

**Incorporating a Rapid Geriatric Assessment in Primary Care**

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### Abstract

As patients age, the complexity of their care increases and the likelihood of developing geriatric syndromes becomes greater. Identification and documentation of geriatric syndromes can be a helpful first step to providing quality care. The goal of the quality improvement project was to assess documentation of frailty, sarcopenia, the risk for weight loss, and cognitive impairment before and after screening with the Rapid Geriatric Assessment (RGA) tool. Convenience sampling of participants took place at an Internal Medicine and Geriatric Clinic in Kansas City, Kansas. The charts were reviewed prior to the clinic visit for mention of frailty, sarcopenia, the risk for weight loss, and CI. After verbal consent, SH screened individuals with the RGA and shared the results with the physician before the visit. A repeat chart review following the visit determined if the identified geriatric syndromes were documented in the problem list or the clinic visit note. Ninety patients were screened with the RGA. The pre visit screening revealed only two patients with a diagnosis of either frailty, sarcopenia, or weight loss in the problem list or last provider note. After the intervention, 23 participants had documentation of either frailty, sarcopenia, the risk for weight loss, or CI in the problem list or the provider note. As the population of the United States ages, brief geriatric assessment tools such as the RGA may help primary care providers meet the needs of older patients without performing a comprehensive geriatric assessment (CGA).

*Keywords:* geriatric, assessment tools, frailty, sarcopenia, malnutrition, cognitive decline, older adults, advance directive

### **Incorporating a Rapid Geriatric Assessment in Primary Care: A Project Proposal**

As the population of the United States ages, primary care providers will see higher volumes of patients over the age of 65. As patients age, their care becomes more complex and their likelihood of developing geriatric syndromes also increases (Sattar et al., 2014). The mainstay of geriatric care has been a comprehensive geriatric assessment (CGA) performed by a geriatrician (Morley et al., 2017a). The goal of performing a CGA is not only to assess the physical needs of the patient but also to assess their cognition, mood, and social function (Seematter-Bagnoud & Bula, 2018). Unfortunately, this process is lengthy and the demand versus supply of geriatricians in the coming years will be great. It is anticipated that there will be a shortage of nearly 30,000 geriatricians in the United States in the year 2025 (U.S. Department of Health and Human Services, Health Resources, and Services Administration, National Center for the Health Workforce Analysis, 2017). To help combat this issue, St. Louis University developed the Rapid Geriatric Assessment (RGA) to help screen for common geriatric syndromes in the primary care setting (Morley et al., 2017a). The RGA is composed of four separate questionnaires that screen for frailty, sarcopenia, the risk for weight loss, and cognitive impairment (Morley et al., 2017a).

#### **Significance**

Healthy People 2020 is a comprehensive list of goals and objectives ultimately aimed at improving the overall health of the American people (Healthy People 2020, n.d.). A primary goal of the Healthy People 2020 initiative is to improve the care and quality of life of older adults (Healthy People 2020, n.d.). It is important to consider how meaningful the increasing age of people in the United States will be when discussing the assessment and problem identification of

patients in the primary care setting. The population of the United States is aging rapidly, and primary care providers will need to assess geriatric patients efficiently and effectively. The age of people in the United States has been increasing since the 1960s and specifically for those over the age of 65 (Mather et al., 2015). This increase is in part to the “Baby Boomer” generation which constitutes people who were born between 1946 and 1964 (Mather et al., 2015). In the year 2050, there will be almost double the number of people over the age of 65 in the United States compared to the year 2012 (Ortman et al., 2014). In 2060, one-quarter of Americans will be age 65 or older (Mather et al., 2015). According to Colby and Ortman (2014), the decade between 2020 to 2030 is when the United States population will see the biggest increase in people over the age of 65. In terms of office visit rates for people over the age of 65, it was 658 per 100 persons in 2015, making this the highest age category seeking care (Ashman, 2015).

### **Local Burden**

Similarly, to the overall population of the United States, the ages of people in the states of Missouri and Kansas are also increasing. In the year 2018, the state of Missouri had just over 16% of its population over the age of 65 (Missouri Census Data, 2020). The percentage of people over the age of 65 has increased from just over 14% in the year 2010 and 13.4% in 2006 (Missouri Census Data, 2020). In the year 2018, the population of adults age 65 and older in the state of Kansas was 15.88% (Missouri Census Data, 2020). The project took place in Wyandotte County and just over 12% of their population is age 65 or older compared to 10.68% in 2010 and 10.7% in 2006 (Missouri Census Data, 2020).

### **Diversity Considerations**

Medicare was the primary insurance coverage for the participants as they were all age 65 or older. Data specific to the participant’s race was not collected during the project. However,

according to the U.S. Census Bureau, nearly 60% of the population in Kansas City, Kansas is White. African Americans make up 23.5% of the population, nearly 30% of the population is Hispanic or Latino, and only a small percentage of the population is Asian, American Indian, or Native Hawaiian (U.S. Census Bureau, n.d.).

### **Problem**

Geriatric assessment in the primary care setting will become increasingly important as the population of the United States ages. Recognizing geriatric syndromes can help to prevent functional decline and reduce hospitalization (Morley et al., 2017b). Additionally, primary care providers are often the first point of contact for elderly patients. This fact also supports the need to properly identify geriatric syndromes. However, identifying certain geriatric syndromes is more difficult than others. For example, cognitive decline and malnutrition may go under-diagnosed in the primary care setting (Seematter-Bagnoud & Bula, 2018). Geriatric assessments can be performed with brief screening tools to avoid the complexity and time commitment of a CGA (Barel, 2012; Barkhausen et al., 2015; Morley et al., 2017a; Mueller et al., 2018). A variety of screening tools exist to evaluate for common geriatric syndromes, but few are broad enough to encompass more than two potential diagnoses, and many cannot be completed efficiently. Utilizing the RGA can help solve the problem of efficiency and capturing more than two diagnoses.

### **Facilitators and Barriers**

The aging population of the United States is the major facilitator of the project. The RGA will screen older adults for potential geriatric syndromes and takes only five to seven minutes to complete, making efficiency an additional facilitator. The project facilitator is a geriatrician who is passionate about the project. Since the RGA is available in the public domain, without



copyright, the cost-effectiveness of the project serves as an additional facilitator. Patient refusal should always be considered a potential barrier. However, there was no participant refusal during the project. Another barrier to consider is time. Even though the assessment is efficient, there may be times where five to seven minutes during a patient visit is too valuable to lose.

### **Feasibility and Sustainability**

The RGA is designed to be used by primary care providers and therefore was workable in the project setting (Morley, 2017a). Since the project leader was conducting the RGA prior to the provider entering the room, sustainability was promoted during the intervention. While the project leader assessed each participant with the RGA, the screening tool could be easily self-administered after the patient checks in for their appointment and is in the waiting room. This type of implementation could help the project sustain over time. According to Morley (2017a), the RGA can be embedded into the electronic medical record and therefore could enhance sustainability over the long term.

## **Review of the Evidence**

### **Inquiry**

In adults age 65 and older, does the use of the Rapid Geriatric Assessment tool improve identification and documentation of geriatric syndromes in a four-month time frame, in a primary care setting?

### **Literature Search**

The two primary search engines that were utilized include Google Scholar and The University of Missouri- Kansas City Health Science Library. A variety of databases including CINAHL, PubMed, and Medline were used with the following keywords searched: geriatric assessment, primary care, geriatric syndromes, frailty, sarcopenia, malnutrition, cognitive

function, cognitive decline, geriatric assessment tools, and screening tools (see Appendix A for the definition of terms). Reference lists and author lists were also used to conduct searching for relevant studies. A total of 27 quantitative studies and two qualitative studies were reviewed with the emergence of frailty, sarcopenia, malnutrition, cognitive decline, and geriatric assessment as subtopics. Two clinical practice guidelines related to the management of sarcopenia and nutrition in the elderly were identified (Dent et al., 2018; Volker et al., 2019). Inclusion criteria primarily focused on studies that applied the components of the RGA and whose sample population was reflected outpatient or community-dwelling participants age 65 or older. All levels of evidence were included despite the lack of identifying any level II studies. Studies were excluded if they did not meet the needs of the population in focus or were greater than 10 years old. Additional exclusion criteria include non-English articles or articles whose full text was not available. The goal was to keep the studies as current as possible and of the studies identified only four were published eight years ago or more (See Appendix B).

The studies had a wide range of levels of evidence. One level I meta-analysis and three-level III well-designed control studies were identified. As mentioned above, no level II studies were identified. Many of the studies were level IV and either cross-sectional or cohort design. Fifteen level IV studies were identified. Four studies from systematic reviews of descriptive studies were identified as level V. Lastly, six studies came from single descriptive studies as level VI, and two evidence-based practice guidelines were identified (See Appendix C and D).

### **Synthesis of Evidence**

Since the RGA comprises four individual screening tools, the subtopics that emerged for the synthesis of evidence included frailty, malnutrition, sarcopenia, and cognitive decline. It is important to consider how these individual components of the tool are relevant and validated in

the literature. Geriatric assessments also emerged as the fifth subtopic. This subtopic is important to consider as the RGA should be compared to other existing brief geriatric assessment tools. The desired outcome of the inquiry would be that these specific geriatric syndromes are better identified in the primary care setting for adults over the age of 65. Geriatric syndromes and functional limitations may better predict health outcomes compared to chronic health conditions (Korukian et al., 2016).

***Frailty assessment can help determine patients at risk for decline and disability.***

Depending on the source, the term frailty can encompass cognitive and physical characteristics. For this discussion, the term frailty will focus on the physical aspect of the syndrome and can be defined as a state of limited reserve and functional decline because of the aging process (Xue, 2011). Frailty is associated with negative health outcomes such as a decline in the ability to perform activities of daily living (ADLs), premature mortality and increased risk of hospitalization (Morley et al., 2012; O'Hoski et al., 2019; Sternberg et al., 2011; Vermeiren et al., 2016). The identification of frailty can be made with different screening tools in the primary care setting. The frailty measurement tool within the RGA is the FRAIL scale. The FRAIL Scale is a self-reported questionnaire that asks the patient five simple questions and deems them frail with a score of three or greater. The patient is deemed pre-frail with a score of one or two (Morley et al., 2017a). In a study of 816 community-dwelling adults over the age of 65, frailty and pre-frailty were detected via the FRAIL scale in 52.4% and 12.5% of the study participants, respectively (Woo et al., 2015).

Those who are deemed pre-frail also increase their chances of having ADL difficulty (Morley et al., 2012; Woo et al., 2015). The FRAIL scale was also recommended for screening in a narrative review of different frailty scales by Kasim et al. (2019). The identification and

prevention of pre-frailty compared to frailty maybe even more important as it relates to functional decline (Laur et al., 2017). With that information in mind, the FRAIL scale is beneficial in that it not only screens for frailty but pre-frailty as well. In contrast, the FRAIL scale was deemed only moderately accurate in identifying frailty compared to the Kihon Checklist and Reported Edmonton Frail Scale (Ambagstheer et al., 2019). Considering the high likelihood of patients to be deemed pre-frail, and the known consequences of such, this should prompt providers to consider how important frailty screening is in practice.

A systematic review by Pialoux et al. (2012) aimed to determine a validated screening tool for frailty based on the recommendations of the 2008 Canadian and American Geriatric Advisory Panel. Their review consisted of 10 frailty screening instruments and only two were found to be potentially suitable in the primary care setting (Pialoux et al., 2012). The FRAIL Scale was not included in this review. The FRAIL scale did however, predict disability at three years and nine-year follow-up in an African American-based population (Morley et al., 2012). The FRAIL Scale was only moderately accurate in predicting frailty in community-dwelling patients over the age of 75 (Ambagstheer et al., 2019; Malmstrom et al., 2014).

***The risk of malnutrition in the elderly is high and should be screened for.***

A variety of factors can cause malnutrition in the elderly patient population. The prevalence of malnutrition also increases in those aged 75 to 80, likely because of medications, economic status, and/or chronic illness (Seematter-Bagnoud & Bulla, 2018). The European Society for Clinical Nutrition (ESPEN) defines malnutrition as loss of body mass or muscle mass and should be diagnosed when there is unintentional weight loss, low body mass index, or reduced muscle mass (Volker et al., 2019). Within the RGA, the Simplified Nutritional Assessment Questionnaire (SNAQ) is used to assess elderly patients at risk for weight loss or

malnutrition in the next six months (Morley et al., 2017a). The SNAQ is a four-item question that ranges in score from four to 20. A score of 14 or less puts the patient at high risk for weight loss or malnutrition (Morley et al., 2017a). Identifying quantitative studies that validate the SNAQ in the general older adult population was challenging. A cross-sectional study by Wilson et al. (2005) was able to validate the ability of the SNAQ to predict weight loss in community-dwelling adults with 84% sensitivity and 77% specificity. More recently, a study by Wang and Shen (2018) determined that the SNAQ was able to predict weight loss with a 90% sensitivity and 72% specificity in patients with liver cirrhosis. Unfortunately, it may be difficult to generalize the information from this study to the overall older adult population. The study sample was small, and specific laboratory values associated with liver diseases such as hemoglobin, body mass index, albumin, and pro-albumin levels were taken into consideration (Wang & Shen, 2018).

Barriers exist in screening for malnutrition, treating malnutrition, and promoting oral nutritional supplements when indicated (Harris et al., 2019). For this reason, looking at the current guidelines will be very important. ESPEN guidelines recommend that specific screening tools be routinely used to assess for malnutrition (Volker et al., 2019). The Mini Nutritional Assessment (MNA) is mentioned as a validated screening tool within the ESPEN guidelines (Volker et al., 2019). The SNAQ and MNA both only take a few minutes to complete, but the SNAQ may prove better at identifying people who will lose weight earlier than the MNA (Rolland et al., 2012; Volker et al., 2019).

***Decreased physical performance may be reflective of sarcopenia and may not directly relate to patient weight.***

Sarcopenia can be defined as the loss of muscle mass, strength, and/or physical performance (Carvalho do Nascimento, 2018). While there are many ways to assess for sarcopenia the SARC-F Questionnaire is the tool used within the RGA. The questionnaire asks five questions regarding how the patient feels on a usual day and a score of four more indicates sarcopenia (Morley et al. 2017a). The SARC-F Questionnaire was 34% sensitive and 85% specific in diagnosing sarcopenia in a cross-sectional study by Rolland et al., (2017). In addition to a high level of specificity, the SARC-F questionnaire was able to predict poor physical performance and determine a decrease in the inability of older adults to perform their ADLs (Malmstrom et al., 2016; Rolland et al., 2017).

Sarcopenia may be one of the more well-studied components of the RGA. Current guidelines for screening, diagnosing, and management exist (Dent et al., 2018). While these guidelines can help aid in the identification and management of sarcopenia, it should be noted that the guidelines may be more beneficial in patients who have primary sarcopenia versus secondary sarcopenia because of another disease process (Dent et al., 2018). Primary sarcopenia can occur even in adults who have normal nutrition or an elevated body mass index (Yadigar et al., 2016). More than half of the sarcopenic patients in the study by Yadigar et al. (2016) had a body mass index of over 30. This is important to consider as patients will present in the clinic as overweight or obese, but assumptions should not be made about their ability to perform ADLs or their physical performance status. A patient's weight alone cannot be representative of their muscle mass or strength.

Even though the recommendation is conditional, and the level of certainty is considered low, screening for sarcopenia can be performed with the SARC-F questionnaire (Dent et al., 2018). In a recent narrative review by Kasim et al. (2019), nearly 20 studies were reviewed and

ultimately the SARC-F questionnaire was recommended for sarcopenia screening. There is clear support for the sarcopenia screening tool offered in the RGA within the guidelines (Dent et al., 2018). A recent study that tried to improve upon the SARC-F by combining it with a calf circumference measurement did not see any superiority in sarcopenia identification compared to the SARC-F screen alone without calf circumference measurement (Bahat et al., 2018).

***Cognitive decline can be detected early with screening tools.***

Cognitive decline may go unnoticed in the primary care setting unless it is properly screened for. Many providers may not notice the subtle changes in their patients (Seematter-Bagnoud & Bula, 2018). Increasing age is also a primary risk factor for the development of dementia (Seematter-Bagnoud & Bula, 2018). Early recognition of cognitive decline is crucial, and many physiological problems can affect normal cognitive function. Cognitive function will be assessed via the Rapid Cognitive Screen (RCS) within the RGA (Morley et al., 2017a). The scoring on the RCS ranges from zero to 10. A score of six to seven indicates mild cognitive impairment, and a score of zero to five indicates dementia (Morley et al. 2017a). The number of studies that use this specific cognitive impairment screening tool is extremely limited. However, the RCS is a shortened version of the more well-known and well-studied St. Louis University Mental Status Examination (Malmstrom et al., 2015). The specificity and sensitivity for determining mild cognitive impairment via the RCS are 94% and 89% respectively and takes only approximately two minutes to complete (Malmstrom et al., 2015). The most well-studied brief cognitive screen is the Mini-Mental State Exam, but it is lengthy to complete in clinical practice (Lin et al., 2017). Without additional large-scale studies to determine the effectiveness of the RCS, it will be important to consider the overall role of cognitive screening, management, and impact.

Regarding screening for cognitive function in the primary care setting, 21% of primary care providers felt confident in recognizing cognitive decline, but only 13% felt comfortable making a definitive diagnosis (Bernstein et al., 2019). Primary care providers were also more likely to order imaging studies to evaluate cognitive function, but only 14% felt confident in interpreting the results (Bernstein et al., 2019). The potential harm in screening patients for cognitive decline is minimal, and therefore, should be considered routinely by primary care providers (Lin et al., 2017). However, misdiagnosis of a patient with dementia would be concerning, especially if the cause for the cognitive decline was because of an underlying reversible physical or metabolic problem. The RCS's primary aim is to detect mild cognitive impairment (Lin et al., 2017; Malmstrom et al., 2015).

***Geriatric syndromes can be detected with the use of screening tools.***

At present, there has only been one quantitative study that incorporates the use of the RGA in its primary intervention, and the study sample was very small (Tuna et al., 2019). Besides a small sample size, the study incorporated comparisons of the RGA to a Physical Activity Questionnaire and the Pittsburgh Sleep Quality Index, so the applicability and relevance to the inquiry are limited (Tuna et al., 2019). For this reason, support from other brief geriatric screening tools in the literature will be discussed. The primary care provider can help reduce functional decline by utilizing brief geriatric screening tools (Morley et al., 2017b).

A non-randomized control trial by Barel (2012) validated a brief geriatric screening tool called the INDEPENDENT assessment tool. The INDEPENDENT assessment tool may be considered more comprehensive than the RGA as it encompasses 11 categories. (Barel, 2012). The INDEPENDENT tool's consistency and reliability were compared to the Barthel Index and showed a high level of correlation (Barel, 2012). The INDEPENDENT assessment is like the



RGA because it takes only approximately five minutes to complete (Barel, 2012; Morley et al., 2017a). Another geriatric assessment tool is the MAGIC assessment tool, and it can also be used by the primary care provider (Barkhausen et al., 2015). The MAGIC tool is more like the INDEPENDENT tool in that it covers a wider range of geriatric problems, unlike the RGA, whose focus remains on frailty, sarcopenia, the risk for weight loss, and cognitive decline. A valuable study by Mueller et al (2018) designed a Brief Assessment Tool (BAT) for family physicians to utilize and compare its diagnostic accuracy of identifying geriatric syndromes compared to a CGA. The BAT encompasses eight geriatric syndromes of which frailty, sarcopenia, malnutrition, and cognitive decline would be included in their categorization (Mueller et al., 2018). Although the sample size was small, the ability of the BAT to identify geriatric syndromes was significant (Mueller et al., 2018).

### **Qualitative**

Qualitative research is an important piece of the inquiry as it can add value by exploring the different aspects of the human experience. Qualitative research rounds out the evidence for the project by giving insight into the lived experiences of individuals. The perspective on aging for older adults was studied in two qualitative studies that apply to the project (Halaweh et al., 2018; Esbensen et al., 2016). Older adults tend to associate aging with illness and limitations (Esbensen et al., 2016). In the study by Halaweh et al. (2018), one of their major findings centered on the preservation of good mental health for older adults. The Esbensen et al. (2016) study focused more on the physical aspect of aging with the emergence of themes such as the ability to perform ADLs and the use of mobility aids. These studies cover the physical and cognitive perspectives on aging and can help add value to the evidence through their qualitative

study design. Understanding how each individual perceives aging is important so that primary care providers can provide care that is holistic.

### **Summary**

The inquiry is specific to the use of the RGA tool in the primary care setting to better identify and document geriatric syndromes. The RGA was developed by St. Louis University in 2017 and therefore is a relatively new screening tool. The RGA tool is based on brief questionnaires and is composed of four separate screening tools that assess for frailty, sarcopenia, the risk for weight loss, and cognitive impairment (Morley, 2017a). Specifically, the FRAIL Scale, SARC-F Screen, SNAQ, and RCS make up the majority of the RGA. Additionally, the RGA also asks about the presence of an advance directive. There are many benefits to the RGA tool. The RGA tool takes only five to 10 minutes to complete, assesses for important geriatric syndromes, is not copy written, and can be easily embedded into the electronic medical record (Little, 2017).

The driving force behind the synthesis of evidence is validating the individual components because the literature is lacking for studies that focus on the use of the RGA for their primary intervention. The FRAIL Scale and SARC-F Screen seem to have the most well-documented quantitative studies in the literature. Studies by Morley et al., 2012 and Woo et al., 2015, have validated and determined the feasibility of the FRAIL scale in certain populations. While the quantitative studies may be lacking information regarding malnutrition and the SNAQ screen, there are evidence-based practice guidelines that can help direct care (Dent et al., 2018). In addition to providing evidence to support the components of the RGA, there is evidence to support the use of other brief geriatric-specific assessment tools in the primary care setting (Barel, 2012; Barkhasuen et al., 2015; Mueller et al., 2018; Seematter-Bagnoud & Bulla, 2018).

Considering how closely some of these geriatric syndromes resemble each other, overlap in the diagnosis and treatment will likely exist especially when evaluating for frailty, sarcopenia, and malnutrition (Laur et al., 2017).

### **Evidence Strength**

Two key evidence-based practice guidelines were identified within the search. These two guidelines add strength to the evidence (Dent et al., 2018; Volkert et al., 2019). Only one level I study has been identified that analyzes the concept of frailty and how it associates with negative health outcomes (Vermeiren et al., 2016). No level II randomized controlled trials were identified. Therefore, the literature is lacking in high-level studies. Most of the research applicable to the inquiry has been done through level IV cross-sectional or cohort studies. Additionally, a handful of level V and level VI studies were identified.

### **Limitations and Gaps**

The most obvious limitation relates to the extremely limited number of studies that have utilized the RGA tool as its primary intervention. Thus far, the author has identified one quantitative cross-sectional study that utilized the RGA to assess for geriatric syndromes (Tuna et al., 2019). However, this study also aimed to associate geriatric syndromes with physical activity and sleep quality so its application to the inquiry could be controversial (Tuna et al., 2019). There were also gaps in identifying current literature to support the SNAQ in the general population. For example, a study by Wang and Shen (2018) was conducted but was specific to patients with liver failure. In addition to the limited number of studies specifically utilizing the RGA, there is a limited number of studies whose primary intervention centers on the use of the RCS, which is the component of the RGA that assesses for cognitive impairment. According to Malmstrom et al. (2015), the RCS exhibits a high level of sensitivity and specificity for detecting

mild cognitive impairment. Despite the lack of studies specific to the RCS, the literature supports the value in assessing cognitive function in elderly patients (Lin et al., 2013; Malmstrom et al., 2015; Rosenbloom et al., 2018). Another limitation to consider would be the difficulty in defining and operationalizing the concepts of frailty and sarcopenia.

### **Theory**

The Theory of Gerotranscendence provided a strong theoretical support for this inquiry. The Theory of Gerotranscendence was developed by Lars Tornstam and focuses on the aging individual (Tornstam, 1997). This middle-range theory focused on the psychological aspect of aging and the different dimensions one may go through to reach one final maturation (Tornstam, 1996; Tornstam, 1997; Tornstam, 2003). The theory is likely derived from Erikson's Psychodynamic Theory that focuses on eight stages from birth to old age. Gerotranscendence could be considered the ninth stage. The literature often defines this theoretical term as a "shift in meta-perspective from a materialistic and pragmatic view of the world to a more cosmic and transcendent one" (Hauge, 1998; Rajani & Jawaid, 2015; Tornstam, 2003). Gerotranscendence offers a positive view on aging and is meant to be viewed as a way to enjoy one's life, one's activities, oneself, and others (Wood, Jepsen, & Stadler, 2018). The Theory of Gerotranscendence acknowledges that the care of the older adult must differ from people in other stages of life because of the psychological shift in perspective. The Theory of Gerotranscendence guides the project by exploring how the patient can have a positive experience with aging (See Appendix E).

### **Methods**

#### **Institutional Review Board Approval**

The faculty at the University of Missouri- Kansas City approved the project proposal in the Summer of 2020 (See Appendix F). The project was deemed a quality improvement project by the University of Kansas Medical Center Institutional Review Board. The project supplemented routine care with the addition of the RGA to help identify and document common geriatric syndromes (see Appendix G).

### **Ethical Considerations**

There are no conflicts of interest for the project leader to report. The privacy, protection, and confidentiality of the participants were maintained through the Health Insurance Portability and Accountability Act (HIPAA) and the Office for Human Research Protections (OHRP). The participants of the study were older adults, which could be considered a vulnerable population. However, each participant's involvement in the project was voluntary and the care they received at the clinic did not differ if they chose not to be evaluated by the project leader. The attempt at improving the care of older adults through the assessment of potential geriatric syndromes did not pose any risk to the participants who took part, thus adhering to the ethical principles of beneficence and nonmaleficence.

### **Funding**

Total costs of the project were minimal and therefore outside funding was not sought (See Appendix H). The only expense accrued was printing copies of the RGA, which was estimated to cost approximately 30 dollars. The time of the project leader and project facilitator was donated.

### **Setting and Participants**

The project took place at the internal medicine and geriatric division of a large health care system in a metropolitan community. The health care system for the project is part of a large

academic medical center that provides comprehensive primary care to geriatric patients and is one of 18 nationally recognized Comprehensive Primary Care Plus regions. A convenient sampling of participants took place via those patients who sought care at the project site. The goal of the project was to offer the intervention to as many participants as possible. The primary inclusion criteria were adults over the age of 65. Community-dwelling, those living in assisted living facilities, long-term care, and skilled nursing facilities were included. If a participant had a documentation of all four geriatric syndromes the RGA screens for including frailty, sarcopenia, malnutrition, and cognitive impairment, they were excluded from participation. Participants will also be excluded if they do not speak English or were unable to verbalize their responses to the questions on the RGA, either due to cognitive status or physical inability. Verbal consent was obtained from each participant.

### **EBP Intervention Protocol**

The project aimed to increase identification of frailty, sarcopenia, the risk for weight loss, and cognitive impairment and subsequently increase documentation of those geriatric syndromes that were identified. The completion of the RGA on each participant was the main intervention of the project. Equally important to the screening was the chart review that was done before and after the completion of the RGA. The project leader gave a brief overview of the project and the RGA tool to the project site staff who were directly involved in the project.

Once a week for 16 consecutive weeks, the project leader would be on-site for data collection. First, the project leader would review the project facilitator's schedule for the day. Any patient that was scheduled for an in-person clinic visit would be considered a potential participant. Thus, convenient sampling of participants occurred. The first patient of the day was intentionally left out as not to delay the start of the clinic for the project facilitator. The charts of

each potential participant were reviewed. The problem list and most recent provider note were included in the chart review. The specific terms and codes will be listed here. The identification and documentation of frailty were reviewed for the term itself and/or ICD-10 code R54. The identification and documentation of sarcopenia were reviewed for the term itself and/or ICD-10 Code M62.84. The identification of malnutrition was through the term itself or nutrition deficiency, protein-calorie malnutrition, weight loss, and/or ICD-Codes E43, E44.0, E44.1, and E46. The identification of cognitive impairment was through the term itself, or dementia, neurocognitive disorder, Alzheimer's Disease, vascular dementia, and/or ICD-10 codes F01, F03, G30, R41.81, and G31.84. If there was mention of any type of cognitive impairment, that participant would be excluded from the cognitive portion of the RGA. In addition to exclusion from the cognitive portion of the RGA, those with previously determined cognitive impairment had their responses to the other portions of the RGA verified by the person accompanying them at the visit.

After the LPN roomed the patient, the project leader would enter and ask for verbal consent to screen the participant with the RGA. Next, the project leader would evaluate the patient by verbally asking them the questions on the RGA and document their responses. The project leader would then share the results of the RGA with the project facilitator. Once documentation on each participant was complete, a repeat chart review was conducted looking for documentation of any of the diagnoses that were identified through the RGA in the problem list of provider note. Since the project leader was on-site weekly, the post-RGA screening chart review was completed the following week (see Appendix I and Appendix J).

### **Organizational Change Model**

Kotter and Cohen's Model of Change was the organizational change framework for this study. Kotter and Cohen's Model of change focuses on the feelings of the people who are about to make a change (Melnyk & Fineout-Overholt, 2019). Seeing, feeling, and changing patterns are crucial components of successful organizational change (Melnyk & Fineout-Overholt, 2019). The eight steps of this model include urgency, team selection, vision, and strategy, communicating the vision, empowerment, interim success, ongoing persistence, and nourishment (Melnyk & Fineout-Overholt, 2019). This model complements the project as the need for change is existing based on the aging population of the United States, a shared vision is established with the project facilitator who is also passionate about quality care of the elderly, and teamwork for implementation was developed at the project site.

The provider's agreement in using the RGA in their practice will be one of the primary factors to consider for the sustainability of the project. Providers that appreciate that ease and value of the RGA will be more likely to continue using this screening tool. The results of the project may hinder or promote the continued use of the RGA. How the RGA is implemented in the clinic may look different than the process of the project. The RGA could be self-administered when the patient checks in for their appointment and then the medical staff calling the patient from the waiting room could collect the RGA and give it to the provider. The provider could discuss their results during their appointment. This type of workflow has the potential for the project to be more sustainable.

### **Evidence-Based Practice Model**

The Iowa Model of Evidence Base Practice to Promote Quality Care was the evidence-based practice model for this project. The Iowa Model can be used by clinical staff seeking to improve quality care by using evidence that supports an intervention (Buckwalter et al., 2019). A



detailed synthesis of evidence has been completed and supports the inquiry in that early identification of geriatric syndromes in the outpatient setting is important. The steps of the Iowa Model include identification of triggers, making clinical application, organization of priorities, formation a team, piloting the practice change, evaluation of the change, and dissemination of the results (Buckwalter, 2019). This project has identified geriatric syndromes as a trigger, made clinical application as to how proper assessment can be employed in the primary care setting, outlined the utilization of the RGA, evaluated the results, and will disseminate the results appropriately.

### **Project Design**

A quantitative, quasi-experimental approach was used for this project. This study design was appropriate for the project as the outcomes were generated through a one cohort pre-posttest measurement. The project did not have a randomized or control group and therefore was quasi-experimental. Specifically, the chart of each participant was reviewed for documentation of frailty, sarcopenia, malnutrition, or cognitive decline through the ICD-10 codes in the problem list or mention in the most recent provider note. The participant was then asked the questions on the RGA by the project leader, and the results were reviewed with the provider. The chart was then reviewed to determine if any of the identified syndromes were documented (see Appendix K).

### **Validity**

The design of the evidence-based practice project does not include a control group and therefore may lack internal validity. However, despite the lack of a control group, the study design may promote internal validity by testing many different participants. Attrition did not affect the internal validity as the participants will be assessed with the RGA at their already

scheduled appointment. There is not a significant time commitment for the participants, and they did not need to follow up specifically as it relates to the project. The project leader was at the site on a variety of days and evaluated different participants each day with the RGA tool. Another threat to the internal validity of the project is the lack of studies that have applied the RGA tool in their research. To date, the tool has been used on a relatively small number of patients and primarily in the state of Missouri (Morley et al., 2017a). The project aimed to incorporate participants of varying ages to be able to transfer the results to “young older adults and old older adults” and to promote external validity. Considering the project will take place at a large academic medical center, hopefully the data easily transferable to a variety of demographics.

### **Outcomes**

The primary outcome for the evidence-based practice intervention will be to increase the identification and documentation of frailty, sarcopenia, the risk for weight loss, and cognitive decline in the primary care setting. Identification is the first step in quality healthcare and the ability to assess or screen for these syndromes to prevent disability, rather than managing it after it occurs, is beneficial (Morley et al., 2017a).

### **Measurement Instrument**

The measurement instrument is the RGA tool. While the RGA is the primary component of the project intervention, it will also serve as the tool used to measure the geriatric syndromes of frailty, sarcopenia, the risk for weight loss, and cognitive decline. The RGA consists of four separate questionnaires and each of those has been validated in three continents, but the entire RGA tool has been limitedly studied (Morley et al., 2017a). The RGA is a non-copywritten tool and is therefore open for public use (See Appendix L). In terms of completion, the project leader verbally asked each participant the components of the tool. Data that was collected from the

patient chart also served as a measurement instrument. This data is reliable, even though it will not be represented through a formal measurement instrument.

### **Quality of Data**

Unfortunately, there are no benchmark or published studies that the results of the project will be compared to. Quality was enhanced by having the project leader assess each participant with the RGA by reading the questions to the participants. This limited confusion or misunderstanding due to differing levels of education or cognitive function of the participants. The project leader remained honest in her assessment of each participant and accurately completed the form based on their responses to limit bias. An “A priori power analysis” was completed to determine the sample size. The project aimed for a sample size of 96 with a power of 0.8 and a significance level of 0.05. The power analysis was completed through the G\*Power analysis software (Heinrich-Heine-Universität Düsseldorf, 2020). Pre- intervention data from the chart was collected somewhat in conjunction with the intervention data (See Appendix M).

### **Statistical Analysis**

Age and gender were demographic data and were analyzed via descriptive statistics (See Appendix N and Appendix O). The project aimed to compare the charts of the participants prior to the intervention and after the intervention. The documentation of frailty, sarcopenia, malnutrition, and cognitive impairment will be determined on the participant’s chart prior to the assessment with the RGA and after the documentation is completed for the patient encounter.

## **Results**

### **Setting and Participants**

The project took place at an Internal Medicine and Geriatric Clinic within a large metropolitan academic medical center every Tuesday from August 25<sup>th</sup>, 2020 to December 8<sup>th</sup>,

2020. The participants of the project were those scheduled for an in-person office visit. Those who met the pre-established inclusion criteria and provided verbal consent were included. A total of 90 participants had a pre-intervention chart review completed, were screened with the RGA, and post-intervention chart review. The age range of participants was from 66 years to 100 years, with the average being 80.5 years. Females outnumbered men in the project with 61% being female and 39% male.

### **Intervention Course**

A pilot day of the project was completed on August 18<sup>th</sup>, 2020. On this day, the intervention workflow was trialed, but the data collected was not included in the results. This pilot day proved to provide valuable insight into a specific piece of the project intervention. Because the participants with cognitive impairment were included in the screening for frailty, sarcopenia, and risk for weight loss, it was on the pilot day that it was determined that the person, whether it be a family member, friend, or caregiver, would verify the participants answers to the other screening questions. This helped give stronger authentication of the results of the remaining portions of the RGA for those with cognitive impairment. The project leader would arrive on-site and complete the pre-chart review prior to entering the participant's room to receive verbal consent. The project leader would screen the participant with the RGA and discuss the results with the provider. Most often, the post-chart review would be completed the following week. All the data was entered and managed in REDCap (Harris et al., 2009). Because the project ran consecutively over 16 weeks, there were no key points of data analysis or interpretation until the project was complete.

### **Outcomes Data**

The primary outcome included identification and documentation of the geriatric syndromes. Of the 90 participants screened with the RGA, 80% screened positive for either pre-frail or frail, 51% screened positive for sarcopenia, and 48% screened positive for risk for weight loss. Of the 59 participants who were screened for cognitive impairment, 25% screened positive for mild cognitive impairment while 27% screened positive for dementia. During the pre-chart review, only two participants had documentation of either frailty, sarcopenia, or weight loss.

After screening with the RGA documentation of the identified geriatric syndromes was increased to a small degree (see Appendix P). Of the 72 participants who screened positive for pre-frailty or frailty, five were documented in the patient chart (7%). Forty-six participants screened positive for sarcopenia and seven of those were documented in the chart (15%). Of the 43 who were at risk for weight loss, five were documented in the participant's chart (12%). Thirty-one of the 59 screened positive for cognitive impairment and six of those were documented in the participant's chart (19%) (see Appendix Q).

Additional statistical analyses were completed to determine associations between the identifiable geriatric syndromes. There was a significant association between frailty and sarcopenia. As frailty increases, the risk for sarcopenia also increases. The opposite is also true. As frailty decreases, the risk for sarcopenia decreases. This is based on a Pearson Chi-Square with a p-value of <0.001. There is a moderate strength of association based on Cramer's V (see Appendix R). SPSS Version 26 was used to compute this association.

## **Discussion**

### **Successes**

Overall, the project was able to increase documentation of geriatric syndromes to a small degree. The project facilitator frequently acknowledged the valuable information that was

collected through the RGA screening, despite the results not showing drastic improvements in documentation. Specifically, the project facilitator acknowledged the potential need for routine nutrition screening in the geriatric population.

### **Study Strengths**

One of the most notable strengths of the project was working alongside a geriatrician who was passionate about improving the care of geriatric patients. The other staff members involved in the project implementation were supportive. Those included the LPN rooming the patient and the resident physicians working alongside the geriatrician. In terms of recruiting participants, the project site proved to be a significant strength in offering participants over the age of 65. The project site was part of a large academic medical center; therefore, the culture of the organization promotes quality improvement projects such as this. Several meetings were had with the project facilitator leading up to the implementation. The frequent and clear communication helped streamline the process. The project leader also discussed the workflow with the LPN, who was directly involved in the project prior to implementation and aided in the project's overall success.

### **Results Comparison**

When reviewing the literature leading up to the project implementation, no studies were identified that utilized the RGA in such a way that it could be used for comparison for the project. However, as the literature search continued, two major studies were identified that would serve as a comparison for the project. Sanford et al. (2020) set out to determine the prevalence of frailty, sarcopenia, the risk for weight loss, and cognitive impairment in Missouri individuals age 65 and older using the RGA. Their study screened 11,344 individuals and the RGA was completed by a variety of healthcare workers (Sanford et al., 2020). Even with a much larger number of participants their study also found a relationship between frailty and sarcopenia. Only

5% of their participants were frail and not sarcopenic (Sandford et al., 2020). The overall prevalence of the identified geriatric syndromes is as follows; frailty was found in 30.4% of the participants, sarcopenia was found in 42.9% of participants, and risk for weight loss in 29.3% of participants. According to the cognitive portion of the RGA, 28.1% met the criteria for dementia and 19.7% met the criteria for mild cognitive impairment (Sandford et al., 2020).

An electronic version of the RGA was developed as an application on an iPad in a study in Singapore (Merchant et al., 2020). Like the project, the study in Singapore had a nurse complete the RGA with each participant. Rather than having the nurse discuss the results with the provider, the patient was given a handout of their results and then the handout was given to the provider on the same day of their visit (Merchant et al., 2020). This study also developed a personalized management plan based on the results of the RGA. For example, if an individual answered yes to the fatigue question in the frailty assessment, they were further screened for disorders such as depression, sleep apnea, vitamin deficiencies, and/or metabolic abnormalities (Merchant et al., 2020). In this study 2,589 individuals were screened with the RGA. The prevalence of frailty was 5.9%, sarcopenia 15.4%, and 10.9% were at risk for weight loss (Merchant et al., 2020). Their study also indicated that the RGA is an efficient screening tool that can be completed in about five minutes (Merchant et al., 2020).

### **Limitations**

#### **Internal Validity**

Bias within the project could be considered the major threat to the internal validity of the project. First, the project leader was the only person screening participants with the RGA and inputting data. The possibility of error could be considered great without an additional person verifying responses of the RGA or the inputted data. Working alongside a geriatrician could also

predispose more favorable results of the project. The project facilitator also had a vested interest in the project, and therefore, could have documented in a way that was more conducive to yielding positive results for the project. A second threat to the internal validity is the lack of studies to validate the RGA because it has not been widely used in large research studies. The RGA has primarily been used in the state of Missouri (Morley et al., 2017a). Attrition was not a factor that would contribute to the internal validity of the project as no follow-up from the participants was needed. All the data collected for the project was gathered from the participants on the day of their scheduled appointment.

### **External Validity**

Effects on the external validity of the project centered around the project site and patient population. The project was conducted at an academic medical center that promotes quality improvement initiatives. Smaller-scale primary care offices may resist incorporating the use of the RGA in their clinic. Reasons for resistance could include lack of time, lack of staff to complete the RGA, and/or lack of acceptance of the RGA's value. Because the project was conducted with a geriatrician, the participant's mean age could be considered higher than the average primary care office. This may make generalizing the results of the project difficult.

### **Sustainability**

The greatest facilitator of sustainability for the project was the project facilitator's acknowledgment of the value of utilizing the RGA. While the project facilitator has not fully adopted the use of RGA routinely, her expression of its importance is vital. Sustainability is also supported financially as the RGA is a non-copywritten tool and available at no cost. The RGA also has the potential to be easily embedded into the electronic medical record. As discussed with the project facilitator, the project may be more sustainable over time if the RGA was completed



at a dedicated office such as a Medicare Annual Wellness Visits, compared to routine follow-ups on chronic diseases or acute issues as was the case for the project. Performing the RGA at a specific visit would also allow for dedicated time from an identified person of the healthcare team to complete the RGA.

### **Efforts to Minimize Limitations**

Efforts to minimize the effects of the limitations were made. In addition to sharing the results with the project facilitator, the project leader shared the results of the RGA with different residents who were working alongside the project facilitator. This helped eliminate the threat of documentation bias as the residents were not as vested in the project and were likely not documenting in a way that was advantageous to the project. During the project implementation and after data collection, an ongoing literature search was conducted to determine other studies utilizing the RGA. Education, with an emphasis on the efficiency of the RGA, may prove to be beneficial when discussing the use of the RGA to other primary care offices. Explanation on performing the RGA at a designated office visit would also be warranted to other primary care offices.

## **Interpretation**

### **Expected and Actual Outcomes**

A high identification rate of the geriatric syndromes and an increase in documentation of those syndromes were the expected outcomes of the project. During the project, 80% of participants screened positive for pre-frailty or frailty, 50% screened positive for sarcopenia, 48% screened positive for risk for weight loss, and 52% screened positive for either mild cognitive impairment or dementia (See Appendix Q). Documentation rates were increased to a small degree. The pre-visit screening revealed that only two participants had documentation of

either frailty, sarcopenia, or risk for weight loss. At the end of the project 23 of the 90 participants had documentation of at least one of the geriatric syndromes (See Appendix P).

### **Intervention Effectiveness**

The project was effective in identifying geriatric syndromes and slightly effective in documenting those that were identified. While the mean age of the participants can be viewed negatively in some aspects of the project, no participants were excluded because of their age. Therefore, the project site proved to be an acceptable location. The exact process of the intervention was largely impacted by the pilot day that was completed one week prior to the project implementation. A quality workflow for the project intervention was established. The decision to validate the answers by the person at the visit with the patient who had known cognitive impairment was also made during the pilot day of the project. The ideal setting for the project would be in a primary care office that wants to screen adults age 65 and older for common geriatric syndromes. A different primary care setting may prove more valuable, such as a site with equal number of young-old to old-old patients.

### **Intervention Revision**

As mentioned previously, one potential revision for the project would be completing the RGA at a specific office visit. Even though there were not significant issues with the project workflow, completing the RGA at a specific visit may promote sustainability over the long term. Incorporating the RGA into the electronic medical record should also be considered when discussing potential intervention revisions.

### **Impact to Health Systems, Cost, and Policy**

Identification and documentation of geriatric syndromes can be an important first step to providing quality care to older adults. The components of the RGA closely align with the World

Health Organization Integrated Care for Older People guidelines (World Health Organization, 2017). The RGA offers a way for primary care providers to capture the early physical and mental declines of patients to prevent further decline and disability (World Health Organization, 2017).

It was estimated that the project would cost approximately \$30, which accounted for the printing of the RGA tool. Due to the participant size of 90 participants, the actual cost of the project was \$13.50. The project is economically sustainable since the RGA can be incorporated without a major impact on the budget. No outside funding was obtained for the development or implementation of the project.

## **Conclusions**

### **Practical Usefulness of Intervention**

The project provided a worthwhile first step in process improvement of identifying and documenting geriatric syndromes. Identification of geriatric syndromes could be considered an important first step to improve patient outcomes. The RGA offers a way for primary care providers to capture the early physical and mental declines of patients to prevent further decline and disability (World Health Organization, 2017). As the population of the United States ages, brief geriatric assessment tools such as the RGA may help primary care providers meet the needs of older patients without performing a CGA. The RGA can be completed in around five minutes and at no cost making it a practical and useful tool.

### **Further Study of Intervention**

When looking to the future to expand the project, the likely next steps would include determining what specific interventions come from the identification and documentation of the geriatric syndromes. A side-by-side studying comparing the RGA to another brief geriatric assessment tool may provide valuable information for providers trying to determine which

specific tool may be most beneficial in their practice. Incorporating the RGA at designated visit such as the Medicare Annual Wellness visits seems like the most logical change to make to the intervention protocol.

### **Dissemination**

The manuscript will be submitted to the *Geriatric Nursing Journal*. This is the official journal of the Gerontological Advanced Practice Nurses Association and is a peer-reviewed journal. The journal aims to provide clinical information in the care of older adults. The final project paper will be submitted to the University of Missouri-Kansas City MoSpace Repository. The initial project proposal was presented via poster presentation at the Association of Missouri Nurse Practitioners 6<sup>th</sup> Annual Show-Me Conference in October 2020. The project was also accepted for presentation at the American Geriatric Society Conference in May 2021.

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## Appendix A

### Definition of Terms

**Frailty:** a state of increased vulnerability resulting from aging-associated decline in reserve and function across multiple physiologic systems such that the ability to cope with every day or acute stressors is compromised (Xue, 2011).

**Sarcopenia:** Age-associated loss of skeletal muscle function and muscle mass (Dent et al., 2018).

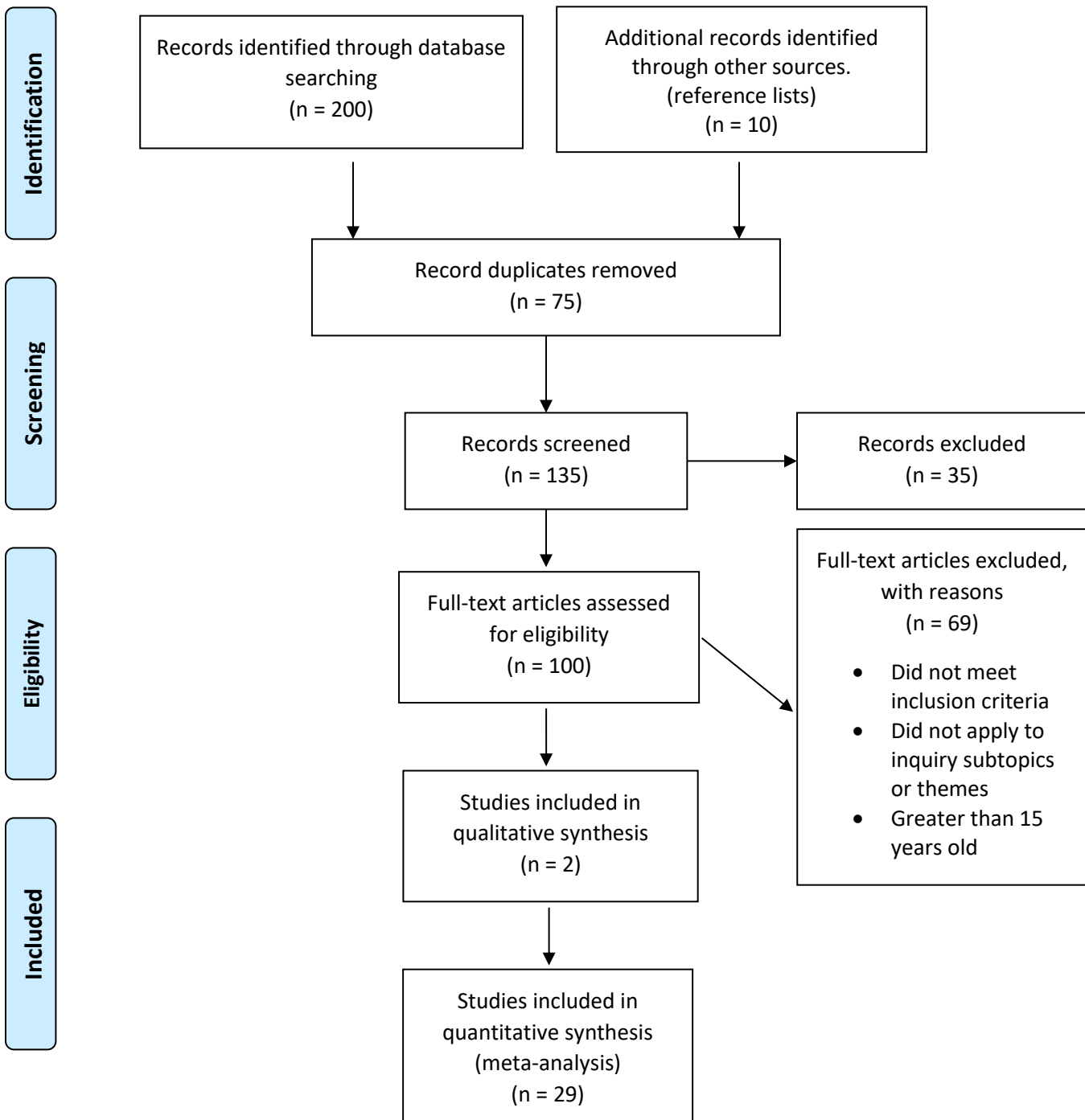
**Malnutrition:** Loss of body mass or muscle mass and should be diagnosed when there is unintentional weight loss, low body mass index, or reduced muscle mass (Volker et al., 2019).

**Cognitive Impairment:** a decline in cognitive function due to the aging process that is not severe enough to interfere with independence in daily life (Lin et al., 2013)

**Advance Directive:** a legal document that that expresses the values and desires of a person related to end-of-life care that goes into effect should the person be incapacitated or unable to speak for themselves (National Institute on Aging, 2018)

## Appendix B

### PRISMA Flow Diagram



### Appendix C Evidence Table

**Inquiry:** In adults age 65 and older, does the use of the Rapid Geriatric Assessment tool compared to assessment without a standardized tool improve the identification of geriatric syndromes in a four-month time frame in a primary care setting?

First author, Year, Title, Journal	Purpose	Research Design <sup>1</sup> , Evidence Level <sup>2</sup> & Variables	Sample & Sampling, Setting	Measures & Reliability (if reported)	Results & Analysis Used	Limitations & Usefulness
<b>Frailty</b>						
Woo, J (2015). Frailty Screening in the Community Using the FRAIL Scale. <i>Journal of the American Medical Directors Association</i>	To assess the feasibility of the FRAIL scale, followed by a CGA for those deemed frail or pre-frail	Two Phase Study  Single Descriptive Study  Level VI	Adults age 65 and older. Participants were recruited via invitation.  816 participants for phase one  225 participants for phase two	Phase One was to determine whether participant was frail or pre-frail.  Phase Two: those who were frail or pre-frail underwent CGA	Use of SPSS.  Univariate and multivariate models adjusted for age and sex.  Prevalence of pre-frailty and frailty were 52.4% and 12.5% respectively. Prevalence of frailty increases with age.	Limitations: not all participants who were deemed frail or pre-frail returned for CGA, not a rigorously designed research study  Usefulness: FRAIL scale may be beneficial in identifying at risk adults and decreasing the rate of decline and disability in older adults
Morley, J. E. (2012). A simple frailty questionnaire (FRAIL) predicts outcomes in middle aged African Americans. <i>The journal of nutrition, health &amp; aging.</i>	To validate the FRAIL scale.	Cross-Sectional Study, Level IV	African American patients age 49-65, two diverse communities in St. Louis, MO	Association of the FRAIL score (those frail or prefrail) vs healthy with ADL difficulty, instrumental ADL difficulty, short physical	Cross sectional results: FRAIL score correlated with IADL difficulty, SPPB, grip strength and one-leg stand among participants with no baseline ADL difficulty.	Limitations: only in African American population and in middle-late aged adults, 25% of participants excluded in cross-sectional analyses



				performance battery (SPPB), gait speed, one-leg stand test, grip strength, injurious falls, lab tests, and mortality.	Longitudinally: those considered pre-frail at baseline had ADL difficulty, worse one-leg stand score and mortality.	due to preexisting ADL difficulty  Usefulness: validation of the FRAIL Scale, a useful screening tool to prevent disability
Vermeiren (2016). Frailty and the Prediction of Negative Health Outcomes: A Meta-Analysis. <i>Journal of the American Medical Directors Association</i> .	Aims to give an overview of frailty and potential negative health outcomes.	Meta-Analysis; Level I	291 articles for analysis via searches of PubMed, Web of Science, and Psych Info of which N=39 were included for systemic review	Quality of the research was assessed by two reviewers.	Use Open Meta-Analysis Software  Pre-frailty increased the likelihood of developing negative health outcomes. Examples include premature mortality, hospitalization, or the development of disabilities in basic activities of daily living	Limitations: Results may be complicated due to the lack of similarities in the ratios, cofounders, and tools  Usefulness: associates the concept of frailty and the negative health outcomes
Pialoux (2012). Screening tools for frailty in primary health care: A systematic review. <i>Geriatrics &amp; Gerontology International</i>	Review validated screening tools for frailty.	Systematic Review, quantitative non-experimental, level III	PubMed and Cochrane databases searched for validated screening tools to measure frailty in a primary care setting, 11 studies with 10 screening tools	Each tool independently assessed by each author using an assessment scale by Terwee et al., tools were also measured against a geriatric advisory panel (GAP)	No tool contained all items needed to screen the elderly for frailty based on the GAP recommendations, two potentially suitable tools but need to be further evaluated in larger primary care settings	Limitations: No benchmark for comparison of tools, heterogeneous nature of statistics  Usefulness: generates data to support specific tools to measure frailty

O'Hoski (2019). Physical function and frailty for predicting adverse outcomes in older primary care patients. <i>Archives of physical medicine and rehabilitation</i> .	Explore three assessments for falls, hospitalizations, emergency room visits, and low self-rated health over 1 and 2 years	Secondary analysis from a longitudinal study, Level IV	Patients from primary care clinics age 65 and older; N=391	Separate logistic regression models using the three assessment tools as independent variables.	All three assessment tools predicted hospitalizations and low self-rated health over two years one tool better-predicted emergency room visits, while another better predicted falls, and another better predicted self-reported health	Limitations: some missing data for 34 participants could have resulted in false negatives.  Usefulness: may help primary care providers determine which type of assessment tool to use in their practice
Malmstrom (2014) A comparison of four frailty models. <i>Journal of American Geriatric Society</i> .	Comparing different frailty scales in an African American cohort	Longitudinal Cohort Study, Level IV	At baseline N= 998  3 years follow up N=853  9 years follow up N=582	Disability was assessed via scales to measure ADLs.	Descriptive statistics using SPSS, FRAIL scale was superior in predicting disability at 3 and 9 years follow up	Limitations: younger age groups  Usefulness: FRAIL scale with strong validity in determining disability
Ambagtsheer (2019). Commonly used screening instruments to identify frailty among community-dwelling older people in a general practice (primary care) setting: a study of diagnostic test accuracy. <i>Journal of Gerontology: Medical Sciences</i> .	Evaluating diagnostic accuracy of several frailty screening instruments	Cross-sectional Study, Level IV	Community-dwelling participants over the age of 75, N=243	Sensitivity, specificity, predictive values, likelihood ratios, Youden Index and AUC for several frailty instruments	Kihon Checklist and Reported Edmonton Frail Scale proved superior.	Limitations: Only moderate diagnostic accuracy for the FRAIL scale.  Usefulness: supports the use of frailty screening in practice, may need to increase provider awareness.
Sternberg (2011). The identification of frailty: a systematic literature review.	Identification of frailty in the literature.	Systematic Review Level V	After analysis of articles N=22	N/A	Physical functioning, gait speed, and cognition helped	Limitations: an older study as articles range from 1997-2009

					identify those who were frail.  Common outcomes measure of frailty was disability (7 of 22 articles), death (12 of 22 articles), and institutionalization (6 of 22 articles)	Usefulness: The needs of the provider and setting will help determine how to screen for frailty.
<b>Sarcopenia</b>						
Dent (2018). International Clinical Practice Guidelines for Sarcopenia (ICFSR): Screening, Diagnosing, and Management. <i>Journal of Nutrition and Health</i>	Screening, diagnosis, and management of sarcopenia	Clinical Practice Guideline, Level VII	Two systematic reviews and consensus reports of working groups	Grading based on GRADE approach.	Recommendations were graded as either strong or conditional, advocate for rapid screening with SARC-F	Limitations: Not reviews of RCT  Usefulness: offers a direct guideline for the topic
Yadigar (2016). Primary sarcopenia in older people with normal nutrition. (2016). <i>Journal of Nutrition, Health &amp; Aging</i> .	Determine the presences of primary sarcopenia in older adults with normal nutrition, assess relationships between the primary sarcopenia with anthropometric measurements	Cross-sectional study, Level IV	214 total participants of which 148 females and 66 males	Screening to rule out secondary sarcopenia was completed.  Muscle mass was measured, skeletal muscle index, handgrip strength, timed up and go walking test.  Sarcopenia criteria of EWSGOP.	Post Hoc Analysis and Chi-Square.  Sarcopenia in 105 subjects.  Waist circumference high in sarcopenia group (p=0.02)  Of 105 with sarcopenia 51% had BMI over 30	Limitations: Study completed outside the United States in Turkey  Usefulness: identifies that sarcopenia should not be overlooked in the overweight or obese population; women are at high risk for sarcopenia.
Bahat (2018). Comparing SARC-F with SARC-CalF to Screen Sarcopenia in Community Living Older Adults. <i>Journal of Nutrition, Health &amp; Aging</i> .	To compare the SARC-F Screen with the SARC-F plus calf circumference	Cross Sectional Study, Level IV	Geriatric outpatient clinic, adults 65 years or older, N=207	Muscle mass, muscle strength, grip strength, and physical performance measured.	Briefly, the SARC-F with calf circumference was not superior to the SARC-F screen alone	Limitations: Use of BIA for muscle mass estimation and not DXA or MRI-CT,

						which may be more precise  Usefulness: Validates the use of the SARC-F
Rolland (2017). Sarcopenia Screened by the SARC-F Questionnaire and Physical Performances of Elderly Women: A Cross-Sectional Study. <i>Journal of the American Medical Directors Association.</i>	To determine if the sarcopenia screening tool SARC-F is a valid tool	Single cross-sectional study Level IV	3,025 women from a previous study	N/A	Data Analysis with STATA v11 software.  SARC-F tool able to predict poor physical performance  Diagnosing sarcopenia was 34% sensitive and 85% specific	Limitations: may not be as useful of a tool compared to the definition set out the FNHI, cross-sectional design limited causal relationship between sarcopenia and poor physical performance  Usefulness: a worthwhile screening tool for primary care due to ease and efficiency
Kasim. (2019). Screening for Frailty and Sarcopenia in Primary Care: Where are we now? <i>Middle East Journal of Age &amp; Ageing.</i>	Discuss and propose reliable screening tools for frailty and sarcopenia in primary care	Narrative Review, Level V	19 studies in the final list for review for sarcopenia  37 articles in final review list for frailty	N/A	Three frailty screening tools summarized  Three sarcopenia screening tools summarized  Ultimately the FRAIL Scale and SARC-F questionnaires are recommended for screening for frailty and sarcopenia	Limitations: Screening tools for sarcopenia yield a low sensitivity  Usefulness: Algorithm developed to assess for frailty and sarcopenia in primary care using FRAIL Scale and SARC-F (two components of the RGA)

<p>Malmstrom (2016). SARC-F: a symptom score to predict persons with sarcopenia at risk for poor functional performance. <i>Journal of Cachexia, Sarcopenia, and Muscle</i>.</p>	<p>Investigating the use of SARC-F into current study, and survey</p>	<p>Cross-Sectional and Longitudinal Components, Level IV</p>	<p>Sampling from previous studies including African American Health (AAH) Cohort, Baltimore Longitudinal Study of Aging (BLSA) and National Health and Nutrition Examination Survey (NHANES)</p> <p>AAH N= 853</p> <p>BLSA N= 1053</p> <p>NHANES N= 3288</p>	<p>SARC-F with short portable sarcopenia measurement (SPSM) and portable Tanita Ultimate Scale Model 2001</p>	<p>AAH 18.4% sarcopenia; IADL deficits, slower chair stand times, and lower grip strength, lower SPSM score, and higher likelihood of hospitalization</p> <p>BLSA 15.4% sarcopenia; same results as above group without increase in hospitalization</p> <p>NHANES 15.4% sarcopenia, slower walk times, less knee strength, more likely to be hospitalized</p>	<p>Limitations: Some differences in SARC-F items, late-middle age in the AAH group</p> <p>Usefulness: validates assessment with SARC-F in determining potential adverse outcomes</p>
<b>Malnutrition</b>						
<p>Harris (2019). Barriers and facilitators to screening and treating malnutrition in older adults living in the community: a mixed-methods synthesis. <i>BMC Family Practice</i>.</p>	<p>To identify barriers and facilitators in malnutrition screening in primary care.</p>	<p>Mixed-Method Synthesis, Level III</p>	<p>21 studies reviewed</p>	<p>Studies assessed using Mixed Methods Appraisal Tool for high-quality studies</p>	<p>Barriers and facilitators exist for screening (in both patients and providers), treating malnutrition (psychosocial barriers predominantly), and promoting oral</p>	<p>Limitations: Low quality of studies</p> <p>Usefulness: Combines qualitative and quantitative data.</p>

					nutritional supplements (providers were hesitant)	
Volkert (2018). ESPEN guideline on clinical nutrition and hydration in geriatrics. <i>Clinical Nutrition</i> .	To provide evidence-based recommendations on nutrition and hydration in the elderly	EBPG Level VII	Systematic reviews based on 33 clinical PICO questions.	Evidence was graded based on SIGN grading system.	82 recommendations over four main topics.	Able to directly to research inquiry.
Wang (2018). Usefulness of Simplified Nutritional Appetite Questionnaire (SNAQ) in Appetite Assessment in Elder Patients with Liver Cirrhosis. <i>Journal of Nutrition, Health &amp; Aging</i> , 22(8), 911.	To determine the feasibility of the SNAQ in patients with liver disease.	Single Study, Level VI	N=60, convenience sampling of participants from hepatic disease department of hospital	Measurements of weight, hemoglobin, albumin, pro-albumin, and Child-Pugh class (liver cirrhosis class)	SNAQ <14 yielded significantly less hemoglobin, BMI, albumin, and pro-albumin levels compared to those with SNAQ > or equal to 14  SNAQ ability to predict weight loss was 90% sensitive and 72% specific	Limitations: specific to patients with liver cirrhosis  Usefulness: helpful to determine those at risk for weight loss
Rolland (2012). Screening Older People at Risk of Malnutrition or Malnourished Using the Simplified Nutritional Appetite Questionnaire (SNAQ): A Comparison with the Mini-Nutritional Assessment (MNA) tool. <i>Journal of the American Medical Directors Association</i> ,	Whether or not the SNAQ can screen older adults for malnutrition.	Cross-Sectional Study, Level IV	N= 175	Correlations between the SNAQ and MNA.	The ability for the SNAQ to determine abnormal MNA was 0.767 for AUC  SNAQ and MNA significantly correlated with Spearman test $r=0.48$ and $P<0.001$	Limitations: does not support the use of the SNAQ as a valid nutritional assessment, the population largely heterogenous  Usefulness: may be used as an initial step in determining weight loss, takes significantly less to administer

Wilson (2005) Appetite assessment: simple appetite questionnaire predicts weight loss in community-dwelling adults and nursing home residents. <i>American Journal of Clinical Nutrition</i> .	Validate the SNAQ and CNAQ tools and predict age-related weight loss	Cross-Sectional Study, Level IV	N=868 Convenience sampling	Validated against a more well-known tool the appetite hunger and sensory perception questionnaire (AHSP)	SNAQ ability to predict weight loss in community-dwelling older subjects (over the age of 60) was 84% sensitive and 77% specific	Limitations: Population setting was narrow in scope  Usefulness: validates the SNAQ tool
<b>Cognitive Function</b>						
Malmstrom. (2015). The Rapid Cognitive Screen (RCS): A point-of-care screening for dementia and mild cognitive impairment. <i>The journal of nutrition, health &amp; aging</i> .	1.Determine RCS sensitivity and specificity  2.Evaluate RCS predictive validity for nursing home placement and mortality	Case control study, Level IV	1.N=702  2.N=533/702	The RCS is an abbreviated version of the St. Louis University Mental Status Examination (SLUMS) which is a tool with good sensitivity and specificity.	IBM SPSS Statistics  Study One: RCS predicted dementia and MCI with 89% sensitivity and 94% specificity.  Study Two: RCS scores were protective against nursing home placement and mortality.	Limitations: Need additional studies to validate the use of the RCS to detect cognitive impairment  Usefulness: RCS is easier to administer and efficient
Rosenbloom, M. (2018). Screening positive for cognitive impairment: impact on healthcare utilization and provider action in primary and specialty practice. <i>Journal of General Internal Medicine</i> .	Evaluate the impact of screening positive for cognitive impairment and in turn how that impacts provider action and healthcare utilization	Single Descriptive Study, Level VI	N=787, convenient sampling of participants in primary care and neurology clinics, participants without known cognitive impairment.	Positive Mini-Cog screen rates, provider action, and healthcare utilization for 18 months prior to screening and 18 months after screening	Participants who screened positive did have higher emergency department visits and high hospitalizations, 32% of providers had followed up action on participants who screened positive	Limitations: Not an RCT, did not review notes by the provider therefore healthcare utilization and provider intervention may be underestimated Usefulness: supports that cognitive impairment can be detected early in

						primary and specialty care
Bernstein (2019). Dementia assessment and management in primary care settings: a survey of current provider practice in the United States. <i>BMC Health Services Research</i> .	Quantify perspectives and behaviors of primary providers and neurologist who evaluate patients with neurocognitive disorders	Cross-Sectional Survey, Level IV	N=200 providers and neurologists, via invitation	Survey with the reflection of the Behavior Change Wheel Framework	Wilcoxon Ran Sum Tests for stratification of primary providers and neurologists.  20% of primary providers feel comfortable in interpreting cognitive tests results, 14% feel confident in interpreting scans even though they were more likely to order. 70% of neurologists feel comfortable interpreting scans.  21% of primary providers felt confident in recognizing cognitive disorder, but only 13% were highly confident in making a specific diagnosis	Limitations to sample size and self-selection of participation  Usefulness: adds another layer of research for primary provider and cognitive function testing
<b>Geriatric Assessment</b>						
Tuna (2019) Rapid Geriatric Assessment, Physical Activity, and Sleep Quality in Adults more than 65 years: A preliminary study. <i>The Journal of Nutrition Health and Aging</i> .	To evaluate geriatric syndromes using the Rapid Geriatric Assessment and associate physical activity with sleep quality.	Cross-Sectional Study, Level IV	Convenience sampling, 56 adults from an outpatient physical medicine and rehabilitation clinic	Rapid Geriatric Assessment Tool, Physical Activity Questionnaire, and Pittsburgh Sleep Quality Index	FRAIL and SARC-F positively correlated with PSQI score, negatively correlated with RCS score.	Limitations: small sample size.  Usefulness: a study utilizing the RGA in the intervention



<p>Esbensen, B. (2016). Growing older in the context of needing geriatric assessment: A qualitative study. <i>Scandinavian Journal of Caring Science</i></p>	<p>To describe how older adults who need geriatric assessment experience growing older</p>	<p>Single Qualitative Interview, Level VI</p>	<p>Eight participants from a different study, two main inclusion criteria</p>	<p>Allowing participants to describe the phenomenon of “growing older” in relation to needing a specific assessment based on their age</p>	<p>Five themes emerged:            1. Weakness            2. Perform ADLs            3. Mobility Aides            4. Lifestyle            5. End of Life</p> <p>Older adults associate growing older with illness and limitations.</p> <p>Interviews were analyzed based on Giorgi’s descriptive phenomenological methodology.</p>	<p>Limitations:            Different viewpoints on the use of aides, no record of coding, limited by the use of participants from prior study</p> <p>Usefulness: the ability to add information on how older adults feel about aging.</p>
<p>Barel, M. (2012). A new tool for rapid geriatric assessment in the elderly. <i>Israel Medical Association Journal</i>.</p>	<p>To assess the design, application, validity, and reliability of the INDEPENDENT geriatric screening tool</p>	<p>Quantitative, non-randomized control trial, Level III</p>	<p>Convenience sampling of 90 elderly participant</p>	<p>Measuring the efficiency of the INDEPENDENT tool compared to the Barthel Index for ADL scoring</p>	<p>The INDEPENDENT tool was reliable and valid according to Cronbach and Pearson coefficients</p>	<p>Limitations:            sample size, not specific to the use of the RGA assessment tool in this student’s intervention</p> <p>Usefulness: much more efficient tool, simple interpretation, wide range of functional status within the participants</p>
<p>Koroukian (2016). Combinations of chronic conditions, functional limitations, and geriatric syndromes that predict health outcomes. <i>Journal of General Internal Medicine</i>.</p>	<p>Predicting health outcomes via identification of chronic conditions, functional limits,</p>	<p>Case-Control Study, Level IV</p>	<p>Sampling Health and Retirement Study, adults age 50 and</p>	<p>Self-reported outcomes included fair/poor health, worse health at 2 years</p>	<p>Use of classification and regression tree (CART) analysis.</p> <p>Self-reported fair/poor health at 2</p>	<p>Limitations: self-reported nature and chronic conditions limited to specific 10</p>

	and geriatric syndromes		older, N=16,640	and 2year mortality.	years was 29%, 23% had a 2-year decline and 5% had died.  Functional limitation and geriatric syndromes better-predicted health outcomes compared to chronic conditions	Usefulness:
Veronese (2017). A comparison of objective physical performance tests and future mortality in elderly people. <i>Journal of Gerontology: Medical Sciences</i> .	To compare the usefulness of objective physical performance tests on mortality.	Case Cohort Study, Level IV	Community-dwelling older adults, N=2,096 in	Main outcome measured – mortality just over a four-year period. Physical performance was measured via short physical performance batter (SPPB), gait speed, chair stand time, leg extension/flexion, handgrip strength, and 6-minute walk test	Harrell's C-Index  327 participants died during follow-up.  SPPB, gait speed, leg flexion and walk test more greatly affected men who died in follow-up.  SPPB, handgrip, and walk test more greatly affected women who died in follow-up.	Limitations: No physical performance testing for baseline measurement, bias in the participant follow up exists  Usefulness: recommend screening for community-dwelling older adults
Morley (2017). Integrated Care: Enhancing the Role of the Primary Health Care Professional in Preventing Functional Decline: A Systematic Review. <i>JAMDA</i> .	To identify screening programs for primary care providers to use to identify geriatric syndromes.	Systematic Review of descriptive studies, Level V	48 articles reviewed	N/A	Four specific brief geriatric screening tools were identified.	Limitations: tools need to be closely studies for benefits  Usefulness: identified validated tools (specifically the RGA)
Barkhausen, (2015). "It's MAGIC" - development of a manageable geriatric	To design a new geriatric assessment tool	Evidence from literature	Many different data	N/A	The screening tool MAGIC yielded nine	Limitations: Feasibility is still being tested in a

assessment for general practice use. <i>BMC Family Practice.</i>	to be used in primary care	analysis of quantitative and qualitative data Level V	collection steps all merged into the MAGIC instrument		specific geriatric screening categories.	RCT at large (RIME)  Usefulness: Offers research for the development of a geriatric screening tool
Mueller (2018). Performance of a brief geriatric evaluation compared to a comprehensive geriatric assessment for detection of geriatric syndromes in family medicine: a prospective diagnostic study. <i>BMC Geriatrics.</i>	Estimate the ability of the Brief Assessment Tool (BAT) to identify geriatric syndromes compared to a CGA	Prospective diagnostic study, Level VI	N=85, convenient sampling of patients from specific practices	N/A	Looking at eight geriatric syndromes, the sensitivity of BAT had a wide range of 25%-82% for the differing syndromes, and specificity ranged from 45%-87%  Most providers considered the BAT met needs their needs of geriatric assessment	Limitations: sample size, assessments between the BAT and CGA were not simultaneous meaning patient condition may have changed  Usefulness: supports the use of a brief geriatric assessment tool in practice
Halaweh (2018). Perspectives of older adults on aging well: A focus group study. <i>Journal of Aging Research</i>	Explore perceptions on aging	Single Qualitative Study, Level VI	N=56, convenient sampling	Data analysis interpreted via Braun and Clarke	3 Major Themes: 1." Sense of wellbeing" 2." Having good physical health" 3." Preserving good mental health"	Limitations: some participants with higher level of physical functioning Usefulness: Helps determine considerations to take to help older adults age well

## Appendix D

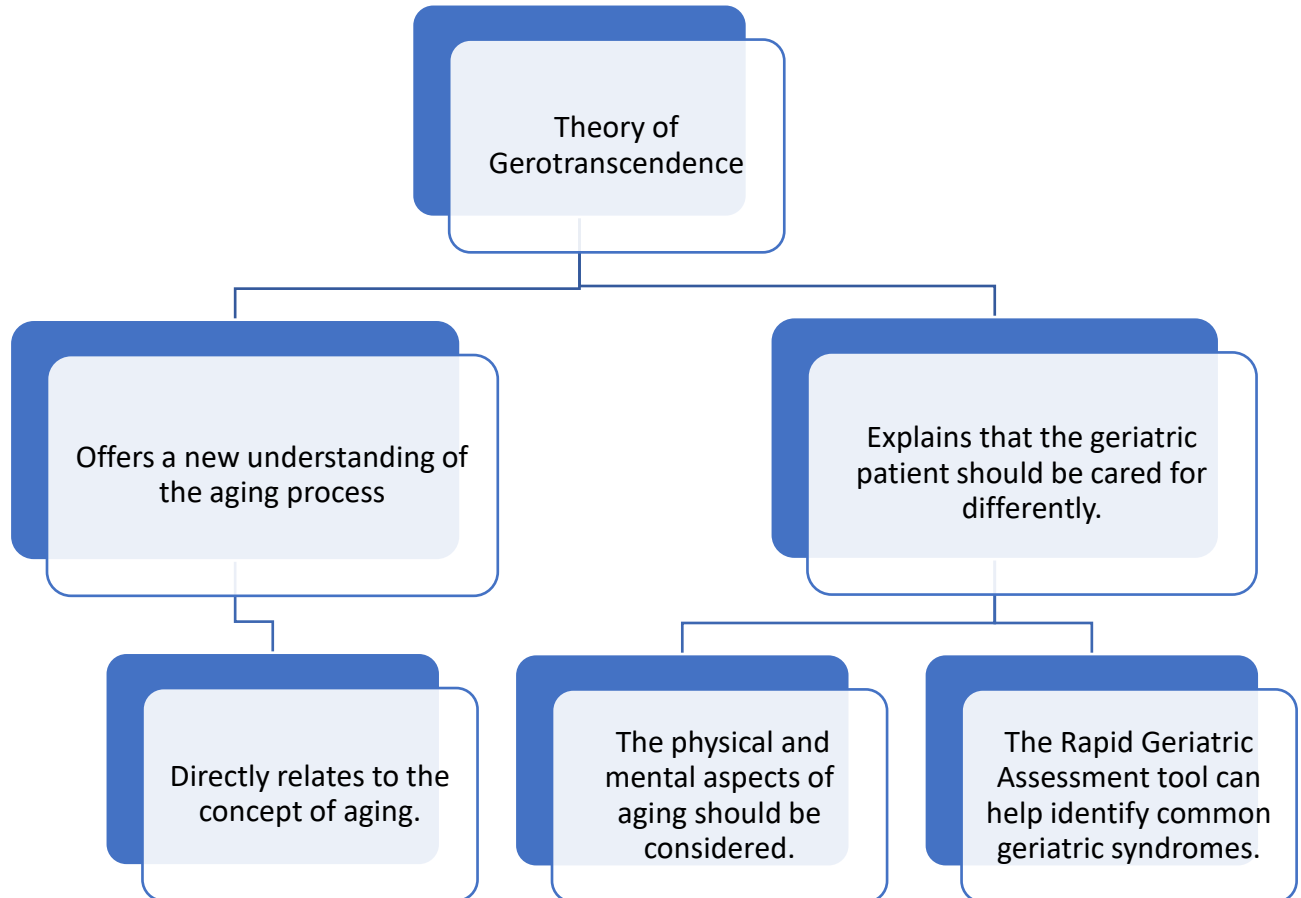
## Evidence Grid

<b>Themes for the inquiry</b>	<b><i>Frailty:</i></b> Identifying older adults who are at risk for decline and disability.	<b><i>Sarcopenia:</i></b> Physical performance is reflective of sarcopenia and may not directly be related to patient weight.	<b><i>Malnutrition:</i></b> Risk of malnutrition in the elderly is high and should be screened for.	<b><i>Cognitive Function:</i></b> Cognitive decline can be detected early with screening tools.	<b><i>Geriatric Assessment:</i></b> Geriatric syndromes can be detected with the use of screening tools.
<b>Article</b>					
Woo (2015)	<b>X</b>				
Morley (2012)	<b>X</b>				
Vermeiren (2016)	<b>X</b>				
Pialoux (2012)	<b>X</b>				
O'Hoski (2019)	<b>X</b>				<b>X</b>
Malmstrom (2014)	<b>X</b>				
Ambagtsheer (2019)	<b>X</b>				<b>X</b>
Sternberg (2011)	<b>X</b>				
Dent (2018)		<b>X</b>			
Yadigar (2016)		<b>X</b>			

Bahat (2018)		<b>X</b>			
Rolland (2017)	<b>X</b>	<b>X</b>			
Kasim (2019)	<b>X</b>	<b>X</b>			
Malmstrom (2015)		<b>X</b>			
Harris (2019)			<b>X</b>		
Volkert (2018)			<b>X</b>		
Wang (2018)			<b>X</b>		
Rolland (2012)					
Wilson (2005)			<b>X</b>		
Malmstrom (2015)				<b>X</b>	
Rosenbloom (2018)				<b>X</b>	
Bernstein (2019)				<b>X</b>	
Tuna (2019)	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
Esbensen (2016)					<b>X</b>
Barel (2012)					<b>X</b>
Koroukiam (2016)					<b>X</b>

Veronese (2017)	<b>X</b>				<b>X</b>
Morley (2017)					<b>X</b>
Barkhausen (2015)					<b>X</b>
Mueller (2018)					<b>X</b>
Halaweh (2018)					<b>X</b>

**Appendix E**  
**Theory Diagram**



**Appendix F****Faculty Approval**

July 13, 2020

Shelby Hawkins  
UMKC DNP Student

Congratulations Shelby. The UMKC Doctor of Nursing Practice (DNP) faculty has approved your DNP project proposal, *Incorporating a Rapid Geriatric Assessment in Primary Care: A Project Proposal*.

You may proceed with IRB application

Sincerely,

A handwritten signature in purple ink that reads "Lyla Lindholm".

Lyla Lindholm, DNP, RN, ACNS-BC  
Clinical Assistant Professor, DNP Faculty  
MSN-DNP Program Coordinator  
UMKC School of Nursing and Health Studies  
[lindholm1@umkc.edu](mailto:lindholm1@umkc.edu)

A handwritten signature in black ink that reads "Cheri Barber".

Cheri Barber, DNP, RN, PPCNP-BC, FAANP  
Clinical Assistant Professor  
DNP Program Director  
UMKC School of Nursing and Health Studies  
[barberch@umkc.edu](mailto:barberch@umkc.edu)

DNP Faculty Mentor Name, DNP  
UMKC School of Nursing and Health Studies



**Appendix G**  
**IRB Designation**



**KUMC HUMAN SUBJECTS COMMITTEE**

**REQUEST FOR  
QUALITY IMPROVEMENT/QUALITY ASSURANCE DETERMINATION**

***\*THIS FORM MUST BE TYPED\****

***PLEASE EMAIL THIS FORM TO: HUMANSUBJECTS@KUMC.EDU***

<b>Project Leader:</b> Dr. Deon Hayley and Doctor of Nursing Practice Student Shelby Hawkins	
<b>Department:</b> Internal Medicine General/Geriatric Clinic	
Email: dhayley@kumc.edu and sstone4@kumc.edu	Phone: Dr. Hayley 913-588-6005 and Shelby Hawkins 816-665-1904
<b>Alternate Contact Person (e.g., Project Coordinator):</b>	
Email:	Phone:

**Project Title:**

Incorporating a Rapid Geriatric Assessment in Primary Care

**Project Number, Version and/or Date:**

Project Number 1, Version 1, July 22, 2020

**FOR OFFICE USE ONLY**

**Quality Improvement Determination Acknowledged. IRB review is not required.**

Karen Blackwell, HRPP Director

HRPP Official

*Karen Blackwell*

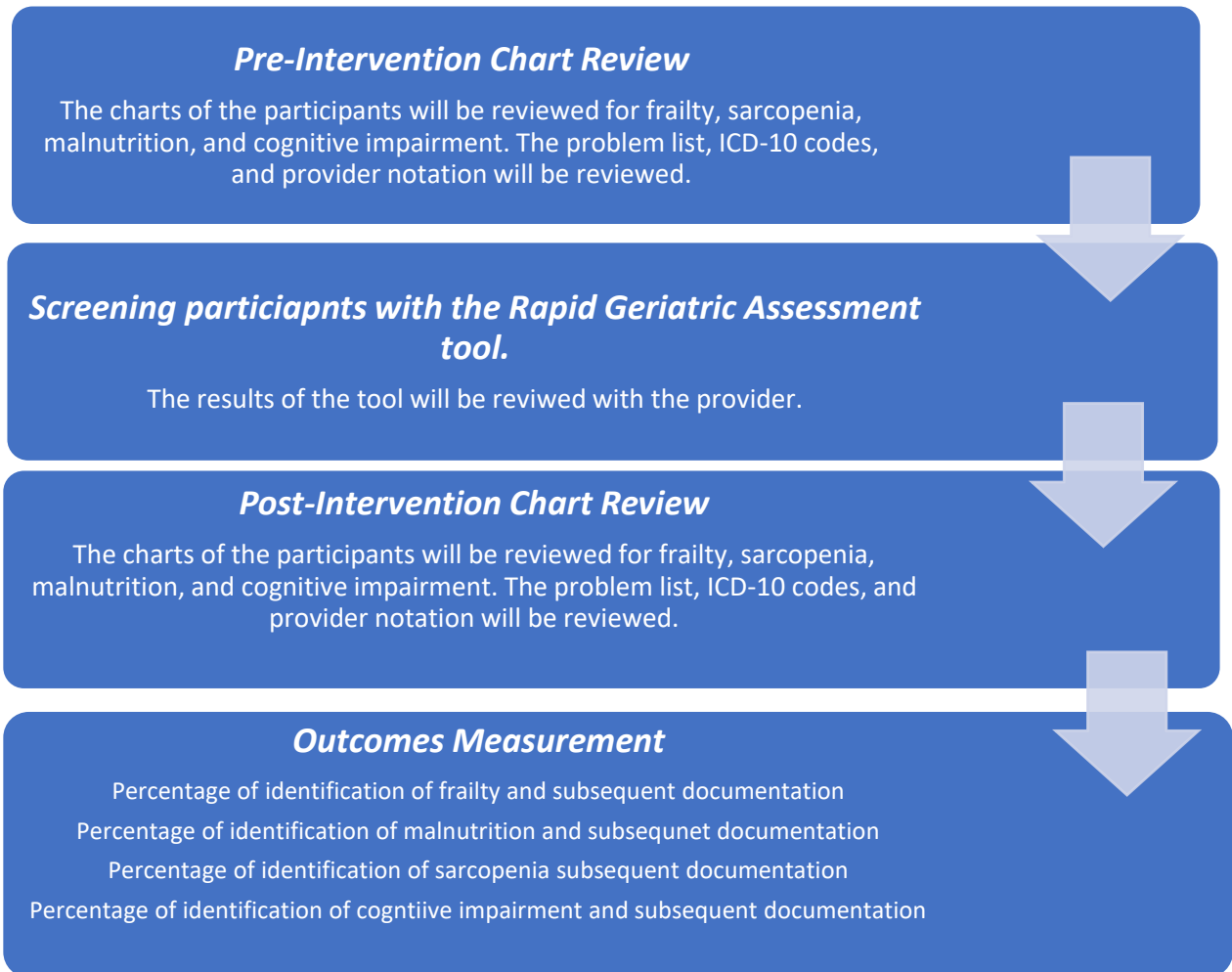
Signature

7/28/20

Date

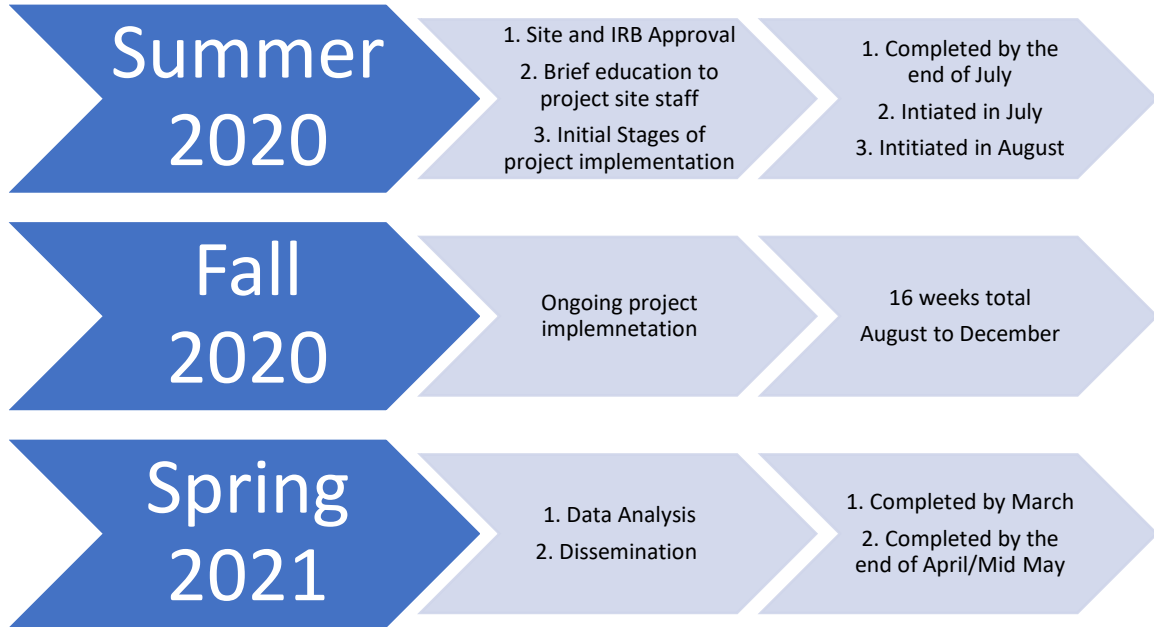
**Appendix H****Cost Table**

<b>Item</b>	<b>Item Description</b>	<b>Quantity</b>	<b>Unit Cost</b>	<b>Anticipated Cost</b>
Print Materials	Copies of the Rapid Geriatric Assessment tool	200	\$0.15 per page	\$30.00
Equipment	Computers (personal and project site computer)	2	Supplied by student and clinical site	\$0
Miscellaneous	N/A	N/A	N/A	N/A
Student Time	Clinical hours at project site	~85 hours	\$36.00 per hour	Donated
<b>Total</b>				<b>\$30.00</b>

**Appendix I****Intervention Flow Diagram**

**Appendix J**

**Project Timeline Diagram**



Appendix K

Logic Model

Logic Model for DNP Project						
<b>Student: Shelby Hawkins</b>						
Inquiry, PICOTS: In adults age 65 and older, does the use of the Rapid Geriatric Assessment tool compared to assessment without a standardized tool improve the identification of geriatric syndromes in a four-month time frame in a primary care setting?						
Inputs	Intervention(s)		Outputs	Outcomes -- Impact		
	Activities	Participation		Short	Medium	Long
<p><b>Evidence, sub-topics</b></p> <ol style="list-style-type: none"> <li>1. Frailty</li> <li>2. Sarcopenia</li> <li>3. Malnutrition</li> <li>4. Cognitive Decline</li> <li>5. Geriatric Assessment</li> </ol> <p><b>Major Facilitators or Contributors</b></p> <ol style="list-style-type: none"> <li>1. Anticipated high number of participants</li> <li>2. Passionate project stakeholder</li> <li>3. Diverse project site</li> </ol> <p><b>Major Barriers or Challenges</b></p> <ol style="list-style-type: none"> <li>1. Patient refusal</li> <li>2. Time</li> <li>3. COVID-19 Pandemic</li> </ol>	<p><b>Each patient will be screened with the RGA to identify frailty, sarcopenia, malnutrition, cognitive impairment, and the presence of an advanced directive.</b></p> <p><b>Major steps of the intervention:</b></p> <ol style="list-style-type: none"> <li>1. Charts of the patients being seen will be reviewed.</li> <li>2. Will determine if the presence of any of the above geriatric syndromes are already present.</li> <li>3. Patient will be screened with the RGA.</li> <li>4. Charts reviewed after RGA and discussed with provider.</li> </ol>	<p><b>The participants:</b> Adults age 65 and older seen at the project site.</p> <p><b>Site:</b> The University of Kansas Health System Internal Medicine Group – Geriatric</p> <p><b>Time Frame:</b> Four months total</p> <p><b>Verbal consent will be sought with each participant being screened with the RGA.</b></p> <p><b>Other person(s) collecting data?</b> No</p> <p><b>Others directly involved in consent or data collection?</b> No</p>	<p><b>(Completed during DNP Project)</b></p> <p><b>Outcome(s) to be measured.</b></p> <p><b>Primary:</b> Increased identification of frailty, sarcopenia, malnutrition, and cognitive decline.</p> <p><b>Secondary:</b> Does the number of completed advanced directives increase?</p> <p><b>Measurement tool(s)</b></p> <ol style="list-style-type: none"> <li>1. Pre/Post chart review.</li> </ol> <p><b>Statistical analysis to be used</b></p> <ol style="list-style-type: none"> <li>1. Power Calculator to determine sample size</li> <li>2. McNemar Test via SPSS</li> </ol>	<p><b>(after student DNP)</b></p> <p>Decreased in number of reported falls with those diagnosed with frailty or sarcopenia.</p> <p>Enhanced provider knowledge on the importance and impact of geriatric syndromes.</p>	<p><b>(after student DNP)</b></p> <p>RGA imbedded in the electronic medical record.</p> <p>Improved quality care in older adults.</p>	

## Appendix L

### Measurement Tool



Saint Louis University  
Rapid Geriatric Assessment\*



\*There is no copyright on these screening tools and they may be incorporated into the Electronic Health Record without permission and at no cost.

ID#: \_\_\_\_\_ Sex: \_\_\_\_\_ Age: \_\_\_\_\_ Primary Care Provider Y / N  
Ethnicity (circle): African/Am Asian Caucasian Hispanic Non-Hispanic

#### The Simple "FRAIL" Questionnaire Screening Tool

- F**atigue: Are you fatigued?
- R**esistance: Cannot walk up one flight of stairs?
- A**erobic: Cannot walk one block?
- I**llnesses: Do you have more than 5 illnesses?
- L**oss of weight: Have you lost more than 5% of your weight in the last 6 months?

Scoring: 3 or greater = frailty; 1 or 2 = prefrail

From Morley JE, Vellas B, Abellan van Kan G, et al. J Am Med Dir Assoc 2013;14:392-397.

Total FRAIL Score: \_\_\_\_\_

#### SARC-F Screen for Sarcopenia (Loss of Muscle)

Component	Question
Strength	How much difficulty do you have in lifting and carrying 10 pounds? Scoring: None = 0 Some = 1 A lot or unable = 2
Assistance in Walking	How much difficulty do you have walking across a room? Scoring: None = 0 Some = 1 A lot, use aids or unable = 2
Rise from a Chair	How much difficulty do you have transferring from a chair or bed? Scoring: None = 0 Some = 1 A lot or unable without help = 2
Climb stairs	How much difficulty do you have climbing a flight of ten stairs? Scoring: None = 0 Some = 1 A lot or unable = 2
Falls	How many times have you fallen in the last year? Scoring: None = 0 1-3 Falls = 1 4 or more falls = 2

Total score of 4 or more indicates Sarcopenia

From Malmstrom TK, Morley JE. J Frailty and Aging 2013;2:55-6.

Total SARC-F Score: \_\_\_\_\_

#### SNAQ (Simplified Nutritional Assessment Questionnaire)

- |  |  |
|--|--|
| <p><b>My appetite is</b></p> <ul style="list-style-type: none"> <li>a. very poor</li> <li>b. poor</li> <li>c. average</li> <li>d. good</li> <li>e. very good</li> </ul> <p><b>When I eat</b></p> <ul style="list-style-type: none"> <li>a. I feel full after eating only a few mouthfuls</li> <li>b. I feel full after eating about a third of a meal</li> <li>c. I feel full after eating over half a meal</li> <li>d. I feel full after eating most of the meal</li> <li>e. I hardly ever feel full</li> </ul> | <p><b>Food tastes</b></p> <ul style="list-style-type: none"> <li>a. very bad</li> <li>b. bad</li> <li>c. average</li> <li>d. good</li> <li>e. very good</li> </ul> <p><b>Normally I eat</b></p> <ul style="list-style-type: none"> <li>a. Less than one meal a day</li> <li>b. One meal a day</li> <li>c. Two meals a day</li> <li>d. Three meals a day</li> <li>e. More than three meals a day</li> </ul> |
|--|--|

Scoring: a=1, b=2, c=3, d=4, e=5.  
A score  $\leq 14$  indicates significant risk of at least 5% weight loss within 6 months.

From Wilson et al. Am J Clin Nutr 2005;82:1074-81.

Total SNAQ Score: \_\_\_\_\_

#### Rapid Cognitive Screen (RCS)

1. Please remember these five objects. I will ask you what they are later.  
[Read each object to patient using approx. 1 second intervals.]  
**Apple Pen Tie House Car**
2. [Give patient pencil and the blank sheet with clock face.] **This is a clock face. Please put in the hour markers and the time at ten minutes to eleven o'clock**  
- [2 pts/hr markers ok; 2 pts/time correct]
3. **What were the five objects I asked you to remember?**  
[1 pt/ea]
4. **I'm going to tell you a story. Please listen carefully because afterwards, I'm going to ask you about it.**

Jill was a very successful stockbroker. She made a lot of money on the stock market. She then met Jack, a devastatingly handsome man. She married him and had three children. They lived in Chicago. She then topped work and stayed at home to bring up her children. When they were teenagers, she went back to work. She and Jack lived happily ever after.

What state did she live in? [1 pt]

SCORING  
8-10..... Normal  
6-7..... Mild Cognitive Impairment  
0-5..... Dementia

From Malmstrom TK, Voss VB, Cruz-Oliver DM et al J Nutr Health Aging 2015;19:741-744.

Total RCS Score: \_\_\_\_\_

#### Advance Directive

Do you have an advance directive? Y/N

### Appendix M

#### Data Collection Table

Pre-Chart Review	Documentation of Frailty	Documentation of Sarcopenia	Documentation of Malnutrition	Documentation of Cognitive Decline
Participant 1 Age, Gender Identified				
Participant 2 Age, Gender Identified				
Participant 3 Age, Gender Identified				

Post-Chart Review	Documentation of Frailty	Documentation of Sarcopenia	Documentation of Malnutrition	Documentation of Cognitive Decline
Participant 1 (same participant as above)				
Participant 2 (same participant as above)				
Participant 3 (same participant as above)				

## Appendix N

## Statistical Analysis Table

	State	Measurement Instrument Name	Tool validity and reliability	Permission Need	Statistical Analysis
Primary Outcome	An increase in the identification and documentation of frailty, sarcopenia, malnutrition, and cognitive decline	Rapid Geriatric Assessment	Low	No, not a copywritten tool	Descriptive Statistics with percentages
Demographics	Age Gender	N/A	N/A	N/A	Descriptive Statistics
<p>Participant Completion of the Measurement Tool (Procedure):  The completion of the measurement tool will be the primary intervention of the project. The project leader will verbally ask the participants the components of the RGA which will also serve as the measurement tool.</p>					



## Appendix O

### SPSS Variable View

Variable Sheet Project Proposal.sav [DataSet1] — PSPPIRE Data Editor

File Edit View Data Transform Analyze Graphs Utilities Windows Help

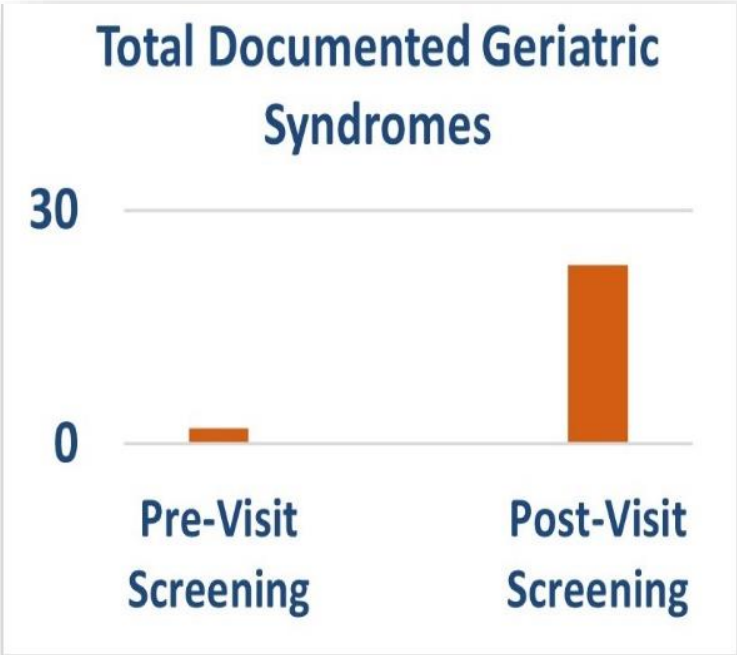
Variable	Name	Type	Width	Decimal	Label	Value Labels	Missing Values	Columns	Align	Measure	Role
1	Frailty_Pre	Numeric	8	2		None	None	13	Right	Nominal	Input
2	Frailty_Post	Numeric	8	2		None	None	12	Right	Nominal	Input
3	Sarcopenia_Pre	Numeric	8	2		None	None	15	Right	Nominal	Input
4	Sarcopenia_Post	Numeric	8	2		None	None	15	Right	Nominal	Input
5	Malnutrition_Pre	Numeric	8	2		None	None	14	Right	Nominal	Input
6	Malnutrition_Post	Numeric	8	2		None	None	14	Right	Nominal	Input
7	Cognitive_Decline_Pre	Numeric	8	2		None	None	16	Right	Nominal	Input
8	Cognitive_Decline_Post	Numeric	8	2		None	None	17	Right	Nominal	Input
9											
10											
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Data View Variable View

Filter off Weights off No Split

Appendix P

Documentation Graph



## Appendix Q

## Percentage of Documented Geriatric Syndromes

Pre-Visit Screening, N=90, 2 with at least one syndrome documented		
Geriatric Syndromes	Screened Present, RGA	Documented
Frailty	72 (80%)	5 (7%)
Sarcopenia	46 (51%)	7 (15%)
Risk for Weight Loss	43 (48%)	5 (12%)
Cognitive Impairment (n=59)	31 (52%)	6 (19%)

## Appendix R

### Associations

#### Chi-Square Tests

	Value	df	Asymptotic Significance (2- sided)	Exact Sig. (2- sided)	Exact Sig. (1-sided)
Pearson Chi-Square	23.523 <sup>a</sup>	1	.000		
Continuity Correction <sup>b</sup>	21.035	1	.000		
Likelihood Ratio	30.538	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	23.261	1	.000		
N of Valid Cases	90				

#### Symmetric Measures

		Value	Asymptotic Standard Error <sup>a</sup>	Approximate T <sup>b</sup>	Approximate Significance
Nominal by Nominal	Phi	.511			.000
	Cramer's V	.511			.000
Interval by Interval	Pearson's R	.511	.061	5.580	.000 <sup>c</sup>
Ordinal by Ordinal	Spearman Correlation	.511	.061	5.580	.000 <sup>c</sup>
N of Valid Cases		90			