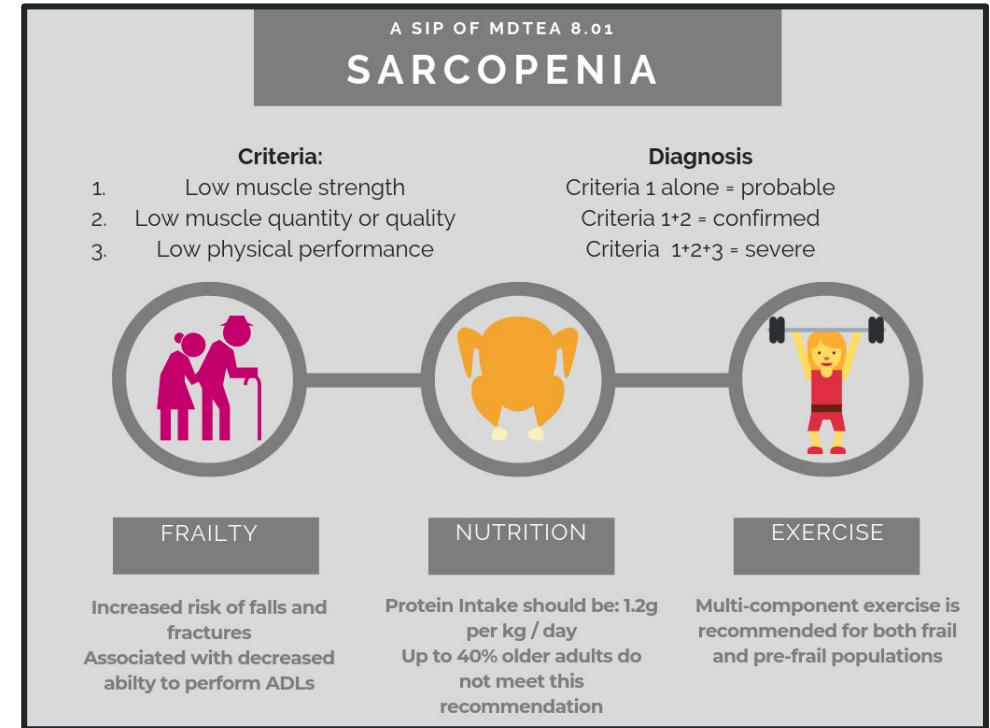


# What Is Sarcopenia?

- “Sarcopenia” = Officially coined in 1989
- Is Greek for “Poverty of the flesh”
- Primary Sarcopenia
  - Exists when age is the only factor, no other medial issues or causes are known
- Secondary Sarcopenia
  - Exists when factors other than age are present that may play a role in the muscles decline
  - Example = sarcopenia that results from joint problems leading to immobility, and from the muscle wasting that sometimes accompanies cancer



# Sarcopenia & Joint Degeneration

Acute & Chronic



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## Research Article

### Prevalence of Sarcopenia and Sarcopenic Obesity Vary with Race/Ethnicity and Advancing Age

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#### What is Known About the Topic

- Individuals are living longer than ever before and in the United States the older adult population is becoming more ethnically and racially diverse.
- There can be genetic variability in body mass index and body composition.
- Sarcopenia and obesity contribute to poor health outcomes and when occurring together as sarcopenic obesity, can cause even further health complications that limit the human condition and functionality.
- Few studies have specifically considered these conditions across different racial/ethnic populations and with advancing age.

Aging is associated with changes in body composition, and there is some evidence that these changes in body composition vary by ethnic groups [2-4]. Body composition changes can contribute to the decline in health and physical function. Sarcopenia is one such change and is defined by the loss of lean mass with associated loss of strength and/or physical function [5,6]. Sarcopenia develops naturally as a result of aging, decreased physical activity, or extended immobilization (i.e. hospitalization). Acute and chronic disease can also lead to muscle loss and sarcopenia [7,8]. Sarcopenia is associated with an increased risk for falls and mobility-disability, as well as various deleterious health outcomes including poor balance, reduced activities of daily living (ADLs), and dependency leading to nursing home placement [9,10]. These conditions can perpetuate the cycle of inactivity and muscle loss, eventually leading to frailty and even mortality [11-14]. While the prevalence of sarcopenia varies depending on how it is defined and the specific techniques used to measure muscle mass, it is estimated to occur in 25-45% of older adults in the U.S. and in a substantial proportion of older adults across the world even among healthy populations [7, 15-18].

Even short periods of reduced activity (both immobilization, simulating bed rest or hospitalization, and step reduction, which may better model COVID-19 confinement) have been shown to result in the rapid loss of muscle mass and physical function, even in younger adults [26, 48]. As much as 1.7% of muscle volume can be lost after as little as 2 days of immobilization, with greater losses (5.5% of muscle volume) observed after only 7 days [49]. A recent study

## Early Onset of Atrophy

- 1.7% Muscle Volume Loss Can Be Observed after Two Days of Immobilization

## Atrophy

- 5.5% Muscle Volume Loss Can Be Observed after Seven Days

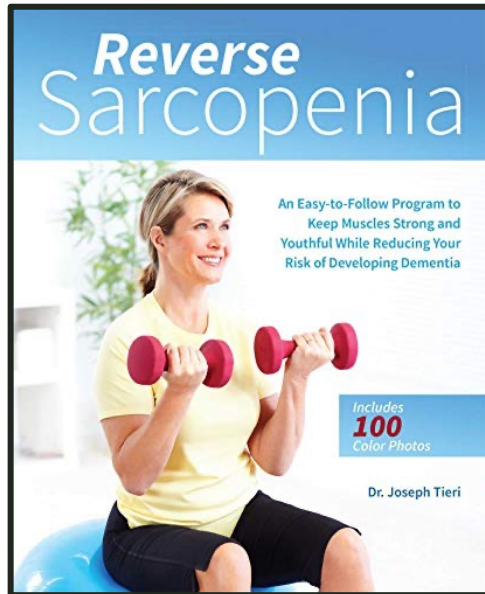
## Early Onset of Sarcopenia

- Severe Atrophy/Early Onset of Sarcopenia Can Be Observed after 10 Days

## Sarcopenia

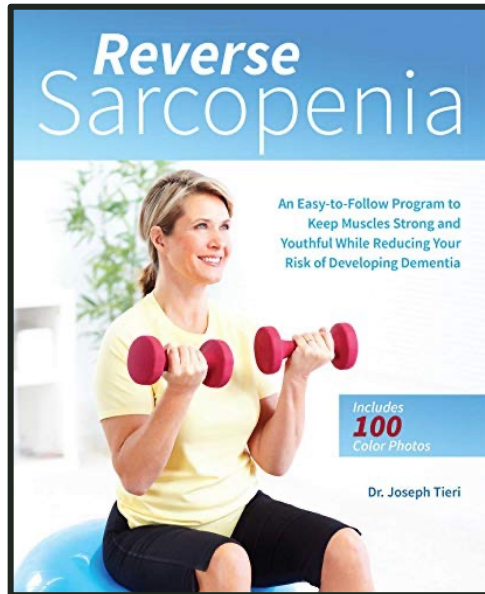
- 6% Decrease in Power Production
- 8%+ Decrease in Strength Production
- 5.5%+ Loss of Muscle Mass all after 14 Days

# What Is Sarcopenia Influenced Decline?

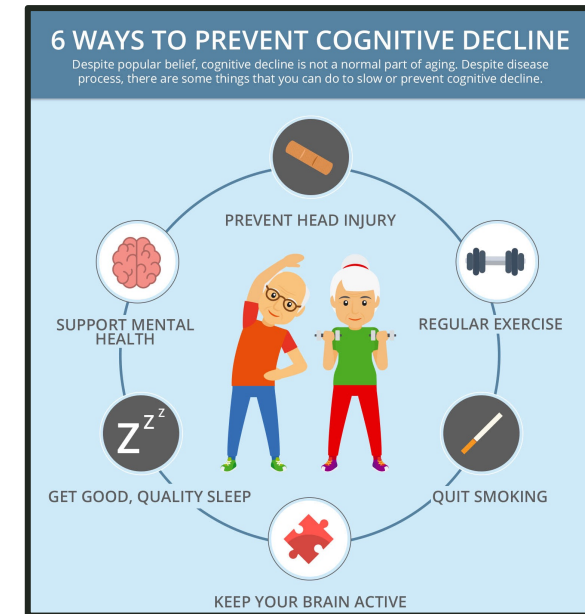


- Sarcopenia Decline Occurs **Physically** & Cognitively
- **Physical** Decline Includes:
  - Walk Quickly
  - Reach Over Head
  - Sit to Stand
  - Getting Out of the Car
  - Lifting Grandchildren or Children
  - Opening Windows or Jars
  - Up & Down from the Floor
  - Up & Down Stairs
  - Carry Groceries from Car to Kitchen

# What Is Sarcopenia Influenced Decline?



- Sarcopenia Decline Occurs Physically & **Cognitively**
- **Cognitive** Decline Includes:
  - Hand Eye Coordination
  - Balance
  - Reaction Time
  - Coordination
  - Implement Tracking
  - Memory & Recall
  - Dual Tasking





# Results from 14 Day Stay-At-Home Quarantine in those Over the Age of 59



Before Pandemic Average Person Step Count  
= 6,000 steps per day

During 14 Day Stay-At-Home Quarantine  
= Average was 1,500 steps per day  
= Decreased by 75%  
= 4% reduction in fat free body mass  
= 8% reduction in muscular strength

Two-week Post-Rehabilitation Training Sessions  
Failed to Rebuild Lost Muscle Mass

*"Two weeks of inactivity has been shown to decrease muscle strength by approximately 8%, and despite a seemingly low value, 2 weeks of rehabilitation were ineffective in recovering muscle function, emphasizing the impact of abrupt reductions in physical activity in an already vulnerable population"*