PS2-39:

Evaluating Prevalence of Pathology Prognostic Indicators in a Cohort of Women Residing in Rural Pennsylvania (PA) Counties

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Mammography utilization gap has been significantly narrowed between urban and rural settings in recent years. Yet, evaluation of breast cancer incidence and mortality data suggest that women residing in rural areas in the US experience a higher incidence of breast cancer and shorter disease free and overall survival regardless of access to health care services. We have implemented a cohort study design to evaluate the pathologic prognostic indicators of breast cancer at the initial presentation of the disease and their association with shorter survival among women in rural PA. We identified women (n=550) diagnosed with their first primary invasive cancer between January 1, 2001 and December 31, 2007 from the Cancer Registry at Geisinger Health System (GHS). Pathologic, clinical and demographic data were retrieved from electronic health records. The mean age at the initial clinical presentation of the disease was 67(± 12.5). The majority, were diagnosed with either stages I and II, 58.6% and 26.8%, respectively. About 6.9% of women were diagnosed with stage III and 7.6% with stages IV. The proportions of women diagnosed with histologic grade 1, 2, and 3 were 31.8%, 41.7% and 26.5%, respectively. Assessment of the joint distribution of estrogen receptor (ER) and progesterone receptor (PR) yielded 58.6% as phenotypic positive for both receptors and, 26.8% as negative. The remaining 16.5% were discordant for the expression of hormone receptors. Sub-typing of breast cancer biomarkers by the three prognostic markers, ER, PR and HER2/neu, yielded 69.7% as hormone receptor positive, epidermal growth factor negative; 7.5% as triple positive; 3.5% as hormone receptor negative, epidermal growth factor positive and 19.3% as triple negative. Preliminary findings from this ongoing research project suggest that the prevalence of triple negative breast cancer is higher in this population. Expression of other markers such as HER1, Vimentin, CK 5/6, P53 and E-Cadherin are also being evaluated.

Cardiovascular Disease

C-D2-01:

Outcomes Associated With Thiazide Combinations for Second-line Treatment of Hypertension in Older Patients

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Context: Consensus guidelines recommend thiazides for first-line treatment in uncomplicated hypertension. Most patients require two or more drugs and little is known about the relative efficacy and outcomes of second-line treatments including thiazide. **Objective:** To compare differences in blood pressure, renal function and medical outcomes between commonly used two drug regimens, each including thiazide. **Design:** Retrospective cohort using data from a longitudinal electronic medical record. **Setting:** Large group medical practice. **Patients:** All patients >60 years treated for hypertension between 2001 and 2006. **Main Outcome Measures:** Changes in blood pressure and renal function, incident medical events, and time to failure indicated by an event or regimen change. **Results:** Of 47,419 patients, 6,534 received second-line therapy including thiazide for > 3 months. Thiazides + angiotensin converting enzyme inhibitors (ACE-I), and thiazides + potassium sparing diuretics (PS) were associated with the greatest reductions in systolic pressure, and thiazides + ACE-I with the greatest reductions in diastolic. However, thiazide combinations with PS and ACE-I were associated with the greatest declines in estimated glomerular filtration rate, and these and thiazides + angiotensin receptor blockers (ARB) with increased incidences of renal disease. ACE-I + thiazide were also associated with high incidences of stroke and diabetes. Thiazide + Betablocker (BB) were associated with high rates of cardiovascular

disease while thiazide + antiadrenergics (AA) were associated with low event rates overall. Thiazide + Calcium channel blockers (CCB) had no consistent pattern overall, but performed somewhat better in the oldest patients. Thiazides + BB were associated with low composite event rates and the longest time before regimen change. **Conclusions:** The present study suggests disjunction between blood pressure reduction and the events that treatment is intended to prevent. Thiazide with BB was associated with the best composite outcomes, and thiazide with ACE-I with the poorest. These findings must be interpreted with caution because of potential confounding by indication. Exploration in more robust datasets is warranted.

C-D2-02:

Integrating Clinical Trial Findings Into Practice Through Risk Stratification: The Case of Heart Failure Management

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Background: Heart failure case management programs have been shown to be highly effective at preventing future hospitalizations in clinical trials. But these programs absolute benefits depend on the baseline risk of outcome in the treated population. Since baseline risks of hospitalization in trials are often higher than community-based samples, translating trial results to the community setting may be misleading. One solution is to identify subgroups for intervention that have sufficiently high baseline risk. **Objective:** Using estimates of hospitalizations averted from a previously published systematic review of heart failure (HF) management we estimated a program's efficiency based on level of predicted risk. **Methods:** Medical history and demographic data on HF patients from a large integrated US health plan were used to build a prognostic risk-score for cardiovascular-related hospitalization over 1-year. We calculated the crude rate of hospitalizations for comparison with trial data. We also calculated the program's potential dollar savings from averting hospitalizations. **Results:** The average risk for hospitalization in the systematic review's trials was 45%; our population's average observed risk was 18% and the risk among the highest risk patients was 33%. After accounting for the intervention cost, the base-case analysis shows a savings of \$122/patient at highest risk. Failing to intervene according to predicted risk (no targeting) would actually cost \$211/patient. **Conclusion:** Our findings illustrate how clinical trial findings can be efficiently integrated into community-settings by using a prognostic risk score to focus attention on high-risk subgroups.

C-D2-03:

Effects of Race and Comorbidities on Differences in Blood Pressure Control in Urban and Rural Populations

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While it is acknowledged that control of blood pressure (BP) in primary care is of major importance in reducing the burden of cardiovascular diseases, control is suboptimal in most populations. Previous work by Turner et al found that the presence of related comorbidities increased the likelihood of a patient's physician addressing hypertension, while unrelated comorbidities competed for attention. We evaluated BP control over a 3 year interval according to JNC-VII guidelines in primary care patients managed in two Pennsylvania health care systems, one urban (Penn = P, n=16,690) and one rural (Geisinger = G, n=79,934). Factors assessed included number of comorbidities (diagnoses occurring >2 times that could compete for clinician attention), number of primary care visits, age, sex, race, insurance and health system. The reduced JNC-VII threshold of 130/80 was applied for diabetes and chronic kidney disease. The G population was more Caucasian (C)(98 vs 49 percent), less African American (AA)(1 vs 46%), marginally older (60.2 vs 59.2 years), and less female (56 vs 61%) than P. Mean months of follow-up

and number of BP readings were 39 and 12.4 at G and 33 and 9.9 at P. The mean number of comorbidities was 3.4 at G and 3.7 at P and, by race, 3.5 for C, 3.9 for AA. Medicare coverage was slightly more common at P (32 vs 29%) and commercial insurance slightly more common at G (63 vs 58%). BP was controlled in a similar proportion of readings overall, 66% and 65% (G and P). Binary logit models were constructed using percent of visits with BP controlled (%vBPc) as the dependent variable as a function of the above factors. Overall, increasing comorbidity was associated with a slightly greater %vBPc ($P < 0.0001$), with an effect size averaging 1–2% for each comorbidity. Increasing number of unrelated comorbidities was associated with better BP control, while the opposite was true for related comorbidities. Stratified analyses conducted because of significant interactions showed the effect of related comorbidities to be more dominant in African Americans than Caucasians, particularly in patients over age 60. Nevertheless, similar effects were seen independent of race, age, gender and insurance. After accounting for race, there were no differences between the urban and rural systems. These findings suggest that race may explain urban-rural contrasts in BP control, and management of comorbidities may complicate control in African Americans more so than in Caucasians.

C-D2-04:

Persistence With Statins and All-Cause Mortality: A Population-based Cohort Study

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Background: The beneficial effects of statins in secondary-prevention on cardiovascular mortality have been established in several long-term placebo-controlled trials; however, the value of statin therapy in reducing overall mortality in patients without coronary heart disease (CHD) is questionable. The study objective was to evaluate the effect of statin therapy in an unselected cohort of subjects with no indication of a cardiovascular-disease (primary-prevention) and patients with known CHD (secondary-prevention). **Methods:** Retrospective cohort study including 229,918 adult HMO enrollees in Israel, who initiated statin treatment in 1998–2006 (mean age 57.6; 50.8% female), and were followed-up for a maximum of 9.5 years. Proportion of days covered (PDC) with statins was measured by the number of dispensed statin prescriptions during the interval between the date of the first statin and end of follow-up. Adjustments were made for baseline values of age, sex and other personal characteristics, chronic medical conditions and healthcare utilization. **Results:** During 4.02 and 4.98 years of mean follow-up, there were 4,259 and 8,906 deaths among primary prevention and secondary prevention cohorts, respectively. In both cohorts, high persistence with statins (PDC > 90%) confers at least 45% reduction in risk of death compared to patients with a PDC of < 10%. Stronger risk reduction was calculated among patients with baseline LDL of > 190 mg/dl and patients initially treated with high-efficacy statins. **Conclusion:** Better persistence with statin treatment provided an ongoing reduction in mortality among patients with and without known history of CHD. The observed benefits from statins were greater than expected from randomized clinical trials.

PS2-02:

Using a Patient's Absolute and Relative Risk for Cardiovascular Disease to Manage Therapy

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Background: As the patient role evolves from that of a traditional, passive participant in the care process to an engaged, active consumer of health care goods and services, new venues and/or tools for provider-patient communication will be required. The Electronic Health Record (EHR) can be used to facilitate such communication. We consider one model for how measures of individual risk derived from EHR data can be used in different ways to improve and maintain health. **Objective:** To explore how use of absolute risk (AR) or relative risk (RR) of cardiovascular disease can be used to select patients for intervention, communicate risks for informed choice

and shared decision making, and then guide clinical decision support for targeted intervention and continuous care. **Methods:** We embedded the Framingham risk score in our EHR to calculate a patient's individual risk for cardiovascular disease. Absolute risk for 10-year mortality from cardiovascular disease (CVD) was calculated based on actual patient data, with decision support automatically ordering any missing values such as labs. A patient's relative risk (compared to a hypothetical, optimally managed age- and sex-matched control) was used to select patients for intervention. Patients then selected therapeutic preferences from among multiple evidence-based and rank-ordered options for their modifiable risk factors, via an interactive touch-screen kiosk in the waiting room. These selections were summarized and used to guide clinical decision support. The specific treatment options presented to each patient were selected as a function of the maximal relative risk reduction that could be achieved by compliance with those treatments. **Application:** Risk scores were used for four purposes in this study: patient stratification, selecting only those patients for intervention who are at high risk, and have available options to reduce that risk; informed choice, allowing patients to model risk scenarios by selecting different combinations of interventions; optimizing decision making, presenting a final list of patient-selected interventions that summarize relative risk reduction across all modifiable risk factors for a patient; and outcomes tracking, following risk over time to guide care. **Conclusions:** Behavior change is most likely to occur when patients understand the severity of their modifiable risks in the context of available treatment options.

PS2-05:

The Readiness of U.S. Health Plans to Manage Cardiometabolic Risk

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Background: A large proportion of health status is determined by personal behavior. One manifestation of unhealthy personal behavior is the development of elevated cardiometabolic risk. Because health plans already manage care for a large proportion of the United States population, they are in a position to make a significant contribution to the control of cardiometabolic risk if they are prepared to offer health assessment, feedback, and behavior change support. Our goal in conducting this research was to assess health plan awareness of cardiometabolic risk and their current activities aimed at preventing and managing cardiometabolic risk. **Methods:** In January 2008, Americas Health Insurance Plans, in collaboration with the HealthPartners Research Foundation, surveyed 74 member health insurance plans that offer commercial Health Maintenance Organization, Point of Service and Preferred Provider Organization insurance. The response rate was 47%, representing 47 million lives. **Results:** The 35 responding health plans reported that they identify members with cardiometabolic risk through referral from case or care management (89%), health risk assessment data (86%), claims data (82%), and pharmaceutical utilization data (79%). Nearly all (97%) plans currently offer interventions for tobacco use, obesity/overweight, and nutrition. Ninety-four percent of the plans reported that they offer interventions to increase physical activity. All plans reported that they offer health risk appraisal or assessment with feedback and education, 91% reported that they use web-based tools, and 85% reported that they use health coaching to help plan members lower their risk. Perceived barriers to broader implementation of cardiometabolic risk control programs included lack of resources (79%), limited availability of enrollee level data (74%), and lack the reporting systems that would be necessary to manage individual plan members (79%). While one quarter of the responding health plans viewed lack of purchaser interest in cardiometabolic risk management programs as an important barrier to program implementation, only 6% named lack of purchaser interest as one of the three most important barriers to implementation. **Conclusion:** While the responses probably represent the best case scenario because of potential response bias, U.S. health plans appear to be well positioned to provide cardiometabolic risk control services.