

was implemented as a software tool on the WinForms platform. It automated the FI calculation by counting deficits accumulation across multiple domains assessing medical conditions, cognition, balance, and dependency of activities of daily living. Debugging, testing, and optimization were performed to enhance the software performance with respect to automation accuracy (processing algorithm), friendly user interface (user manual and feedback), and data quality control (missing data and value constraints). Systematically-designed simulation dataset and anonymous real-world cases were both applied. The optimized assessment tool resulted in fast and convenient conductance of the CGA, and a 100% accuracy rate of the eFI-CGA automation for up to four decimals. The stand-alone eFI-CGA implementation has provided a PC-based software tool for use by geriatricians and primary and acute care providers, benefiting early detection and management of frailty at points of care for older adults.

#### A GENETIC ALGORITHM-BASED APPROACH TO OPTIMIZE THE CONSTRUCTION OF A FRAILTY INDEX

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The frailty index (FI) is a reliable prognostic indicator based on an individual clinical and functional deficits, which is strongly associated with poor outcomes. We hypothesize that an optimization algorithm may help to select the best candidate deficits to generate a highly-predictive FI. We aimed to optimize the predictive accuracy (area under the curve; AUC) of a FI employing a "genetic algorithm", an iterative meta-heuristic that selects and recombines the most accurate FIs among randomly-generated ones. We used data from 3363 individuals aged 60+ enrolled in the Swedish National Study on Aging and Care in Kungsholmen (SNAC-K). To avoid overfitting, the algorithm was run on a randomly-chosen subsample (70%) of 10 imputed datasets. About 825,000 FIs were built, evaluated, and recombined. The best genetic algorithm-based FI (ga-FI) was compared in terms of 3- and 6-year mortality prediction with a clinically-generated FI (c-FI) in the remaining 30% of the data. Ga-FI showed better AUCs in comparison to the c-FI, overall and in all age and sex subsamples. Several sensitivity analyses were carried out. The major AUC improvement was seen among participants aged <75 [3-year mortality AUC: 0.83 vs 0.63;  $p < 0.001$ ; 6-year mortality AUC: 0.76 vs 0.63;  $p < 0.001$ ], while smaller differences were seen among participants aged  $\geq 75$  [3-year mortality AUC: 0.86 vs 0.84;  $p = 0.216$ ; 6-year mortality AUC: 0.84 vs 0.81,  $p = 0.017$ ]. The genetic algorithm is a feasible method to optimize the construction of a highly performant FI that might be used to assess health comprehensively both in clinical and research settings.

#### MULTIDIMENSIONAL FRAILTY SCORE IS SUPERIOR TO PREDICT COMPLICATIONS AFTER SURGERY THAN CONVENTIONAL RISK FACTORS

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Frail older adults are at increased risk for postoperative morbidity compared with their robust counterparts. We compared predictive utility of multidimensional frailty score (MFS) with physical performance parameters or conventional risk stratification indicators to identify postoperative complication in older surgical patients. From January 2016 to June 2017, 648 older surgical patients (age  $\geq 65$ ) were included for analysis. The MFS was calculated through comprehensive geriatric assessment (CGA). Grip strength and gait speed were measured preoperatively. The primary outcome was postoperative complication (eg, pneumonia, urinary tract infection, delirium, acute pulmonary thromboembolism, and unplanned ICU admission). Secondary outcome was 6-months all-cause mortality. Sixty-six (10.2%) patients experienced postoperative complications and 6-months mortality was 3.9% ( $n = 25$ ). Grip strength, gait speed, MFS and ASA classification could predict postoperative complication but only MFS (Hazard Ratio = 1.564, 95% CI, 1.283-1.905,  $p < 0.001$ ) could predict 6-months mortality after full adjustment. MFS (C index = 0.747) had superior prognostic utility than age (0.638,  $p$  value = 0.008), grip strength (0.566,  $p$  value  $< 0.001$ ) and ASA classification (0.649,  $p$  value = 0.004). MFS only had additive predictive value on both age (C-index of 0.638 (age) vs 0.754 (age + MFS),  $p = 0.001$ ) and ASA classification (C index of 0.649 (ASA) to 0.762 (ASA + MFS),  $p < 0.001$ ) for postoperative complication, but gait speed or grip strength had no statistical additive prognostic value on both age and ASA classification.

#### DOES PHYSICAL FUNCTION RESPONSE TO INTENTIONAL WEIGHT LOSS IN OLDER ADULTS VARY BY SEX-GENDER?

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The purpose of this study is to explore whether the effect of intentional weight loss on physical function in older adults varies by sex/gender. Individual level data from 1369 older, (67.7 $\pm$ 5.4 years), obese (BMI: 33.9 $\pm$ 4.4 kg/m<sup>2</sup>), adults (30% male, 21% African American) who participated in eight randomized controlled trials of weight loss were pooled. All studies were 5-6 months in duration and collected baseline demographic and pre/post gait speed ( $n = 1296$ ), short physical performance battery (SPPB;  $n = 866$ ), and grip strength ( $n = 401$ ) data. Treatment effects were generated by weight loss assignment [weight loss (WL;  $n = 764$ ) versus non-weight loss (NWL;  $n = 605$ )], as well as categorical amount of weight change (high loss:  $> -7\%$ , moderate loss:  $-7$  to  $-3\%$ , and weight gain/stability:  $< -3\%$ ). Analyses were adjusted for age, race/ethnicity, study, education, baseline BMI, and baseline value of the outcome measure of interest. Sex/gender

stratified results were presented if the interaction term was  $p \leq 0.10$ . A sex/gender\*weight loss assignment interaction was observed for SPPB ( $p=0.07$ ), with women experiencing greater weight loss-associated improvement in SPPB score (WL:  $0.42 \pm 0.08$  versus NWL:  $0.10 \pm 0.09$ ;  $p=0.02$ ) compared to men (WL:  $0.30 \pm 0.11$  versus NWL:  $0.30 \pm 0.13$ ). A sex/gender\*weight loss amount interaction was observed for grip strength ( $p=0.05$ ), with no difference observed across categories in women; however, greatest grip strength improvement was seen in men experiencing moderate weight loss compared to high loss and weight gain/stability categories. Weight loss-associated improvement in SPPB score is greater in women than men; grip strength gains in men are greatest among those achieving moderate weight loss.

### THE ASSOCIATION OF SUBCLINICAL HYPERTHYROIDISM WITH FRAILTY

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The relevance of subclinical hyperthyroidism in the elderly has not been clearly defined. We studied whether the reported association of low TSH with frailty is an indicator of subclinical hyperthyroidism as assessed by free T3 levels. In a retrospective chart review of patients seen between January 2017 and December 2018 at the Phoenix VA Medical Center, we identified 100 patients aged  $\geq 60$  years with at least 2 low TSH measurements ( $<0.5$   $\mu\text{IU/ml}$ ) and a free T3 measurement within 6 months of the measured TSH and 50 sex- and age-matched controls (TSH  $0.5$ - $5.0$   $\mu\text{IU/ml}$ ). Patients with exogenous or clinical hyperthyroidism were excluded. We used a deficit accumulation approach evaluating 31 factors, to create a frailty index between 0 and 1 for each patient. The higher the FI, the more likely ( $p < 0.001$ ) it was that patients had expired in the interim. Patients with low ( $0.31 \pm 0.11$   $\mu\text{IU/mL}$ ) vs. normal ( $1.84 \pm 0.84$   $\mu\text{IU/mL}$ ) TSH had higher mean FI compared to controls ( $0.25 \pm 0.12$  vs.  $0.15 \pm 0.07$ ,  $p < 0.001$ ). TSH significantly predicted frailty score ( $p < 0.0001$ ) independent of age. However, lower TSH was not associated with higher free T3 or free T4 levels. There was a nonsignificant inverse association of free T3 levels with FI ( $P = 0.09$ ), which disappeared when adjusted for age. Similar to prior studies, low TSH predicted frailty. However, neither free T3 nor free T4 predicted low TSH or frailty index, suggesting that the association of low TSH with frailty is not due to subclinical hyperthyroidism, but perhaps to effects of comorbidities on TSH secretion.

## SESSION 3330 (POSTER)

### HEALTH AND MENTAL HEALTH CARE: USE AND ACCESS

#### A FRAMEWORK FOR CARE TRANSITIONS FOR OLDER ADULTS WITH COMPLEX HEALTH CONDITIONS

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For older adults with complex health conditions, transitions between care settings are common and a major risk to quality of care and patient safety. Care transition interventions have shown positive impacts on continuity of care and health service use, however, most require additional human resources (e.g., transition coach), focus on one transition or “handoff”, and provide support for individual patients without addressing underlying challenges of health system integration. We sought to develop a framework for system-level enhancements to care transitions for older adults. We report a secondary framework analysis of an ethnographic investigation (the “InfoRehab” project) of care transitions for older persons who had experienced a hip fracture. The ethnographic study involved interviews, observations, and document reviews for 23 patients, 19 family caregivers, and 92 health care providers. Data were collected at each transition point (1-4/patient) along the care continuum, at three Canadian sites (large urban, mid-size urban, rural). Our framework analysis followed the approach described by Gale et al. (2013), using as cases 12 peer-reviewed papers which had reported InfoRehab results. Two researchers coded findings from each paper, then developed an analytical framework of eight themes by consensus; these include: patient involvement and choice, family caregiver involvement, patient complexity, health care provider coordination, information sharing, documentation, system constraints, and relationships. NVivo 11 was used to index findings into these themes and to generate a matrix. We are working with system stakeholders, including patients and caregivers, to apply this framework in the development of improved systems for care transitions.

### DECISION-MAKING AND DISPARITIES IN QUALITY OF CHOSEN PLANS AMONG RACIAL-ETHNIC GROUPS IN MEDICARE ADVANTAGE

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Limited research regarding decision-making in Medicare Advantage (MA), which now disproportionately serves racial and ethnic minorities (~45% Hispanics and 30% African-Americans), has been conducted. Without understanding the extent to which vulnerable groups select low quality plans with high out-of-pocket costs (OOPC) and what factors influence this selection, these beneficiaries could continue to be adversely affected. The objective of this study is to understand plan choice decision-making process and differences in quality and OOPC of chosen plans between racial and ethnic minorities enrolled in MA. We used 2015 national data from Medicare and conducted in-depth interviews with 25 MA enrollees. African-Americans were enrolled in plans with higher drug deductibles and lower OOPC. In addition, Hispanics and African-Americans enrollment in high quality