with target drugs. The purpose of this study was to ascertain whether revocation of the PA requirement resulted in inferior rates of HbA1C testing amongst new users of these drugs. **METHODS:** Data on of new users of the target drugs and on HbA1C testing in these patients was extracted from EPR databases for the six-month post-revocation period. The proportion of patients who performed at least one HbA1C test during the four months prior to initiation of treatment and 95% confidence intervals were calculated. The data were stratified by month to detect possible trends in rates of testing during the post policy-change period. **RESULTS:** After rescinding the PA requirement, HbA1C testing amongst incident users of the target drugs dropped from 100% during the PA period to rates of 85.6% (95% CI = 79.7, 91.5) to 94.4% (95% CI = 90.8, 97.9). Statistically significant variance in monthly rates of testing was not observed. **CONCLUSIONS:** The PA requirement resulted in total performance of a lab test necessary to monitor drug-therapy outcomes in diabetic patients. When PA is implemented as a quality-assurance strategy, revocation should be accompanied by continuing-education efforts to maintain adherence to recommendations for appropriate care.

**PDB53**

### SHORT-TERM OUTCOMES FOR AN EMPLOYER SPONSERED PHARMACIST- PROVIDED MULTI CENTER DIABETES MANAGEMENT PROGRAM

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**OBJECTIVES:** To measure the impact of pharmacist-provided diabetes management program on the economic, clinical, and humanistic outcomes for the City of Toledo employees and their dependents for a period of 6 months. **METHODS:** This is a prospective, pre-post longitudinal study. Clinical outcomes collected were A1c, blood pressure (BP), and body mass index (BMI). These outcomes were measured at the baseline, 3 and 6 month visits. Economic outcomes include cost of physician office visits, emergency room visits, and inpatients days. These outcomes were measured at baseline and 6 month visits. Humanistic outcomes collected were quality of life (using Sf36v2), patient satisfaction, adherence with medications, and knowledge about diabetes. The quality of life and knowledge about diabetes were measured at baseline and 6 month visits. The patient satisfaction and adherence with medications (using Morisky scale) were measured at baseline and 3 months visits. Wilcoxon-Signed rank test was used to compare variables at two time points. Friedman test was used to compare variables at multiple time points. Preliminary data analysis for the period between baseline visit to 3 months visit is given below. **RESULTS:** Ninty five patients have been enrolled to date. Mean A1c's have decreased significantly from 7.78 at baseline visit to 7.44 at 3 months ($p = 0.05$) ($N = 59$). For Intention to treat population (baseline A1C > 7), the decrease in A1c is even more significant ($p = 0.01$) ($N = 33$). Diastolic blood pressure has decreased significantly ($p = .001$) while systolic blood pressure and BMI have decreased non-significantly. Self monitoring of blood glucose has increased significantly ($p = 0.01$). Patient satisfaction and adherence with medications has also improved significantly at three-month follow-up visit ($p < 0.05$). Final results for the period between baseline visit to 6 months including economic outcomes will be presented at the ISPOR 14th Annual International Meeting. **CONCLUSIONS:** Preliminary data analysis showed that pharmacists can improve the clinical outcomes in patients with diabetes.

**PDB54**

### DULOXETINE THERAPY AND CHANGES IN OPIOID USE AMONG DIABETIC PERIPHERAL NEUROPATHIC PAIN PATIENTS

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**OBJECTIVES:** This study examined changes in opioid medication utilization following treatment for diabetic peripheral neuropathic pain (DPNP). **METHODS:** We studied commercially insured individuals aged 18–64 years who were dispensed duloxetine or other DPNP standard of care (SOC) medications (i.e. escitalopram, venlafaxine, gabapentin, amitriptyline, or pregabalin) between March 1, 2005 and December 31, 2005. The dispense date of the initial agent was denoted as the "index date." Patients included were diagnosed with DPNP in the 1 year prior to index and received opioids in the prior 90 days. "Duloxetine" and "SOC" cohorts were constructed based on index agent. Patients in the duloxetine cohort were required to be "continuous" users (medication possession ratio ≥0.8). We assessed changes in long-acting (LA) and short-acting (SA) opioid utilization one year before and after the index date. Multivariate linear regressions were performed to control for differences in patient demographic and clinical characteristics between study cohorts. **RESULTS:** We identified 97 duloxetine patients and 943 SOC patients. Study cohorts were similar in age (mean = 55 years) and proportion female (53%). Over 87% and 20% patients in each cohort were dispensed an SA and LA opioid in both the pre- and post-index periods, respectively. Hydrocodone was the most common SA opioid, followed by propoxyphene. Oxycodone and tramadol were the most common LA opioids. Compared to SOC patients, continuous duloxetine patients had a greater reduction in days on SA hydrocodone (25.8 days, $p < 0.05$), number of SA hydrocodone prescriptions (1.4, $p < 0.05$), and days on DPNP-related SA opioids (15.5, $p = 0.09$). Continuous duloxetine users also had greater reduction in days on LA oxycodone compared with the SOC patients (8.9, $p < 0.05$). **CONCLUSIONS:** These findings among DPNP patients indicate that continuous duloxetine users were more likely to have a reduction in use of SA opioids and LA oxycodone versus SOC patients.

**PDB55**

### UTILIZATION OF ANTIDIABETIC MEDICATIONS OF PATIENTS WITH TYPE 2 DIABETES COVERED BY VARIOUS TYPES OF HEALTH INSURANCE IN A US NATIONAL REPRESENTATIVE POPULATION IN YEAR 2005–2006

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**OBJECTIVES:** The impact of various medical insurance structures on the quality of care is not clearly understood. Drug utilizations patterns of type 2 diabetes patients may be affected by health care access, which vary across various types of health insurance and may lead to disparities in disease control and clinical results. **METHODS:** A cross-sectional analysis was conducted on data from the National Health and Nutrition Examination Survey (NHANES) 2005–2006. Based on data from survey, patients aged 20 years and older with diagnosed type 2 diabetes were classified as patients with commercial insurance, Medicare and/or Medigap, Medicaid, multiple insurance, other types of insurance and no health insurance coverage. Likelihood of oral anti-diabetic medications, insulin or combinations and the likelihood of having successful Glycemic control were modeled with multi-variables logistic regression analyses with adjustment for age, gender, BMI, ethnicity, diabetic complications, household incomes and important co-morbidities. **RESULTS:** A total of 403 diabetic patients were included in the analysis. Compared to commercially-insured patients, patients under Medicare (OR = 1.36, 95% CI = 0.62, 3.00) or Medicaid (OR = 2.32, 95% CI = 0.76, 7.04) were more likely to be treated with insulin, but less likely to receive oral anti-diabetic medications (OR = 0.19, 95% CI = 0.09, 0.40 for Medicare; OR = 0.19, 95% CI = 0.07, 0.51 for Medicaid). The likelihood of having successful glucose control varied but was not significantly different across types of plans ($P > 0.05$). **CONCLUSIONS:** Treatment patterns varied across various types of health insurance plans and might have impact on the optimum quality of care and expenditure implications.

**PDB56**

### THE EFFECT OF VALUE-BASED INSURANCE DESIGN ON ADHERENCE TO DIABETES MEDICATIONS: A MATCHED DIFFERENCE IN DIFFERENCE EVALUATION

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**OBJECTIVES:** To evaluate the impact of value-based insurance design (VBID) on adherence to diabetic medications. **METHODS:** Health Alliance Medical Plans of Illinois piloted VBID by placing at least one diabetic drug in each class at Tier 1 with a $10 copayment for a subgroup of 5400 enrollees in January 2007, while keeping drug benefits unchanged for all other plan enrollees. A matched difference in difference method (DID) was used to evaluate the effect of VBID, based on pharmacy claim data. Patients with unchanged benefits in the same plan were used as the control group. Patients included in the analysis needed to be continuously enrolled from January 2006 to December 2007 and have used diabetic medications in both years. Adherence was measured by the proportion of days covered (PDC). A logistic model was used to model the probability of having PDC >= 0.8. A 1-to-1 matched control group was generated based on propensity score. **RESULTS:** There were 71 patients in the case group and 5037 patients in the control group. The matched control group had 71 patients with similar propensity score, baseline characteristics and baseline adherence level with the case group. After the implementation of VBID, the average copayment for diabetic medications decreased from $21.70 to $14.00 for the case group and increased from $19.60 to $22.00 for the matched control group. The probability of being adherent increased from 69% to 79% for the case group and decreased from 72% to 70% for the matched control group. The matched DID model showed that VBID increased the probability of being adherent: OR = 1.84, 95% CI: 0.96–3.54, $p = 0.068$. The full sample DID estimated OR = 1.56 with $p = 0.065$. **CONCLUSIONS:** A VBID program that reduced the copayment for diabetic medications by 35% improved the odds of adherence by 84% and reduced the number of non-adherent patients by 35%.

**PDB57**

### MEDICATION NONADHERENCE AND POTENTIALLY AVOIDABLE HOSPITALIZATIONS AMONG PATIENTS WITH DIABETES

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**OBJECTIVES:** To examine the association between medication adherence and potentially avoidable hospitalizations (PAHs) among Medicare part D enrollees with diabetes. **METHODS:** A longitudinal retrospective cohort study of 493,609 Medicare part D enrollees with diabetes from 6 states (Alabama, California, Florida, Mississippi, New York and Ohio) who had filled at least 1 prescription for oral hypoglycemics, angiotensin-converting enzyme inhibitors/angiotensin II receptor blockers, and statins. Adherence was calculated as proportion of days covered for all three classes of medications using Part D records for the first 6 months of 2006. A summary measure of adherence was computed for each patient as an ordinal variable – adherent to none, any one class, any two classes and all three classes of medications. Medicare part A records for the next nine months were used to identify PAHs, as defined by the AHRQ's Prevention Quality Indicators for diabetes care. Logistic regression was used to assess the association between nonadherence and PAHs. **RESULTS:** A total of 16.2%, 15.7%, 27.3% and 40.8% of patients were adherent with none, any one class, any 2 classes and all three classes of medications respectively. A total of 23,222 (4.7%) patients had at least one PAH, 0.12% had an admission due to diabetes short-term

complication, 2.8% due to a long-term diabetes complication and 1.9% due to uncontrolled diabetes. In logistic regression adjusting for age, sex, race and comorbidities, nonadherence to all three classes of medications (OR = 1.49, 95% CI:1.44–1.55), adherence to any 1 class of medications (OR = 1.41, 95% CI:1.36–1.47), adherence to any 2 classes of medications (OR = 1.26, 95% CI:1.21–1.30) were associated with higher risks for PAHs compared to adherence with all three classes of medications. **CONCLUSIONS:** Medication adherence is necessary to reduce the risk of PAHs. Interventions are needed to improve medication adherence, which will help patients realize the full benefit of hypoglycemic and cardioprotective medications.

**PDB58**

### NONADHERENCE TO ORAL HYPOGLYCEMIC AGENTS AND POTENTIALLY AVOIDABLE HOSPITALIZATIONS: AN EXAMINATION OF THE MEDICARE PART D PATIENTS WITH DIABETES

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**OBJECTIVES:** To examine the association between nonadherence to oral hypoglycemics and potentially avoidable hospitalizations due to diabetes short-term complications among Medicare Part D enrollees. **METHODS:** This is a longitudinal retrospective cohort study. Medicare Part D enrollees with diabetes from six states (Alabama, California, Florida, Mississippi, New York, and Ohio) who had filled at least 1 prescription for oral hypoglycemics during the first half of 2006 were included in the study. Medicare Part D claims data for the first 6 months of 2006 were evaluated for adherence with oral hypoglycemics using proportion of days covered (PDC). Patients were classified as adherent (PDC ≥ 0.8), poor adherent (0.5 ≤ PDC < 0.8), and very poor adherent (0 < PDC < 0.5). Patients' Part A records from July 1, 2006 to March 31, 2007 were evaluated for potentially avoidable hospitalizations due to diabetes short-term complications, one of the diabetes care prevention quality indicators recommended by the Agency for Healthcare Research and Quality. Associations between nonadherence and outcomes were assessed using multivariate regression models. **RESULTS:** Data were available for 1,101,533 patients. Among them, 58.4% were females and the mean age was 71.7 years. About 64.9% were adherent, 11.2% were poor adherent, and 24.0% were very poor adherent with oral hypoglycemics. Of all patients, 1540 had at least one hospital admissions due to diabetes short-term complications during the outcome measurement period. After controlling for age, gender, race, and comorbidities (Charlson Comorbidity Index), the odds for hospital admission due to diabetes short-term complications was 25.4% (OR: 1.254; 95%CI: 1.072–1.467) higher for poor adherent patients and 48.0% (OR: 1.480; 95%CI: 1.326–1.653) higher for very poor adherent patients when compared to patients who were adherent to oral hypoglycemics. **CONCLUSIONS:** Nonadherence to oral hypoglycemics is associated with increased risks for potentially avoidable hospitalizations due to diabetes short-term complications. Medicare prescription drug plans should consider developing targeted interventions to improve adherence to oral hypoglycemics.

**PDB59**

### EFFECT OF CAPITATED MEDICAID HEALTH PLANS ON MEDICATION ADHERENCE AND HEALTH CARE SERVICE UTILIZATIONS IN TYPE-2 DIABETES

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**OBJECTIVES:** There is a scarcity of the literature evaluating the impact of Medicaid payment mechanisms on outcomes in diabetes. The objectives of this study was to examine the impact of Capitated vs. Fee-For-Service (FFS) health plans on medication adherence and health care service utilizations in type-2 diabetes Medicaid enrollees. **METHODS:** A retrospective database study comprised of patients with type-2 diabetes (n = 8,581) enrolled in the Medstat MarketScan® MultiState Medicaid database from July 1, 2002 to December 31, 2005. Patients were followed for 6 months before and 12 months after the index anti-diabetic medication to collect the data on the baseline characteristics, medication adherence and health care service utilizations. Multiple log-linear regression analysis was used to predict medication adherence and logistic regressions were used to examine the health care service utilizations. **RESULTS:** A total of 3763 (44%) of the patients enrolled in capitated plans and 4818 (56%) in FFS plans. Patients with capitated plans had 5% lower adherence to anti-diabetes medications compared to those with FFS plans (5%; P < 0.05). Patients with capitated health plans had 33% more likelihood of getting hospitalized (OR: 1.33; 95% CI: 1.17, 1.49) and 16% increased odds of having ER visit as compared to those with FFS (OR: 1.16; 95% CI: 1.06, 1.28). Further, 10% increase in medication adherence was associated with 7% decreased in the odds of hospitalizations (OR: 0.53; 95%CI: 0.46, 0.66) and 6% decreased in the odds of ER visits (OR: 0.48; 95% CI: 0.40, 0.55). **CONCLUSIONS:** Patients with capitated health plans had significant lower medication adherence and also associated with significantly higher health care service utilizations. Capitated managed care plans may not be cost effective for the long term management of chronic conditions such as diabetes.

**PDB60**

### ASSESSMENT OF THE INTERVAL BETWEEN FIRST EXENATIDE CLAIM AND LAST PRIOR ORAL ANTIDIABETIC CLAIM

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**OBJECTIVES:** Access to prescription drugs may be controlled by formulary step edits. Specific criteria are sometimes set by insurers for drug coverage. Exenatide coverage may require previous prescriptions for oral antidiabetics (OAD), typically either metformin (MET), sulfonylureas (SULF) or thiazolidediones (TZD) within specific intervals or "look-back windows". These typically range from 60 to 180 days. This analysis assessed the timing of OAD claims prior to initiation of exenatide. **METHODS:** Data were obtained from the HealthCore Integrated Research Database™. Adult patients had a claim for exenatide between May 1, 2005 and March 31, 2008, ≥12 months pre-index eligibility, and a type-2 diabetes diagnosis (N = 22,533). **RESULTS:** A pre-index OAD claim was present for 20,228 (95%) patients. The mean (±SD) duration for any previous claim of either MET, SULF or TZD was 60 ± 116. For MET, SULF and TZD individually, durations were 95 ± 168, 116 ± 202, and 135 ± 200 days, respectively. For patients ≥65 years (n = 2301) the mean (±SD) duration for any previous claim for either MET, SULF or TZD was 63 ± 114 days and for MET, SULF and TZD individually, durations were 110 ± 174, 104 ± 169, and 144 ± 199 days, respectively. Of the entire cohort 6280 (28%) did not have a claim for MET, SULF or TZD within 60 days of exenatide. Of those with an OAD claim, 3975 (20%) did not have a claim for MET, SULF or TZD within 60 days. **CONCLUSIONS:** These data represent only successfully adjudicated exenatide claims. Plans in this database may have had OAD step edits in place at some time during the study period. For plans with no OAD step edits, mean durations may have been longer and the percent of patients with fills after 60 days higher. This analysis supports careful consideration of look-back window durations. Overly restrictive intervals (i.e., 60 days) may inappropriately exclude patients from receiving exenatide.

**PDB61**

### HEALTH CARE COSTS AND UTILIZATION ASSOCIATED WITH TREATMENT MODIFICATION IN TYPE-2 DIABETES MELLITUS (T2DM) PATIENTS TAKING ORAL ANTI-DIABETIC DRUGS (OADS)

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**OBJECTIVES:** To provide the optimal benefit-risk profile, OADs must be appropriately titrated and, often, used in combination. We compared overall health care utilization and costs among diabetic patients who added a new OAD medication to initial therapy and those with up-titration of initial OAD **METHODS:** Insurance claims data were obtained from ~90 health plans for patients age ≥18 years with diagnosis of T2DM based on ≥2 ICD-9 claims during the period January 1, 2001–June 30, 2007 and newly prescribed metformin or sulfonylurea monotherapy regimen lasting ≥90 days. Patients with type-1 or gestational diabetes, or OAD use within 180 days prior, were excluded. Patients (N = 22,917) were followed after initiation of monotherapy to identify occurrence of first treatment modification (addition or up-titration). Study outcomes were analyzed during one year after first treatment modification. **RESULTS:** Overall, 27% of patients (n = 6,191) had a new OAD added to their initial OAD, while 73% of patients (n = 16,726) had initial OAD up-titrated. During the post-treatment modification period, all medication costs for the addition cohort were higher than for the up-titration cohort [mean (SD), median = $4618.67 ($8313.00), $2870.73 vs. $4004.19 ($8158.37), $2188.345; p < 0.0001] but total health care costs were lower [$8157.41 (16771.09), $4264.44 vs. $8447.33 (20281.44), $4764.17; p < 0.0001], largely due to lower costs for inpatient admissions [$1641.76 ($10124.90), $1647.73 vs. $1960.42 ($13363.90), $1819.10; p = 0.0002]. In a multivariable model adjusting for prior health care expenditure, demographic and clinical variables, total costs of new OAD addition remained significantly lower than costs of initial OAD up-titration [$9568 vs. $10027.13; p = 0.048]. **CONCLUSIONS:** Up-titration of initial OAD therapy was associated with higher subsequent total health care costs than addition of another OAD, perhaps due to limited incremental efficacy when up-titrating beyond intermediate doses. When appropriate, physicians should consider adding an OAD rather than up-titrating the current OAD.

**PDB62**

### THE IMPACT OF PHARMACISTS INTERVENTIONS ON OUTCOMES OF DIABETIC PATIENTS COMPARED TO USUAL CARE

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**OBJECTIVES:** To evaluate the effect of pharmacist interventions on diabetic patient outcomes compared to usual care without pharmacist clinical intervention. **METHODS:** The study was implemented in "Safety Net" clinics located in Los Angeles County serving poor, Hispanic patients. Pharmacist services included review of the patient's medical and medication history, medication evaluation and adjustments or deletions under an established protocol, ordering and reviewing routine laboratory tests [e.g., HbA1c levels, LDL, HDL, etc.], monitoring patient compliance, patient education and scheduling follow-up visits. Control patients were selected retrospectively to match the intervention cohort. The primary outcome was measured as the reduction of A1c and the percentage of patients who achieved the treatment goal, an A1c <7%. Secondary outcomes focused on the diabetes-related outcomes, a decreased in blood pressure, lipid levels and BMI. **METHODS:**: Multiple linear regres-