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An Analysis of the Accuracy of Physician-Entered Indications on Computerized Antimicrobial Orders

To the Editor—Healthcare-associated technologies such as computerized physician order entry (CPOE), electronic medical records (EMRs), and clinical decision support systems are becoming increasingly widespread. The use of CPOE may provide healthcare institutions the opportunity for computer-assisted antimicrobial stewardship as well as the potential to capture data for management, research, and quality monitoring.^{1,2} The validity of collected data may be limited by the accuracy of physician documentation within the COPE framework. An analysis of the accuracy of physician-documented indications on paper antimicrobial order forms has suggested a high (~95%) rate of concordance with clinical

indications, as determined by reviewers.³ To our knowledge, the accuracy of physician documentation of indication for treatment on antimicrobial orders when using a CPOE system has not been evaluated. This accuracy would, understandably, be of concern when such data are to be used for research and benchmarking.

Northwestern Memorial Hospital is a 900-bed urban academic teaching hospital that has had a CPOE system in place since 2004 and a requirement that physicians document the indications for use of antimicrobials since 2011. A list of indications is imbedded in the CPOE system. Indications are generally organized by organ system and/or defined by common clinical infectious syndromes, for example, genitourinary (GU)—urinary tract infection, GU-pyelonephritis, and GU-prostatitis. Prescribers also have the option to enter a free-text indication in the comments of the order. We sought to assess the accuracy of the indications entered in the electronic antimicrobial orders by the prescribers, to validate further analysis of the data.

Data on all antimicrobial orders for the month of October 2011 were accessed via an electronic data warehouse for analysis by the antimicrobial stewardship program. A total of 12,601 orders for antimicrobials were made during the designated study period. These orders were stratified by surgical or procedural prophylaxis and by treatment indications to provide representative samples of both populations. A random sample of 50 patients from each group was selected. The indication on the electronic antimicrobial order was compared with the indication noted in the physician's progress notes in the EMR. Any discrepancies were deemed an inaccurate CPOE indication.

Of the randomly sampled prophylaxis orders, all 50 orders (100%) reflected accurate CPOE indications. In the antimicrobial treatment order group, 43 (86%) of the 50 CPOE indications were accurate. A total of 7 indications were designated as inaccurate. These consisted of 2 orders where the CPOE indication did not match what was documented in the patient's progress notes and 5 orders where "other—please note in comments" was chosen as the indication but nothing was documented in the comments. A majority of these (3 of 5) were for labor-and-delivery patients receiving antimicrobials for group B *Streptococcus* prophylaxis. This indication was subsequently added to the indications list and prepopulated in the labor-and-delivery order sets to minimize this documentation issue in the future. Assuming that this will resolve documentation issues with this population, it is anticipated that the future accuracy of indication selection will increase to approximately 92% in the treatment category overall.

The use of computer technology offers many opportunities for internal analysis, benchmarking with peers, and assisting in antimicrobial stewardship efforts. We present a validation of the accuracy of indication selection on CPOE antimicrobial orders. On the basis of the results of this integrity evaluation, we feel confident moving forward to undertake analysis of

CPOE antimicrobial orders to track antimicrobial choices for various infections, patterns of use for specific antimicrobial agents, and compliance with institutional empiric antimicrobial guidelines, as well as to monitor effects of stewardship interventions and identify areas of stewardship opportunities.

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