Chronic Care

Call for Papers

Managing Complexities in Chronic Care

Chair: Patricia Coon, Deconess Billings Clinic

Sunday, June 25 o 8:30 am – 10:00 am

●Incorporating Multidisease Care Management into Primary Care Using People and Technology

David Dorr, M.D., MS, Cherie P. Brunker, M.D., Steven Donnelly, Ph.D., Adam Wilcox, Ph.D., Laurie Burns, PT, MS

Presented By: David Dorr, M.D., MS, Assistant Professor, Medical Informatics & Clinical Epidemiology, Oregon Health & Science University, 3181 SW Sam Jackson Park Rd, Mailcode: BICC, Portland, OR 97239; Tel: (503) 418-2387; Fax: (503) 494-4551; Email: dorrd@ohsu.edu

Research Objective: To explore the changes in mortality, morbidity, utilization for a group of senior patients with multiple chronic illnesses when enrolled in multidisease, clinic based care management.

Study Design: Care management (CM) consisted of patient (family) referral by primary care physicians to specially trained nurse care managers. Nurse care managers used information technology to create and Access the care plan over time, follow Best Practice protocols for managing chronic diseases, provide self-management education, and Communicate with patients, caregivers, and other providers. Outcomes (death, hospitalization, and utilization) of patients referred to CM were compared to controls in a retrospective cohort design, matched for previous utilization, primary diseases, comorbidities, and demographic variables. Multivariable analyses were conducted using logistic and negative binomial regression for deaths, hospitalizations (with subanalyses for chronic conditions from a subset of the Prevention Quality Indicators, or PQI), and emergency department visits. National hospitalization and physician costs provided a basis for cost analysis.

Population Studied: The primary population consisted of senior (65+) patients at 22 primary care clinics seen between 2002 and 2005 at Intermountain Healthcare, a large health system in Utah. In all, 1,006 intervention and 2,012 control patients were matched. More than 40 disease states were represented, and 50% had more than one disease.

Principal Findings: In both groups, average age was 76.6 ± 7.2, 64.2% were female, 16.8% had a previous hospitalization (3.0% chronic PQI), and average comorbidity score was 2.3 ± 1.1. Hypertension (70.5%), diabetes (45.6%) and depression (22.3%) were the most common conditions. Mean follow-up time was 23.4 ± 9.7 months. At one year of follow-up, there was no significant difference in CM and control patients in deaths and any hospitalizations. Subanalyses of patients with diabetes (DM) revealed that intervention DM had significant improvement in mortality (CM: 8.5% vs. 11%), and hospitalization (CM: 21.0% vs. 24.2%) versus controls at one year, with differences increasing (death: -2.2%; hospitalization: -8.1%; PQI hospitalizations (-4.9%) at two years of follow-up. Multivariate analyses confirmed that DM who was care managed had 30% and 27%-43% lower odds to die or be hospitalized, even when accounting for confounders. No difference was seen in emergency department visits. Societal benefit for each care management clinic was calculated at $70,349 per year; benefits mainly accrued to health plans.

Conclusions: Our multidisease care management program was very successful in reducing death and morbidity for patients with diabetes, but not other conditions. Different explanations exist, including a more formalized protocol for diabetes, different goals for other conditions, and unmeasured confounders. Overall, however, costs were reduced by the intervention clinics versus controls.

Implications for Policy, Delivery, or Practice: Our program has benefits of efficiency and the simplification of care over many disease management efforts, while still providing high quality and reducing utilization. By addressing multiple diseases and other patient barriers through a reorganized health care team, it provides holistic, efficient care rather than creating multiple disease-specific programs. Policymakers may consider this model in supporting efforts to incentivize high quality care. Additional information can be accessed at http://intermountainhealthcare.org/cmt/ .

Primary Funding Source: John A. Hartford Foundation

●Hospital Readmissions and Multiple Chronic Conditions

Bernard Friedman, Ph.D., H. Joanna Jiang, Ph.D., Anne Elixhauser, Ph.D.

Presented By: Anne Elixhauser, Ph.D., Senior Research Scientist, Center for Organization & Delivery Studies, Agency for Healthcare Research and Quality, 540 Gaither Road Rockville, MD 20850, Phone: (301) 594-6815, Fax: (301) 594-2314, Email: aelixhau@ahrq.gov

Research Objective: It is known that patients with multiple chronic conditions account for a disproportionate share of total healthcare expenditures. This study focuses on hospital readmissions for adults and aims to clarify how multiple chronic conditions and other influences are associated with the number of readmissions and total annual cost of hospital care.

Study Design: First, three groups of hospitalized adults are profiled: those with no readmissions within a year, persons with readmissions within a month of discharge, and all other persons with readmissions. Then the number of readmissions for a person is analyzed with poisson regression and annual cost is analyzed with a semi-log regression. We use an established algorithm to identify chronic conditions for 5-digit ICD-9-CM diagnosis codes and then aggregate to at most one in each of 350 clinical categories to arrive at the number of different chronic conditions ("complexity"). We consider other potential influences on readmission: age, gender, payer group, severity indicators, principal diagnosis of the index admission, quality indicators for the index hospital, and area wages. Cost is adjusted for area wages and principal diagnosis. Censoring is controlled with the number of months exposed to the risk of readmission.

Population Studied: All adult residents of six states (CA, NE, NY, PA, TN, UT) with non-maternity discharges in 2002. About 4.4 million distinct persons were identified with encrypted patient numbers supplemented by established algorithms.

Principal Findings: About 25% of adult hospitalized persons had at least one readmission during the year. Those with any readmission had an average of 1.5 readmissions, over 2.5 times the adjusted annual cost, and twice as many different chronic conditions (5.8 vs. 2.9) as persons with no readmissions. About 10% of persons had only readmissions within 30 days. They had an average of 1.3 readmissions but again over 2.5 times the annual cost and almost twice as many different chronic conditions as persons with no readmissions. Early readmissions were not associated with lower hospital safety indicators. The rate of emergency admissions did not differ between readmission groups, the rate of major procedures was somewhat lower, but the severity indicators were somewhat higher for those with readmissions. Further descriptive study of the early readmission group, and the regression analyses will be completed soon.
Conclusions: (interim) Readmissions are associated with a relatively high number of different chronic conditions and high annual cost. Even persons with only readmissions within 30 days tend to have a relatively high number of multiple chronic conditions and high annual cost. Multivariate methods will clarify the independent effects of a variety of influences on readmissions and cost.
Implications for Policy, Delivery, or Practice: Small-scale intervention studies have found that education and coordination services can achieve a net saving in costs for persons with single or complex chronic conditions. The data and methods from this study permit estimates of the cost of readmissions for persons with various types of problems when first seen in the hospital. If the initial results withstand multivariate testing, the study would encourage health plans to use a relatively high number of different chronic conditions as one of the critieria for targeting new services to reduce costly readmissions.
Primary Funding Source: AHRQ

●The Burden of Obesity among a National Probability Sample of Veterans

Karin Nelson, M.D., MSHS

Presented By: Karin Nelson, M.D., MSHS, Staff Physician, Assistant Professor, Department of Medicine, University of Washington, VA Puget Sound, 1660 South Columbian Way, S-111-GIMC, Seattle, WA 98108; Tel: 206-277-5118; Email: karin.nelson@va.gov
Research Objective: Few national data exist about the prevalence of obesity and the resulting health burden among veterans. The objective of this study is to assess the prevalence of obesity and co-morbid conditions among veterans who receive care from the Department of Veterans Affairs (VA) compared to non-veterans.
Study Design: We analyzed data from the 2003 Behavioral Risk Factor Surveillance System (BRFSS) (n=242,362), a cross-sectional telephone survey, to obtain prevalence rates for overweight and obesity. We used bivariate analyses to describe the association of obesity with physical activity, nutritional intake and co-morbid diseases among veterans who receive care at the VA, compared to veterans who do not use the VA and non-veterans.
Population Studied: Nationally representative sample of US adults.
Principal Findings: Veterans who use the VA for health care have the highest rates of obesity compared to veterans who do not use the VA and non-veterans (27.7% vs. 23.9% vs. 22.8%, $p<0.001$). Only 27.8% of veterans who receive health care at the VA are of normal weight (vs. 42.6% of the general population, $p<0.001$), 44.5% are overweight, 19.9% have class I obesity, 6% have class II obesity and 1.8% are morbidly obese (an estimated 82,950 individuals). Obese veterans who utilize the VA for services have higher rates of hypertension (65.8%) and diabetes (31.3%), are less likely to follow diet and exercise guidelines and more likely to report poor health than their normal weight counterparts.
Conclusions: Veterans who receive care at the VA have higher rates of obesity than the general population, including a significant number who are morbidly obese. There is a large burden of co-morbid disease among obese veterans.
Implications for Policy, Delivery, or Practice: Data from this study should prove useful to health planners and policymakers in determining the VA response to the obesity epidemic. At present, less than half of VA medical centers have weight management and/or physical activity programs. The VA has recently developed and piloted an evidence-based program to improve care for obese veterans. As the largest integrated health system in the US, the VA is uniquely positioned to field systematic programs to respond to the epidemic of obesity.
Primary Funding Source: VA

●Cardiovascular Risk Factors in Type 2 Diabetes and the Structure of Primary Care Clinics

Michael Parchman, M.D., M.P.H., Amer Kaissi, Ph.D., Jacqueline A. Pugh, M.D., Raquel L. Romero, M.D.

Presented By: Michael Parchman, M.D., M.P.H., Associate Professor, VERDICT (11C6), South Texas Veterans Health Care System, 7400 Merton Minter Blvd (11C6), San Antonio, TX 78229-4404; Tel: 210-617-5314; Fax: 210-567-4423; Email: parchman@uthscsa.edu
Research Objective: Modifiable risk factors for cardiovascular disease (CVD)among people with type 2 diabetes include level of control of glucose, blood pressure(BP) and lipids. Control of these risk factors is dependent on both patient self-care behaviors and appropriate care. The Chronic Care Model (CCM) suggests that diabetes outcome should be related to the presence of 6 structural components in the clinic setting: organizational support, community linkages, self-management support, decision support, delivery system design, and clinical information systems. The purpose of this study is to examine the relationship between control of CVD risk factors, patient self-care behaviors, and the presence of CCM components across multiple primary care clinic settings.
Study Design: Observational
Population Studied: Twenty primary care clinics were recruited with an attempt to identify and recruit settings where people with type 2 diabetes are mostly likely to seek care: solo practice physicians, group practice settings, community health centers and city-county health clinics for uninsured patients. Thirty consecutive patients presenting with type 2 diabetes were enrolled from each clinic. Patients completed an exit survey and were asked about their stage of change for each of 4 self-care behaviors: diet, exercise, glucose monitoring and medication adherence. Medical records were abstracted for CV risk factors by recording the most recent values of

glycosolated hemoglobin(A1c), BP and LDL-cholesterol. Target goals for each were: A1c <= 7; BP <= 130/80; and LDL <= 100. Clinicians in each clinic completed the Assessment of Chronic Illness Care(ACIC) survey, a validated measure of the 6 components in the CCM. Hierarchical logistic regression models were used to account for clustering of patients within clinics.
Principal Findings: The proportion of patients with good control of A1c, BP and LDL were 43%, 49% and 50% respectively. Only 13% had good control of all three. Patients who were in the maintenance stage of change for all 4 self-care behaviors were more likely to have all 3 risk factors well controlled.(OR 1.76; 95%CI 1.01, 3.06) After controlling for age, race/ethnicity, health status and self-care behaviors, good control of all 3 risk factors was positively associated with community linkages(O.R.1.78; 95%CI 1.41, 2.25) and delivery system design(OR 1.45; 95%CI 1.17, 1.79), but was inversely associated with clinical information systems(OR 0.56; 95%CI 0.41, 0.76).
Conclusions: Control of CVD risk factors among patients with type 2 diabetes is associated with structural characteristics of the primary care clinic where care is delivered, specifically the strength of the community linkages and the design of the delivery system within the clinic. This remains true after controlling for patient characteristics and self-care behaviors. The "delivery system design" sub-scale of the ACIC included questions on the presence of planned visits for diabetes management, systems for insuring coordination and continuity of care, and the presence of an appointment system that assures scheduled follow-up and customized lengths of visit. The finding that the strength of the clinical information system is inversely associated with CV risk factor control is puzzling and will require more study, although it is possible that the presence of an electronic medical record in the exam room may distract the clinician from providing support for self-care activities.
Implications for Policy, Delivery, or Practice: Although prior studies have suggested that components of the CCM are associated with process quality of care indicators, this study suggests that risk factors for the most common cause of morbidity and mortality among patients with diabetes, CVD, are associated with the structure and design of the clinical micro-system where care is delivered. In addition to focusing on clinician knowledge, future interventions should address the structure and design of the clinical micro-system if we are to reduce the burden of CVD among patients with type 2 diabetes.
Primary Funding Source: AHRQ

●Issues and Innovations in Care Management for Medicaid Enrollees with Multiple Chronic Conditions

Claudia Williams, MS, Melania Bella, M.B.A.

Presented By: Claudia Williams, MS, Principal, AZA Consulting, 305 Buxton Road, Falls Church, VA 22046; Tel: (571) 641 3030; Fax: (360) 237-0307;
Email: cwilliams@azaconsult.com
Research Objective: While considerable attention is being given to disease management in Medicaid, many care models do not meet the needs of enrollees with multiple chronic conditions. The purpose of this study is to address that gap by analyzing their needs and potential models for serving them.
Study Design: Review of literature and expert interviews with researchers and practitioners at the state, health plan, and provider levels to identify: (a) gaps in care for Medicaid enrollees with multiple chronic conditions; and (b) innovations for addressing them.
Population Studied: Medicaid enrollees with multiple chronic conditions.
Principal Findings: Multiple studies have revealed the degree of co-morbidity among Medicaid beneficiaries; this study identified four important gaps in the current system for Medicaid enrollees with multiple chronic conditions. First, the interplay of multiple health issues creates an effect of "cascading conditions". We lack measures, protocols and guidelines that take this into account. Existing guidelines—the foundation of disease management—are disease-specific. A promising strategy is to develop guidelines for the most prevalent and significant "disease clusters", e.g. diabetes, congestive heart failure, and depression. Second, traditional approaches to disease management, which layer a focused behavioral intervention onto the existing care process, are insufficient for Medicaid enrollees facing complex medical and social challenges in fragmented systems of care. Several emerging models, including North Carolina's regional physician networks and the model developed by Bellingham Hospital in Washington, provide the infrastructure, tools and incentives to better organize chronic care for this population. Third, most chronic care initiatives are not patient-centered. One promising model is the use of a patient health record with patient-generated information—which would otherwise be missing from the traditional medical record—about the consumer's goals, living environment, learning style and care preferences. Fourth, genuine improvements in care for this population will require the realignment of financial incentives—primarily through changes in rate setting and risk adjustment. Without a plausible business case for undertaking quality enhancing initiatives that, if successful, would attract more very sick patients, it is unreasonable to expect providers to invest in improving care for this population.
Conclusions: This study outlines four gaps in care for Medicaid consumers with multiple chronic conditions and early insights into strategies for filling them: guidelines addressing common disease clusters; models for organizing and navigating care; more patient-centered, as opposed to disease-focused, approaches; and finally, proposals for realigning financing to support investments in quality.
Implications for Policy, Delivery, or Practice: Studies show that almost two thirds of Medicaid enrollees have a chronic or disabling condition and eighty percent of Medicaid resources are spent on this population. Nearly half have more than one chronic health issue, yet existing models focus on single diseases. Findings will be useful to Medicaid program leaders, state and federal policymakers, providers and plans interested in developing new models and approaches for addressing the needs of Medicaid enrollees with multiple chronic conditions.
Primary Funding Source: RWJF, Kaiser Permanente

Call for Papers

Adding Value in Chronic Care

Chair: Derek Feeley, NHS, Scotland

Monday, June 26 o 3:45 pm – 5:15 pm

●Cost and Cost Effectiveness of Nurse Management for Congestive Heart Failure

Paul Hebert, Ph.D., Jane E. Sisk, Ph.D, Mary Ann McLaughlin, M.D., M.P.H., Jason Wang, Ph.D., Jodi Casabianca, M.P.H.

Presented By: Paul Hebert, Ph.D., Assistant Professor, Health Policy, Department of Health Policy, Mount Sinai School of Medicine, One Gustave Levy Plaza Box 1077, New York, NY 10029; Tel: 212-659-9191; Email: paul.hebert@mssm.edu

Research Objective: To estimate the cost and cost effectiveness of a nurse-led disease management intervention versus usual care among ethnically-diverse patients with congestive heart failure (CHF) recruited from ambulatory practices.

Study Design: Data are from a randomized controlled effectiveness trial. Patients were randomized to usual care or a 12-month nurse intervention. Bilingual nurses counseled patients on diet, medication adherence, and self-management of symptoms through an initial visit and regularly-scheduled follow-up telephone calls. The nurses also facilitated evidence-based changes to medications in discussions with patients' clinicians. The intervention and follow-up lasted 12-month and was conducted between 9/2000 and 9/2002. Primary outcomes were cumulative hospitalizations and physical functioning as measured by the physical component score of the Short-Form 12 (SF-12). Cost effectiveness was measured by the incremental cost effectiveness ratio (ICER). We took a societal perspective regarding costs. We collected costs on the intervention, direct medical expenditures (e.g., hospital costs, ambulatory medical costs), direct non-medical expenditures (e.g., informal care, patient transportation costs), and patient time costs. Effectiveness was measured as differences in quality adjusted life-years. Quarterly SF-12 scores were translated to Health Utilities Index 3 scores using a published algorithm.

Population Studied: We recruited 406 patients --46% non-Hispanic Black, 33% Hispanic, 47% female, 37% > 65 years– who met the eligibility criteria: systolic dysfunction, English or Spanish speaking, community-dwelling, and current ambulatory practice patient at one of the four hospital clinics in Harlem, New York City.

Principal Findings: Nurse-management patients had fewer hospitalizations at 12 months (143 vs. 180, adjusted difference -0.17 95% C.I. (-0.32,-0.01) hospitalizations/person year) and better functioning than usual-care patients at 12 months (SF-12 Physical Component Score, 39.9 vs. 36.3, adjusted difference 3.6 95% C.I. (1.4, 5.9). There were no differences in deaths. Preliminary results suggest total costs in the nurse group were $259,000 greater than the usual care group. The cost of the intervention was $442,000. Hospital costs for the nurse group were lower by $333,000, as were direct non-medical costs (-$32,000), but ambulatory costs (+$16,000) and home health costs (+$32,000) were higher. Permutation-based tests did not uncover statistically significant differences in any cost category. Mean QALYs in the nurse group (mean=0.67±0.02) was higher than the control group (mean=0.62+/-0.02; difference 0.05 95% C.I. (-0.1 to 0.01)). The incremental cost effectiveness ratio was $24,900/QALY for patients.

Conclusions: These preliminary results suggest that a nurse management program for patients with CHF was effective at reducing hospitalizations and improving quality of life. Although overall costs were higher in the nurse management group, the societal cost per quality-adjusted life-year gained was reasonable.

Implications for Policy, Delivery, or Practice: Although several randomized clinical trials suggest nurse management can be effective in CHF, to our knowledge no recent study have performed a rigorous cost-effectiveness analysis along side a clinical trial. These results suggest nurse management for CHF is reasonably cost effective, and should inform insurers and policy makers on potential benefits of expanded coverage for similarly designed nurse management programs.

Primary Funding Source: AHRQ

●Disease Management: Can we Believe the Hype?

Soeren Mattke, M.D., DSc, Michael Seid, Ph.D., Sai Ma, MPA

Presented By: Soeren Mattke, M.D., DSc, Scientist, Health, RAND, 1200 S Hayes St, Arlington, VA 22202; Tel: 703-413-1100; Fax: 703-413-8111; Email: mattke@rand.org

Research Objective: Disease management is increasingly viewed as a potential solution to the twin problems of escalating cost and inadequate quality of care, in particular for chronic conditions. It is, however, not clear whether and to what degree the available evidence is supportive of such high expectations. We set out to answer the following questions: 1) What types of disease management programs in which population groups have been evaluated in the scientific literature? 2) For which chronic conditions has the effect of disease management been researched? 3) What does the evidence say about the effect of disease management on endpoints like quality of care and cost? 4) Is there sufficient evidence for the large-scale, vendor-based disease management programs that are currently of most interest to public and private purchasers?

Study Design: We searched the available literature for meta-analyses and reviews that summarized evaluations of disease management programs. We identified 29 meta-analyses or reviews that covered 317 unique publications and conducted a structured review of those.

Population Studied: N/A

Principal Findings: The types of interventions included in reviews were very heterogeneous and frequently little detail about the intervention was provided. But the typical program was relatively small (about 30-500 patients), was operated by the providers at a single site, and targeted high-risk patients. The interventions typically combined patient education, care planning and follow-up delivered by a nurse or case manager either by telephone or in-person. There were no reviews or meta-analyses and only three studies of large-scale, population-based interventions. Congestive heart failure (CHF) was the condition with most evidence (18 reviews/meta-analyses covering 118 individual studies),

followed by coronary artery disease (CAD) (7/78), diabetes (9/64), asthma (4/37), chronic obstructive pulmonary disease (COPD) (5/25), and depression (4/24). Other conditions were not sufficiently well researched.
Across most conditions, there was consistent evidence that disease management can improve processes of care, disease control and patient experience. We found no consistent evidence that disease management improved long-term outcomes for any condition, at least not in the typical follow-up period of up to 12 months, nor that it influenced utilization of care, except for a reduction in hospitalization rates among CHF patients and for higher utilization of outpatient care and prescription drugs for patients with depression. There was no conclusive evidence that disease management leads to a net reduction of direct medical cost, when the cost of the intervention are appropriately accounted.
Conclusions: Most of the evidence to date concerns small, high-intensity programs focusing on high-risk patients, rather than the large, population-based disease management programs that are currently of most interest to private and public purchasers. Moreover, while these programs show evidence for improved quality of care, the evidence for improved health outcomes and cost savings is inconclusive.
Implications for Policy, Delivery, or Practice: Further research is clearly needed, especially on the effect on cost, quality, and health outcomes of the large-scale, population-based programs to inform the decisions of public and private purchasers and to identify the most successful programs.
Primary Funding Source: No Funding

●Cardiovascular Disease and Quality of Life: Has Productivity Improved?

Emily Shelton, MAE, Hsou Mei Hu, Ph.D., David M. Cutler, Ph.D., Allison B. Rosen, M.D. Sc.D.

Presented By: Emily Shelton, MAE, Ph.D Student, Health Management & Policy, University of Michigan, M3141 SPH II 109 Observatory Street, Ann Arbor, MI 48109; Tel: 734-615-7974; Email: ecshelto@umich.edu
Research Objective: Medical advances have led to marked reductions in cardiovascular disease (CVD) morbidity and mortality over the past three decades. What is less well known, however, is how workplace productivity has changed for those suffering from CVD relative to those without this chronic condition.
Study Design: We compare changes in productivity between those with and those without CVD over time, examining whether medical advances in CVD treatment have narrowed the gap in productivity between these two groups. We define CVD as the presence of coronary heart disease, angina, Acute Myocardial Infarction, transient ischemic attack or stroke. To measure productivity, we use the number of days missed from work due to illness or injury an individual experiences over each study year.
Population Studied: A weighted population of 22,478,035 adults with self-reported CVD and 359,511,731 adults without CVD who were 18 years or older in 1987 and 2000 is studied. The National Medical Expenditure Survey (NMES) and the Medical Expenditure Panel Survey (MEPS) provide nationally-representative data on the non-institutionalized civilian population in 1987 and 2000. These surveys contain information about respondents' medical conditions, productivity and employment characteristics.
Principal Findings: Although a gap in productivity exists between those with and those without CVD in both years of data, the gap narrows significantly over time. While those with CVD report an average of 30 missed days of work in 1987, those without CVD report only 7.3 days missed. In 2000, those with CVD report 4.3 days of work missed, while those without CVD report 3.6 days missed. This narrowing of the productivity gap persists even after controlling for personal characteristics including age, gender, education, medical comorbidities and whether or not the individual has paid sick leave from an employer. While there is a downward trend in the number of days absent from work, the trend is much faster in the CVD population than in the non-CVD population.
Conclusions: Medical advances over recent decades have improved the quality of life for those suffering from cardiovascular disease. The narrowing of the productivity gap may be evidence that CVD is no longer as debilitating as it once was.
Implications for Policy, Delivery, or Practice: Changes in the workplace productivity of those suffering from chronic conditions should be included in estimates of the value of medical care. Estimates of the value of CVD care that do not take into account improvements in occupational functioning undervalue the importance of these advances.
Primary Funding Source: NIA, The Harvard Interfaculty Program for Health Systems Improvement; the Lasker Foundation

●Evaluation of Disease Management on Outcomes and Cost of Care for Medicaid Patients

Jackie (Ning) Zhang, M.D., Ph.D., Hayden Smith, MS, Thomas Wan, Ph.D.

Presented By: Jackie (Ning) Zhang, M.D., Ph.D., Assistant Professor, Department of Health Administration, University of Central Florida, 3280 Progress Drive, Orlando, FL 32826; Tel: 407-823-3344; Email: nizhang@mail.ucf.edu
Research Objective: To examine whether an integrated disease management program designed for Medicaid patients experiencing significant chronic diseases can substantially improve clinical outcomes and reduce unnecessary medical utilization, while lowering costs.
Study Design: The three-year Disease State Management (DSM) program established by Virginia Department of Medical Assistance Services (DMAS) was designed to evaluate the cost and outcomes of a new disease management intervention program across five chronic diseases and their comorbidities, which include diabetes, congestive heart failure (CHF), depression, gastroesophageal reflux disease (GERD), and asthma. In consecutively three years, both physicians and pharmacists were intervened with education program that alerts them about potential opportunities for improved prescribing and intervention with their patients. All patients were quarterly evaluated on their health utilization, health status, and clinical outcomes. ANOVA analysis was used to evaluate the effects of the program over time.
Population Studied: 35,628 patients with five chronic diseases and their physicians and pharmacists were intervened for three consecutive years from 1999-2001 in Virginia.

Principal Findings: This study found that the DSM program statistically significantly improved drug compliance while simultaneously reducing the adverse events. From 1999 to 2001, emergency room, hospital, and physician office visits decreased dramatically across designated diseases. ER visits of asthma patients in the physician and pharmacist intervention group dropped 39% and 21% respectively, compared to the control groups for asthma and diabetes, from 1999 to 2001. Further analysis indicates that the average cost per hospitalization per adjusted targeted patient (ATP) would have been $42 lower than that without disease management intervention. This represents savings of over $1.29 million if all ATP's in the study were included in the disease management plan. In addition, results also suggest that provider interventions impact health utilizations and outcomes differently across chronic diseases.
Conclusions: Disease management programs that include the education of physicians and pharmacists represent an innovation that can reduce drug compliance problems and lower medical costs. This approach justifies many of the political feasibility issues associated with federal and state governments as both quality improvement and cost savings are achieved in one program.
Implications for Policy, Delivery, or Practice: The results of this study suggest the promising outcomes of the integrated DSM program and its cost saving effect, which may be potentially useful for Medicaid programs in other states.
Primary Funding Source: No Funding

Call for Papers

Chronic Care: Patients & the Patient Journey

Chair: Jinnet Fowles, Park Nicollet Institute

Tuesday, June 27 o 8:45 am – 10:15 am

●Implementing Best Practices to Improve the Quality of Care for Schizophrenia (EQUIP)

Amy Cohen, Ph.D., Alexander S. Young, M.D., MSHS, Jim Mintz, Ph.D.

Presented By: Amy Cohen, Ph.D., Psychologist, Mental Illness Research, Education, and Clinical Center (MIRECC), Greater Los Angeles VA Healthcare Center, 11301 Wilshire Blvd. (210A), Los Angeles, CA 90073; Tel: (310) 478-3711 x40770; Fax: (310) 268-4056; Email: ancohen@ucla.edu
Research Objective: Outcomes in schizophrenia are often good when appropriate medication and psychosocial treatments are provided, yet, rates of appropriate care nationally are moderate to low. As a result, the President's New Freedom Commission established national goals for improving care for schizophrenia. Meeting these goals is challenging due to limited research on how care can be improved. The VA "EQUIP" project (Enhancing Quality Utilization in Psychosis) is one of the first projects to implement and evaluate chronic illness management principles in schizophrenia.
Study Design: Information systems and implementation strategies were developed to put into practice a chronic care model for schizophrenia. A controlled trial evaluated the effect of the intervention on treatment quality and patient outcomes. A process evaluation studied the organization of care, and barriers and facilitators to implementation. Psychiatrists at two VA medical centers were randomized to usual care or a novel intervention for 15 months. The intervention included routine management of patient outcomes data by an IT system and care protocols for guideline concordant medication and side-effect management and family services. Patients received a structured, routine assessment at each clinic visit. An informatics system provided these "psychiatric vital signs" to clinicians at the time of the clinical encounter, and facilitated team communication. The informatics system generated regular data reports for clinicians and managers which identified population-based problems. Research data included interviews with patients and providers at baseline and follow-up, utilization data, and implementation records.
Population Studied: 398 patients with schizophrenia or schizoaffective disorder and 65 psychiatrists.
Principal Findings: Poor quality medication management for psychosis decreased significantly more under the intervention compared to usual care (75% to 71% vs. 69% to 86%; p=.04). The most common medication side-effect was weight gain, and wellness groups were established with a 16-session weight control protocol. The intervention group had a mean weight loss of 2.9 pounds and mean reduction of 0.4 BMI points. The intervention did not significantly improve use of clozapine or caregiver involvement in care. The process evaluation identified provider barriers to quality improvement efforts. Twenty-one percent of psychiatrists indicated a high degree of job burnout, with 82% indicating a very low sense of personal accomplishment in their job. Fewer than 14% reported that treatment guidelines had any effect on their practice. Psychiatrists rarely referred patients for clozapine. Psychiatrists held a false belief that patients had little contact with families.
Conclusions: Through the use of an IT infrastructure and care protocols, this intervention improved treatment quality for psychosis and weight management. Research identified barriers to improving use of clozapine and to family involvement. These included provider competency, the organization of care, and access to evidence-based practices.
Implications for Policy, Delivery, or Practice: Education and training of key stakeholders and line staff as well as reorganization of care resources will be necessary to move forward with quality improvement for schizophrenia. The use of informatics to support best practices was necessary for implementation in this disorder. Revised implementation strategies are currently being field-tested and will be discussed.
Primary Funding Source: VA

●A Novel Screening Strategy for Selecting Patients for Diabetes Screening

Lisa M. Kern, M.D., M.P.H., Heejung Bang, Ph.D., Mark A. Callahan, M.D., Steven M. Teutsch, M.D., M.P.H., Alvin I. Mushlin, M.D., ScM

Presented By: Lisa M. Kern, M.D., M.P.H., Assistant Professor, Public Health, Weill Medical College, Cornell University, 411 East 69th St., New York, NY 10021; Tel: (212) 746-3039; Fax: (212) 746-8544;

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Research Objective: National guidelines disagree on who should be screened for diabetes. The optimal strategy for selecting patients for diabetes screening is unclear. Our objectives were: 1) to generate a novel strategy for selecting patients for diabetes screening, and 2) to compare the performance of this strategy with existing national guidelines.
Study Design: Cross-sectional
Population Studied: We used data from the population-based National Health and Nutrition Examination Survey, 1999-2002. We included participants who had no known diabetes and who were randomly assigned to have fasting blood samples drawn to determine their diabetes status (N = 3551). We divided these participants randomly into a derivation dataset and a validation dataset, using a 2:1 ratio. Adjusting for complex sampling, we used logistic regression in the derivation dataset to determine which participant characteristics were independently associated with undiagnosed diabetes (fasting plasma glucose = 126 mg/dl). Using a second logistic model in the derivation dataset that included only the significant characteristics, we generated a weighted risk-scoring system. We calculated the sensitivity and specificity of this scoring system and of 3 national guidelines for detecting participants with undiagnosed diabetes in the validation dataset.
Principal Findings: The prevalence of undiagnosed diabetes was 4.5%. Older age, male gender, family history of diabetes, history of hypertension, and higher body mass index each independently predicted undiagnosed diabetes ($p < 0.05$). Using a weighted sum of these characteristics as our scoring system (with a possible total score ranging from 0 to 9), we found the best performance when participants with 5 or more points were selected for diabetes screening. The resulting rule maximized both sensitivity (80%) and specificity (65%), thereby outperforming the national guidelines, which had moderate-high sensitivity but low specificity [U.S. Preventive Services Task Force (USPSTF): sensitivity 81%, specificity 39%; American Diabetes Association (ADA): sensitivity 96%, specificity 19%; Centers for Disease Control and Prevention (CDC): sensitivity 100% and specificity 8%]. Our rule also selected the smallest proportion of participants for screening (37%), compared to the national guidelines (USPSTF 62%, ADA 81%, CDC 92%).
Conclusions: A novel strategy for selecting patients for diabetes screening has comparable sensitivity but higher specificity and higher efficiency than national guidelines. Future studies are needed to validate this strategy in other populations.
Implications for Policy, Delivery, or Practice:
Implementation of this novel strategy for selecting patients for diabetes screening is likely to be more cost-effective than implementation of the existing national guidelines.
Primary Funding Source: Weill Medical College

●Improved Treatment for Ischemic Heart Disease on Disability and Death in the Elderly

Kate Stewart, MS, Mary Beth Landrum, Ph.D., David M. Cutler, Ph.D.

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Research Objective: To explore the role of improved treatments for ischemic heart disease (IHD) on reductions in disability and death among the elderly IHD patients over time.
Study Design: Using data from the 1984, 1989, and 1994 waves of the National Long Term Care Survey (NLTCS), including Medicare-linked administrative data, we estimated the incidence of IHD hospitalizations over the next 5 years, and the probability of disability and death at the end of each 5 year period among IHD patients. We also obtained data on appropriate use of treatments for myocardial infarction at the hospital referral region level from the Cardiovascular Cooperative Project, and merged these data with the NLTCS survey and administrative data by zip code. We developed a multinomial model of disability and death to estimate whether respondents living in hospital referral regions with higher use of appropriate treatments were less likely to experience disability and death over time. From our multinomial model, we simulated the likelihood of disability, death, and non-disabled survival if all respondents lived in hospital referral regions that provided appropriate care at the 10th and 90th percentile levels at each survey wave.
Population Studied: A total of 3,842 respondents to the 1984, 1989, and 1994 waves of the NLTCS with a hospitalization for IHD in between survey waves and known health status (i.e. disabled, dead, or alive and non-disabled) at each subsequent survey wave.
Principal Findings: IHD incidence ranged from 8.7% to 10.4% to 9.2% among 1984, 1989 and 1994 NLTCS respondents, respectively. The probability of disability and death declined by 1.9 and 6.7 percentage points, respectively, between 1984 and 1994 survey waves, with a corresponding 8.6 percentage point increase in the probability of non-disabled survival ($p = 0.004$). If all respondents lived in hospital referral regions providing appropriate care at the 90th percentile, the probability of disability would have declined from 31% to 19%, the probability of death from 30% to 25%, and the probability of non-disabled survival would have increased from 39% to 57%. In contrast, if all respondents lived in 10th percentile hospital referral regions, the probability of disability would have increased from 16% to 25%, the probability of death from 44% to 39%, and the probability of disability-free survival would have declined from 40% to 36%.
Conclusions: Use of appropriate treatments for IHD was associated with significant declines in the probability of both death and disability over time. Elderly IHD patients were more likely to experience disability-free survival over time in regions that provided high use of appropriate care. This information is critical for providers and policy-makers, particularly since the incidence of IHD remained relatively constant over the study period.
Implications for Policy, Delivery, or Practice: The results of our study suggest that further improvements in health outcomes among elderly IHD patients are possible. We

estimated that significant gains in survival and declines in disability would result if all areas provided appropriate IHD care at the 90th percentile.
Primary Funding Source: NIA

●Does Involving Patients in Treatment Decisions Improve Asthma Controller Medication Adherence?

Sandra Wilson, Ph.D., Peg Strub, M.D., A. Sonia Buist, M.D., Shinu Verghese, M.S., Nancy L. Brown, Ph.D., Jodi Lapidus, Ph.D.

Presented By: Sandra Wilson, Ph.D., Sr. Staff and Department Chair, Dept. Health Services Research, Palo Alto Medical Foundation Research Institute, 795 El Camino Real, Ames Bldg., Palo Alto, CA 94301; Tel: (650) 853-2898; Fax: (650) 329-9114; Email: wilsons@pamfri.org

Research Objective: To compare two models of asthma care management delivered by non-MD clinicians -- shared decision making (SDM) and management based on guidelines (MBG) -- with usual medical care (UC) in terms of asthma controller medication adherence.

Study Design: Randomized controlled clinical trial. In MBG, clinicians determined treatment regimen modifications using established guidelines; in SDM, regimens were negotiated based on patient treatment goals and preferences. Both care management approaches involved two in-person and three phone follow-up contacts, patient education and comparison of objective (lung function, symptoms) with subjective (patient) assessment of asthma control. Audiotaped intervention sessions were scored for intervention protocol adherence and relative interventionist - patient influence on treatment decisions. The latter also was rated independently by patients and interventionists. Pharmacy dispensing data were obtained for one year pre- and one year post-randomization to compute cumulative medication acquisition (CMA) indices for inhaled corticosteroids (ICS) and for all asthma controllers (CONT) combined including ICS. CMA=proportion of days supply dispensed in a given time period (e.g., beclomethasone, 30 days supply dispensed a total of 3 times in one year: CMA = 3x30days/365 days = 0.26, or 26% of days on which the patient possessed sufficient medication for use on the prescribed regimen).

Population Studied: Kaiser Health Plan members 18-70 years of age with poorly controlled asthma and poor adherence (N=613).

Principal Findings: In the pre-randomization year, mean CMA values for ICS and CONT medications did not differ significantly across groups. All three groups had very low mean CMA values for both ICS [Mean for SDM=0.30(StdDev=0.32), MBG=0.28(0.28), UC=0.29(0.32); p=0.9234] and for CONT [CMA for SDM=0.37(0.40), MBG=0.34(0.36), UC=0.39(0.47); p=0.9636]. Close adherence to the intervention protocols was documented. Quality control evaluator, interventionist, and patient ratings gave patients a significantly greater role in treatment decisions in the SDM than the MBG condition. Rates of prescription of ICS and CONT medications in the intervention sessions did not differ between SDM and MBG groups, but patient choices among ICS preparations reflected a preference for convenience as well as disease control. In the post-randomization year the group mean CMA values for ICS and CONT differed significantly overall (Kruskal-Wallis test, both $p<0.0001$). For ICS, the SDM and MBG groups each had significantly greater mean CMA values compared with the UC group [SDM=0.56(0.35), MBG=0.49(0.36), UC =0.35(0.35)] (both $p<0.001$, Bonferroni adj.) and similarly for CONT medications [SDM=0.63(0.40), MBG=0.54(0.42), UC=0.45(0.51)] (both $p<0.001$, Bonf. adj.). Importantly, SDM patients were dispensed a significantly greater supply of both ICS and CONT medications than were MBG patients (both $p=0.03$; Bonferroni adj.).

Conclusions: Treatment adherence, evidenced by medication acquisition, was greater for both care management groups than for usual care. Care management in which patients actively participated in treatment decisions did not lead to treatment choices that departed from quideline-recommended therapy but resulted in better adherence than traditional clinician-directed guidelines-based management.

Implications for Policy, Delivery, or Practice: For non-adherent patients with poorly controlled asthma, substantial improvement in adherence to asthma controller therapy can be achieved by eliciting and accommodating patient treatment goals and preferences. Further benefits in terms of disease control, health resource utilization outcomes, and intervention cost-effectiveness are being determined.

Primary Funding Source: NIH R01 HL69358/R18 HL67092

●The Use of Recommended Health Care Services Among Elderly Cancer Survivors

Xinhua Yu, M.B., Ph.D., Alexander McBean, M.D., M.Sc., Beth A. Virnig, Ph.D., M.P.H.

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Research Objective: Feinstein (1970) theorized that persons with a chronic disease such as cancer would be more likely to be screened or provided other preventive or healthcare services because of regular contact with medical providers. On the other hand, Jean, et al.'s (1994), "competing demands model", suggests that persons with cancer might receive fewer recommended health care services. In the past two years, Earle and colleagues (2003, 2004) have published conflicting information regarding recommended services among cancer survivors: breast cancer survivors had higher rates of health service use than persons without cancer (2003); and colorectal cancer survivors received had lower rates than the controls. (2004). We examined the use of preventive services and recommended diabetes care in 1999-2002 among elderly Medicare beneficiaries who were long-term survivors of 5 different types of cancer: bladder, breast, colorectal, prostate and uterine.

Study Design: We conducted a retrospective cohort analysis useing the linked Surveillance, Epidemiology and End Results (SEER)/Medicare database including the associated control population to compare the rates of influenza vaccine and breast cancer screening, as well as diabetes care services between cancer survivors and elderly persons who were never diagnosed with cancer. Crude and multivariate adjusted rates were calculated and compared.

Population Studied: Elderly fee-for service Medicare beneficiaries living in the SEER areas who survived 5 years

after bladder, breast, colorectal, prostate or uterine cancer diagnosis and a 5% random sample of Medicare fee-for-service beneficiaries with no history of cancer residing in the same areas.
Principal Findings: During 1999-2002, cancer survivors were between 20 and 50% more likely to receive preventive services (influenza vaccine or mammography) than persons who never had cancer (women with breast cancer excluded from mammography analysis. Cancer survivors with diabetes were more likely to have least one annual HbA1c test or eye examination than those without cancer. These differences were smaller than for influenza vaccine or mammography, from 1 to 16%, but all were statistically significant, $p < 0.05$, when adjusted for age-group, gender (if needed), and race. There were no important differences in the serum lipid level determination rates between the cancer survivors and controls, with no pattern of either the cancer survivors or the comparison group receiving testing more or less frequently than the other. Multivariate adjustment including other sociodemographic variables, comorbities and other relevant covariates confirmed these findings.
Conclusions: Elderly persons who have survived cancer were generally more likely to receive preventive and other recommended services compared with those without cancer.
Implications for Policy, Delivery, or Practice: The good news is that cancer survivors received the same, or better preventive care than persons who never had cancer. However, the rates of service use remained below national goals in both cancer and non-cancer populations. Improving the use of these appropriate, recommended services among the elderly remains a high priority.
Primary Funding Source: NIA

Related Posters

Chronic Care

Poster Session A

Sunday, June 25 o 2:00 pm – 3:30 pm

●National Estimated of Excess Healthcare Expenditures Due to Arthritis

Orit Almagor, MA, Larry M. Manheim, Ph.D., Rowland W. Chang, M.D.; M.P.H., Christina J. Yang, BA, Dorothy D. Dunlop, Ph.D.

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Research Objective: Compare health care expenditures for persons with and without arthritis at low (10th percentile), median, and high (75th and 90th percentiles) expenditure levels using a nationally representative sample, to examine whether higher costs due to arthritis are consistent across the expenditure distribution.
Study Design: The 2002-2003 Medical Expenditure Panel Survey (MEPS) is used to obtain a nationally representative sample. MEPS survey followed individuals for two years. Baseline (2002) self-reported information includes demographics, function limitations, and chronic diseases including arthritis, as defined by the National Arthritis Data Workgroup. Total health care expenditures (sum of office and hospital-based care, home health care, dental services, vision aids, other medical equipment and services, and prescribed medicines) and concurrent insurance status were obtained from the second year (2003). We examined three questions at each expenditure percentile studied: 1) Do persons with arthritis have higher expenditures than those without? 2) Does arthritis cost more after controlling for differences in demographics, economics and comorbid chronic conditions? 3) What baseline factors contribute to high arthritis expenditures? Quantile regression at each percentile compared health care expenditures between persons with and without arthritis. Logistic regression examined what factors predict high expenditures among persons with arthritis.
Population Studied: The MEPS is used to obtain a nationally representative sample of 4,788 individuals age forty-five years and older.
Principal Findings: Total health care expenditures for persons with arthritis are at least doubled compared to persons without for all percentiles of expenditures examined. Expenditures for persons with arthritis remain higher after adjusting for demographics, health conditions, and economics status compared to their counterparts without arthritis. A substantial portion of excess costs were explained by functional limitations. Furthermore, among persons with arthritis, the presence of functional limitations strongly predicted high (90th percentile) expenditures.
Conclusions: Total expenditures among persons with arthritis are greater compared to counterparts without arthritis controlling for risk factors across a spectrum of low to high expenditures. Excess expenditures due to arthritis are largely explained by accounting for the presence of functional limitations.
Implications for Policy, Delivery, or Practice: Prevention and intervention programs targeted at reducing functional limitations are central to reducing high health care expenses among persons with arthritis.
Primary Funding Source: NICHD and NIAMS

●The Influence of Psychological and Social Factors on Health and Healthy Behaviors in an Employed Population

Edmund Becker, Ph.D., Douglas W. Roblin, Ph.D., Peter J. Joski, MSPH, David H. Howard, Ph.D.

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Research Objective: Activated patients, family and community resources, and productive interactions with practice teams are components of the Chronic Care Model strategy for improving the health of chronically ill patients. Yet, the social and psychological correlates of health and healthy behaviors are not clearly understood. We simultaneously evaluated the influence of 1) disease state and organizational factors (work climate, social climate, trust in physician) on patient activation and, in turn, 2) the influence of disease state and patient activation on health and healthy

behaviors among working age adult enrollees of a group-model MCO.
Study Design: Data were collected on a mailed survey (42% response rate) from October through December 2005 of MCO enrollees who were 25-59 years of age and employed by large public agencies or private corporations in the Atlanta area. Enrollees were randomly sampled from 3 cohorts defined from MCO databases: diabetes, elevated lipids (without CAD history), and "low risk" (no identifiable major morbidities). The survey measured health (SF-12), patient activation (PAM-13), work and social climate (MIDUS Survey scales), trust in physician (Safran et al.), exercise (BRFSS), and dietary intake (Block Fat and Fruit/Vegetable Screeners). SF-12, PAM-13, work and social climate, and trust in physician scales were scored from 0 (unfavorable) to 100 (favorable). General linear and logistic models were used to estimate the association of activation with work climate, social climate, and trust in physician (controlling for patient cohort, age, gender, race, education, marital status), and the association of health and healthy behaviors with patient activation (both as a main effect and the joint effect with cohort).
Population Studied: 1,787 respondents: 524 with diabetes, 628 with elevated lipids, 635 low risk.
Principal Findings: Both social factors and disease state influenced patient activation. Activation was positively associated with trust in physician (0.20 point increase per 1 point increase in trust, $p<0.01$), social climate (0.16, $p<0.01$), and work climate (0.05, $p=0.10$). Activation was lower among adults with diabetes than among low risk adults (-3.02, $p<0.01$). In turn, patient activation was significantly ($p<0.05$) associated with better physical (PCS-12) and emotional (MCS-12) function, lower percent calories from fat in diet, more daily servings of fruit and vegetables, and greater likelihood of moderate or vigorous exercise. Interactions of activation with disease state were significant for physical function and likelihood of moderate exercise for adults with diabetes and adults with elevated lipids (e.g. OR=1.019, $p=0.02$, for moderate exercise per 1 point increase in activation among adults with diabetes).
Conclusions: Activation of patients to practice healthy behaviors is primarily influenced by interactions with their primary care physicians and relationships (support, stress) among family and friends. Health and healthy behaviors, in turn, are influenced by patient activation. Among adults with diabetes or elevated lipids, activation is more important to likelihood of exercise and better physical functioning than among low risk adults.
Implications for Policy, Delivery, or Practice: Strategies of an MCO to improve health and healthy behaviors in a community need to account for the growing body of evidence that shows these outcomes are influenced not just by physician-patient relationships but also by social circumstances.
Primary Funding Source: CDC

●Financial Burdens Among Patients with Chronic Conditions

Didem Bernard, Ph.D. Economics, William Encinosa, Ph.D. Economics, Jessica Banthin, Ph.D. Economics

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Research Objective: High out-of-pocket costs can pose a significant burden to patients with chronic conditions. In fact, a 2005 survey of sicker adults in six countries found that the United States is an outlier for financial burdens on patients and patients forgoing care because of costs. (Schoen et al., 2005) This study examines financial burdens among adults with highly prevalent costly chronic conditions such as diabetes, heart disease, hypertension, and cancer. We also examine the change in financial burdens over time from 1996 to 2003.
Study Design: We estimate how frequently adults with costly chronic conditions have expenditures on health insurance premiums and health care services that exceed a specified percentage of family-level after-tax disposable income. High burden is defined as out-of-pocket health-related spending greater than 20 percent of family income.
Population Studied: We use data from the Medical Expenditure Panel Survey from 2003. We examine burdens by socioeconomic factors, insurance status and by age group (non elderly, near elderly, elderly).
Principal Findings: Adults with chronic conditions are significantly more likely to have high out-of-pocket burdens. Preliminary results based on 2001 data show that 17.2 percent of non elderly adults with three or more chronic conditions had high burdens compared to 5 percent of adults with no chronic conditions. Among non-elderly adults with chronic conditions, those with individual private coverage had the greatest risk of high burdens (42.4%) followed by the uninsured (40.1%), those with public insurance (28%) and those with private insurance (10%). Among non elderly adults with chronic conditions, the prevalence of high burdens increased significantly from 1996 to 2001 among the uninsured and those with public coverage. The share of uninsured adults with high burdens increased from 27.9 percent to 40.1 percent during this period. Among adults with public insurance, the prevalence of high burdens increased from 12.7 percent to 28 percent. We also find that compared to non elderly adults with no chronic conditions, those with three or more chronic conditions are twice as likely to go without needed care due to financial reasons.
Conclusions: Adults with chronic conditions are significantly more likely to have high out-of-pocket burdens. Among non elderly adults with chronic conditions, the prevalence of high burdens increased significantly from 1996 to 2001 among the uninsured and those with public coverage. We also find that compared to non elderly adults with no chronic conditions, those with three or more chronic conditions are twice as likely to go without needed care due to financial reasons.
Implications for Policy, Delivery, or Practice: The increase in high burdens and financial barriers to care among those with chronic conditions is of concern since the chronically ill with persistently high burdens may fail to receive ongoing care.

Primary Funding Source: AHRQ

●Characteristics of Medicare Beneficiaries Participating in the Lifestyle Modification Program Demonstration (LMPD)

Sarita Bhalotra, M.D., Ph.D., Gail K. Strickler, MS, MA, Donald S. Shepard, Ph.D.

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Research Objective: The Medicare LMPD was initiated in 2000 to evaluate the feasibility and cost effectiveness of providing lifestyle modification programs to Medicare beneficiaries with cardiovascular disease. Feasibility evaluation includes examining the process of implementation to identify barriers, challenges, and successes. Cost-effectiveness evaluation includes clinical effectiveness, quality, and utilization of health services. The demonstration consists of sites that provide either the Dr. Dean Ornish Program for Reversing Heart Disease® (12 sites) or the Mind/Body Medical Institute (M/BMI, founded by Dr. Herbert Benson) program (6 sites).

Study Design: The LMPD evaluation uses a multi-pronged data collection and analytical model, that includes case study, participant and control survey, and claims data and clinical data. The survey was constructed to gather beneficiary characteristics regarding health, clinical status, family history, lifestyle including diet, exercise, and substance use, medications, knowledge about health and cardiac conditions, satisfaction with care, self-efficacy, social support, perceived stress, hostility, living arrangements, and satisfaction with the LMPD. It is administered at baseline to entering participants, and then again at Years One and Two. An algorithm is used to identify controls from claims data, who are surveyed at Years One and Two. This study reports on baseline characteristics of LMPD participants; we conducted preliminary descriptive analyses and refined new variables relating to motivation, self-efficacy, and behavioral change. We also coded and analyzed three text variables.

Population Studied: Baseline survey results were obtained from 259 participants in the LMPD; 75 were in the Ornish program, and 184 were in the M/BMI program. We expect to report on more than 400 by June, 2006, as participant data continue to be received.

Principal Findings: Descriptive aggregate data provide a profile of patients who join LMPD, and will be supplied and discussed. Preliminary findings indicate that participants are mostly male (68.3%), predominantly non-Hispanic Whites (91.9%), with an average age of 72.2 years, (S.D.= 5.44). Forty-two percent reported having at least a four-year college degree. The mean Body Mass Index was 26.9 (S.D.=4.38), while16.6 percent reported current high blood pressure, 23.9 percent reported current high cholesterol, 1.2 percent were current smokers and nearly 80 percent rated their health status as good to excellent. Further analyses will examine other baseline characteristics of participants, with the ultimate aim of testing for demographic and other differences between LMPD participants and control subjects.

Conclusions: Initial descriptive, bivariate, and text analyses provide patient profiles for participants who join either program. These can be compared to census data on the underlying population. Analyses will ultimately examine baseline similarities and differences between LMPD participants and controls.

Implications for Policy, Delivery, or Practice: Enrollment into LMPD has been a most significant barrier. Targeting patient preferences and program components that improve activation and adherence may be one way to improve enrollment. As the incidence and prevalence of chronic illness increases, it will be vitally important to determine and implement customized and appealing interventions for self-management and lifestyle modification.

Primary Funding Source: CMS

●CBPR, Chronic Disease and Assessing the Baseline Health Of Communities Through Existing or Readily Available Data

Jane N. Bolin, BSN, J.D., Ph.D., Marcia Ory, Ph.D., Eugenia Conde-Dudding, M.P.H., John Prochaska, M.P.H., Kerrie Hora, MS Health Ed.

Presented By: Jane N. Bolin, BSN, JD, Ph.D., Assistant Professor, Health Policy and Management, Texas A&M Health Science Center School of Rural Public Health, TAMU-1266, College Station, TX 77842; Tel: (979) 862-4238; Fax: (979) 862-8371; Email: jbolin@srph.tamhsc.edu

Research Objective: Our over-arching research objective in this 5-year CBPR project is collaboration with community/clinical partners to explore local practices for diabetes management and mutually develop both research processes and products for improving public health. In Year-1, the research team will document the baseline burden of diabetes in order to 1) better inform our community/clinical partners about the scope of diabetes; 2) assist in targeting those at risk; and, 3) address barriers and solutions to the translation of chronic disease management guidelines in this diverse region.

Study Design: Our five-year research plan begins with a baseline assessment of diabetes in a seven county region of Central Texas, involving 1) the collection of baseline data, 2) development and implementation of contextually appropriate intervention strategies utilizing both data collected and input from community leadership, and, 3) follow-up data collection to track changes over time.

Population Studied: Our research is focused on the Brazos Valley region of Texas. This population is approximately 25% minority (Black or African American and Hispanic).

Principal Findings: Existing or readily available data included hospital discharge data, 211 data, and surveys of community partners. These data were relatively easy to acquire and provided valuable sources of baseline data for our community partners' benefit.

Conclusions: These data provided valuable information for advising community/clinical partners and will facilitate the translation and diffusion of innovative best practices.

Implications for Policy, Delivery, or Practice: CBPR and community partnerships can be informed through utilization of existing or readily available data sources.

Primary Funding Source: CDC

●Developing a Results-Based Logic Model for Chronic Care

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Research Objective: To develop a framework for evaluating chronic care initiatives, recognizing contexts, inputs, activities, outputs, outcomes, and linkages between each of these that is informed by research evidence and expert input.

Study Design: The framework is guided by the CHSPR Primary Health Care Logic Model(Watson etal 2004), the Treasury Board of Canada Results-based Management and Accountability Framework, extensive review of the research literature, expert input, and review of existing chronic care performance measures.

Population Studied: Chronic Care

Principal Findings: The Chronic Care Logic Model defines the dimensions of a results-based logic model for chronic care and describes each of these dimensions and related performance indicators. The dimensions include (1)Population Characteristics and Contexts relevant to chronic care (CC) needs such as demographics, prevalence, and functional status, social, cultural, economic and other contextual factors;(2)CC Inputs describe the health human resource, material and financial inputs to undertake CC activities;(3)CC Activities use inputs to carry out decisions and processes of organizing care including policy/governance, management, clinical, individual and community-level activities and decisions;(4)CC Outputs are the services delivered by providers and received by individuals e.g. screening, managing acute exacerbations, ongoing monitoring, and end of life care;(5)CC Outcomes span immediate outcomes (patient activation/knowledge, management of chronic conditions, prevention of complications, quality of life), intermediate outcomes (e.g. satisfaction, appropriateness of place and provider) and final outcomes (e.g. improved health and health system sustainability). This approach informs development of chronic care performance measures beyond traditional receipt of recommended care measures.

Conclusions: The Chronic Care Logic Model provides a comprehensive, common framework for evaluating chronic care initiatives across jurisdictions. Based on research literature and expert input, the logic model recognizes dimensions from contexts through inputs and activities to outputs and outcomes. The logic model also recognizes linkages between these dimensions to inform study of efficiency and effectiveness.

Implications for Policy, Delivery, or Practice: This framework provides a comprehensive and consistent guide for planning, management, research and evaluation of chronic care initiatives and supports accountability and performance measurement. The development of a common framework is essential given the increasing prevalence of chronic conditions, concerns for managing costs and utilization associated with chronic conditions and improving quality of care, and the introduction of chronic care / chronic disease management initiatives.

Primary Funding Source: No Funding

●Parental Perceptions of Care Coordination for Children with Autism Spectrum Disorders

Christine Burns, EdM, M.B.A., Abidin Tuncer, D.D.S., Erin Sheeder, DPT, Kristen Pullano, DPT, Mark Orlando, Ph.D., Steven Sulkes, M.D.

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Research Objective: Children with autism have special health care needs that require complex care provided by multiple specialists. Care is often fragmented, challenging parents in their coordination efforts. Emerging electronic information sharing systems (EIS) hold particular promise for improving the coordination of care of children with special needs. The purposes of this study were to (1) evaluate parent perception of effort in coordinating services for their children with autism who have special health care needs (CSHCN), and (2) evaluate which care coordination services families find beneficial. Factors promoting successful care coordination and areas where additional supports are needed were identified.

Study Design: The survey instrument consisted of four sections. The first section asked questions on demographic information and the remaining three sections identified the parent's (1) understanding of their child's condition (2) time spent on care coordination activities and, (3) services received by the child.. The data were analyzed using Statistical Analysis Software, or Statistical Package for Social Sciences – PC, or EPI Info 6.04B Version 2000 (Centers for Disease Control, 1997). Data analysis identified which variables predict and/or contribute to the likelihood of receiving care coordination services. Certain questions that address specific services or needs were scaled. Families' perceptions of "optimal" care coordination services were summarized using a numeric scale.

Population Studied: Surveys were mailed to 300 families of children with autism spectrum disorder, 50% of whom have autistic disorder (ICD9-CM code 299.0) and 50% of whom have Asperger's disorder or PDD NOS (ICD9-CM code 299.8) using randomized selection from an established clinical database.

Principal Findings: Respondents reported significant barriers in communication with providers in health care, financial and school settings and accessing information about community resources. Satisfaction with care coordination was associated with the number of providers working the child. Being involved in decision-making, receiving immediate responses to problems, and assistance with treatment plan implementation were highly valued.

Conclusions: Because considerable variability in models for care coordination continues to exist and the majority of programs have fragmented care coordination, patient and family participation must be increased to assure family-centered care. Improvement of care coordination will enhance health and functional outcomes of children with ASD.

Implications for Policy, Delivery, or Practice: Models of care delivery for children with chronic conditions must include

effective care coordination that includes participation by consumers and families and utilizes efficient information exchange methodologies. Initiatives such as the Medical Home may be able to address these issues and improve family-centered care by using EIS.
Primary Funding Source: HRSA

●Involving Families in the Care of Patients with Schizophrenia: Patient and Provider Barriers

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Research Objective: Family involvement in the care of patients with schizophrenia is critical for recovery. Despite the established efficacy of family psychoeducation and its inclusion in evidence-based practice guidelines, a recent national VA survey indicated that 0% of clinics offer family programs conforming to these recommendations. Even more modest goals including increasing family access to the treatment team, seeking family input on treatment plans, and providing support to resolve family conflict has been difficult to achieve. The VA "EQUIP" project (Enhancing Quality Utilization in Psychosis) provided a unique opportunity to examine implementation issues to improving family services for patients with schizophrenia using both quantitative and qualitative methods.
Study Design: EQUIP was a randomized controlled trial at two medical centers. Psychiatrists were randomized to usual care or a novel intervention for 15 months. The intervention involved care protocols for medication and side-effect management and family services. The family services component focused on engaging families in care by providing educational information and greater access to the treatment team. Nurses were trained in a three-session psychoeducational family intervention for those patients with chronic symptoms, poor adherence, or family stress. Family consent was gathered at baseline. Families received educational materials, support group referrals, and treatment team contact information. The clinical or research team could make referrals to the psychoeducational sessions. Research data included interviews with patients and providers at baseline and follow-up, utilization data, and implementation records.
Population Studied: 398 patients with schizophrenia or schizoaffective disorder and 65 psychiatrists.
Principal Findings: Results focus on those participants randomized to the intervention. Of the patients, 69% named a supportive family member. Of those not living with this person, 73% had at least weekly contact. Fifty-seven percent of patients provided consent for contact; their families were sent mailers. Thirty-eight percent of relatives had never had treatment team contact. Although the clinical staff made no referrals for the psychoeducational sessions, 50% of patients were referred by the research team because they had frequent family contact and either severe psychotic symptoms, poor adherence, or family stress. Of those referred, 12% were already receiving conjoint therapy, 8% were referred to community resources, and 4% refused the intervention. The remaining 76% were not contacted by staff despite referral. Qualitative interviews with staff indicated a belief that patients and families had very limited contact and families were dysfunctional and not helpful. Quantitative surveys with staff showed 20% had job burnout and less than 14% utilized treatment guidelines. Final patient surveys indicated that 90% of patients did not want their families involved, despite giving initial consent for contact. Common reasons included privacy and overburdened family.
Conclusions: Consenting patients, identifying eligible family members, encouraging provider referrals, and reaching out to families did not result in more family involvement.
Implications for Policy, Delivery, or Practice: Revised implementation strategies are currently being field-tested and will be discussed. For providers, we are utilizing education and training of key stakeholders and line staff as well as reorganization of care resources. For patients, we are piloting an engagement protocol that uses motivational interviewing to increase patient interest in family services.
Primary Funding Source: VA

●Savings Associated with the Consumer Reports Best Buy Drugs Program

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Research Objective: Medication cost is one cause of under-treatment. Providers and patients seldom have reliable information on comparative effectiveness and cost of prescription drugs. The Consumer Reports Best Buy Drugs (CRBBD) Program aims to provide consumers and providers with an independent source of information on drug effectiveness and costs in several therapeutic classes, including angiotensin-converting enzyme inhibitors (ACEIs). Using an evidence-based review of drugs in the ACEI class conducted by the Oregon Health and Science University Drug Effectiveness Review Project, the CRBBD program has identified the drugs with the highest value (effectiveness and cost) in the class. Our objective was to determine how much would be saved from a societal perspective by following the CRBBD recommendations.
Study Design: ACEIs were selected as the focus of this study because they are widely used in the treatment of hypertension, congestive heart failure, and other conditions, under-treatment is common, multiple drugs are available in the class, and retail prices vary dramatically. We obtained national aggregate data on pharmaceutical unit and dollar sales and retail pharmacy prices for all formulation, strength and package size combinations of medications in the ACEI class purchased between December 1, 2004 and November 30, 2005. Data were obtained from NDC Health, which collects sales data from a large nationally representative network of pharmacies. Drugs were grouped by formulation, strength and package size to ensure that substitutions were clinically reasonable. ACEIs are generally considered to have "class effects", meaning that both generic and therapeutic substitution are possible. Therefore, we compared the dollar

sales for the ACEI class to what would have been spent if the CRBBD drugs represented the entire market share, and estimated the potential savings.
Population Studied: Users of ACEIs in the U.S.
Principal Findings: Over 135 million prescriptions were sold for ACEIs between December 1, 2004 and November 30, 2005 at a cost of nearly $6.2 billion. The average retail pharmacy price for a one-month supply of ACEIs varied from approximately $18 to $270. The drugs recommended by CRBBD made up 74% of the market but only 58.6% of spending due to their lower average price. We estimated that $1.3 billion would have been saved in 2005 if all individuals taking ACEI had been prescribed one of the CRBBD drugs. A majority of the savings would result from substitution of generic equivalents for brand name drugs.
Conclusions: ACEI are widely used to treat a range of chronic conditions. The medications in this class vary with respect to effectiveness and price. This analysis shows that substantial savings could be achieved by increasing the use of ACEIs identified by the CRBBD program as cost-effective.
Implications for Policy, Delivery, or Practice: Increasing drug costs are of concern to both payers and patients who face high out-of-pocket costs. Reducing the drug costs of patients with chronic conditions through more cost-effective prescribing is one strategy to reduce cost-related underuse of medication therapy. Our findings point to the need to make information on comparative drug effectiveness and price available to providers and patients.
Primary Funding Source: Consumers Union

●What if we Really Believed Addiction was a Chronic Illness?

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Research Objective: To explore the policy, practice, research, funding and recovery implications of addiction if it were scientifically considered a chronic illness and treated as such.
Study Design: 1. Consensus Process – Gathered a group of national leaders to discuss and study current research to reach a consensus on how addiction medicine should be practiced. 2. Key Informant Interviews 3. Focus Groups – Received feedback on ideas generated through consensus.
Population Studied: The field of addiction medicine as it is practiced today.
Principal Findings: The consensus process works, and it is a good way to bring together divergent views and segments of the addiction field that have previously been unable to work together.
Conclusions: 1. Addiction is a chronic illness, but it is generally treated and paid for as an acute illness. This leads to ineffective and inefficient care. 2. The best model to address addictions is one driven by the individual, clinician, and/or recovery support member within a family, community, and set of customs. The model must be flexible to allow for movement between prevention, intervention, treatment, and recovery, as well as stages of use. Recovery supports must be better integrated into all phases of a model dealing with addictions. 3. Health insurance companies and other payers must build financial incentives to connect levels of care and pay for performance. 4. Research must document implementation of a new model, document learning, and build performance strategies to maximize care and recovery. 5. Systems of care must build clinical linkages to all levels of the chronic care continuum. 6. The split in the field between recovery and treatment needs to be mended to provide optimal care for all suffering from a substance use disorder.
Implications for Policy, Delivery, or Practice: 1. Change the way payers would pay for substance use disorder care, shifting the model from pathology-based to recovery-based. 2. Make it easy for employers to open a conversation with employees to treat those with substance use disorders and prevent current users from developing further problems. 3. Integrate prevention and intervention into all phase of addiction care. 4. Integrate a formerly disenfranchised aspect of addiction services, recovery supports, with other services, which will define and strengthen its role. 5. Build a common vision to approach addiction in America.
Primary Funding Source: CSAT

●The Effect of Major and Minor Depression on Medicare Home Healthcare Services Use

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Research Objective: To examine how major and minor depression affect utilization of Medicare certified home health agency (CHHA) services.
Study Design: An observational prospective research design. A 40% random sample of new admissions to a CHHA was recruited. Of 889 potential study subjects, 539 (60.6%) consented to enter the study. Major and minor depression were diagnosed by a consensus "best estimate" process using medical charts plus a Structured Clinical Interview for DSM-IV (SCID) administered during home interviews shortly after admission to Medicare home care. Logistic regression, linear regression, and their combination into two-part models were used to investigate probability and amount of 6 service types: skilled nursing, home health aide, physical, occupational, and speech therapy, and medical social services visits. Bootstrapped standardized predicted means and their 95% confidence intervals (CIs) were calculated. Our regression models included independent variables for major and minor depression and controlled for sociodemographic characteristics and health status. We expected that patients with major or minor depression would have significantly higher use of each service than patients with neither major nor minor depression. We did not expect any differences between patients with major depression and patients with minor depression.
Population Studied: Medicare patients age 65+ newly admitted to a CHHA.
Principal Findings: The patients' mean age was 78.4 years, 65.1% were female, and 15.0% were nonwhite. The prevalence

of major and minor depression was 13.5% and 10.8%, respectively.
For probability of use there was only one significant effect: major depression was associated with higher probability of aide use (OR=2.20) (p=.028) during the first year. For conditional amount of use there were several significant effects: major depression was associated with fewer aide visits during the first episode (p=.06), and with more skilled nursing visits (p=.054) and more medical social services visits (p=.065) during the first year. Examination of the 95% CI's for the bootstrapped standardized predicted means for the two-part models revealed that the CI's for major and minor depression each overlap with that for no depression for all 6 visit types combined, skilled nursing, therapist, and medical social services for the initial episode as well as the entire year after admission to home care.
Conclusions: While major depression seems to have little effect on Medicare home care services during the initial episode, during the year after admission it may be related to higher probability of aide use, more skilled nursing visits, and more medical social services visits for patients who used those services. Minor depression appears to have no effect on probability or amount of use of any Medicare home care services both during the first episode and during the entire year after admission.
Implications for Policy, Delivery, or Practice: To our knowledge this is the first study of the effect of depression on Medicare home healthcare use. Because this is a study of a single agency in one county, additional research with larger samples covering other geographic areas as well as a nationally representative sample is required.
Primary Funding Source: National Institute of Mental Health

●The Standard Gamble vs. Willingness to Pay: Examining Older Adult Health Preferences for Functional Dependence Across Methods of Valuation

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Research Objective: To compare older adult health preferences for functional independence across two methods of valuation, the Standard Gamble (SG) utility elicitation and the Willingness to Pay (WTP) measure, for hypothetical health states and for respondents' actual current health.
Study Design: Participants were asked to imagine being dependent in six Activities of Daily Living (ADLs), a combination of all six ADLs (All6), and a serious health condition in which they would have to spend the rest of their life in a coma. We elicited SG utilities by having participants rate the greatest risk of death they would be willing to accept in order to be restored to perfect health for someone their age. Using the WTP method, participants reported the highest dollar amount they would be willing to pay in a one time payment and a monthly payment to be restored to health. Respondents also reported SG utilities and WTP amounts for their own current health.
Population Studied: Older adult members (n=445) of Northern California Kaiser Permanente Medical Care Program, mean age =75 (sd=6.2), 61% female, 31% non-white were interviewed as part of an ongoing longitudinal study (FLAIR2) of older adult health preferences.
Principal Findings: 445 participants completed both methods of valuation for all hypothetical health states. Mean SG utilities reported ranged from .81 for current health to .19 for coma. Dressing (.78), bathing (.77), and transferring (.75) resulted in the highest utilities followed by continence (.71), eating (.69), and toileting (.69). Finally, All6 had a mean utility of .50. Mean WTP monthly payments ranged from 174 for bathing to 9,483 for coma. In addition to bathing, dressing (204) and transferring (260) resulted in the lowest monthly payments followed by eating (286), continence (325), and toileting (382). Current health and All6 had mean monthly payments of 1,793 and 2,578, respectively. Mean WTP one time payments ranged from 10,298 for bathing to 10,000,000 for coma. After bathing, dressing (11,086) and transferring (11,242) had the next lowest one time payments followed by continence (15,310), toileting (15,725), and eating (17,163). Of the highest one time payments, current health had a mean payment of 88,191 and All6 had a mean payment of 92,297. Median WTP payments resulted in similar grouped ordering.
Conclusions: Rankings of the hypothetical health states were similar across SG and WTP methods, such that bathing, dressing, and transferring were all rated as the most desirable health states and continence, eating, and toileting were rated as the least desirable individual ADL dependencies. For each method, All6 and coma elicited the most negative response. In contrast to hypothetical states, actual current health had discrepant ratings by method: participants were willing to trade off the least amount of time (SG), but were willing to pay almost the largest amount of money (WTP) to be restored to perfect health.
Implications for Policy, Delivery, or Practice: The similarity of rating across elicitation methods for hypothetical health states but not for individuals' actual current health suggests that SG and WTP address different aspects of valuation.
Primary Funding Source: NIA

●Evaluating Mode Effects in the CAHPS® In-Center Hemodialysis Survey

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Research Objective: The CAHPS® In-Center Hemodialysis (ICH) survey focuses on patient experiences in receiving care from their dialysis center and has not been previously evaluated for comparability across methods of administration. To evaluate the presence of mode effects, we compared mail and telephone responses in a field test of the CAHPS ICH survey administered to patients receiving care from dialysis centers across the United States.
Study Design: Patients were randomly assigned to either mail or telephone administration of the CAHPS ICH survey. Patients assigned to mail administration were contacted by phone if they did not complete the instrument by mail. The

randomized group comparison included only patients who responded using the mode to which they were randomly assigned. We also conducted a respondent group comparison that focused on the mode to which the patient actually responded. This second comparison included patients assigned to mail who responded during phone follow-up and patients who elected to respond to the mode to which they were not assigned (e.g., a patient with vision impairment assigned to mail, but requested to participate by phone). Analyses included response rates, missing data rates, internal consistency reliability of multi-item scales, and mean differences.
Population Studied: A random sample of 3143 hemodialysis patients was selected from across 32 hemodialysis centers.
Principal Findings: A total of 1781 patients responded to the survey (46% response rate overall; 636 mail, 818 phone). Both the randomized group comparison and the respondent group comparison indicated significantly more inappropriately missing data to mail surveys. Significant differences in internal consistency reliability of scales were also observed. After adjustment for age, survey language, language spoken at home, race/ethnicity, education and overall rating of health, some significant associations of mode with report and rating items were found. In the randomized comparison, six of 40 report items, one of three global rating items, and one composite had a significant mode effect. In the respondent comparison, four of 40 report items, one of three global rating items, and one composite had a significant mode effect. The size of these significant differences was small, with effects sizes ranging from .09 to .31.
Conclusions: Differences by mode were observed in rates of missing data and reliability of the multi-item scales. Fifteen percent (n=14) of the casemix adjusted comparisons of mail versus phone responses to items and multi-item composites from the survey were significantly different ($p<.05$). Responses were more positive for mail than phone administration for 9 of the 14 significant differences. Previous mode experiments in other populations have typically observed more positive responses to phone surveys; however, these results do not follow this pattern.
Implications for Policy, Delivery, or Practice: Although differences by mode were small, development of the CAHPS ICH survey should focus on reducing these effects. Further, users of the survey should statistically adjust for mode effects. The direction of the mode effect (often more favorable responses by phone) is not consistent with previous mode studies. Additional work is needed to replicate these results and to determine whether there are unique characteristics of hemodialysis patients that may lead to these unusual differences by mode.
Primary Funding Source: AHRQ

●Cost-Efficient Pharmaceutical Treatment for Insulin Dependent Diabetes With Comorbidity

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Research Objective: The primary purpose of this study was to determine whether a cost efficient drug or drug combination exists in the treatment of Insulin Dependent Diabetes, with Comorbidity.
Study Design: Information on medical and pharmacy claims was extracted from a clinical data mart for the two-year time period of January 1, 2003 through December 31, 2004. Episode Treatment Grouper (ETG) methodology was used to group associated costs in the treatment of Insulin Dependent Diabetes, with Comorbidity. Drugs or combinations of drugs used in 10 or more episodes, with at least 358 episode days during the two-year timeframe, were selected for the analysis. Total Health Care costs per episode day were compared. Total Health Care costs consisted of Ancillary, Facility Ancillary, Facility Room and Board, Management, Surgery, and Pharmacy. The costs associated with drugs or drug combinations were analyzed. The drugs and drug combinations were grouped into three categories – Human Insulin, Oral Agent with Human Insulin, and Oral Agent.
Population Studied: Primary insured commercial population (5,487 Insulin Dependent Diabetics with Comorbidities) administered by a large, single-state health insurance carrier in the Southeastern US.
Principal Findings: The Kruskal – Wallis nonparametric test showed a significant difference ($p < .05$) in the overall treatment cost per episode day among the drug combinations within the three categories. Sulfonylurea showed the lowest average cost per episode day in the "Oral Agent" category, while the combination of Biguanide, Human Insulin and Sulfonylurea had the lowest average cost per episode day within the "Oral Agent with Human Insulin" category. The "Human Insulin" category was analyzed among different Human Insulins, but the specific products are not reported.
Conclusions: Variability in overall episode cost and pharmaceutical therapy cost is evident in this analysis. The lowest overall episode cost does not relate to the lowest pharmacy cost. The addition of another oral agent, for instance, increases pharmacy cost but may be related to a lower overall episode cost. For comprehensive results, outcomes are being investigated to test whether positive outcomes are associated with the pharmaceutical therapy implemented.
Implications for Policy, Delivery, or Practice: There is evidence that the overall episode treatment cost of Insulin Dependent Diabetes, with Comorbidity can be reduced by using certain drugs or combinations. Health care cost components should be considered when selecting pharmacotherapy for diabetes.
Primary Funding Source: BlueCross BlueShield of Tennessee

●An Analysis of State Differences in Health-Related Quality of Life Among Persons with and without Diabetes

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Research Objective: To analyze state variations in health-related quality of life (HRQOL) among persons with and without diabetes and determine if state health system characteristics can explain those variations.

Study Design: Two-level hierarchical models were estimated in two steps. Individual-level data came form the Behavioral Risk Factor Surveillance System (BRFSS) Survey 1997-2001. BRFSS is a continuous, state-based, random telephone survey of more than 210,000 community-dwelling U.S. adults and aged 18 and older. The purpose of HRQOL measures in BRFSS is to assess a person's perceived sense of well-being related to physical health, mental health, and activity limitation. Physical and mental health is measured by "number of days when physical or mental health was not good," while activity limitation is assessed by "number of recent activity limitation days because of poor physical or mental health." Data on state health system characteristics were taken from the Area Resource File. In the first step, we estimated HRQOL among persons with and without diabetes (controlling for individual-level demographic and socioeconomic characteristics). In the second step we examined factors associated with the first-step state-level estimates. Individual-level controls included age, sex, race/ethnicity, education, marital status, labor force status, insurance coverage, smoking status, and month of interview. State health system characteristics included densities of physicians, hospitals, and hospital beds, number of primary care physicians as percent of total number of physicians, health care coverage, HMO penetration, percent of population aged 65 or over, percent of population who is black, percent of population who is Hispanic, and percent of population under poverty.

Population Studied: U.S. non-institutionalized populations aged 18 or over with and without diabetes.

Principal Findings: Persons with diabetes had twice more physically unhealthy days; 20 percent more mentally unhealthy days; 64 percent more activity limitation days. HRQOL among persons with and without diabetes varied significantly across 54 U.S. states and territories. In some states, the diabetes population did as well as the non-diabetes counterparts. For recent days of poor physical health and activity limitation, physician and hospital densities were positively associated with HRQOL among persons with diabetes but not those without diabetes. For persons without diabetes, physician and hospital densities did have a negative association with recent days of poor mental health, and the association is comparable to those with diabetes. For persons with diabetes, stronger associations were found for recent days of poor physical health and activity limitation. HMO penetration was negatively associated with HRQOL for both persons with and without diabetes. Health care coverage had a positive and significant association with HRQOL for persons with diabetes but not for those without diabetes. Percent of primary care physicians has a negative association with recent days of activity limitation for both persons with and without diabetes, and the association is 7 times stronger for those with diabetes.

Conclusions: There are significant state-leve variations in HRQOL among persons with and without diabetes, and part of those variations can be explained by state health system characteristics.

Implications for Policy, Delivery, or Practice: The results suggest the importance of state health systems in improving HRQOL, especially for people with chronic disease.

Primary Funding Source: No Funding

●Remote Physiological Monitoring: Innovation in the Management of Heart Failure

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Research Objective: Heart failure is one of the most costly and debilitating chronic diseases in the United States. There are currently five million Americans living with heart failure, with approximately 550,000 new cases reported each year. New devices and services are being developed to actively manage heart failure patients in their homes. Defined broadly as remote physiological monitoring (RPM), these devices show great potential to improve heart failure outcomes. This study assessed the impact of RPM on congestive heart failure (CHF) patients and examined barriers to RPM adoption.

Study Design: To understand the clinical and economic value of RPM, the New England Healthcare Institute (NEHI) used a Markov model of heart failure management to examine the cost-effectiveness of RPM for CHF patients relative to standard care over a 180 day time horizon. The model was used to estimate the total costs, total number of rehospitalizations, and total number of quality-adjusted life years (QALYs) for patients receiving RPM and standard care, respectively. Cost-effectiveness was estimated in terms of the cost per rehospitalization averted and cost per QALY gained. NEHI consulted over 70 experts from major sectors of the health industry to develop the value analysis, vet findings, and identify the potential barriers to widespread use of RPM technology. Nationally-recognized experts from academic institutions, medical device and disease management industries, providers, payers, and home health care specialists were brought together in a panel to discuss the impact of RPM for CHF. Their feedback provided the basis for the assumptions NEHI used to model the value of RPM technology and to identify the collaboration required to speed its adoption.

Population Studied: The target population for the cost-effectiveness model included patients with Class III or IV heart failure (as defined by the New York Heart Association).

Principal Findings: In the base-case analysis, RPM decreased rehospitalizations by 32 percent, increased QALYs by two percent, and lowered net health-care costs by 25 percent relative to standard care. When NEHI assumed that RPM was associated with a lower mortality rate than standard care, RPM increased QALYs by 112 percent. NEHI organized the most significant barriers to the adoption of RPM for heart failure

into three categories: payment issues, clinician concerns, and lack of patient awareness.
Conclusions: NEHI concluded that widespread adoption of RPM technology in the management of CHF would both save money and improve patient outcomes when compared to standard outpatient care.
Implications for Policy, Delivery, or Practice: Collaboration among RPM stakeholders is necessary to address adoption barriers. Providers and payers must prepare to move quickly as new clinical trial data illustrates the benefits RPM provides over traditional CHF disease management. To address coverage payment issues, payers need to be educated about the findings of this study, and should construct policies for access to, and payment for, RPM for CHF. NEHI also calls for the collaboration of provider organizations, heart disease associations, and health plans to better understand and address provider's concerns about RPM; working sessions should be created to provide a forum for providers, RPM experts, and vendors to address potential barriers in daily clinical practice, reimbursement, and liability.
Primary Funding Source: New England Healthcare Institute

●Continuous Glucose Monitoring: Innovation in the Management of Diabetes

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Research Objective: Over 18 million Americans are afflicted with diabetes, a pernicious disease associated with decreased quality of life and costly, harmful complications. Providing vastly more information than today's episodic glucose monitors, continuous glucose monitoring technology (CGM) shows great promise to help diabetics achieve and sustain tight blood glucose control. Experts predict that in the near future, CGM will exist as an unobtrusive, easy-to-use device approved to replace episodic monitoring. In this study, the New England Healthcare Institute (NEHI) assessed the potential economic and clinical value of forthcoming CGM technology.
Study Design: NEHI developed a model to predict the cost-effectiveness of CGM technology following its widespread adoption. The model used conservative assumptions about the expected costs and capabilities of advanced CGM devices in order to quantify the long-term expected value of the technology. NEHI used an existing Monte Carlo simulation of the progression of type 1 diabetes over a 100 year period, and estimated the complication cost, daily blood glucose management cost, total cost, and total quality-adjusted life years (QALYs) for two cohorts of 10,000 patients: one utilizing CGM and the other, standard care. Value was expressed in units of dollars per QALY. NEHI engaged a diverse group of over 65 health care stakeholders including patients, payers, providers, device manufacturers, and government officials to better understand emerging classes of CGM technology, as well as the potential barriers to their adoption. Experts representing major sectors of the health industry participated in a panel discussion, which provided evidence for the estimates NEHI used to predict the value of prospective CGM devices.
Population Studied: The target population of the cost-effectiveness model consisted of patients with type 1 diabetes.
Principal Findings: Base-case analyses suggested that CGM could result in an increase of 0.34 QALYs, a reduction in long-term complication cost of $4,528, and an increase in management cost of $21,880, over the lifetime of the average patient. These results yielded a cost-effectiveness ratio of $51,245 per QALY, suggesting that the use of future CGM devices would be cost-effective if they met the parameters established in this analysis. Some broad barriers that could potentially impede CGM adoption included regulatory issues, reimbursement hurdles, clinician adoption challenges, and the need for patient involvement and education.
Conclusions: NEHI concluded that CGM will become a clinically valuable, cost-effective way to help diabetes patients better manage their disease on a daily basis. If, as expected, sufficient evidence is developed to justify the widespread use of CGM, innovative planning and effective action should be taken in order to bring CGM technology to more diabetics, sooner.
Implications for Policy, Delivery, or Practice: NEHI recommends a series of steps that stakeholders can take to overcome the barriers to CGM adoption. To ensure timely FDA approval, NEHI stresses the importance of creating a pragmatic consensus on glucose accuracy standards for CGM devices. NEHI calls stakeholders to identify realistic incentives that can improve patient education and self-management. To overcome clinical adoption barriers, NEHI recommends a collaborative effort to anticipate how CGM can be integrated into clinicians' practices and evaluated as the technology becomes more broadly deployed.
Primary Funding Source: New England Healthcare Institute

●Factors Associated with Evidence-Based Depression Treatment for Persons with COPD and Depression

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Research Objective: Chronic obstructive pulmonary disease (COPD) and depression are common illnesses in the general population and leading causes of disability. Importantly, adequate management of health conditions may diminish as patients experience multiple diseases and treatment becomes more complex. Nationally, 65% of Veteran's Affairs (VA) patients with depression received evidence-based depression treatment; however, the use of evidence-based depression treatment among patients with COPD experiencing a depressive episode is unknown. The objective of this study is to examine factors associated with provision of evidence-based depression treatment for COPD patients with new onset or recurrent depression.
Study Design: In this retrospective cohort study, we assessed the extent to which patients received depression treatment that is consistent with NCQA practice guidelines. Guideline-consistent depression treatment during the 12-week acute

phase is defined as (1) having >= 84 day supply of antidepressant medication during the 114 days after the index depression diagnosis, and (2) having at least 3 outpatient follow-up visits. Multivariate logistic regression analyses were used to examine factors associated with receiving guideline consistent depression treatment.
Population Studied: Using VA and Medicare administrative data, we identified VA patients with COPD in FY99 that experienced a new onset or recurrent episode of major depressive disorder during FY99-FY02. Patients needed to be free of a depression diagnosis for one year, and without claims for antidepressant prescriptions for 90 days prior to their index depression diagnosis. Patients with an extended care stay or a diagnosis of schizophrenia or bipolar disorder were excluded.
Principal Findings: We identified 15,564 patients with COPD and depression. The average age was 65, and 97% were male. Although nearly 80% of the study sample received an antidepressant during the acute phase, only 47.3% of patients received at least an 84 day supply of antidepressant medication. Less than 35% of patients had at least 3 outpatient follow-up visits. Only 22.2% of patients received guideline-consistent amounts of medication and follow-up visits. Patients seen in mental health clinics were most likely to have received guideline consistent treatment.
Conclusions: The proportion of VA patients with COPD and comorbid depression receiving guideline consistent depression treatment was much lower than the rate reported for a national sample of VA patients with depression.
Implications for Policy, Delivery, or Practice: Given that the prevalence of depressive disorders is 34%-72% among COPD patients, these study results point to a potential gap in the quality of depression management for patients with COPD. Opportunities may exist to improve depression management strategies for patients seen in non-mental health clinic settings.
Primary Funding Source: No Funding

●Structures, Processes and Patient Behaviors in Diabetes Primary Care Clinics

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Research Objective: The Chronic Care Model (CCM) provides insight into the extent to which a primary care clinic that provides diabetes care has a prepared proactive team and well informed patients. In this study, we examine this issue by assessing the relationship between CCM components, diabetes process quality measures and patient self-management behavior.
Study Design: The CCM consists of 6 structural dimensions: organization support, community linkages, self-management support, decision support system, delivery system design, and clinical information systems. The diabetes process quality measure consisted of whether each patient received all six of the following indicators within the past 12 months: referral for dilated eye exam, foot exam, two blood pressure measurements, one HbA1c measurement, one urine micro albumin measurement, and one lipid measurement. The patient self-management behavior measure was whether the patient reported always doing all four of the following behaviors as instructed: checking blood sugar level, following diabetes diet, always exercising and taking diabetes medication.
Population Studied: Thirty consecutive patients presenting with type 2 diabetes were enrolled from twenty clinic primary care clinics from across South Texas. The "Assessment of Chronic Illness Survey," modified slightly to be specific to the care of patients with type 2 diabetes, was used to measure the CCM dimensions. The survey was filled by caregivers in the clinic. Process quality measures were abstracted from medical records and self-management behaviors were obtained from patient exit surveys. To account for clustering of patients within clinics, hierarchical logistic regression models were used. Additional patient characteristics such age, sex, number of visits, race/ethnicity and self-rated health status were controlled for.
Principal Findings: Overall, nearly 26% of patients had all six process indicators done, and nearly 25 % reported doing all four of the self-management behaviors. The 2-level regression model showed that "community linkages" was positively associated with having all six indicators done (O.R.3.57; 95% CI 2.05-6.23), while "organizational support" was, surprisingly, negatively associated with that same measure (O.R.0.44; 95% CI 0.31-0.62). As for patient self-management behavior, "decision support system" was positively associated with the patient doing all four behaviors (O.R.1.31; 95% CI 1.08-1.60) while "clinical information system" was negatively associated with that same measure (O.R.0.81; 95% CI 0.68-0.97).
Conclusions: Some dimensions of the CCM model are predictive of whether a primary care clinic has a prepared proactive team that provides adequate processes of care and whether its patients are well informed. Adequate links between the clinic and its community allows the clinic to establish high quality processes, while having access to evidence-base info by the providers enable the patients to better take care of their diabetes. However, clinical information systems seem to negatively affect patient's adherence to care instructions. Either these systems are not well implemented, or they have been in place for a short period of time, or the presence of a compute in the patient exam room negatively affects communication and patient-centered care. As for the "organizational support," it is important to note that many of the clinics studies are small and autonomous, and are not part of a larger system. Therefore, given the way the questions were asked, the validity of this CCM component is questionable.
Implications for Policy, Delivery, or Practice: Leaders of primary care clinics should focus on linking their clinics with diabetes specialists and giving providers better access to evidence-based information if their clinics are to have better processes and if their patients are to better manager their disease. More research should examine issues like clinical information systems before any implications can be made.
Primary Funding Source: AHRQ, VA

●Improving Depression Outcomes among Hispanic Patients with Type 2 Diabetes through an Integrated Nurse-Community Health Worker Disease Management Intervention

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Research Objective: To assess symptoms of depression among uninsured Hispanic patients with Type 2 diabetes participating in an integrated nurse-Community Health Worker (CHW) disease management intervention and to determine whether improvements in depression symptoms were associated with improved clinical and behavioral outcomes.

Study Design: Prospective repeated measures design to assess clinical and behavioral outcomes. Key dependent variables: (1) hemoglobin A1c, (2) total cholesterol, low-density lipoprotein (LDL-C), and triglycerides, (3) Patient Health Questionnaire (PHQ-9) depression severity score, (4) indication of Major Depressive Syndrome or Other Depressive Syndrome, (5) self-reported exercise, (6) self-reported dietary intake, and (7) self-reported medication adherence.

Population Studied: One hundred eight adult uninsured Hispanic patients with Type 2 diabetes enrolled in an integrated nurse-CHW intervention in an inner-city public health clinic were followed for 12 months. Clinical data were also collected through chart review for the year prior to program implementation.

Principal Findings: Program participants achieved lowered mean hemoglobin A1c from baseline to follow up (9.6% to 6.9%, P<0.01) with 61% achieving goal of <7.0% (P<0.01); lowered mean LDL cholesterol (126 mg/dL to 82 mg/dL, P<0.01) with 83% meeting goal of <100 mg/dL (P<0.01); and lowered mean triglycerides (191 mg/dL to 120 mg/dL, P<0.01) with 76% below goal of 150 mg/dL (P<0.01). Self-reported depression severity score on the PHQ-9 decreased from 8.7 to 6.0 (P<0.01). The proportion of individuals meeting diagnostic criteria for Major Depressive Syndrome decreased from 22% to 11% at follow-up (P<0.01). The proportion of individuals meeting diagnostic criteria for Other Depressive Syndrome decreased from 16% to 8% at follow-up (P<0.01). Self-reported behavioral change improvement was demonstrated from baseline to follow up in healthy eating (56% to 84%, P<0.01) and regular physical activity (53% to 79%, P<0.01) with 48% reporting exercising 3 or more times per week (P<0.01). An improvement in PHQ-9 score at exit was significantly correlated with improved self-reported medication adherence (P <0.01), increased frequency of weekly physical exercise (P <0.01), improvement in behavior stage of change for both healthy eating and exercise (P <0.01), and increased daily intake of vegetables (P <0.05).

Conclusions: Implementation of an integrated, clinical protocol-supported Type 2 diabetes nurse management and CHW program achieved American Diabetes Association clinical standards, lifestyle behavioral change and decreased the burden of depression in an underserved Hispanic population.

Implications for Policy, Delivery, or Practice: These data suggest that a nurse-directed disease management intervention that incorporates community health workers is a viable model for improving clinical and behavioral outcomes among uninsured Hispanic patients with Type 2 diabetes with co-morbid depression.

Primary Funding Source: Pfizer Health Solutions, Inc

●Medicare's First Pay for Performance Initiative for Physicians

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Research Objective: To design and implement Medicare's first pay for performance initiative for physicians.

Study Design: RTI International was contracted by the Centers for Medicare & Medicaid Services (CMS) to design and implement the Medicare Physician Group Practice (PGP) Demonstration project, Medicare's first pay for performance initiative for physicians. A methodology for assigning Medicare fee-for-service patients to physician groups was developed based on utilization of Evaluation and Management (E&M) services. For patients assigned to physician groups, financial incentives were designed to encourage physician groups to implement care management strategies, prevent chronic disease complications and avoidable hospitalizations, and improve quality of care. Physician groups will be eligible for performance payments if they improve efficiency and quality.

Population Studied: Medicare fee-for-service patients.

Principal Findings: Medicare's first pay for performance initiative for physicians began in 2005 and will run for three years. Ten physician groups, located in various communities across the nation, are participating in the PGP demonstration project. Physician groups were selected through a competitive process based on technical review panel findings, organizational structure, operational feasibility, geographic location, and implementation plan. The multi-specialty groups have at least 200 physicians and include freestanding group practices, integrated delivery systems, faculty group practices, and independent practice associations. During the PGP demonstration project's base year, 2004, the number of assigned patients for the ten physician groups ranged from 8,383 to 44,609, and totaled 223,203. The PGP demonstration project provides financial incentives for quality improvement if a physician group can also demonstrate cost savings. The quality measures for the PGP demonstration project are a subset of the measures developed for the Doctors Office Quality (DOQ) project, including diabetes, congestive heart failure, coronary artery disease, hypertension, and preventive care condition modules. In addition, DOQ preventive care vaccine and cancer screening measures will also be used in the PGP demonstration project for the diabetes and heart failure patient populations. Both quality performance and quality improvement will be rewarded under the PGP demonstration project. Cost savings are rewarded if a

participating PGP holds its rate of growth in average Medicare cost per patient below the growth rate in its surrounding service area.
Conclusions: Currently, Medicare reimburses physicians and other fee-for-service health care providers on the number and complexity of the services provided to patients. There is good evidence that by anticipating patient needs, especially for patients with chronic diseases, health care teams that partner with patients can intervene before expensive procedures and hospitalizations are required. The PGP demonstration project is designed to encourage this and other preventive efforts.
Implications for Policy, Delivery, or Practice: As another step to make higher payments for quality in the Medicare program, ten large physician groups across the nation are participating in Medicare's first pay-for-performance initiative for physicians. The PGP demonstration project gives physician groups an opportunity to demonstrate that improving care in a proactive and coordinated manner also saves money.
Primary Funding Source: CMS

●Clinical Management and Physiologic Outcomes for Patients with Diabetes: Patient, Clinical, and System Factors

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Research Objective: Despite substantial evidence demonstrating the benefits of intensive diabetes management, little is known about care in everyday practice. We examined the association between patient, clinical, and system factors with prescription drug use, laboratory measurements, and physiologic outcomes.
Study Design: Using automated databases in a large, prepaid integrated delivery system, we examined the proportion of diabetic patients receiving diabetes drugs (eight drug classes) and laboratory testing (HbA1c) in 2004. We defined drug adherence as the proportion of days covered (PDC) for any diabetes drug>0.8 for the 90 days before the first HbA1c test in 2004. We defined HbA1c<8.0 as the physiologic outcome target. Patient factors included age, gender, neighborhood socio-economic status (SES), and race/ethnicity. Clinical factors included number of drug classes, renal function, and history of coronary artery diseases or heart failure. System factors included having a regular doctor, insurance type, and years in the health system. We used logistic regression models to examine the association between these factors and each outcome: having a HgA1c test, being adherent to drugs, and achieving the physiologic target.
Population Studied: All 177,622 patients were health system members, 18+ years old, and had an existing diagnosis of diabetes as of January 2004: 70.6% received 1 or more diabetes drug in 2004.
Principal Findings: Among diabetic patients receiving diabetes drugs in 2004, 87.6% had 1 or more HbA1c test during the year and 62.6% met criteria for drug adherence. Among those with a HbA1c test in 2004: 10.6% did not receive any drugs in the 90 days before their test, 21.8% received insulin and 77.7% received an oral hypo-glycemic drug. Additionally, 50.5% received drugs in one, 30.7% in two, and 8.3% in three or more classes of diabetes drugs. Among patients with laboratory tests, 32.2% had a HbA1c>8.0% on the first measurement of the year, i.e. they exceeded target levels. In multivariate analyses, patients with non-white race/ethnicity (OR=1.14, 95%CI: 1.10-1.79), low SES (OR=1.06, 95%CI: 1.04-1.10), or without a regular doctor (OR=3.85, 95%CI: 3.33-4.54) were more likely to have poor drug adherence in the 90 days prior to their first test. Patients with non-white race/ethnicity (OR=1.33, 95%CI: 1.29-1.37) or low SES (OR=1.19, 95%CI: 1.15-1.22) also were more likely to have a HbA1c>8.0% on their first measurement in 2004.
Conclusions: Two out of five patients with diabetes are not receiving recommended glycemic monitoring or meeting minimum levels of drug adherence. One in three was above the target level for glycemic control. Patients without a regular physician, of non-white race/ethnicity, or low SES are at particular risk.
Implications for Policy, Delivery, or Practice: Evidence from large, randomized controlled trials have demonstrated the benefits of intensive diabetes management in improving glycemic control and reducing complications. Yet, many patients in everyday practice remain poorly controlled and do not receive the recommended standards of care. This difficulty in translating evidence into actual practice has been attributed to factors ranging from the medical system down to the patient level. This study provides the first steps in identifying which of these factors are associated with minimum levels of diabetic care and with the appropriate intensification of therapy.
Primary Funding Source: AHRQ

●Unstaged or Unknown Stage- Cancer in Elders: An Indicator of Disparities?

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Research Objective: Unknown stage or unstaged cancer indicates incomplete diagnostic evaluation of their cancer. The objective of this study is to evaluate the contribution of older patients' care needs to unstaged cancer.
Study Design: This is a cross-sectional study using a linked database consisting of the Ohio Cancer Incidence Surveillance System (OCISS), Medicare and Medicaid enrollment files, as well as with the home health care Outcome and Assessment Information Set (OASIS), and the long term care Minimum Data Set (MDS). We identified patients who were admitted to a nursing home (high complexity of care needs), those receiving home health services (moderate complexity), and those neither admitted to a nursing home nor receiving home health services in the six months prior to cancer diagnosis (low complexity). We employed logistic regression analyses to evaluate the independent association between complexity of

care needs and unstaged cancer after adjusting for patient demographics and socioeconomic attributes.
Population Studied: The study population included Ohio residents 65 years of age or older, and diagnosed with incident breast (n=4,412), prostate (n=5,346), or colorectal cancer (n=4,839) in year 2000.
Principal Findings: The proportion of unstaged cases increased significantly with older age, by Medicaid status, and by complexity of care needs at baseline. Patients 85 years of age or older were 2 to 4 times as likely as those in the 65-69 age group to have incomplete diagnostic evaluation for their cancer. Similarly, compared with low complexity of care needs, moderate complexity and high complexity were associated with 2-4 times and 4-5 times greater likelihood of unstaged cancer, respectively.
Conclusions: The occurrence of unstaged cancer follows a systematic pattern of disparities by age and complexity of care needs at baseline.
Implications for Policy, Delivery, or Practice: Relative to clinical practice, these findings indicate that older age and higher levels of complexity in care needs are associated with a lower likelihood of undergoing complete diagnostic evaluation for the cancer -- a necessary step to assign a cancer stage. From a methodological perspective, the gradient observed in the findings relative to the complexity of care needs supports the notion that receipt of home health services and long term care could be considered as proxies for increasing complexity of clinical presentation and health care needs.
Primary Funding Source: NCI, National Institute on Aging

●Cancer burden to the Ohio Medicaid program: Patterns of enrollment and expenditures incurred by beneficiaries with cancer as the underlying cause of death

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Research Objective: The burden of cancer to the Medicaid program has been assessed to some extent. However, much remains unexplored, especially relative to the timing of enrollment of cancer patients in the Medicaid program prior to their death, and the expenditures that they incur. This study aims at filling this gap in knowledge.
Study Design: Using 1992-2002 linked Ohio Medicaid and death certificate files, we conducted a retrospective cohort analysis of Medicaid beneficiaries who were deceased while enrolled in the program, and who had cancer as the underlying cause of death. Medicaid enrollment and death certificate files were linked using patient identifiers, including social security, name, gender, and date of birth. The underlying cause of death was retrieved from death certificate, and categorized by various types of cancer. History of enrollment was constructed using Medicaid enrollment files, and expenditures were aggregated using summary expenditures files developed by the Ohio Department of Job and Family Services, which administers the state Medicaid program. The outcomes of interest, including the timing of cancer patients' enrollment in Medicaid relative to their date of death, as well as the aggregate expenditures were examined by patient demographics, and by cancer type.
Population Studied: The study cohort included Ohio Medicaid beneficiaries who died in the years 1992-2002 with cancer as the underlying cause of death.
Principal Findings: The study cohort included 47,960 cancer patients who died of cancer during the 11-year study period, and who were enrolled in Medicaid at least one month during the year preceding death. Two thirds were enrolled in Medicaid at least 12 months prior to death. Of the remaining one third of patients enrolling in Medicaid during the last year of life (n=15,824), 44% enrolled in Medicaid within the 3 months prior to death, and 24% enrolled in the 4-6 months preceding death. Medicaid expenditures incurred by these patients in the year preceding death amounted to $1.01 billion over the study period, averaging over $90 million per year, and $21,113 per patient. The highest average per capita expenditures ($34,082) was observed in patients dying of neoplasms of lymphoid, hematopoietic, and related tissues -- common cancers in children. The average per capita expenditures were highest among patients in the youngest age group of 0-4 ($95,910), and lowest in the oldest age group of 85 years of age or older ($21,013). The difference in the average per-capita expenditures between these two age groups is likely due to the fact that health care costs incurred by elders are covered in part by Medicare. Also, older patients are less likely to be treated as aggressively at the end of life as their younger counterparts.
Conclusions: Most Medicaid beneficiaries dying of cancer enroll in Medicaid as they near death if they had not been enrolled in Medicaid for at least a year preceding death.
Implications for Policy, Delivery, or Practice: While more analysis is warranted to understand the nature of care rendered to terminally ill cancer patients, the findings highlight the importance of case management strategies aimed at improving their quality of life while controlling the financial burden of end-of-life care to the Medicaid program.
Primary Funding Source: NCI

●Evidence of Inadequate Hemoglobin A1c Monitoring Among Medicare Beneficiaries in Outpatient Settings

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Research Objective: The American Diabetes Association recommends hemoglobin A1c (HbA1c) testing at least twice annually for individuals with diabetes. This monitoring reduces risks of complications, and is a measure of the quality of preventive care for individuals with diabetes. We examined the prevalence of testing over a six year period, and identified individual-level factors associated with HbA1c monitoring.
Study Design: Longitudinal survey data that is nationally representative of the United States' population ages 65 and over, combined with Medicare claims from 1991-2000. Examining all diagnoses from 1991-1994, we restricted the sample to individuals diagnosed with diabetes. To focus on individuals in reasonably stable medical condition, the sample was further restricted to those living in the community and

surviving to 2000. The HbA1c testing we examined was limited to outpatient settings. The analysis examined testing from 1995 through 2000, and accounted for periods in managed care. Individual-level factors included sociodemographics (age, education of respondents and spouses, sex, marital status, having adult children), lifestyle risks (smoking, heavy alcohol use), cognitive status, 19 comorbidities, and activities of daily living (ADLs). Multivariate logistic regression controlled for these factors and used generalized estimating equations to account for repeated annual measures.
Population Studied: Participants in the National Long-term Care Survey (n=1041).
Principal Findings: The mean prevalence of having at least 1 annual HbA1c test was 21.2%; the analogous prevalence for at least 2 tests was 12.3%. There was no evidence that rates increased notably over time. Among those with at least 2 tests, 35.3% had at least 2 tests in all years. In unadjusted results, individuals were more likely to have at least 2 annual tests if they were: ages 65-72 (odds ratio 1.79, 95% confidence interval 1.29-2.50; reference=73-79), had as least 12 years of education (1.26, 1.06-1.50), had a spouse with at least 12 years of education (1.71, 1.24-2.35), or were parents (1.74, 1.16-2.62). They were less likely to have 2 tests if they: were age 80 or over (0.35, 0.24-0.51); had severe cognitive impairment (0.02, <0.01-0.16), Alzheimer's disease (0.36, 0.22-0.58), an ADL disability (0.49, 0.37-0.65), or a hip fracture (0.33, 0.16-0.67); or used a wheelchair (0.31, 0.18-0.53). In adjusted results, 2+ annual tests were more likely for ages 65-72 (1.50, 1.08-2.07), and less likely for: those 80 or older (0.42, 0.29-0.60), and those with severe cognitive impairment (0.05, 0.01-0.39).
Conclusions: Medicare beneficiaries may not receive adequate HbA1c monitoring. Test rates were lower than some published rates for the Medicare population. This may be due to restricting the sample to community residents who survived the entire study period, requiring 2+ tests, and restricting the analysis to outpatient settings. A notable age gradient after adjusting for other factors suggests that physicians may not adequately test older individuals.
Implications for Policy, Delivery, or Practice: Providers should increase HbA1c monitoring for Medicare beneficiaries with diabetes. Patients who are older, have less education, or have either mobility difficulties or an ADL disability may be at particular risk of low-quality preventive care. Providers may reduce risks of diabetes-related complications by providing HbA1c testing to patients in these groups.
Primary Funding Source: HRSA

●Prevalence-based Costs of Interstitial Cystitis in an HMO

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Research Objective: To estimate the excess annual direct medical care costs of interstitial cystitis among female members of a large integrated HMO.
Study Design: KPNW administrative database records from May 1998 through May 2003 were used to identify female members with a coded ICD-9 diagnosis of 595.1 - interstitial cystitis (IC). Subjects with IC were matched with 3 non-diagnosed controls based on age and duration in health plan. Direct medical costs (outpatient visits, inpatient stays, pharmacy fills [IC meds, urinary analgesics, antidepressants], lab tests) were based on health plan utilization and cost accounting data. Mean 2003 total cost, as well as mean 2003 subcategory costs were compared between cases and controls.
Population Studied: Adult female membership of Kaiser Permanente Northwest Region (Portland, OR)--apx. 200,000 members. Female members with IC (n=267) were each age-matched with 3 controls (n=801).
Principal Findings: In 2003, mean total annual direct medical costs among patients with IC were $7,705 vs. $3,337 for controls (t = 6.2). Annual outpatient ($1,700 vs. $800) and pharmacy costs ($2,400 vs. $1,100) among patients with IC were twice those of controls. In both cases, differences were statistically significant.
Conclusions: Our preliminary results suggest that the direct medical costs of IC present a huge burden to the public, with $2 spent on IC patients for every dollar spent on those without the disease.
Implications for Policy, Delivery, or Practice: More information is what drives these cost differences, including clinical characteristics, comorbidities, and natural history of IC, as well as data on the indirect cost burden of IC incurred by patients outside the healthcare system.
Primary Funding Source: NIDDK

●Engaging People with Co-occuring HIV and Chronic Mental Illness in Treatment.

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Research Objective: Twenty sites across the United States provide mental health services to people living with HIV in underserved, minority communities. Some sites were initially mental health providers that needed to learn about HIV disease; others were HIV providers that needed to develop the means to provide mental health services. Our research objective is to understand how personal factors influence the likelihood of clients (a) understanding their health care needs, (b) remaining in treatment, and (c) being adherent to mental health and HIV medications.
Study Design: Two data collection tools have been implemented. A baseline instrument that will be administered through May 2006 shows clients' status early in treatment. In addition to fundamental background information (demographics, social supports, sexual and drug risk behavior), it also captures a wealth of data on trauma (events, symptoms, and coping). The survey also collects both the client's understanding of their medical status (CD4 counts, viral load, medications) and the clinical records of multi-axial mental health assessments; medical conditions; stage of HIV disease; opportunistic infections; HIV and psychotropic medications). The second tool, a consumer satisfaction

survey, garners clients' perspective mid-treatment, particularly regarding the degree to their treatment was culturally competent. This survey is administered in the spring of 2005 and 2006.
Population Studied: HIV-positive people, predominantly African-American, Latino, Haitian, and Native American, at 20 U.S. sites. This population has very high rates of chronic, often severe, mental illness (52% depressive disorder, 7% bipolar disorder, and 5% schizophrenia), which can affect their ability as well as willingness to manage their diseases. Many clients have frequent disruptions in their lives and suffer from acute mental health needs such as response to recent trauma (average 7.4 major events), other anxiety disorders, and adjustment disorder.
Principal Findings: Preliminary data indicate discordance between client's actual and self-reported health status. Clients were most satisfied when clinicians dealt with all their concerns, not just mental health issues, and addressed religion, spirituality, and beliefs about medicine. Methods of coping with trauma, including substance use may influence participation in mental health treatment or adherence to medication.
Conclusions: The challenge for providers is that clients must be actively engaged in mental health treatment in order to become adherent to HIV treatment, and must be adherent to HIV treatment in order to remain alive and medically stable enough to maintain mental health treatment.
Implications for Policy, Delivery, or Practice: HIV Disease is widely accepted as a chronic disease by the medical establishment, but continues to be perceived as a "death sentence" in some populations. In a highly stigmatized context, mental illness can easily remain untreated. Identifying the key factors in reaching patients with co-occuring chronic illnesses will contribute to their treatment.
Primary Funding Source: SAMHSA Center for Mental Health Services

●Predictive and Convergent Validity of Claims-Based Measures of Adherence to Medications NIDDK# 5R01DK64695-3

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Research Objective: Although poor medication adherence (MA) contributes to inadequate type 2 diabetes (DM2) and LDL-cholesterol control (LDL), ways to feasibly measure MA in clinical practice have yet to be established. Previously we were able to show pharmacy claims-based measures of MA to be associated with clinical outcomes in patients with DM2 (predictive validity). The aim of this study was to estimate the convergent and predictive validity of both claims-based and self-reported measures of MA among patients with DM2. MA was measured for oral antidiabetic and lipid-lowering drugs.
Study Design: A continuous measure of medication gaps (i.e., nonadherence) was constructed using claims data. In 2005, patients were invited to participate in a mixed-mode (mail and telephone) 45 minute survey that included scales to measure self-reported adherence, diabetes self-management skills, autonomous motivation and support (self-determination model), and drug treatment satisfaction. Spearman correlation coefficients were used to estimate predictive and convergent validity. Multivariable regression methods will be used to estimate the association between both types of MA measures and outcomes while adjusting for potential confounders.
Population Studied: The study setting was a large, integrated healthcare delivery and financial system serving the residents of southeastern Michigan. The study population included 2,973 patients with DM2 who met the following inclusion criteria during the 2003-2005 period: At least 2 separate fills for a medication in each drug class per year (i.e., greater than or equal to 2 fills of an oral antidiabetic agent, and greater than or equal to 2 fills of a lipid-lowering drug); age greater than or equal to 18 in 2001; greater than or equal to 1 laboratory test for HbA1c, greater than or equal to 1 laboratory test for either total Cholesterol or LDL-cholesterol; and continuous enrollment in the health plan for the study period.
Principal Findings: 2,038 patients completed the survey (69% response rate). Preliminary results show that self-report and claims-based adherence measures have both predictive and convergent validity. The Spearman correlation coefficients between nonadherence, as measured using claims data (CMG), and adherence, as measured by self-reports, were stronger for lipid-lowering (-0.37) than for oral antidiabetic drugs (-0.27); however, both correlations were statistically significant ($P<0.0001$). On the other hand, correlations with outcomes were stronger for claims-based measures of nonadherence than for self-reported MA. The correlations of LDL-cholesterol levels with both claims-based CMG and MA self reported measures were 0.29 and -0.24, respectively. For HbA1c, the corresponding correlations for CMG and self-reported measures of oral antidiabetic adherence were 0.18 and -0.13. All correlations were statistically significant ($P<0.001$).
Conclusions: Claims-based measures of medication adherence show both predictive and convergent validity and therefore may prove to be useful in clinical practice.
Implications for Policy, Delivery, or Practice: As adherence measures may be useful in clinical practice and in chronic disease management, more research is needed on methods to introduce these measures, as well as how to use them to improve health outcomes. One particular benefit of claims based measures of adherence is that may be easily generated electronically on large number of patients. Therefore, linking these data with other existing clinical information systems, such as E-prescribing, may hold great potential for providing valid measures of adherence at the time of care.
Primary Funding Source: No Fuding

●Correlations Between Mediating Behavioral Variables and Adherence to Medications and Outcomes among Patients with Type 2 Diabetes (DM2) NIDDK# 5R01DK64695-3

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Research Objective: Nonadherence to medications is a common problem in clinical practice especially among patients with asymptomatic chronic conditions such as type II diabetes (DM2). Previously we were able to show that pharmacy claims-based measures are associated with clinical outcomes in patients with DM (predictive validity). When designing interventions to improve adherence to medications among patients with DM2 is important to identify what behavioral mediating variables might be related to adherence to medications. The aim of the study was to of explore the associations between self-management skills, autonomous motivation, and physicians' support of patients' autonomy with both adherence to medications (self-reported and claims-based measures) and outcomes (diabetes control [HbA1c levels] and treatment satisfaction) among patients with DM2.

Study Design: A continuous measure of medication gaps (i.e., nonadherence) was constructed using claims data. In 2005, patients were invited to participate in a mixed-mode (mail and telephone) 45 minute survey that included scales to measure self-reported adherence, diabetes self-management skills, autonomous motivation and support (self-determination model), and drug treatment satisfaction. Spearman correlation coefficients were used as measures of association. Confirmatory factor analysis will be used to analyze the role of those behavioral variables in determining both adherence to medications and outcomes.

Population Studied: The study setting was a large, integrated healthcare system serving the residents of southeastern Michigan. The study population included 2,973 patients with DM2 who met the following inclusion criteria during the 2003-2005 period: At least 2 separate fills for a medication in each drug class per year (i.e., greater than or equal to 2 fills of an oral antidiabetic agent, and greater than or equal to 2 fills of a lipid-lowering drug); age greater than or equal to 18 in 2001; greater than or equal to 1 laboratory test for HbA1c, greater than or equal to 1 laboratory test for either total Cholesterol or LDL-cholesterol; and continuous enrollment in the health plan for the study period.

Principal Findings: Preliminary findings show that Spearman correlation coefficients between self-management scores and adherence were stronger for self-reported than for claims-based adherence measures (0.16 vs. -0.06 for antidiabetic drugs; and 0.15 vs. -0.08 for lipid-lowering drugs, respectively). Self-management scores were also correlated with HbA1c (-0.18, P<0.001) and with LDL-cholesterol levels (-0.08, P<0.001). Correlations of autonomous motivation scores with claims-based measurements of nonadherence and LDL were weak. However, both autonomous motivation and clinicians' autonomous support were correlated with self-management scores (0.37 and 0.45 respectively, P<0.0001), self-report measures of adherence to antidiabetic agents (0.24 for both, P<0.0001), and with HbA1c (-0.10 and -0.06, P<0.01). Moreover, Self-management (0.34) and autonomous motivation (0.43) were also significantly correlated with treatment satisfaction scores.

Conclusions: Self-management skills and intrinsic motivation measures are associated with adherence to medication and outcomes.

Implications for Policy, Delivery, or Practice: Among patients with DM2, interventions designed to promote self-management, intrinsic motivation, and providers' support of patient autonomy might improve patients' adherence to medications, treatment satisfaction, and HbA1c.

Primary Funding Source: No Funding

●Improved Intermediate Clinical Outcomes from Participation in a Diabetes Education Class: How Much is the Class Effect and How Much is Regression to the Mean?

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Research Objective: Health education classes are an essential strategy for improving health behaviors; however, little empirical evidence exists on the extent to which education classes also improve intermediate clinical outcomes. The principal objective of our study was to estimate the impact of participation in a diabetes health education program on glycemic and lipid levels, independently of regression to the mean.

Study Design: A retrospective observational cohort study using a case/control design. Adults with diabetes in a group-model MCO who attended the diabetes health education program ("participants") were randomly matched with 4 adults with diabetes who did not participate ("non-participants"). The diabetes education program consists of 2, 2-hour classes on diabetes self-management practices, meal plans, and exercise. For analysis of HbA1c (or LDL), participants and non-participants were matched on age group, gender, mean HbA1c (or LDL) in the 6-months prior to the class (or randomly selected index month for non-participants), and primary care practice where the patients received regular care. Using a fixed effects linear regression, we evaluated the effects of baseline HbA1c (or LDL), class participation, and the interaction of class participation with baseline HbA1c (or LDL) on change in HbA1c (or LDL) between the baseline period and a 6-month follow-up period.

Population Studied: 1,991 adults with diabetes 25 years or older who participated in a group-model MCO's diabetes health education program during the period 1/1/2003 through 6/30/2004 and 7,964 adults with diabetes who did not participate

Principal Findings: On average, participants had significantly (p<0.05) worse glycemic and lipid levels in the 6-months prior to participation compared to non-participants. Participants had significantly improved glycemic and lipid levels between baseline and follow-up periods compared to non-participants. Among non-participants with baseline HbA1c > 10.0%, mean HbA1c levels improved -1.7% (p<0.01); however, among

participants, mean HbA1c levels improved an additional -1.6% (p<0.01). There was also significant incremental improvement in mean HbA1c levels among participants with baseline HbA1c of 8.1%-10.0% (-0.6%, p<0.01). Participants with baseline HbA1c ,<8.1% had smaller, but significant, improvements in glycemic levels compared to non-participants. Among non-participants with baseline LDL > 160 mg/dl, mean LDL levels improved -41 mg/dl (p<0.05); however, among participants, mean LDL levels improved an additional -23 mg/dl (p<0.05). There was also significant incremental improvement in mean LDL levels among participants with baseline LDL of 130-159 mg/dl (-7 mg/dl, p=0.02). Participants with baseline LDL < 130 mg/dl did not experience significant improvements in LDL levels compared to non-participants.
Conclusions: Participation in a multifactorial diabetes health education class resulted in significant improvement in glycemic and lipid levels, particularly among participants with extremely adverse HbA1c or LDL levels prior to participation.
Implications for Policy, Delivery, or Practice: Reliable estimates of the effects of interventions in health care settings need to account for the potential bias of regression to the mean that can occur as a consequence of participant selection effects.
Primary Funding Source: CDC

●Voluntary Physician Switching Among HIV-Infected Individuals: A National Study of the Effect of Patient, Physician, and Organizational Factors

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Research Objective: Users of medical care are generally unable to assess the technical quality of care, and lack reliable and accessible information to make informed decisions. Thus, most patients do not actively search for or select physicians on the basis of quality. Patients with chronic conditions, however, rely heavily on the technical expertise of their medical provider. Because of this, there is reason to believe that the technical aspects of care, including technical quality, physician knowledge, and specialization, could be salient factors influencing loyalty to a physician. This study aims to clarify which patient, physician, and organizational factors are related to voluntary physician switching among HIV-infected patients.
Study Design: The relationship between measures of physician-patient relationship quality, structural aspects of care, the technical quality of care, physician and site characteristics, and voluntary switching were analyzed using generalized linear latent and mixed models (GLLAMM). The analysis used hierarchical logit models that nested repeated observations over time within patients, patients within providers, and providers within region to account for sampling effects.
Population Studied: Subjects were part of the HIV Cost and Services Utilization Study (HCSUS), a longitudinal study of a nationally representative sample of 2,864 non-institutionalized HIV-infected individuals receiving care in the contiguous United States in early 1996. Respondents were interviewed three times, using computer-assisted personal interviewing instruments. Physicians and site directors were also surveyed. This study is based on 2,466 patients enrolled during the first follow-up, when the first assessment of physician switching was made.
Principal Findings: Approximately 15% of the sample voluntarily changed their usual source of care at some point during the two-year study period. There were few patient characteristics that differed between respondents who switched and those who did not. Significant predictors of voluntary switching in a multivariate model were patient trust (OR=0.73, CI=0.60-0.89), physician anti-retroviral knowledge (OR=0.71, CI=0.54-0.93), HIV care site patient volume (OR=0.48, CI=0.30-0.78), and Ryan White Care Act funding (OR=0.58, CI=0.42-0.80).
Conclusions: These results indicate that structural aspects of care for patients with complex chronic conditions are less important determinants of voluntary switching than the quality of the physician-patient relationship. In addition, expertise is more strongly associated with switching than visit continuity with an individual physician.
Implications for Policy, Delivery, or Practice: This study contributes to our understanding about the effect of physician and organization characteristics on patients' decisions to voluntarily change their physicians. While most studies have found that patients cannot assess the technical quality of care they receive, the findings from this study challenge this notion. Patients with complex, chronic illnesses have several markers of technical quality, including their physician's specialization, whether or not other patients with their condition are being cared for at their physician's site, and the level of services available to support the management of their condition. Our results suggest that patients may use this information to make decisions about their care.
Primary Funding Source: AHRQ

●The Essential Elements of Primary Care Physician-Mental Health Specialist Collaboration

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Research Objective: Despite the well-documented effectiveness of collaborative care models for depression, these models have not achieved extensive adoption. One potential reason is a poor understanding of the essential elements of effective collaboration between primary care physicians and mental health specialists. The objective of the current study was to determine what constitutes effective collaboration between primary care physicians and mental health specialists for patients with depression.
Study Design: We conducted a modified Delphi expert panel to solicit input on several concepts derived from our literature based conceptual model of the process of primary care-mental health collaboration. Prior to the panel meeting, we mailed

panelists a rating form and set of key articles on collaboration which supported the inclusion of the various items in the rating form. The form consisted of items related to core concepts delineated in the collaborative care and social sciences literature and included three sections: essential elements of good PC-MH collaboration, conditions that maximize collaboration, and the expected outcomes of good collaboration. The articles included: an editorial on generalist-specialist collaboration, a study of the key elements of the referral process between primary care physicians and specialists, a study of the impact of co-management on mortality for patients post-MI, a study of the impact of collaborative depression care on disability, a conceptual piece on provider behavior, a review article on collaborative care for depression, and a conceptual piece from the organizational management literature on various forms of coordination.
Population Studied: Eight clinical leaders from large HMO and VA medical systems who represented internal medicine, family medicine, psychiatry, and mental health nursing participated in the panel.
Principal Findings: Elements deemed to be required for effective collaborative care between PC and MH providers regarding patients with depression consisted of A: Relational Coordination Factors: 1. timely curbside consultations with MH specialists; 2. timely exchange of written reports; 3. incorporation of MH colleagues recommendations into treatment plans; 4. MH specialist input for depressed patients refractory to treatment by PC providers; 5. PC and MH specialist supervision for depression care managers; 6. multidisciplinary case conferences as needed; and 7. shared care planning AND B: Organizational Coordination Factors: 1. comprehensive depression assessments; 2. timely access to MH specialty care for patients with complex, acute, or refractory depression.
Conclusions: Based on an extensive literature review and the culled expertise of a group of practicing clinical leaders, we identified key elements required for effective collaboration between PC physicians and MH specialists in the management of depressed patients in the outpatient setting, which will provide a strong foundation for the development of measures of the processes of physician collaboration for use in empirically evaluating its contribution to improving chronic illness care for depression and patient safety.
Implications for Policy, Delivery, or Practice: PC-Specialist collaboration represents a key component of delivering high quality, safe health services to patients, particularly those with chronic conditions. Future studies should empirically evaluate the impact of more effective collaboration on key patient oriented outcomes and of performance measures based on the essential elements of collaboration for which PC and MH are jointly responsible.
Primary Funding Source: VA, NRSA

●Obesity and VHA cost of treating veterans with diabetes

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Research Objective: Research shows that excess medical cost associated with obesity is largely attributable to the increased prevalence of diabetes. However, little is known about the association of obesity upon medical care costs among patients with established diabetes. We examined the association among VHA patients with diabetes.
Study Design: We identified survey respondents of 1999 Large Veterans Health Survey with diabetes by linking the survey with 1999 VHA Diabetes Epidemiology Cohort database. We obtained FY1999 VHA costs from the HERC Average Cost database. We assessed the inpatient cost, outpatient cost and their summation as total cost. In addition, we examined the diabetes-related cost which was the sum of inpatient and outpatient costs of treating microvascular, macrovascular metabolic conditions. We used primary diagnosis codes to identify these conditions. Based on the self-report on weight and height, we calculated BMI (body-mass-index) and grouped diabetes patients into four exclusive categories: underweight (<18.5), normal (18.5-25) overweight (25-29), obese (>=30). We used multivariate analysis to examine how BMI affected the total cost as well as other cost components, controlling for other personal characteristics including diabetes duration, health status, self-reported physical and mental co-morbidities and smoking behavior. To deal with outliers and skewness of the cost items, we took the log-transformation of the costs as dependent variables.
Population Studied: Survey respondents of 1999 Large Veterans Health Survey with diabetes (N=161,398).
Principal Findings: A majority of the population was either overweight (41%) or obese (37%). About 6.3% were under weight, 16.4% were normal weight. Underweight patients had the highest total cost, followed by obese patients. The total cost was similar between normal weight and overweight groups. For both outpatient and diabetes-related costs, obese patients cost the most; normal weight patients cost the least; while the other two groups had similar costs. However, we found a negative association between obesity and inpatient cost.
Conclusions: The association between obesity and costs was complex and varied by type of service and complications.
Implications for Policy, Delivery, or Practice: A clearer understanding of resource needs for obese patients with established diabetes will help to improve treatment for this specific cohort. Further research is needed to explore the impact of obesity on inpatient cost.
Primary Funding Source: VA

●A Study of Lifestyles – The Driving Force Behind Chronic Care

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Research Objective: A report by the U.S. Surgeon General has concluded that fully 70% of the diseases and subsequent deaths in the United States today are from lifestyle related chronic conditions, which are highly preventable. Unfortunately, techniques used throughout the insurance and healthcare industries have proved largely ineffective at identifying or predicting the probability of these lifestyle-based diseases in the early stages. This paper will review a new technique called Lifestyle-Based Analytics that is making great strides in the identification of chronic conditions in the early onset and pre-disease states.

Study Design: The analysis of consumer data elements has become big business in most industries. It is now possible to purchase of over 2,000 fields of publicly available data on 95% of the U.S. population. A large percentage of these data fields relate to the lifestyles we have. These same lifestyles are the leading causes for many of the diseases we are faced with today. Our study looks at the lifestyle factors that are the roots of many chronic medical conditions such as diabetes, heart disease, and cancer. Through data mining and predictive modeling techniques, lifestyle-based data elements are pulled from consumer datasets, which possess high correlations to these disease states. As an end result, predictive models are developed that can be used to identify those individuals most at risk for having or developing a chronic condition in the near term.

Population Studied: Detailed claims analysis for over 80,000 individuals was studied in a series of predefined medical states. Over 1,000 individuals per disease state were included in the model development. A random sampling of 20,000 individuals was used for normality and an additional 50,000 individuals were used for model testing and accuracy measures. In addition to detail claims, over 2,700 fields of publicly available consumer data was appended to each individual. The data contained a variety of elements including lifestyle, demographic, and financial data points.

Principal Findings: The data contained in publicly available consumer datasets provides some of the highest correlations to early chronic disease detection in the marketplace today. Consumer datasets are rich with medically correlated data elements such as activity or inactivity indicators, exercise elements, food preferences (ex. diet, vegetarian and fast food), work and stress indicators, tobacco elements and a variety of other closely related elements.

Conclusions: Lifestyle-Based Analytics and consumer datasets are exceptional tools for studying the correlations between consumer behaviors and chronic diseases. In addition, data mining and advanced predictive models using consumer datasets can provide early warning indicators to future chronic health risks posed by individuals and groups alike.

Implications for Policy, Delivery, or Practice: The healthcare and insurance industry has focused on historical medical information as a means to identify and predict chronic based conditions. Unfortunately, historical medical history is a poor predictor of chronic conditions in the early stages. As the industry moves towards a more proactive approach in addressing chronic conditions, our current modeling techniques will more often than not fail. However, Lifestyle-Based Analytics provides a well-founded approach to help identify and predict early stage disease states of chronic conditions in support of this proactive movement.

Primary Funding Source: No Funding

●Asthma Treatment and Perception of Symptom Control Among Adult Residents in Singapore

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Research Objective: This survey investigates the prevalence of asthma, degree of asthma symptom control and use of emergency health services for acute exacerbations of asthma among adults in Singapore. The survey also assesses the perception of asthma control and wellness among people with asthma.

Study Design: A population-based, cross-sectional survey on asthma was conducted from December 2004 to October 2005 in Singapore. Trained Health Survey Officers conducted direct face-to-face interviews at randomly selected households. Respondents with asthma were asked about their experience and perceptions of asthma, including their current symptom control, use of long-term preventor medication and recent exacerbation of asthma. Perception of good asthma control was compared with their limitations of daily activities. Data were analysed using SPSS v13. Significance testing of proportions was carried out using Fisher's exact test, where a probability (p) of <0.05 was considered statistically significant.

Population Studied: Singapore residents aged 15-69 years who were diagnosed with asthma by a physician were invited to participate in this survey.

Principal Findings: A total of 2,779 respondents participated in the survey; their demographic characteristics were similar to and representative of the general Singapore population. Overall prevalence of asthma was 4.7% (130/2779), being disproportionately higher among the Malays (10.3%) and Indians (8.1%) compared with Chinese (2.7%) ($p<0.001$). Asthma prevalence was also higher among those below 45 years of age (6.9% vs 2.6%; $p<0.001$). Among them, 22.3% (29/130) of asthmatics were ever prescribed long-term preventor medication. Overall, 66.9% of all asthma respondents perceived improvement in their asthma control

compared to 10 years ago and 66.2% reported complete or well control of asthma in the past 4 weeks. However, fewer respondents on long-term preventor medication perceived improvement in their asthma control compared with those without (41.4% vs 74.3%; p=0.002). Only 62.1% of those on long-term preventor medication claimed complete or well control compared to 67.3% among those without. About 44.6% reported having symptoms of asthma in the day and 39.2% at night, 43.1% on exertion or exercise. Those on long-term preventor medication reported more symptoms compared to those without. Respondents perceived limitations in their lifestyle (50.0%), physical (70.8%) and social (49.2%) activities and career opportunities (41.5%) as a result of asthma. In the preceding 12 months, 20.8% reported having an unscheduled visit to a healthcare facility, 12.3% visited an Emergency Department and 5.4% were hospitalised for asthma exacerbation. Rates were higher among those with were treated with long-term preventor medication.
Conclusions: There are ethnic differences in asthma prevalence among Singaporeans. Asthma treatment and control among adult Singaporeans appears inadequate as many people continued to experience symptoms and perceived limitations in daily activities despite being on long-term preventor medication. They frequently perceive themselves as being well controlled although remaining symptomatic.
Implications for Policy, Delivery, or Practice: Healthcare professionals should target to reduce acute exacerbations of asthma that result in unplanned visits to healthcare facility through adequate treatment of asthma. People with asthma need to be educated to recognize asthma symptoms and be compliant with treatment to prevent acute exacerbations.
Primary Funding Source: National Healthcare Group

●Evaluation of Administration of ACE Inhibitors and Angiotensin Receptor Blockers Among Diabetic Patients with Chronic Kidney Disease

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Research Objective: Angiotensin-converting enzyme inhibitors (ACE) and angiotensin II receptor blockers (ARB) are efficacious in slowing the progression of diabetic nephropathy. However, there is scant information available regarding the prescription rates of ACE/ARB among these high-risk patients in practice. Our objective was to evaluate the uses of ACE/ARB rates among patients with diabetes and chronic kidney disease (CKD) as a new quality improvement measure.
Study Design: This was a retrospective cohort study using the VHA Diabetes Epidemiology Cohort, a database including linked VHA administrative, laboratory and pharmacy records with Medicare claims. We used serum creatinine levels to calculate estimated Glomerular Filtration Rate (eGFR) with the 4 variable MDRD formula which takes into account age, sex, and race. Prescription of an ACE/ARB was determined within 365 days of the initial eGFR for patients with CKD (based on two eGFRs at least 90 days apart). With stratification by age (<65; 65-75 years), we calculated facility-level prescription rates of ACE/ARB. We used a decile approach to rank facilities; those with less than 50 patients were not ranked (five for the <65 group; 32 for the 65-75 group). Correlation between facility ranks for the two age groups was evaluated using Spearman Rank correlation coefficient.
Population Studied: We studied 54,961 diabetes patients, 18-75 years old, with CKD stage 3 or 4 in Fiscal year (FY) 1999 from 143 VHA facilities. They had no diagnosis of end stage renal disease or dialysis during FY 1998-2000 and were alive as of October, 2000. There were 17,226 patients less than 65 years old and 37,735 between 65 and 75 years old.
Principal Findings: The overall mean proportion prescribed ACE/ARB was 72.6% for the <65 age group and 67.7% for the 65-75 age group (p<0.001). The median, minimum, and maximum for the facility-level rates were 68.0%, 51.6%, and 80.1% for the 65-75 age group and 73.7%, 51.7%, and 81.6% for the <65 age group. Among the facilities ranked in the top decile (higher rates) for the 65-75 group, 3 shifted more than 2 deciles for the <65 group; among those ranked in the bottom decile (lower rates) for 65-75 group, 5 shifted more than two deciles for the <65 group. Spearman rank correlation between facility rankings for the two age groups was 0.51 (p=<0.001).
Conclusions: Overall, a moderately high percentage of veterans with CKD were administered ACE/ARB, with patients 65-75 years of age having rates about 5% lower than younger individuals. However, marked facility variations were present for both age groups (~50% To ~80%). Among facilities, prescription rates between different age groups were only moderately correlated.
Implications for Policy, Delivery, or Practice: Our results indicate that a performance measure for the proportion of patients with diabetes and CKD on ACE/ARB can be constructed from an electronic health record. This measure can identify population and facility level differences between older and younger individuals. Further evaluation is necessary to assess reasons for lack of adherence and to inform quality improvement.
Primary Funding Source: VA

●Obesity and Medical Expenditures among Individuals with Diabetes

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Research Objective: Many of the individuals with diabetes are obese; while many studies have focused on obesity and medical expenditures, research on their association among individuals with diabetes are scare. Our objective was to estimate annaul total medical expenditure and its components among diabetic patients by their obesity status and examine their relationship while controlling for other comorbidities and patient-level factors.
Study Design: Cross-sectional analysis of Medical Expenditures Panel Survey (MEPS) data, a nationally representative data of households in the US, for the calendar year of 2003. Individuals with diabetes were identified using

ICD-9-CM codes from the medical conditions file. Obesity was measured by the body mass index (BMI) and individuals with BMI over 30 were considered as obese. Components of medical expenditures included inpatient, non-inpatient, pharmacy, and total expenditures. Expenditures were transformed to natural logarithmic scale to reduce skewness. T-tests and and ordinary least squares regressions on log dollars were used to assess the relationship between obesity and expenditures.
Population Studied: The study population included 1,699 individuals with diabetes who were alive at the end of calendar year 2003.
Principal Findings: Overall, 51% (n = 870) of individuals with diabetes reported being obese. Nearly one third (32%) reported being over-weight. Average total expenditures for obese individuals was $9,578, compared to $7,916 for those who were over-weight and $9,870 for those who were normal weight. Inpatient expenditures averaged $2,965, $2,554, and $4,608 respectively. After controlling for demographics, socio-economic status, health status and comorbidities, individuals with obesity had significantly higher non-inpatient and pharmaceutical expenditures compared to those with normal BMI.
Conclusions: The relationship between obesity and expenditures varied depending on the type of expenditures. Lower inpatient expenditures by those with obesity could be due to factors such as difference in their diabetic treatment regimen, which are not controlled for in this study. Further research is needed to understand the reasons for the negative relationship between inpatient expenditures and obesity.
Implications for Policy, Delivery, or Practice: These findings suggest that for individuals with diabetes and obesity may have greater outpatient care that may reduce the need for acute hospitalizations, leading to lower inpatient expenditures.
Primary Funding Source: No Funding

●Health Related Quality of Life and Treatment Compliance with Diabetic Care

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Research Objective: The primary objective of this study was to explore the relationship between health related quality of life (HRQOL) and treatment compliance among a sample of diabetic patients.
Study Design: Compliance with treatment guidelines has been shown to improve health outcomes for chronic diseases. Past research has shown a positive correlation between HRQOL and treatment compliance, but little is known about the specifics of this relationship. HRQOL was measured using the 12-item Short Form Health survey (SF-12), a multidimensional tool that assesses a person's overall physical and mental health. Treatment compliance was measured using medical claims data. Compliance scores were then computed as the number of American Diabetes Association recommended treatment guidelines completed in 2004. These guidelines include: two hemoglobin tests, a cholesterol test, a microalbuminuria test, and an eye exam. Compliance scores ranged from zero (no treatments) to five (all treatments).
Population Studied: All members of the study were employees and members of a large health plan. To be included in the study, members had to be continuously enrolled from January 2004 to December 2004 and have diabetes. Members who met the following conditions within a 24 month period were identified as diabetics: a diagnosis of diabetes on at least two different encounters in a hospital or ambulatory setting, one emergency room visit with a resulting diagnosis of diabetes, or at least one pharmaceutical utilization of insulin and/or hypoglycemics. There were 198 members who met the inclusion criteria. Of the 198 identified members, 111 (56%) completed and returned the SF-12.
Principal Findings: Both age and the Mental Composite Score (MCS) of the SF-12 were significant predictors of compliance. Age was positively related to compliance, meaning that the older a person gets the more likely he or she is to be compliant with treatment guidelines. MCS was negatively related, meaning that those with better mental health scores were less likely to be compliant. The MCS consisted of five components, of which the depression/anxiety component was the only one significantly negatively related to treatment compliance. Those who had a more optimistic and less depressive outlook on life were less likely to be compliant.
Conclusions: Results of this study indicate that disease management programs may need to focus special attention on younger diabetics who hold more optimistic views of themselves and their health risks. The theory of depressive realism posits that those who are depressed have a more realistic view of their health risks and are thus more likely to be compliant with preventive care guidelines.
Implications for Policy, Delivery, or Practice: Diabetes prevention and disease management efforts should be directed toward those who are younger and more optimistic. Factors other than past utilization of care or predicted costs need to be considered in the inclusion criteria for disease management programs.
Primary Funding Source: BlueCross BlueShield of Tennessee

●Improving Patient Self Management through Office-based Care Managers

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Research Objective: To examine the sustained effect on patient self-management of multidisease, clinic-based care management program after care management has ended.
Study Design: Patients were referred by primary care physicians to trained nurse care managers, located within the clinic setting. Referral was based on need for guidance and assistance in disease management, rather than for a specific disease, however, nearly half of all patients referred were diabetic. Glycosolated hemoglobin (HbA1c) levels of diabetic patients referred to care management were compared to

diabetic patients who did not receive care management. HbA1c levels were compared prior to care management or diabetes diagnosis, and at 3 months, 6 months, and 12 months after care management, as well as 6 months after care management has ended. We compared change in HbA1c levels for the intervention and control groups using a randomized block ANOVA.
Population Studied: The population consisted of diabetic patients seen between September 2003 and February 2004 at primary care clinics of Intermountain Healthcare. Patients were included if they had a 250.XX ICD-9 diagnosis. Patients were matched on age, sex, previous HbA1c level, and HbA1c testing rate in the year prior the selected patient visit. Controls were matched at a 4:1 ratio.
Principal Findings: There were 348 control and 87 intervention patients. The intervention group had a higher baseline HbA1c, but a lower HbA1c one year after care management. Between the baseline and 3-6 month measurement, the mean change in HbA1c for the intervention group was -0.8069, while the control group's change was -0.4293; this mean change in HbA1c levels for the two groups were found to be significantly different (p= 0.0103). The effect of care management was seen to persist over 1 year after care management was initiated. In addition, the majority of patients in the intervention group had less than 6 months of care manager treatment. The average care management period was 44 days, with 30% of patients having just one care management encounter. Six months after the care management intervention, the patients HbA1c levels were 15% lower than baseline levels.
Conclusions: Our program demonstrated that office-based care managers can be effective at improving patient self-management. Patients were often referred to care management based on the physician perspective that they had barriers to self-management. Care management can improve management of patient outcomes, and this improvement continues even after the care management period has ended.
Implications for Policy, Delivery, or Practice: Effective interventions to improve and sustain patient self-management ability address a significant concern about the primary care health system, where patients are being forced more and more to shoulder the burden of disease management.
Primary Funding Source: Hartford Foundation

•Influence of Prevention on Health Outcomes Among Medicare Beneficiaries with Diabetes

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Research Objective: The purpose of this research was to examine the influence of prevention on health outcomes among Medicare beneficiaries with diabetes, to inform the development of intervention strategies.
Study Design: This research involved secondary data analysis of the 2002 Medicare Current Beneficiary Survey (MCBS) Access File Community Questionnaire. The MCBS is an ongoing household panel survey conducted by the Centers for Medicare & Medicaid Services (CMS), of a representative national sample of Medicare beneficiaries. The Access File includes data on beneficiaries continuously enrolled for the year. The Community Questionnaire is administered by face-to-face interview with community-dwelling beneficiaries or their designated proxies, and assesses a wide range of variables, including demographics and health insurance, health status and functioning, health and preventive behavior, and knowledge. In addition, a Diabetes-Specific Battery of questions assesses diabetes-specific health history and outcomes, diabetes self-management and other preventive behaviors, and diabetes prevention knowledge. The data files include a sample weight variable and variables to permit adjustment for the complex cluster sample design. First, logistic regressions were conducted predicting each health outcome from each predictor, to examine unadjusted effects and to select the final set of predictors. Second, backward elimination logistics regressions were conducted predicting each health outcome from the final set of predictors, to adjust for multicollinearity among the predictor variables.
Population Studied: Of the 15,142 in the community sample, 2,795 (18%) reported ever having been told by a doctor that he or she had diabetes. Of that diabetic subsample, the 2,672 (96%) who responded to the Diabetes-Specific Battery of questions constituted the analytic sample. This sample is 16% disabled and under 65 years, 53% female, 79% white, and 80% overweight or obese.
Principal Findings: Counterintuitively, many diabetes-specific preventive behaviors (e.g., taking prescribed medications or insulin, testing own blood sugar, or doctor discussing diabetes treatment) were associated with negative health outcomes (e.g., problems with feet or eyes from diabetes, uncontrolled blood sugar, or cardiovascular problems). This pattern of associations suggests that some preventive behaviors may be reactions to negative health outcomes, a suggestion supported by exploratory longitudinal analyses examining preventive behaviors and health outcomes in 2000 and 2002. However, regular exercise, self-rated diabetes management knowledge, and not being depressed were consistently associated with positive health outcomes. Moreover, obesity was associated with less regular exercise and greater depression, and regular exercise was associated with less depression. Finally, not surprisingly, Medicare eligibility due to disability vs. age, diabetes type 1 vs. 2, time since diabetes diagnosis, and having high blood pressure all predicted poorer health.
Conclusions: These analyses show that regular exercise, diabetes self-management knowledge, and not being depressed predict better health outcomes among Medicare beneficiaries with diabetes. In addition, weight status is associated with both regular exercise and depression status.
Implications for Policy, Delivery, or Practice: These findings can be used to inform intervention strategies for Medicare beneficiaries with diabetes. Specifically, interventions should emphasize exercise promotion and weight management, diabetes self-management training, and treatment for depression.
Primary Funding Source: CMS

●Costs of Chronic Conditions in Regione Emilia Romagna, Italy

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Research Objective: Given increasing limitations on health care dollars available for care, the ability to identify those with high healthcare costs conditions within large populations is a priority for health care planners, insurers, and governmental agencies. Individuals with chronic medical conditions often incur costs on an ongoing basis, resulting in disproportionately high health care costs. Additionally, health care costs often increase exponentially when individuals have more than one chronic condition. While the costs of chronic conditions have been profiled in the United States, fewer studies have described these patterns in Europe. In this paper, we examine the health care costs associated with chronic conditions in Regione Emilia Romagna (RER), Italy.

Study Design: Individual-level health service use and costs in 2004 were captured for RER's 4 million residents by merging administrative files from hospital, pharmacy, specialty, and demographic data sources. Residents with chronic conditions were identified using the Chronic Condition Drug Groups, a validated instrument based upon the consumption of specific medications that identify those with chronic disease. We studied six common chronic conditions: cardiovascular disease, gastric acid disorders, rheumatologic conditions, psychiatric disorders, chronic respiratory disease, and diabetes. Hospital, pharmacy, and specialty costs were examined. Costs for those with chronic conditions were compared with costs of a baseline population, defined as those who used health services in 2004 but who were not identified as having a chronic condition. Statistical analyses included analysis of variance and multiple analyses of variance.

Population Studied: 3.2 million individuals in Regione Emilia Romagna, Italy, who used hospital, pharmacy, and specialty services in 2004.

Principal Findings: Individuals with six chronic conditions represented 35.2% of the total population in 2004, but used 73.2% of total 2004 hospital costs, 85.7% of pharmacy costs, and 67.4% of specialty costs. The mean health services costs for those with one or more of the six chronic conditions was 1,880 compared to 334 for the baseline population. When compared to the baseline population, mean hospital costs for those with one of six chronic conditions were 1,145 compared to 237 ; drug costs were 519 compared to 31 ; and specialty care costs were 232 compared to 67 . Those with cardiovascular disease accounted for the largest proportions of health service costs in 2004. Thirteen percent of the population with two or more of the six chronic conditions had mean health service costs over eight times the costs of the baseline population.

Conclusions: The study provides strong evidence that a small number of clinically discrete chronic conditions account for large proportions of health care costs. In particular those with two or more chronic conditions utilize significantly higher proportions of health care resources.

Implications for Policy, Delivery, or Practice: The ability to identify those in a population who are at higher risk for increased morbidity and higher costs is critical for governments, insurers, and managed care plans. These individuals are prime candidates for targeted disease management programs that address their complex clinical needs.

Primary Funding Source: Regione Emilia Romagna