R. Coeytaux, MD, PhD; Gregory Samsa, PhD; Vic Hasselblad, PhD; John W. Williams, MD, MHS; Michael D. Musty, BA; Liz Wing, MA; Amy S. Kendrick, RN, MSN; Gillian D. Sanders, PhD; and David Lobach, MD, PhD
- 148 RCTs assessing clinical decision-support systems and ...
  - Healthcare process measures
    - Preventive care (high level of evidence; OR 1.42 [1.27 - 1.58] across 25 studies)
    - Clinical orders (moderate evidence; OR 1.72 [1.47 - 2.00] across 20 studies)
  - Clinical outcomes
    - Morbidity (moderate evidence; RR 0.86 [0.80 - 0.96] across 16 studies)
    - Mortality (poor evidence; OR 0.79 [0.54 - 1.15] across 6 studies)
Future Directions

● Important for all stakeholders to “buy” into implementation
● Work to expand CDS content to accommodate multiple comorbid conditions simultaneously
● Specify which members of the care team should receive clinical decision support
● Incorporate randomization in daily practice using EMR
● Improve clinical outcome signal (vs. healthcare process measures)