

(21%) and showed higher systolic and diastolic blood pressure, blood glucose levels, hemoglobin A1c, total cholesterol, and triglycerides levels compared with normal-weight adolescent females ( $p < 0.05$ ). There was a statistically significant association between the BMI status of mothers and infants' birth weight, with underweight/normal-weight mothers having more low birth weight (LBW) babies and overweight/obese mothers having more large babies. The odds of having a LBW baby was 0.61 (95% CI: 0.41, 0.89) lower in obese compared with normal-weight adolescent mothers. The risk of having a preterm birth before 37 weeks was found to be neutral in obese compared to normal-weight adolescent mothers (OR = 0.81, 95% CI: 0.53, 1.25). Preliminary associations are similar to those reported in the published literature. **DISCUSSION/SIGNIFICANCE OF IMPACT:** This EHR database uses available measures from routine clinical care as a "rapid assay" to explore potential associations, and may be more useful to detect the presence and direction of associations than the magnitude of effects. This partnership has engaged community clinicians, laboratory and clinical investigators, and funders in study design and analysis, as demonstrated by the collaborative development and testing of hypotheses relevant to service delivery.

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### Collective capacity building tool (CCBT): A unique instrument and process supporting community-campus partnerships for translation

Kathryn Nearing, Donald Nease, Montelle M. Tamez, Martha Tenney and Elizabeth Sweitzer

**OBJECTIVES/SPECIFIC AIMS:** (1) Provide an innovative tool used to accelerate and evaluate T3-T4 research; (2) describe the collective capacity building tool (CCBT) methodology—both programmatic and evaluative applications; and (3) share insights about the process and outcomes of community-engaged research. **METHODS/STUDY POPULATION:** Academic and community-based partners complete the assessment together at the beginning and conclusion of their Community Engagement pilot projects. Further, they are encouraged to use the tool and the associated insights/priorities that emerge as the basis for data-driven coaching with Community Research Liaisons throughout the 12-month grant cycle. **RESULTS/ANTICIPATED RESULTS:** Pre/post results with 4 cohorts of pilot grantees consistently demonstrated the most positive change in relation to 1 item: overcoming previously identified barriers to community engagement (eg, language, mistrust, scheduling conflicts). Other key findings: (1) networks of reciprocal ties expand, providing structures to support dissemination of information and interventions. (2) Partners leverage expanded networks to pursue follow-on funding and extend the scope/reach of their efforts geographically and/or with new populations. (3) Projects enhance trust in the research process by developing group processes that facilitate the respectful sharing of diverse (often alternative) viewpoints and through culturally-responsive project implementation. **DISCUSSION/SIGNIFICANCE OF IMPACT:** The CCBT can be used at multiple points in time to help project partners achieve the deliberate integration of CBPR principles in practice and advance community-engaged translational research efforts for sustainability and scalability. The CCBT is sensitive enough to document the iterative nature of partnership development and CBPR. An example: a great deal of variability was found in how formally partners defined roles. Further, partner roles often changed as projects evolved. Still, results indicated a general trend toward achieving greater clarity in partner roles over time. Further, the tool captured set-backs due to partner turn-over and partnerships regaining momentum after new staff came on board. Results have strong face validity: more mature partnerships reported stronger community connections and previous successes to build upon. Perhaps most importantly: the tool and associated process was well-received by academic and community-based partners alike.

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### The SDM learning loop model

Sarah Ronis, Kurt Stange and Lawrence Kleinman  
Case Western Reserve University, Cleveland, OH, USA

**OBJECTIVES/SPECIFIC AIMS:** (1) To propose an iterative decision-making model of care planning for CSHCN. (2) To identify targets warranting measurement in future studies of SDM in care planning for CSHCN. **METHODS/STUDY POPULATION:** Conceptual model developed by a multi-disciplinary team iteratively considering the complex relationships among diverse factors affecting care planning for CSHCN, informed by clinical and implementation science experience and a scoping literature review of medical and cognitive sciences literature addressing interpersonal decision-making,

communication, negotiation, and trust among children, their parents, and their clinicians. **RESULTS/ANTICIPATED RESULTS:** Decision-making interventions in pediatrics tend to focus narrowly on single acute decisions, providing minimal guidance for decisions related to chronic disease management over time. Few models account for the role of the child in the decision-making process, despite their ongoing development. Therefore, we propose a model of shared decision-making in the context of managing chronic illness in children that recognizes all actors and can support both the design of clinical care and research. This model—The SDM Learning Loop Model—highlights the dynamic iterative nature of exchanges between and among the clinical team and the parent-child dyad and recognizes the child as the center of each decision-making cycle. The model accounts for key practice, family, experiential, and emotional contexts influencing the decision-making encounter. In this model, change in child health status and developmental capacity resulting from a given cycle's care plan will directly influence the relationship between clinician and parent-child dyad (eg, mutual trust, attunement) and impact each party's engagement in the next round of decision-making. The relationship between experience and outcome stimulates learning. **DISCUSSION/SIGNIFICANCE OF IMPACT:** Our proposed SDM Learning Loop Model suggests that increasing the shared nature of decision making is not only likely to optimize care planning, but creates "buy-in" that can both reinforce the impact of positive outcomes, and moderate the negative impact on relationships when the outcome is other than desired. We hypothesize that this model can guide care planning and shape research to the benefit of both clinical outcomes and clinician-family relationships. Future work should focus on the development and validation of measures to account for the experiential and emotional contexts in which such decisions are made, and the outcomes of care in this population.

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### Screening for diabetes in high-risk women: Building the data infrastructure to study postpartum diabetes screening among low-income women with gestational diabetes

Cynthia Joan Herrick, Ben Cooper, Matthew Keller, Margaret Olsen and Graham Colditz

Institute of Clinical and Translational Sciences, Washington University in St. Louis, St. Louis, MO, USA

**OBJECTIVES/SPECIFIC AIMS:** Women with GDM have a 7-fold higher risk of developing T2DM, and rates of GDM are higher among racial and ethnic minorities and women of lower socio-economic status. There are no data on postpartum diabetes screening after the first postpartum year or among women receiving care in FQHCs. We aim to address this gap in the literature by (1) defining the rates of follow-up screening for T2DM at 6–12 weeks and 1–3 years postpartum and (2) characterizing patient, provider, and healthcare system attributes that are associated with lack of follow-up screening for T2DM in a population of low-income women with GDM. **METHODS/STUDY POPULATION:** This is a retrospective cohort study of women with GDM during pregnancy receiving care in Missouri FQHCs from 2010 to 2015. Electronic health records (EHR) data from 26 FQHCs is housed in a central repository through the Missouri Primary Care Association (MPCA). This includes patient demographic, lab, and medication information as well as encounter level patient and provider data for the prenatal and postpartum period. EHR data does not include accurate delivery information, however. Pregnancies during the study time frame were identified using CPT and ICD9/10 codes. Deidentified data on individuals with a pregnancy was utilized to identify a subpopulation of "GDM candidates," using a broad definition of glucose abnormalities as follows: ICD-9/ICD-10 codes for diabetes, medications and testing supplies used for diabetes, infant birth weight  $\geq 4000$  g or 8 lb or 13 oz, or abnormal glucose labs [defined as fasting glucose  $\geq 95$ , gestational glucose screen  $\geq 130$ , 1 h test  $\geq 130$  (or  $\geq 180$  if 2 h test and 3 h test recorded on same day), 2 h test  $\geq 155$ , 3 h test  $\geq 140$ , A1C  $\geq 6$ , any glucose  $\geq 130$ , or any positive urine glucose]. This subpopulation was then linked to Medicaid administrative claims data [housed at the University of Missouri Office of Social and Economic Development Analysis (OSED)], providing detailed information on delivery, to further characterize patients with GDM in the time frame and provide all dates necessary to classify pregnancy and postpartum periods. **RESULTS/ANTICIPATED RESULTS:** From the de-identified pregnancy data set including 45,810 individuals, we identified 8008 "GDM candidates." EHR data were linked to Medicaid claims data for these individuals from 2010 to 2015. Utilizing the enhanced data set, we are defining a pregnancy for each individual by the delivery date in the Medicaid record and an algorithm using lab and ultrasound record dates to define gestational age at delivery. This will result in a pregnancy level data set linked with individual encrypted identifiers with each record representing 1 pregnancy and postpartum period. GDM in pregnancy will be

defined as having a baby with birth weight  $\geq 4000$  g or 8 lb or 13 oz, ICD-9 or ICD-10 code for GDM during pregnancy or at delivery, or an oral glucose tolerance test (oGTT) 12–16 weeks before delivery with 2 or more abnormal results by Carpenter and Coustan criteria. We anticipate that our final GDM data set will include 2000–3000 individuals. We will then calculate the percentage of individuals receiving recommended screening tests at 6–12 weeks (fasting glucose or 2 h oGTT) and 1–3 years postpartum (fasting glucose, 2 h oGTT, HbA1C). We will use multivariable regression techniques to identify risk factors for lack of screening. We will be able to incorporate predictors not previously evaluated including distance from home to health center, access to public transport, specialty and training of the patient's providers, pregnancy weight gain, postpartum appointment time of day, and number of various types of office visits. **DISCUSSION/SIGNIFICANCE OF IMPACT:** The creation of a linked data set of pregnancies complicated by GDM in women receiving care in FQHCs in Missouri is the first step toward better characterizing follow-up diabetes screening rates in this population and understanding patient, provider, and healthcare system variables that affect postpartum screening. The ultimate goal is to translate evidence-based patient-centered sustainable interventions into practice for low-income women with a history of GDM and improve population outcomes with the ability to track progress prospectively over time.

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### Decreasing loss to follow up after surgery for meningioma

Whitney Muhlestein, Alice Song, David G. Schlundt and  
Lola B. Chambless

**OBJECTIVES/SPECIFIC AIMS:** "Loss to follow up" is a common phenomenon and challenge in clinical medicine. Missed appointments are a well-documented source of waste in the health care system, and can lead to strained patient-physician relationships and inferior quality of care. Meningiomas are relatively common, benign tumors that arise from the dural coverings of the brain. Although complete surgical resection is considered curative, surgically excised meningiomas have a well-documented propensity to recur, necessitating continued imaging surveillance of postresection patients. A recent retrospective study at our institute demonstrated that 20% of postresection patients fail to return for follow up within a year of their surgery. Although social determinants of health have been associated with failure to follow up in this population, there has been no research identifying patient-reported barriers that result in loss to follow up in this patient population. The purpose of this study is to identify specific barriers that prevent patients from returning for surveillance. **METHODS/STUDY POPULATION:** We used an IRB approved, prospective brain tumor clinical database to identify patients who underwent surgical resection of intracranial meningioma at our institution between 2001 and 2013. "Loss to follow up" was defined as failure to attend follow-up appointments with neurosurgery, radiation oncology, or neuro-oncology within a year of the most recent assigned follow-up interval, as recorded in the electronic medical record. Structured interviews were conducted with patients who met study criteria and specific barriers to follow-up were elicited, transcribed, and coded. In 2 cases, a primary caregiver participated in all or portions of the interview with the patient. A general assessment of patient knowledge about meningioma and a screening for basic health literacy were also conducted. **RESULTS/ANTICIPATED RESULTS:** There were 80 patients in the brain tumor clinical database met chart review criteria for inclusion in the study. A total of 9 structured interviews were conducted; 1 interview was excluded from analysis for failure to meet study criteria. In total, 24 unique obstacles to follow up were recorded. These were stratified and grouped into 4 broad categories: 2 of 8 (25%) patients identified environmental factors, including distance to appointment and challenges with insurance coverage as barriers to follow up; 2 patients (25%) identified psychosocial factors, including poor communication with and distrust of their neurosurgeon as barriers to follow up; 2 (25%) patients identified health factors, including poor health and old age, as barriers to follow up; 6 patients identified healthcare systems factors as barriers to follow up, with 6 patients (75%) reporting seeing a non-specialist for follow up after surgery and 4 patients (50%) reporting not being told by their neurosurgeon that they would need continued follow up. Of those patients seen by non-specialists, only 1 reported any recent brain imaging by those providers. All patients had limited to no prior knowledge of meningiomas before their diagnosis. Four (50%) patients reported satisfaction with the level education about meningiomas they received from their physician. Of these patients, 3 (75%) correctly reported that meningiomas may recur following surgery. Of the patients who did not report satisfaction with physician counseling, 3 (75%) did not realize that meningiomas can recur. **DISCUSSION/**

**SIGNIFICANCE OF IMPACT:** Healthcare system factors, including uncoordinated transition of postoperative care to non-neurosurgeons and uncertain postoperative surveillance schedules, represent that most common patient-identified barriers to follow up after meningioma resection. Improving transition of care from specialists to non-specialists, including designation of appropriate imaging surveillance schedules, as well as improving communication between specialists and patients about the need for continued follow up, represent clear points for intervention that could improve care for this patient population. In addition, consistent and clear counseling about meningioma and its disease course may reduce loss to follow up following meningioma resection. It is important to note, however, that the small sample size represents a significant limitation of the study.

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### Incidence and predictors of noncompliance with evidence-based guidelines for early stage breast cancers using the National Cancer Data Base

Albert Liao, Grant W. Carlson, John William Eley and  
Theresa W. Gillespie

**OBJECTIVES/SPECIFIC AIMS:** Evidence-based guideline-concordant care leads to better outcomes in patients with early stage breast cancer, including survival. However, previous studies of guideline compliance have been limited by small study sample sizes, localized geography, unknown causal factors, and lack of diverse population. We use a national database to assess socio-economic, clinical, and facility factors that impact treatment compliance with evidence-based guidelines from the American Society of Clinical Oncology (ASCO) and the National Comprehensive Cancer Network (NCCN). **METHODS/STUDY POPULATION:** This is a retrospective cohort study of the National Cancer Data Base Participant User File Breast 2014, which captures ~70%–80% of all newly diagnosed cancer cases in the United States. Female patients who were diagnosed with early stage breast adenocarcinoma (T0, T1, T1A, T1B, 2, 2A, or T2N1) from 2004 to 2014 were eligible for this study. **RESULTS/ANTICIPATED RESULTS:** A total of 807,314 patients were included in this study. Evidence-based guidelines examined with associated compliance rates include surgery completion (79.3% overall compliance), breast conserving surgery Versus mastectomy (88.05% vs. 11.95%, respectively), radiation after breast conserving surgery (77.5% overall compliance), HER2 testing (88.6% overall compliance), estrogen/progesterone receptor (ER/PR) testing (96.3% overall compliance), hormone treatment for positive ER/PR breast cancer (80.2% overall compliance), and sentinel lymph node biopsy completion (67.5% overall compliance). Univariate association between these guidelines and covariates such as facility type, facility location, age, race, insurance status, median income quartiles, achievement of high school degree, urban Versus rural, Charlson-Deyo score, year of diagnosis, and overall survival were assessed. Logistic regression analysis will be used to determine multivariate relationships between these characteristics and the probability that a patient will be compliant to guideline regimen. **DISCUSSION/SIGNIFICANCE OF IMPACT:** The results of this study will help identify socio-economic, clinical, and facility factors that influence guideline-concordant care and subsequent critical outcomes for patients with early stage breast cancer. Lack of guideline concordant care for specific stages of cancer or treatment modalities will point to a need for tailored interventions to enhance compliance. A prediction model will help identify the most important predictors of noncompliance in breast cancer treatment so noncompliance can be prevented in at-risk populations.

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### Brain thermometry to detect neuroinflammation in traumatic brain injury

Kelsey Campbell, Joanne C. Lin, Robert C. Brunner,  
Thomas A. Novack and Jarred W. Younger

**OBJECTIVES/SPECIFIC AIMS:** In this pilot study, we are testing a new approach for detecting neuroinflammation in individuals who have sustained a traumatic brain injury (TBI). We hypothesize that many long-term adverse consequences of TBI are driven by abnormal inflammatory processes in the brain that occur secondary to the original neural injury. This inflammation can spread well beyond the damaged tissue and cause profound fatigue, widespread pain, cognitive impairment, and depressed mood. **METHODS/STUDY POPULATION:** Using a technique based on magnetic resonance spectroscopy, we can obtain precise and accurate temperature measurements throughout the human brain, which may serve as a proxy for neuroinflammation. In this study, we examine 20 men who have sustained a moderate-to-severe TBI and 10 age-