Observational comparative effectiveness studies face the challenge of selection bias. Due to lack of randomization, an alleged treatment effect may reflect inherent differences in baseline characteristics between comparison groups, rather than the outcome of treatment. Propensity score methods were devised to “resample” a most comparable comparison group, under a strong yet untestable assumption of no unmeasured confounding. We present an “exposure crossover” study evaluating complementary and integrative health approaches (CIH) among 6,379 US veterans who received acupuncture, massage or chiropractic therapies between 10/1/2011-9/30/2013. Their average pain intensity ratings (PIRs) during the 12-months after CIH initiation (effect period, EP) were compared with the 12-months before (baseline period, BP). Through this built-in self-matching, veterans’ characteristics and other stable baseline confounding, measured and unmeasured, were presumably eliminated. After accounting for time-varying opioid use and within-subject correlations using a generalized estimating equation, we found that in comparison to the BP, the adjusted mean PIR during the EP was -0.40 (95% Confidence Interval (CI): -0.51, -0.29) points lower; while the adjusted rate ratio of moderate to severe pain (PIRs ≥ 4) was 34% lower [0.66 (95% CI: 0.62, 0.70)]. The effect sizes were greater among veterans older than 65 years, yet diminished to null after 6-9 months. Assuming a 3-month induction period, using alternative random-intercept model, and examining post-CIH opioid use as an alternative outcome, derived similar results. These observations echo some randomized trials suggesting a modest, short-term CIH benefit, and highlight the merits and usefulness of exposure-crossover design to observational studies of medical interventions.

ADVANCING AN INTERDISCIPLINARY SCIENCE OF AGING THROUGH A PRACTICE-BASED DATA SCIENCE APPROACH

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Two hundred and fifty thousand older adults die annually in United States hospitals because of tiastronomic conditions (ICs). Clinicians, aging experts, patient advocates and federal policy makers agree that there is a need to enhance the safety of hospitalized older adults through improved identification and prevention of ICs. To this end, we are building a research program with the goal of enhancing the safety of hospitalized older adults by reducing ICs through an effective learning health system. Leveraging unique electronic data and healthcare system and human resources at the University of Florida, we are applying a state-of-the-art practice-based data science approach to identify risk factors of ICs (e.g., falls) from a structured (i.e., nursing, clinical, administrative) and unstructured or text (i.e., registered nurse’s progress notes) data. Our interdisciplinary academic-clinical partnership includes scientific and clinical experts in patient safety, care quality, health outcomes, nursing and health informatics, natural language processing, data science, aging, standardized terminology, clinical decision support, statistics, machine learning, and hospital operations. Results to date have uncovered previously unknown fall risk factors within nursing (i.e., physical therapy initiation), clinical (i.e., number of fall risk increasing drugs, hemoglobin level), and administrative (i.e., Charlson Comorbidity Index, nurse skill mix, and registered nurse staffing ratio) structured data as well as patient cognitive, environmental, workflow, and communication factors in text data. The application of data science methods (i.e., machine learning and text-mining) and findings from this research will be used to develop text-mining pipelines to support sustained data-driven interdisciplinary aging studies to reduce ICs.

MEDICAL COMPLICATIONS AND INJURY LEADING TO EMERGENCY DEPARTMENT USE AMONG OLDER ADULTS

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Medical injury consistently ranks among the most expensive hospital stay diagnoses and represents a frequent cause of hospital readmission. Although older adults are at greater risk of medical injury, in part because of greater incidence of comorbidity and increased medical complexity, little is known about the burden of medical injury leading to ED use or the costs and outcomes associated with these events among older adults. In response, this study used nationally representative data from the 2014 Nationwide Emergency Department Survey to examine the epidemiology of older adult ED-visits for medical injury. Principal diagnosis codes were grouped using AHRQ’s Clinical Classification Software to identify medical injury-related visits. Results indicated that in 2014, 506,466 ED-visits for medical injuries occurred, comprising 2% of all older adult ED-visits. Leading causes of medical injury included malfunction of device, implant and grafts (24%); infection and inflammation of internal prosthesis device, implant, and graft (16%), and other complications of surgical and medical procedures (15%). Risk factors for medical injury included being male, Medicaid as primary payor, and number of chronic conditions. Multinominal logistic regression and multivariate regression results indicate that Medical injury-related ED visits were associated with higher hospitalization risk (RRR=2.08, p<0.000), 27% longer hospital stays, and 24% higher total charges relative to non-medical injury related visits. However, medical injury was not associated with risk of death after adjustment. Study findings suggest that ED-visits for medical injury occur frequently among older adults and are associated with significant burden and cost.

IN HIP FRACTURE, GENDER CONFOUNDS COGNITION ASSESSMENT, TIME TO DEATH, AND COGNITION-RELATED MORTALITY

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Of 300,000 annual hip fractures in the US, about 30% occur in men, over 30% experience cognitive impairment or dementia, and 30% die within one year. This study compares time-to-death and cognition-related cause of death (CR-COD) by gender after hip fracture using different methods of cognitive impairment ascertainment. Baseline hospital charts and Modified Mini-Mental State Examination (3MS) were from the Baltimore Hip Studies 7th cohort (2006-2011) (171 women, 168 men). National Death Index was obtained up to December 31, 2014. Cox models