auditing and surveys of staff we present information demonstrating how the VDW is used at the 3 HMOs. **Conclusions:** The original intent of the VDW was to increase efficiency in the use of data on multi-site studies. However, single site studies can also gain efficiencies from using the VDW and at some HMOs the VDW has become the first data source to use for almost all research. The VDW advantages of standard data structures and standard methods are also useful for single site projects.

Abstract PS2-32

Prescription Errors in the Electronic Medical Record: Provider Perceptions and Suggestions for Modification

Jody M. Jackson, RN, BSN, *HealthPartners Research Foundation*; James D. Nordin, MD, MPH, *HealthPartners Research Foundation*; Beth A. Molitor, BS, *HealthPartners Research Foundation*; Rick Bruzek, PharmD, *HealthPartners Pharmacy Administration*; Stephen E. Asche, MA, *HealthPartners Research Foundation*; Kevin Palattao, *HealthPartners Patient Care Systems*; Cheri J. Rolnick, PhD, MPH, *HealthPartners Research Foundation*

Background: Electronic prescribing has been purported to be the panacea in decreasing prescribing errors. However, the potential for problems has not been explored. **Aims:** To examine provider perceptions regarding the potential for prescription errors inherent in the electronic medical record (EMR) and possible solutions. This survey is part of a larger study to examine the frequency and sources of prescription errors in the EMR. **Methods:** All pediatricians, internists, family practitioners, cardiologists and oncologists within HealthPartners Medical Group were surveyed electronically. Questions included types of prescription errors, which were most problematic, impact of electronic prescription errors, frequency of errors, and suggestions for modifications. **Results:** One hundred nine out of 248 providers have currently completed surveys (45%); 52% were female, and 76% practiced for >10 years. Dosing errors (choosing wrong strength or form) were reported by 72% as being potentially problematic in the EMR, picking errors (choosing wrong medication from a list) were reported by 53%, errors in instructions (e.g., choosing bid vs. qid) by 48%, and 24% indicated other types of errors. Dosing errors were reported by half of all respondents to be most problematic, while 24% reported picking errors to be most common. Self-reports of the frequency of prescribing errors were: 9% >once/week, 34% once/month, 39% once every 3-6 months, 11% once/year, and 7% never. Using a five-point scale (1=no impact, 5=major impact), only 32% selected a 3 or higher to describe the amount that this issue impacts their practice. Concerns most frequently mentioned were issues involving dosing, inability to find desired drug, default instructions, lack of interface/communication with pharmacy, and accuracy and management of current patient medication lists. Suggestions for modifying the EMR to reduce errors included consistency in naming of medications, provider-specific drug lists, and simplifying or eliminating default directions. **Conclusions:** Providers perceive dosing errors as problematic when using the EMR. Although providers report an inherent potential for prescription errors, many do not feel that this issue has much of an impact on their practice. Suggestions for modifications should be explored to make future improvements in the electronic prescribing component of the EMR.

Abstract PS2-33

Enabling Quality of Care Metric Reporting Using an EMR

Katherine A. Konitzer, BA, *Marshfield Clinic*; Theodore A. Praxel, MD, FACP, MMM, *Marshfield Clinic*; Peggy L. Peissig, MBA, *Marshfield Clinic*; Nicholas R. Berger, BA, *Marshfield Clinic*; Corey M. Turnquist, BA, *Marshfield Clinic*

Background: There is an increasing demand from local, state and national organizations to develop quality metric reporting in healthcare. At the same time there is both external and internal demand to not only report data, but to treat patients with multiple chronic diagnostic conditions in a cost effective manner. A model has been developed at Marshfield Clinic that offers a consistent, efficient, scalable and automated process to evaluate and report quality of care metrics and manage chronic disease populations. Data have been extracted from the electronic medical record (EMR), transformed into entity relationships, and loaded into an enterprise data warehouse to facilitate this model. **Methods:** A systematic approach has been developed to

standardize the measurement of both process and outcome quality measures using the following key steps: (1) defining and documenting quality of care metrics for a population, (2) identifying patients with the population of interest, (3) attributing those patients to a care provider, (4) evaluating and validating data, and (5) providing feedback in the form of storyboards and also in the form of an intervention list application that is managed by medical staff. The first step clearly describes and documents the population of interest and quality of care metrics to be evaluated. The remaining four steps are programmatically automated for timely and efficient evaluation. **Results:** Programs run nightly on a client PC that evaluates the health record for 61,000 unique patients with four possible chronic diagnostic conditions and up to 33 metrics. The average run time of this nightly program over a given month is 4 hours compared to a recent mandated manual chart abstraction of 418 records and 5 measures that took a total of 46 hours to complete. A report for diabetes mellitus shows improvement for low density lipoprotein control of 14% over a 2-year period. **Conclusions:** This process demonstrates a model that is re-usable and scalable, providing an efficient delivery method of quality metric reporting. Quality of metric reporting using an EMR provides a consistent, standardized, and efficient feedback loop by having defined, retrievable data.

Abstract PS2-34

A Targeted, Age-Specific Alert Within an Electronic Medical Record to Reduce Inappropriate D-dimer Testing

Ted E. Palen, PhD, MD, MSPH, *Kaiser Permanente Colorado, Institute for Health Research*; David W. Price, MD, *Colorado Permanente Medical Group*; Megan H. Hawthorn, *Kaiser Permanente Health Plan, Colorado*; Susan M. Shetterly, MS, *Kaiser Permanente Health Plan, Colorado*

Background: The negative predictive value and accuracy of d-dimer assays for venous thromboembolism (VTE) worsens with patient age, meaning additional testing is not avoided in the majority of older patients. We evaluated the effectiveness of a computerized alert to reduce the number of tests ordered for these patients. **Methods:** We hypothesized that an alert at the time of d-dimer ordering for patients ≥65-years-old would decrease the rate of d-dimer testing for these patients. We randomized two groups of clinics. We analyzed the baseline rate of d-dimer orders/1000 patient visits, the rate in the intervention group, and the rate in the control group. After 18 months, the alert was activated for control clinic providers. **Results:** Rate of d-dimers orders/1000 clinic visits in intervention clinics before and after the alert was significantly reduced. We saw a reduced rate in the control clinics also, but it was smaller (possibly due to secular trend). After the alert was turned on in the original control clinics the rate was significantly smaller. The reduced rate persisted in the intervention clinic throughout the study. No significant rate changes were seen in patients <65-years-old.

d-dimer orders/1000 patient visits

≥65-years-old	Baseline rate (no alerts)	Rate difference (95% CI)
Intervention clinics	4.91	-3.36 (-4.05, -2.66)
Rate difference (95% CI)	-1.30 (-2.18, -0.42)	
Control clinics	3.61	-1.23 (-1.91, -0.55)
<65-years-old		
No alerts		
Intervention clinics	4.07	0.30 (-0.18, 0.77)
Rate difference (95% CI)	-0.27 (-0.81, 0.27)	
Control clinics	3.8	1.53 (-0.31, 0.61)

Conclusions: A targeted electronic alert can change the ordering behavior of providers, decrease inappropriate test ordering, and may foster adherence to evidence-based guidelines for management of patients with suspected VTE.