# Orders and Evidence-based Order Sets – Vanderbilt's Experience with CPOE Ordering Patterns Between 2000 and 2005.

**Jack Starmer, MD and Lemuel R. Waitman, PhD**
**Department of Biomedical Informatics**
**Vanderbilt University Medical Center, Nashville, TN**

*Order sets have been used to make evidence-based guidelines actionable at the point of care with evidence of improved outcomes. In order to understand the impact evidence-based order sets might have on patients and providers at Vanderbilt, it is important to understand current and past use of order sets. This study examined ordering patterns over a 6-year period and results are reported.*

**BACKGROUND:** Order sets have been used to make evidence-based guidelines actionable at the point of care, and have been associated with improved patient outcomes. Order sets are collections of orders designed to streamline and standardize the order entry process. Order sets can range in complexity from a simple list of orderables to more complex order entry advisors that include imbedded decision support. Our institution has actively used a computerized provider order entry (CPOE) system (WizOrder) for more than a decade, and has undertaken a comprehensive effort to make sure order sets are up to date with current evidence. In order to better ensure compliance with evidence-based care guidelines, it is important to understand current and historical ordering patterns associated with use of the CPOE system. The purpose of this study was to examine the ordering patterns seen at Vanderbilt over a 6-year period.

**FACILITY:** Vanderbilt University Medical Center is an 864 bed academic facility made up of Vanderbilt University Hospital (658 beds) and the Monroe Carell Jr. Children's Hospital at Vanderbilt (206 beds). Yearly admission rates ranged from 32,099 in 2000 to 42,599 in 2005. Yearly emergency department (ED) visits ranged from 57,604 to 82,051 for the same period.

**RESULTS:** Ordering data were analyzed for two distinct categories; inpatient orders and ED orders. Ordering data was aggregated by month, and the results are illustrated in figures 1 and 2.

*Inpatient Ordering Patterns:*
Order sets and advisors were utilized in WizOrder for the entire period of data collection, but advisors were not logged by the orders database until January, 2004. The mean percentage of orders arising from order sets between January, 2004 and December, 2005 is 62.5% with a standard deviation of 5.3%. The mean percentage of orders arising from order sets prior to January, 2004 is 40.7% with a standard deviation of 3.9%.
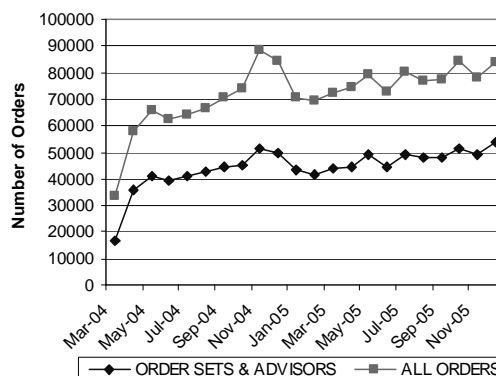


Figure 1. Inpatient Orders
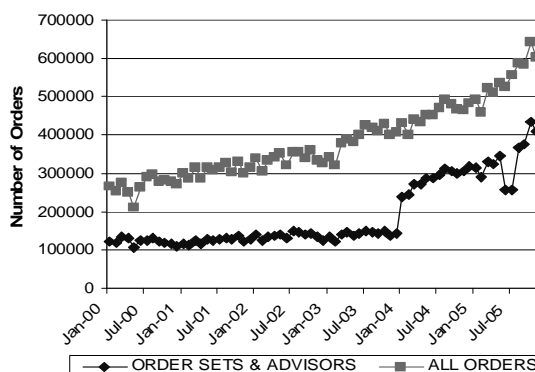
*Ordering Patterns in the ED:*
The Vanderbilt ED went live on the WizOrder system in March, 2004. Since April 2004, the mean percentage of orders arising from order sets is 61.6% with a standard deviation of 1.6%.



Figure 2. Emergency Department Orders

**DISCUSSION:** Over the past two years, orders arising from order sets and advisors have accounted for more than 60% of all hospital and ED orders. Ensuring order sets and advisors are evidence-based an important step to delivering evidence-based guidelines at the point of care.