



Summaries of Research Projects Using the LTC Data Cooperative

These projects have been approved to use the LTC Data Cooperative and received funding from external sources.

Summaries included:

- Trial to Reduce Antimicrobial use in nursing home residents with Alzheimer's Disease and other dementias
Principal Investigator: Susan Mitchell
- Prevention of Injury in Skilled Nursing Facilities through Medication Optimization (PRISM)
Principal Investigators: Sarah Berry and Cathleen Colon-Emeric
- Identifying Important Drug-Drug Interactions that Impact Nursing Home Residents (NH-DDIs)
Principal Investigator: Andrew Zullo
- Deprescribing of Diabetes Treatment Regimens in Long Term Care Residents with Alzheimer's Disease and Related Dementias
Principal Investigator: Medha Munshi
- Using EHR-Medicare linked Data to Examine Responses to and the Impact of COVID-19 in SNFs
Principal Investigators: Vince Mor/Brown Researchers

Title: Trial to Reduce Antimicrobial use in nursing home residents with Alzheimer’s Disease and other dementias (TRAIN-AD)

Principal Investigator: Susan Mitchell

Background: The late-stage of Alzheimer’s disease and other dementias is characterized by the onset infections that are widely mismanaged. Antimicrobials are extensively prescribed, most often without evidence to support a bacterial infection. In a prospective study conducted by our group in 2015, antimicrobials were prescribed for 72% of suspected infections of skilled nursing facility (SNF) residents with advanced dementia, but only 44% episodes met guideline-based criteria for treatment. Motivated by these findings, we conducted TRAIN-AD (Trial to Reduce Antimicrobial Use in Skilled nursing facility residents with Alzheimer’s disease and other Dementias) from 2017-21. TRAIN-AD 1.0 was a Stage III (efficacy-effectiveness) trial with mixed traditional and pragmatic trial design features. The multicomponent intervention merged best practices in infectious diseases and palliative care and included provider training and proxy information. Building on this work, the objective is to conduct TRAIN-AD 2.0; a larger, fully pragmatic trial to evaluate the effectiveness of the TRAIN-AD intervention to improve infection management among residents with dementia in 50 SNFs that are members of an integrated provider managed care network (Iowa Health Care Quality Network). The pragmatic design is enabled by leveraging an established Long-Term-Care (LTC) Data Cooperative, an NIH-funded initiative that allows access to the SNFs’ electronic health records for subject characterization and outcome ascertainment.

Study design: Observational, retrospective cohort study

Key measures:

1. Compare the number of burdensome interventions (hospital transfers, bladder catheterization, chest x-ray, blood cultures) used to evaluate suspected infections/person-year (secondary outcome) in the intervention vs. control arms among residents with i. moderate to severe dementia and ii. dementia at any stage. Medicare Claims (hospital transfers) and the SNF EHR (other interventions) will be used to ascertain outcomes.
2. Conduct a process evaluation of the TRAIN-AD 2.0 intervention guided by the RE-AIM (Reach, Effectiveness, Adoption, Implementation, and Maintenance) framework. Each RE-AIM component will be assessed using quantitative measures (e.g., participant vs. non-participant SNFs features (Reach), % providers completing training (Implementation)), and qualitative interviews with SNF champions (N=25) and providers (N=25) (e.g., factors enabling Champion engagement (Adoption) and program uptake (Implementation)).

Funding source: NIH-NIA

Title: Prevention of Injury in Skilled Nursing Facilities through Medication Optimization (PRISM)

Principal Investigators: Sarah Berry and Cathleen Colon-Emeric

Background: Fractures are a leading cause of disability, need for long-term care, and death. Prior studies have shown that we can prevent poor outcomes, including death, by treating patients with osteoporosis medications and stopping risky medications that cause falls and injury. Many patients with a fracture receive care in Skilled Nursing Facilities (SNFs), making SNFs an opportune site to engage patients and their caregivers in medication review. Patients may have a wide range of preferences about whether to prioritize fall and fracture prevention over the management of symptoms like pain, anxiety and depression. Our nurse care managers will provide patients, their families, and providers with information about how much benefit they will get from starting osteoporosis medications or reducing medications that cause falls but may relieve other important symptoms.

Study design: Effectiveness Study

Key measures: The primary outcome (injurious falls) will be collected using Medicare claims data linked with patient identifiers. As a secondary outcome, we will use the EHR to compare the number of patients treated for osteoporosis and the number of patients on fall-risk increasing drugs at the time of SNF discharge. Other secondary outcomes reflecting patient priorities are validated scales measuring medication burden, falls self-efficacy, pain, anxiety and sleep ascertained during a telephone survey with the patient or their caregiver approximately 90 days after discharge.

Funding source: PCORI

Title: Identifying Important Drug-Drug Interactions that Impact Nursing Home Residents (NH-DDIs)
(The “NH-DDIs” Project)

Principal Investigator: Andrew Zullo

Background: Nursing home (NH) residents need multiple medications for the multiple chronic conditions that they have, which results in polypharmacy. The unintended result of polypharmacy is that it can sometimes increase the risk of harmful drug-drug interactions (DDIs). We must balance the need for medications against the potential risks of DDIs. Many DDI risks for NH residents are unknown, especially for residents living with Alzheimer’s Disease and Related Dementias (ADRD). Information on DDIs has been almost exclusively generated by pharmacology studies in laboratory settings rather than by studies in humans in the real world. To balance the need for medications against the risks of DDIs, we need to identify important DDIs using human data. Ultimately, the information produced by this study will help to refine the DDI warnings in the clinical decision support software that are used by clinicians and improve the outcomes of NH residents.

Study design: Observational study

Key measures: Based on existing data, we will directly compare the outcomes of residents who experience what appears to be a potential DDI (based on the Long-Term Care Data Cooperative [LTCDC] electronic medication administration records) compared to only one of the two medications or medication classes involved in the potential DDI (i.e., individuals without a potential DDI). We will look at an array of outcomes that are important to NH residents, from changes in physical function to fall-related injuries and hospitalizations. We also will examine whether the effects of DDIs differ for certain groups of people, or subpopulations, who are at higher risk of adverse events (e.g., residents living with ADRD versus those without ADRD).

Funding source: NIH-NIA (R01AG077620)

Title: Deprescribing of Diabetes Treatment Regimens in Long Term Care Residents with Alzheimer's Disease and Related Dementias

Principal Investigator: Medha Munshi

Background: While deprescribing medications with a higher risk of hypoglycemia is now a part of the Standards of Medical Care established by the American Diabetes Association for the general population, implementation of such a strategy for older adults in the nursing home (NH) setting requires incorporating additional geriatric care principles into diabetes management and thus, a distinct skillset and expertise. Many NHs may lack easy access to a specialist or staff (i.e., physicians, nurse practitioners, or physician assistants) with such skills. There is also currently a lack of practical algorithms for deprescribing diabetes treatments for NH residents with Alzheimer's Disease and Related Dementias (ADRD) and diabetes. These are major barriers to deprescribing and glucose-lowering medication optimization in NHs. Our research team developed and implemented the Simplification of Treatment Regimens and Individualized Diabetes Education (STRIDE) intervention to enhance geriatric diabetes care by educating NH physicians, nurse practitioners, and physician assistants. We provided these clinicians with resources, specifically deprescribing algorithms, to engage in optimization of medications with a higher risk of hypoglycemia among NH residents with ADRD and diabetes. To facilitate a future larger pragmatic trial of the STRIDE intervention, we also placed continuous glucose monitors (CGMs) on NH residents and collected detailed glycemetic control data. The CGM data will be used as a gold-standard measure to validate use of medications with a higher risk of hypoglycemia measured routinely in the electronic health records (EHR) as a pragmatic trial outcome (i.e., a proxy for CGM-identified hypoglycemia events).

Study design: Effectiveness study

Key measures: Most critical to this project are: 1) measures of glycemetic control like fasting plasma glucose and HbA1c from the LTCDC EHR data; these measures will be used to assess the concordance between the gold-standard CGM measures and the routinely collected EHR data; and 2) measures of medication administration records from the LTCDC EHR data; these measures will be used to assess use of medications with a higher potential to cause hypoglycemia.

Funding source: NIH-NIA

Title: Using EHR-Medicare linked Data to Examine Responses to and the Impact of COVID-19 in SNFs

Principal Investigators: Vince Mor/Brown Researchers

Background: The arrival of coronavirus (COVID-19) and the threat that it represents to the population of frail elderly living in skilled nursing facilities (SNFs) is profound. Research done to date on the determinants of a SNF outbreak reveals that the local prevalence of the virus in the community is the most important factor influencing whether residents are infected with COVID-19. A major barrier to developing appropriate clinical and operational responses to the coronavirus pandemic confronting the SNF sector has been the lack of systematic information that is sufficiently current to describe trends and patterns of changes in the incidence rates of COVID-19 diagnosis, the rates of hospital transfer and even mortality rates. The purpose of this study is to document the incidence, prevalence and treatment of COVID-19 as it appeared in US nursing centers by drawing on detailed electronic medical record (EMR) data available from the Long Term Care Data Cooperative made up of EMR data from customers of 3 large EMR vendors and many SNFs from across the country who've authorized their EMR vendor to share their own EMR data with the Cooperative.

Study design: Interventional/ Quality Improvement Study

Key measures:

1. **Defining COVID-19** will be done using a combination of ICD-10 codes or the medication administration record. Some corporations have already created a coronavirus specific user defined assessment in order to identify whether any of their nursing centers has a positive case.
2. **Defining Outcomes** will focus on hospital transfers, mortality and functional recovery, which come directly from the MDS discharge record and follow-up MDS assessments. We will estimate both the hospitalization and mortality rates of persons diagnosed with COVID-19 as well as for the population of persons with a dementia diagnosis in general since this population may be systematically excluded from hospital treatment due to hospital demand from community cases of coronavirus. Other outcomes ranging from behavioral measures or even vital signs will be explored, particularly temperature increases in which we've shown to be strongly predictive a new COVID-19 infection.
3. **Defining Treatments** will also be derived from various aspects of the EMR. First, we anticipate a shift in drug regimen (e.g., use of broad-spectrum antibiotics, antiviral therapies, and other treatments) among those with COVID-19 diagnoses which will be identified from the eMAR. Second, we will monitor vital signs such as temperature and blood pressure to determine whether these indicators are predictive of a future diagnosis of COVID-19. We also anticipate working with clinical leadership to characterize facility-level responses to the discovery of an "outbreak" of coronavirus (at least one positive test) qualitatively such that we can create a classification scheme for the initial response: e.g. universal testing, isolation of the person and those with contact with the case, concentration of positive and suspected positive in one wing, etc.

Funding source: NIH-NIA