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**Data Analysis Challenges in Switching Electronic Medical Record Systems:
The Kaiser Permanente Colorado Experience**

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Background: Kaiser Permanente of Colorado (KPCO) implemented an electronic medical record in 1998, the Clinical Information System (CIS). CIS was used to document all outpatient encounters until October of 2004. In October, 2004 KPCO implemented the Health Connect electronic medical record (EMR) system developed by Epic Systems. The new EMR was implemented on a rolling basis over a six week period to all outpatient clinics in the region. At the end of this roll-out period, CIS was retired. There are many issues surrounding the implementation of any EMR, including training of personnel, ensuring proper equipment at all sites, and the ability of the software to operate properly. These issues are primarily front-end user issues, and are very important for the day-to-day use of the EMR by users. Presented here are the challenges of data extraction, from data-user perspective, of switching data sources by changing the EMR system while conducting a research project.

Methods: Health Connect and CIS were compared for Workflow and resources required to extract and query data from each system, as well the differences in data fields available for query.

Results: Work flow and resources to determine the differences in data output and to adapt to these differences was 4 times higher than planned for initially; requiring supplemental funding to cover costs. This increase in programmer resources continued 15 months past the time of implementation of the new EMR system in the clinics. Multiple research studies involving smoking cessation were adversely impacted because of programming issues related to accessing data required to identify smokers and for generating reports for feedback to clinicians and research project personnel.

Conclusions: Access to data generated by input into an EMR and analysis of the data are not usually the primary considerations when selecting or switching EMR systems. Because of the lack on continuity of data structure and types between the different EMR systems extended time and resources were required to determine and adapt to data output differences between systems. The problems caused by this increased time dramatically impacted research studies that depended on access to and accuracy of EMR data.