

used to assess patient health status. There is an emerging trend of using morphomic variables such as muscle mass and bone mineral density to predict surgical and medical outcomes. In certain cases, it has been shown to predict cancer survival more accurately than conventional staging methods. With the growing popularity of morphomic analysis, it is vital to establish baseline variability against which patient populations can be validated. Of populations receiving radiographic imaging, trauma patients are approximately representative of the general population. We created a reference population of morphomic variables from over 6000 University of Michigan patients presenting with trauma. **METHODS/STUDY POPULATION:** Computed tomography (CT) scans were obtained for all patients who underwent scans for trauma indications at the University of Michigan starting from April 1998. High throughput image processing algorithms written in MATLAB 2015a were used to semi-automatically process chest, abdomen, and pelvis CT scans. Scans were referenced to a common coordinate system based on vertebral levels and body anatomy. Measurements of adiposity, muscle group, and bone density measurements were performed at each level. Percentile curves of morphomic measures of body composition by age and sex were created. The reference population dataset is periodically updated and is publicly accessible. **RESULTS/ANTICIPATED RESULTS:** As of July 2017, over 6000 patients aged 1–81 years have been included in the Reference Analytics Morphomics Population. Patient CT scans were analyzed at the T10, T11, T12, L1, L2, L3, and L4 vertebral levels. Morphomic measures analyzed include body depth, body cross-sectional area, vertebral trabecular bone density, visceral fat area, fascia area, subcutaneous fat area, central back fat, and psoas muscle area. **DISCUSSION/SIGNIFICANCE OF IMPACT:** We created reference curves for several morphomic variables from a Reference Analytic Morphomics Population of over 6000 University of Michigan patients presenting with trauma.

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### Development of the expanded access oversight committee at Michigan Medicine

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**OBJECTIVES/SPECIFIC AIMS:** Expanded Access is an avenue for patients with no available treatment options to access investigational drugs and devices for clinical therapy. This process requires physicians treating these patients to submit requests to the FDA and the local IRB, processes which are typically unfamiliar to clinicians. **METHODS/STUDY POPULATION:** With the goal of reducing burden and ensuring access to investigational products, Michigan Medicine established the Expanded Access Oversight Committee in January 2015. This committee brought together key stakeholders to develop appropriate policy and infrastructure to support these requests. **RESULTS/ANTICIPATED RESULTS:** Outcomes from this committee have resulted in a uniform process with a single point of entry for interested physicians and patients. With standardized policy implemented across the institution, a revised IRB application has been developed that is more tailored to Expanded Access and an informed consent document has been developed specific to the clinical use of investigational therapies. To ensure timely execution of these agreements, the contracts office has streamlined the process for negotiating Expanded Access agreements with manufacturing companies. Further development has begun with the Michigan Clinical Research Unit to provide space for clinical visits in Expanded Access cases, allowing for initiation of outpatient therapy. These changes have allowed Michigan Medicine to support triple the number of Expanded Access requests, including more than 45 Expanded Access requests in fiscal year 2018. **DISCUSSION/SIGNIFICANCE OF IMPACT:** Institutional support for Expanded Access requests within a large academic medical center is feasible and can increase access to investigational therapies for patients.

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### Early findings from a real-world RCT: Acceptance and commitment therapy (ACT) for persistent pain in an integrated primary care setting

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**OBJECTIVES/SPECIFIC AIMS:** This study seeks to test the feasibility and effectiveness of a brief Acceptance and commitment therapy (ACT) treatment for patients with persistent pain in a patient-centered medical home. **METHODS/STUDY POPULATION:** Participants are recruited via secure messaging, clinic advertisements and clinician referral. Primary care patients

age 18 and older with at least 1 pain condition for 12 weeks or more in duration are stratified based on pain severity ratings and randomized into (a) ACT intervention or (b) control group [Enhanced Treatment as Usual (E-TAU)]. Participants in the ACT arm attend 1 individual visit with an integrated behavioral health provider, followed by 3 weekly ACT classes and a booster class 2 months later. E-TAU participants will receive usual care plus patient education handouts informed by cognitive behavioral science. Currently, 17% of our overall goal of 60 patients have completed ACT or enhanced treatment as usual. Average participant age is 49 years old, 70% female, and 70% Hispanic/Latino. Most report multisite pain conditions (e.g., musculoskeletal, fibromyalgia) and 30% are taking opioid medications. Data analysis in this presentation will include early correlational findings from baseline assessments. Upon study completion, we will analyze data using a general linear mixed regression model with repeated measures. **RESULTS/ANTICIPATED RESULTS:** The overall hypothesis is that brief ACT treatment reduces physical disability in patients with persistent pain when delivered by an integrated behavioral health provider in primary care. By examining a subset of patients on opioid medications, we also anticipate a reduction in opioid misuse behaviors. Additionally, it is anticipated that improvements in patient functioning will be mediated by patient change in pain acceptance and patient engagement in values-consistent behaviors. **DISCUSSION/SIGNIFICANCE OF IMPACT:** This pilot study will establish preliminary data about the feasibility and effectiveness of addressing persistent pain in a generalizable, “real-world” integrated primary care setting. Data will help support a larger trial in the future. If effective, findings could improve treatment methods and quality of life for patients with persistent pain using a scalable approach.

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### Evolution of the interdisciplinary co-citation network supported by the Georgia Clinical and Translational Science Alliance Program from 2006 through 2016

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**OBJECTIVES/SPECIFIC AIMS:** The National Institutes of Health (NIH) has provided continual support for the Georgia Clinical and Translational Science Alliance (CTSA) since 2006. An overarching goal of the Georgia CTSA is to accelerate clinical and translational research to impact health in Georgia and beyond. Toward these ends, a primary objective has been to support interdisciplinary research projects encompassing 2 or more disciplinary domains. The goal of the present study is to evaluate the degree to which interdisciplinary research projects increased in prevalence during the first decade of funding. **METHODS/STUDY POPULATION:** We began by using PubMed to identify all publications citing the Georgia CTSA hub (n = 1865), categorizing each article as encompassing 1 or more research domain using a taxonomy derived from the Web of Science. We created 1 network for each of the 10 years with nodes representing research areas and ties between pairs of nodes representing the presence of 1 or more publication integrating both research areas. We conducted longitudinal network analyses using an approach called MCMC MLE Temporal Exponential Random Graph Models, which models the antecedents of networks over time. **RESULTS/ANTICIPATED RESULTS:** Supporting Georgia CTSA objectives, results suggest the probability of publications connecting multiple research areas increased over time, with substantially greater increases appearing initially as compared to later years. **DISCUSSION/SIGNIFICANCE OF IMPACT:** This study advances an innovative approach to modeling the system-wide impact of CTSA hub funding.

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### Exploring the relationships between acculturation, discrimination and function in older African immigrants: A dissertation study

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**OBJECTIVES/SPECIFIC AIMS:** Acculturation and discrimination are associated with negative health outcomes including functional disability. The effect of these on functional disability in older African immigrants in the United States is not well understood. The purpose of this study is to describe and examine the experiences of acculturation, racial discrimination and functional disability in older African immigrants. **METHODS/STUDY POPULATION:** This study will use cross-sectional quantitative and qualitative mixed methods design. We plan

to recruit 150 older (>55 years) participants through the African Immigrant Health Study and community-based organizations serving African immigrants. We will use the PROMIS physical function measure to assess functional disability, the Everyday Discrimination scale and the Psychological Acculturation scale will be used to measure discrimination and acculturation respectively. Higher scores indicate greater severity. RESULTS/ANTICIPATED RESULTS: We have recruited 12 participants so far. The mean age is 57 years and mean length of stay in the United States is 23 years. Mean disability score is 6.5 (range 1–38). Mean discrimination is 8.2 (range 4–15). The prevalent acculturation strategy of these participants (7) is marginalization (neither identified with the American nor African cultures). DISCUSSION/SIGNIFICANCE OF IMPACT: Preliminary results indicate pervasive discrimination and marginalization of study participants. Exploring these experiences can inform preventive strategies of coping and health behaviors that can decrease the negative effects of discrimination, acculturation and functional disability in African immigrants.

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### Factors associated with dual use of VA and civilian healthcare among U.S. National Guard and Reserve soldiers

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OBJECTIVES/SPECIFIC AIMS: Approximately 25%–45% of veterans are dual users of VA and civilian healthcare. In order to maximize patient outcomes, understanding factors related to dual use is important. This study examined mental and physical health factors related to dual use of VA and civilian healthcare among U.S. National Guard and Reserve (NG/R) soldiers. METHODS/STUDY POPULATION: NG/R soldiers and their partners ( $n=411$  couples) participated in an electronic survey assessing health and health behaviors. Logistic regression models were used to examine the relationship between mental health (anxiety, depression, PTSD, anger), general health, and VA disability status at baseline, with usage of both VA and civilian healthcare among male soldiers ( $n=109$ ) at the second year follow-up, controlling for age and race. RESULTS/ANTICIPATED RESULTS: In the final adjusted models, of the mental health conditions, only anxiety was related to dual use (OR: 1.08, 1.01–1.16,  $p < 0.05$ ). Having a VA disability rating (OR: 4.00, 1.22–13.18;  $p < 0.05$ ) was also related to being a dual user. General health was not related to dual use. DISCUSSION/SIGNIFICANCE OF IMPACT: While research has identified demographic characteristics (e.g., rurality, race, income) related to dual healthcare use, our results indicate that mental health, particularly anxiety, may also be related to dual use. Further study is needed to tease out the prime drivers of dual use to identify future care delivery mechanisms that will maximize treatment outcomes and minimize duplicative care.

2400

### How have characteristics of end-of-life family caregiving changed from 1999 to 2015? Preliminary results from two waves of nationally representative data

Judith Vick and Jennifer Wolff

OBJECTIVES/SPECIFIC AIMS: Family members are often critical in the delivery of hands-on care and decisions about care for persons approaching end-of-life (EOL). Prompted by concerns about the poor quality and high costs of care at the EOL, recent delivery reform efforts—such as the growth of hospice and palliative care—have been directed at improving EOL care for both patients and family. Trends of the characteristics of EOL family caregivers and care recipients over time have not been well described. The goal of this study is to evaluate changes in EOL family caregiving from 1999 to 2015. METHODS/STUDY POPULATION: This study uses reconciled data from two nationally representative surveys and their linked caregiver surveys: the 1999 wave of the National Long-Term Care Survey (NLTC) and the Informal Care Survey (ICS), and the 2015 wave of the National Health and Aging Trends Study (NHATS) and the National Survey of Caregiving (NSOC). RESULTS/ANTICIPATED RESULTS: Crude analysis shows that older adults living in the community and receiving help from family caregivers in the last year of life were significantly better educated (72% with greater than 12 years of education vs.

46%), and more diverse (78% White vs. 89%) in 2015 compared with 1999. Family caregivers in the last year of life were less likely to be female in 2015 compared with 1999 (74% vs. 68%, NS) and significantly less likely to be spouses (45% vs. 38%) in 2015. In 2015, a significantly greater proportion of older adults received help with five or more activities of daily living (47% vs. 34%), but family caregivers reported significantly lower levels of caregiving-associated distress: financial strain (80% reporting none in 2015 vs. 53%), emotional (51% vs. 39%), and physical strain (70% vs. 45%). In addition, a significantly greater proportion of EOL family caregivers used respite care in 2015 compared to 1999 (15% vs. 4%). DISCUSSION/SIGNIFICANCE OF IMPACT: Changes in the experience of EOL family caregiving may be impossible to capture in studies of single interventions, but tracking nationally representative trends can be used as an indicator of broader changes that take place cumulatively over time. Although studies of this nature cannot identify causal mechanisms of change, they are important to monitor long-term impact of program implementation and to guide future research, policy, and resource allocation.

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### Impact of primary care physician gatekeeping on medication prescriptions for atrial fibrillation

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OBJECTIVES/SPECIFIC AIMS: Atrial fibrillation (AF) is the most commonly encountered arrhythmia in clinical practice, and has widely varying treatments for stroke prevention and rhythm management. Some of these therapies are increasingly being prescribed by primary care physicians (PCPs). We therefore sought to investigate if healthcare plans with PCP gatekeeping for access to specialists are associated with different pharmacologic treatment strategies for the disease. In particular, we focused on oral anticoagulants (OACs), non-vitamin K-dependent oral anticoagulants (NOACs), rate control, and rhythm control medications. METHODS/STUDY POPULATION: We examined a commercial pharmaceutical claims database (Truven Marketscan™) to compare the prescription frequency of OAC, rate control, and rhythm control medications used to treat AF between patients with PCP-gated health plans (where the PCP is the gatekeeper to specialist referral—i.e., HMO, EPO, POS) and patients with non-PCP-gatekeeper health plans (i.e., comprehensive, PPO, CHDP, HDHP). To control for potential confounders, we also used multivariable logistic regression models to calculate adjusted odds ratios which accounted for age, sex, region, Charlson comorbidity index, CHADS2Vasc score, hypertension, diabetes, stroke/transient ischemic attack, prior myocardial infarction, peripheral artery disease, and antiplatelet medication use. We also calculated median time to therapy to determine if there was a difference in time to new prescription of these medications. RESULTS/ANTICIPATED RESULTS: We found only small differences between patients in PCP-gated and non-PCP-gated plans regarding prescription proportion of anticoagulants at 90 days following new AF diagnosis (OAC 44.2% vs. 42%,  $p < 0.01$ ; warfarin 39.1% vs. 37.1%,  $p < 0.01$ ; NOAC 5.9% vs. 6.0%,  $p = 0.64$ ). We observed similar trends for rate control agents (76.4% vs. 73.4%,  $p < 0.01$ ) and rhythm control agents (24.4% vs. 24.6%,  $p = 0.83$ ). We found similar odds of OAC prescription at 90 days following new AF diagnosis between patients in PCP-gated and non-PCP-gated plans (adjusted OR for PCP-gated plans relative to non-gated plans: OAC 1.006,  $p = 0.84$ ; warfarin 1.054,  $p = 0.08$ ; NOAC 0.815,  $p = 0.001$ ; dabigatran 0.833,  $p = 0.004$ ; and rivaroxaban 0.181,  $p = 0.02$ ). We observed similar trends for rate control agents (1.166,  $p < 0.0001$ ) and rhythm control agents (0.927,  $p = 0.03$ ). Elapsed time until receipt of medication was similar between PCP-gated and non-gated groups [OAC 4 ± 14 days (interquartile range) vs. 5 ± 16 days,  $p < 0.0001$ ; warfarin 4 ± 14 vs. 5 ± 14,  $p < 0.0001$ ; NOAC 7 ± 26 vs. 6 ± 23,  $p = 0.2937$ ; rhythm control 13 ± 35 vs. 13 ± 34,  $p = 0.8661$ ; rate control 10 ± 25 vs. 11 ± 30,  $p < 0.0001$ ]. DISCUSSION/SIGNIFICANCE OF IMPACT: We found that plans with PCP gatekeeping to specialist referrals were not associated with clinically meaningful differences in prescription rates or delays in time to prescription of oral anticoagulation, rate control, and rhythm control drug therapy. In some cases, PCP gatekeeping plans had very small but statistically significant lower odds of being prescribed NOACs. These findings suggest that PCP gatekeeping does not appear to be a major structural barrier in receipt of medications for AF, although non-PCP-gated plans may vary slightly favoring facilitating the prescription of NOACs. Our findings that overall OAC prescriptions did not differ by PCP gating status may suggest completion of the rapid dissemination and uptake phase for most AF treatments. The small but statistically significant odds ratios favoring the non-PCP-gated populations in NOACs further suggests that in this newer drug group, the process is ongoing, with more specialists representing early adopters. Interestingly,