> 85%, while the completion rate for anticonvulsants ranged from 30-75%. The lowest test completion rate was for phenobarbital levels to monitor phenobarbital (30%). For all cardiovascular and anticonvulsant drugs, the proportion of recommended tests not ordered by the clinician ranged from 5% to 60%. The lowest test order prevalence was for phenobarbital level for phenobarbital use (35%), followed by valproic acid level for valproate use(48%), and carbamazepine level for carbamazepine use (60%). Rates of patient noncompletion of ordered tests for all drugs was generally <10%. **Conclusion:** Completion of laboratory monitoring tests for high-risk cardiovascular medications was higher than for high-risk anticonvulsants according to HEDIS guidelines. Clinician ordering behavior exhibited more variation than patient adherence to test orders. Underestimation of HEDIS quality of care monitoring due to patient non-adherence is minimal for cardiovascular medications, but higher for anticonvulsants.

Keywords: Pharmacology, Epidemiology, Adherence

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C-C5-04:

Can Claims Data Accurately Identify Graft Type and Infections Following Anterior Cruciate Ligament Repairs?

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Background: The frequency of human tissue allograft contamination leading to infection is unknown. Attributing infections to allograft contamination versus surgical factors is elusive. National claims data may facilitate study of allograft-associated infections but first require accurate algorithms to identify implantations and infections. We explored the feasibility of using claims data to identify anterior cruciate ligament (ACL) allograft implants and infections. **Methods:** We selected candidate diagnosis, procedure, visit type, and antibiotic prescription criteria to identify ACL allograft repairs and infections. Candidate criteria were categorized by likelihood of infection and putative pathogen type. Criteria were then applied to HMO Research Network Virtual Data Warehouse files for 2000-2008 from six sites. We defined the infection risk period as 90 days following ACL repair. We reviewed charts flagged by each criterion to determine implant type and to assess for infection. Sensitivity and positive predictive values (PPV) were calculated. **Results:** Preliminary results are available from five of six sites. Procedure codes 29888 and 81.45 (ACL repair, unspecified) flagged 11,202 episodes of care. Diagnosis codes compatible with infection flagged 139 episodes (1.2%) of which 71 were categorized as high probability (0.63%). Microbiology and infection management procedure codes flagged 1,029 episodes (9.2%) and 68 episodes (0.6%) respectively. Antibiotics were prescribed for 1,523 episodes (14%) of which 580 were deemed high likelihood prescriptions (5.2%). There were 1011 hospitalizations within 90 days of ACL implantation (9.0%), 787 emergency department visits (7.0%), and 43 infectious disease specialist visits (0.4%). Over 1500 chart reviews are planned of which 107 have been completed thus far. The PPV for allograft implantation is 33% (95% CI 25-43%). Sufficient data are currently available to confirm 14 infections. Antibiotic prescribing was the most sensitive criterion while infectious disease visit had the highest PPV (sensitivities 86% and 7%, PPVs 35% and 100% respectively). **Conclusions:** Claims data do not discriminate between allografts and autografts in ACL repair but do identify a subset of patients with possible infections. Once chart reviews are complete we will assess whether combinations of criteria can increase accuracy.

Keywords: Allograft, Infection, Epidemiology

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C-A4-05:

Design for Identification, Retrieval and Adjudication of Acute Myocardial Infarction Cases in the Mini-Sentinel Distributed Database

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Background/Aims: The goal of the FDA's Mini-Sentinel pilot is to inform development of an active safety surveillance system, the Sentinel System, for monitoring medical product safety. Mini-Sentinel is a collaborative endeavor by Data and Academic Partners including the HMORN and Kaiser, designed to evaluate barriers to the creation of this surveillance system. Orchestrated via the Mini-Sentinel Coordinating Center (MSCC), the Acute Myocardial Infarction (AMI) Validation project is a test case for medical outcome validation within a distributed system designed for medical product safety surveillance. **Methods:** A 3-component process for validation of medical outcomes was used : (1) Case definition and identification: Development of a clinical definition of AMI, an algorithm for identifying likely AMI from Mini-Sentinel Distributed Databases (ICD-9 code-based) and a sampling strategy to select approximately 100 likely AMI cases for chart retrieval; (2) Chart retrieval: Agreement between the MSCC and Data Partners regarding: (a) amount of de-identified medical information to be extracted ; (b) mode of data transfer to the MSCC; and (c) approach to maintaining the privacy and security of protected health information; (3) Abstraction and Adjudication: creation of (a) abstraction forms for use by trained nurse abstractors; and (b) an adjudication process for cardiologist reviewers. **Results:** Challenges encountered to date include: (1) the number of participating Mini-Sentinel Data Partners; (2) decision-making surrounding centralized vs. decentralized abstraction; and (3) concerns over privacy of transmitted health information and medical record de-identification for centralized review. Ultimately, concern over quality and variability of abstraction at the Data Partners' sites, together with small numbers of charts requested from each Data Partner, led to selection of a centralized abstraction process. Procedures needed to be established for this novel activity that addressed how to proceed with this project as a public health activity exempt from IRB review. **Conclusions:** The Sentinel System can yield timely data for active surveillance of medical product safety, and may be useful for other purposes, including research and quality improvement. Ongoing challenges include ensuring the minimum necessary amount of data is transmitted from Data Partners for centralized chart review and adhering to established procedures to maintain data security.

Keywords: Safety surveillance, Acute myocardial infarction, Validation project

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PS1-29:

Preparing for Genetics Research on Serious Skin Rash in the HMO Research Network

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Background/Aims: Stevens-Johnson syndrome (SJS) and toxic epidermal necrolyssis (TEN) are life-threatening widespread serious skin rashes (SSR), often accompanied by extensive epidermal detachment and/or mucous membrane involvement. Recent genetic studies have shown a strong link in Han Chinese between HLA-B*1502 and risk for SJS with use of Carbamazepine; however, more research is needed to identify similar markers among other ethnic groups. With support from The International Serious Adverse Event Consortium, we evaluated the potential for using electronic clinical and administrative data from Kaiser Permanente Hawaii and Kaiser Permanente Georgia to identify provisional SSR cases. **Methods:** We searched inpatient encounters, problem lists and allergy tables for codes

specific to SJS/TEN and for related non-specific codes for erythema multiforme, drug dermatitis, and drug allergies. All records from 1/1/00-8/1/09 that were identified as potential cases were reviewed manually for confirmation and abstraction of suspected implicated drugs. In addition, we reviewed medical records of patients with two additional SSR: angioedema on ACE inhibitors, and drug hypersensitivity syndrome (DHSS). **Results:** Of 29 patients with codes specific for SJS/TEN, 23 (79%) were confirmed on chart review. Of 140 patients with non-specific SJS/TEN codes, 13 (9%) were confirmed. The most commonly implicated medications included amoxicillin, dilantin, trimethoprim and sulfamethoxazole, and isoniazid. Of 56 subjects with angioedema while on ACE inhibitors, 20 (36%) were confirmed. Of patients with DHSS, 1 of 29 (3%) that had inpatient codes plus abnormal lab values were confirmed on record review, while only 1 of 51 (2%) with inpatient DHSS codes and normal lab values were confirmed. **Conclusions:** We found that large linked electronic HMORN datasets efficiently identified highly probable cases of SJS/TEN. Searches for angioedema following ACE inhibitor exposure were also relatively successful. However, searches for DHSS were unsuccessful and only yielded 2 potential cases. These findings will be useful for planning the next study phase where patients will be recruited for genomic studies from a larger number of HMO sites.

Keywords: Serious skin rashes, Electronic datasets
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C-C5-01:

Drug Safety Data Mining with a Tree-Based Scan Statistic

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Background/Aims: Active post-marketing drug safety surveillance has traditionally focused on predefined drug-adverse event (AE) pairs. However, evaluating predefined pairs does not illuminate unsuspected potential AEs. Drug safety data mining is a surveillance approach that formally evaluates the relationship between medications and a very large number of AEs. We used varying specifications of the tree-based scan statistic data mining method (TreeScan) to search for adverse events among clozapine drug users. **Methods:** Electronic health records from three HMO Research Network health plans were assessed. We used TreeScan to evaluate a hierarchical clinical classification to identify signals of excess risk during prevalent drug exposure as compared to unexposed time. The test statistic – a Poisson based log likelihood ratio – is adjusted for multiple testing inherent in the many potential AEs evaluated. Four alternate specifications were incorporated: ramp-up periods of 180 and 400 days and outcome definitions using inpatient plus outpatient diagnoses and inpatient diagnoses only. For each drug and specification, we calculated expected and observed counts for each level of the hierarchical tree, adjusting for age, sex, and health plan. **Results:** We identified 242,000 to 580,000 exposed clozapine days and 150 to 345 exposed outcomes across the different specifications. Both ramp-up periods found 17 unique statistical signals using inpatient plus outpatient diagnoses. Of those, several represent confounding by indication (three signals in mental health, two for injury and poisoning) and others are known AEs (e.g., convulsions, hypotension, GI system). Limiting outcomes to the inpatient setting reduced the number of signals to 14 (180-day ramp-up) and 10 (400-day ramp-up). Overall, the inpatient-only AE signals were in the same clinical systems, with some exceptions. The inpatient specification signaled for circulatory events and diseases of the heart, but hypotension was no longer found. Genitourinary AEs signaled using inpatient plus outpatient diagnoses but were not identified using inpatient diagnoses only. **Conclusions:** Data mining using electronic health records is an important complement to other post-marketing drug safety research. Once specifications are finalized, TreeScan will be applied to assess the safety of over 100 oral outpatient medications.

Keywords: Data mining, TreeScan, Clozapine
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PS1-31:

Assessing the Potential for Research on Genetics of Drug Induced Liver Injury in the HMORN

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Background/Aims: Drug Induced Liver Injury (DILI) is a major cause of liver failure in the US and the leading reason for failure of investigational drugs in clinical trials, lack of drug approval, and post-market withdrawal of approved drugs. Recent genome-wide association studies have identified variations within the major histocompatibility complex in Caucasians to be linked with flucloxacillin and lumiracoxib-related liver injury. The need for replication of these findings and extension of these investigations to other drug exposures and other ethnic groups will require substantial case numbers with supporting medical record documentation. With support from The Serious Adverse Event Consortium, an international consortium led by the pharmaceutical industry in conjunction with the FDA, we conducted a feasibility study to evaluate the potential for using electronic clinical and administrative data from two HMORN sites to identify provisional DILI cases. **Methods:** Building upon previous research, we developed data specifications for electronic searches of ICD-9 codes with time proximate laboratory results indicative of liver-related disease. Electronic criteria were used to 'rule out' other liver diseases and other co-morbid conditions indicative of systematic liver-related effects. For feasibility testing, two methods of population identification were incorporated: the VDW and EMR reporting. All records from 1/1/00-8/1/09 that were identified as 'potential DILI cases' were reviewed manually, and selected data were abstracted, including suspected implicated drug(s). **Results:** Records for 1,123,173 individuals were screened for potential case status; 29,893 records with one or more diagnoses of interest were identified. After application of the "rule out' exclusion criteria, 584 potential DILI cases were reviewed and 99 ultimately met provisional case status. Drugs commonly associated with provisional DILI cases were sulfa-containing antibiotics, anticonvulsants, isoniazid, and statins. Roughly one-half of provisional DILI cases were associated with a single implicated drug. **Conclusions:** Electronic infrastructures currently available within many highly integrated health care delivery systems can be efficiently leveraged to support identification of provisional DILI events. Systems that have comprehensive episodic, historic and post-event data, including lab, diagnostic, treatment, imaging, and medication records that can be accessed electronically should be considered primary systems for expanding DILI case accumulation efforts.

Keywords: Drug-induced liver injury, Research, Feasibility studies
doi:10.3121/cmr.2011.1020.ps1-31

PS1-18:

A Feasibility Pilot to Determine the Practicality of Using the HMO Research Network to Research the Genetics of Drug-Induced Serious Adverse Events

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Background/Aims: The International Serious Adverse Events Consortium (iSAEC) is a pharmaceutical industry and FDA-led consortium focused on identifying DNA variants useful for predicting risk of drug-induced rare serious adverse events (SAEs). We assessed the feasibility of using electronic medical databases at six HMORN sites to identify provisional cases of three SAEs: drug-induced liver injury (DILI), serious skin rashes (SSR), including