

Introduction of Evidence-Based Diagnostic Order Sets in an Electronic Medical Record is Associated with an Increase in Laboratory Orders

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Published In/Presented At

Kane, B., Arnold, J., Morrison, J., Southworth, R., Greenhut, W., Russell, W., Selley, J., & Stanley, M. (2014, February 22). *Introduction to evidence-based diagnostic order sets in an electronic medical record is associated with an increase in laboratory orders*. Poster presented at: The 2014 Society for Academic Emergency Medicine (SAEM) Regional Mid-Atlantic Meeting, Philadelphia, PA.

Poster presented at: The PaACEP Scientific Assembly, Harrisburg, PA. (April 7-9, 2014)

Poster presented at: The SAEM, Dallas, TX. (May 13-17, 2014)

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Background:

Medical Records (EMR) have seen the rapid growth of decision support to assist providers. This decision support (DS) can be based on Evidence Based Medicine (EBM). An aspect of the EMR where DS can be provided is within Computerized Physician Order Entry (CPOE) using order sets. However, there has been little evidence demonstrating that these order sets actually change the behavior of the provider.

Study Objective:

We hypothesize that EM provider diagnostic ordering patterns can be influenced by the DS contained in CPOE.

Methods:

An IRB-approved retrospective analysis of the orders placed for laboratory tests on paper charts containing a single generic diagnostic order set was compared to those after the institution of a CPOE system with 59 EBM complaint-based order sets at three hospitals contained within a regional health network. Timeframes were chosen as follows: The last six months of paper charts, a six month rollout period gap, and then the next six months of provider CPOE. The time periods were 7/1/2004 to 12/31/2004 for paper charts, 1/1/2005 to 6/30/2005 for rollout, and 7/1/2005 to 12/31/2005 for CPOE. Population data were gathered for comparison. Diagnostic orders were pre-classified as positive (not contained on paper chart, but in CPOE order sets), negative (on paper chart, but not contained in CPOE order sets) and neutral (contained in both).

Results:

A total of 55,380 patients (52.2% female) in the paper chart group were compared to 58,733 (51.7% female) patients in the CPOE group. The increase in patient volume was 6%, which was used as a baseline. The two groups had similar admission rates, 21.5% and 21.8%, respectively. Table 1 demonstrates the change in order patterns, with all positive variables increasing greater than the expected 6% excepting blood cultures. The neutral and negative controls had variable changes.

Table 1. Percent change in specific laboratory orders (baseline patient population increased by 6%)				
	Variables	Paper	CPOE	% Change
Neutral Controls	Total CMP	18895	20265	7%
	Total Lipase	6074	5924	-2%
Positive Variables	Total Ammonia	223	359	61%
	Total Blood Cultures	3862	4060	5%
	Total BNP	3078	3496	14%
	Total Lactate	1814	2580	42%
	Total VBG	178	316	78%
	Total Trauma Labs	9348	24538	162%
Negative Variables	Total ABG	1262	1424	13%
	Total ETOH	2259	2402	6%
	Total PTT	14050	11577	-18%
	Total Type & Screen	3372	4053	20%
	Total Urinalysis	5109	5865	15%

Conclusion:

This retrospective study shows an association between CPOE and an increase in the ordering of diagnostic testing by EM providers. However, removal of specific laboratory orders from EBM-based CPOE order sets was not associated with a decrease in ordering of diagnostics that were previously included in a generic order set. This association suggests that providers may be open to new EBM diagnostic order suggestions in CPOE, but are reluctant to change prior ordering habits.

Disclosure Information:

The authors have no financial conflict of interest to disclose.

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