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PREVENTING FRAILITY IN OBESE OLDER ADULTS

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Similar to other sectors in the current economy, the health care industry faces significant financial challenges in the years to come. The health care industry is particularly vulnerable because not only is it experiencing rising costs, but also it is at risk to a number of other challenges such as increased life expectancy and the prevalence of obesity. The increasing prevalence of obesity and obesity-related complications with aging are challenging our existing health care delivery and financing systems. To start, there has been a dramatic increase in the life expectancy over the last century and people are living longer. Further, obesity is becoming more common in the older adult population, and therefore bringing increased negative consequences of comorbidities to light¹. The number of obese older adults has increased markedly during the past two decades. Recent estimates suggest that 37% of adults 65 years of age or older are obese, and this prevalence will become even more evident as baby boomers become senior citizens². Indeed, the prevalence is lower in extreme old age, but this is also likely to increase in the future. Obesity in the older adult population is particularly problematic because of the numerous medical consequences that are likely to ensue such as cardiovascular disease, diabetes mellitus, arthritis, urinary incontinence and depression. Moreover, there is cumulative evidence that suggest that obesity exacerbates the age-related decline in physical function, which causes frailty, impairs quality of life, and results in increases in nursing home admissions. That said, there is a real need to be proactive in preventing frailty, especially in the obese older adult population.

Decreased physical activity and decreased energy expenditure with ageing predispose to fat accumulation and fat redistribution, but muscle loss continues with ageing³. Despite a greater absolute amount of muscle mass, obese older adults have low muscle mass relative to body weight (relative sarcopenia). In fact, a loss of muscle mass may be overlooked in obese people unless there is clear functional loss of muscle strength. This condition is known as sarcopenic obesity⁴. Age-related progression of sarcopenia and degenerative joint disease is exacerbated by obesity. A vicious cycle is set up when such individuals are so limited in their physical ability that they cannot perform even the simplest activities of daily living.

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Obesity in older adults is associated with an increased risk for difficulties in performing physical functions. Both objective and subjective functional capacity, particularly mobility, are significantly decreased in overweight and obese compared to that of non-obese and lean older adults^{5,6}. Frailty develops when impairment in function and reduction in physiologic reserves are severe enough to cause disability and difficulty in performing one's day to day activities⁷. Previously, frailty was usually conceptualized as being a wasting disorder. Cumulative evidence suggests, however, that the risk of frailty is greatly increased with obesity⁸. In one study, 96% of community-living older subjects (65–80 y old) with obesity were frail, as determined by physical performance test scores, aerobic capacity, and self-reported ability to perform activities of daily living⁶. Another more recent study found that obesity was an important determinant of frailty among HIV-infected older adults⁹. Older adults are often susceptible to the adverse effects of excess body fat on physical function because not only do they experience decreased muscle mass and strength which occurs with aging (sarcopenia), but also this population may need to carry greater body mass due to obesity. Interestingly, it should be noted that older persons who are obese have a higher rate of nursing home admissions than those who are not obese¹⁰. Considering the high cost associated with nursing home care, controlling obesity in older adults can not only prove to have significant health benefits, but also have very tangible financial benefits. With respect to one's health, it has been shown that obesity impairs the quality of life in older persons. Specifically, increased BMI and age are inversely associated with physical function, freedom from bodily pain, and limitations due to physical problems¹¹. Obesity is also associated with significant impairment in health-related quality of life in older subjects (e.g., physical functioning, role limitations due to physical problems, and vitality)⁶. The increasing prevalence of obesity in older adults is a significant concern because of the high risk of functional decline these individuals experience. This, perhaps, may be the most common phenotype of frailty of obese, disabled, older adult in the years to come.

Even though scientists are in general agreement that obesity is an important cause of disability in older adults, there is still debate with respect to weight management as a clinical approach to treat obesity in older adults given the reduction in relative health risks associated with increasing body-mass index (BMI) in this age group. Moreover, there is major concern that weight loss could worsen frailty by accelerating the usual age-related loss of muscle that leads to sarcopenia. Therefore, a current challenge for clinicians and researchers working with overweight and obese older adults is to design lifestyle-based interventions that can produce significant weight loss while minimizing the loss of lean mass. The current therapeutic tools available for weight management in older persons are life-style modifications, pharmacotherapy and surgery¹. To-date, weight loss drugs have not been extensively studied in older people because there is a concern for polypharmacy, drug side effects and interactions. While weight loss surgery appears to be safe and effective in younger adults, little is known about the outcomes of this surgery in older adults.

Lifestyle modification is another way to manage obesity in older adults. Caloric restriction is generally required to achieve significant weight loss. Typically 25–30% of the lost weight is lean mass, a significant concern for older adults¹². In contrast, exercise can increase or maintain muscle mass and improve muscle quality in older adults, but it does not typically produce significant weight loss on its own¹. That said, identifying interventions designed to

maximize functional improvement while limiting muscle and bone loss during weight loss is a current challenge. In short-term studies, a combination of moderate diet-induced weight loss and exercise has been seen to improve both subjective and objective measures of physical function and health-related quality of life physical function and ameliorate frailty in obese older adults¹³. These findings indicate that obesity is a remediable cause of frailty and impaired quality of life in older persons. However, little evidence exists regarding the long-term benefits and risks of weight loss interventions to guide the care of this population.

Recently, in a 52-week randomized controlled clinical trial, 107 adults who were 65 years of age or older and obese were studied to investigate the independent and combined effects of weight loss and exercise on physical function, body composition and quality of life in obese, older adults¹⁴. These subjects were randomized into a weight management program, exercise training program, weight management plus exercise training program, and a control group. The diet-only weight management program consisted of a balanced diet producing an energy deficit of 500 to 750kcal per day from participants' daily energy requirements. The exercise intervention included both aerobic and resistance training components. While physical function improved in all of the intervention groups compared to the control group, the diet plus exercise group exhibited significantly better physical function compared to the diet-only and exercise-only groups. Lean body mass and bone mineral density (BMD) at the hip decreased less in the diet–exercise group than in the diet group. Additionally, the diet plus exercise group lead to improved aerobic capacity, strength, balance, and gait speed compared to all other groups. These findings suggest that combination of weight loss and exercise is more effective at preventing frailty and preserving quality of life for obese older adults compared with either modality alone. Moreover, the combination of weight loss and exercise is a safe and effective method to attenuate weight loss-induced reduction in lean tissues¹⁵. Further studies are needed to determine whether weight loss can be maintained beyond 1 year and prevent institutionalization of obese older adults. Future long-term randomized controlled clinical trials should focus on evaluating whether long-term weight maintenance is likely to produce the most meaningful change in health outcomes in obese older adults.

In conclusion, obesity causes frailty and negatively impacts the quality of life for individuals, especially in older adults. It is particularly important to consider therapeutic approaches to prevent frailty among obese older adults with the least potential adverse effects. Recent evidence suggests that a combination of weight-loss and exercise therapy is an effective and safe approach to prevent and manage frailty in the obese older adult population. Preventing and treating the medical complications of obesity by weight management may be the most important goal of therapy in young and middle-aged adults, whereas improving physical function and quality of life should be the most important goal of weight management therapy in older adults.

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