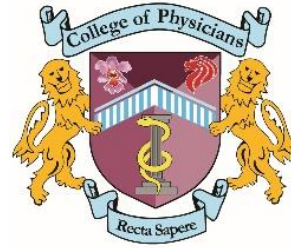




**ACADEMY OF MEDICINE
SINGAPORE**



**CHAPTER OF GERIATRICIANS
COLLEGE OF PHYSICIANS, SINGAPORE**

CLINICAL PRACTICE GUIDELINE ON SARCOPENIA

GERIATRIC MEDICINE

20 OCTOBER 2022

Developed by

**CHAPTER OF GERIATRICIANS
COLLEGE OF PHYSICIANS, SINGAPORE**

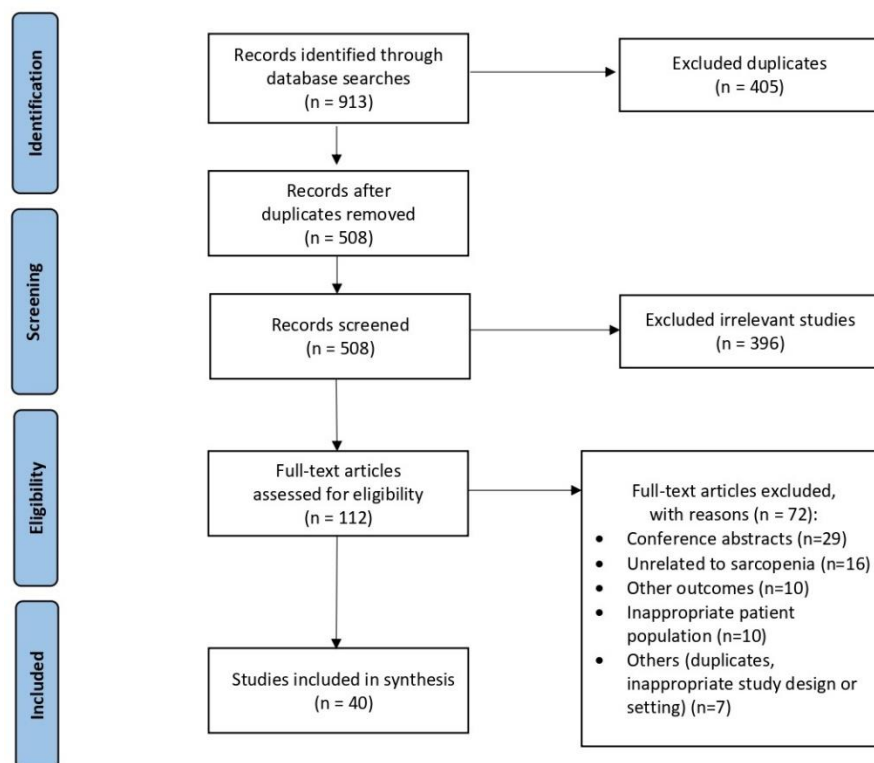
1. Background

1. Sarcopenia is defined as the age-associated progressive and generalised skeletal muscle disorder that involves loss of muscle mass plus loss of muscle strength and/or reduced physical performance. Sarcopenia is associated with adverse health consequences, including falls, functional decline, hospitalisation, frailty, increased healthcare costs, and mortality. Locally, the prevalence of sarcopenia in older persons ranges from 27 to 32%, with a male predominance.^{1,2}
2. In 2014, the Asian Working Group for Sarcopenia (AWGS) proposed a diagnostic algorithm based on Asian data.³ The recognition of sarcopenia as an independent condition with an International Classification of Diseases-10 code (M62.84) in 2016 represents a further step forward in translating sarcopenia into clinical practice.⁴
3. Although these developments spurred clinical and research interest in sarcopenia in Asia, most clinicians remain unaware of the condition and the diagnostic tools needed to identify it. This situation provided the impetus for the AWGS consensus update in 2019. The updated document includes an algorithm for identifying and diagnosing older adults with or at risk for sarcopenia. It includes case-finding and diagnostic protocols to support the management of sarcopenia in clinics and research, taking into account the different settings of geriatrics (from the hospital to primary healthcare and community-based preventative services).⁵
4. Commensurate with the rapidly ageing population in Singapore, the local prevalence of frailty ranges from 5.7% to 6.2% among older adults.⁶ As an antecedent and important risk factor for physical frailty, sarcopenia is thus a salient condition of public health concern. However, there is heterogeneity in clinical practice with regards to the diagnostic criteria for sarcopenia, tests used for case finding and evaluation of muscle function, the cutoffs for these tests, and how these tests are being performed. Although there are published research studies on sarcopenia in the local population, these have not been systematically examined and summarised.
5. A Clinical Practice Guideline workgroup was thus convened by the Chapter of Geriatricians and the Society for Geriatric Medicine Singapore to develop evidence-based recommendations, which took into consideration the local evidence as well as the healthcare landscape, to facilitate the adoption of the AWGS 2019 consensus into current practice in Singapore. When developing the guidelines, the focus was to summarise available local evidence and present contextualised evidence-based recommendations for the most effective practices in case-finding, diagnosis, treatment and prevention which can be used by practitioners (namely clinicians and allied health professionals) to guide care in line with patient preferences and priorities.

2. Methods and Results

1. The workgroup adopted the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach to develop the recommendations, which involved a structured evaluation of the current literature base, followed by the formulation of recommendations.⁷
2. Because the AWGS 2019 consensus included studies from East and Southeast Asia (including Singapore) till December 31, 2018, the workgroup performed an updated literature review of Singapore studies till December 31, 2020. Included studies were: 1) full-text articles in the English language only; 2) original research articles inclusive of letters and reviews that meet criteria for integrative scholarship (such as systematic, scoping, or critical reviews); and 3) Singapore studies of older persons (age \geq 60 years). We excluded editorials, expert opinion, book chapters, protocols, and conference proceedings.
3. A literature search of five major databases (Medline (Ovid), Embase (Ovid), PubMed, CINAHL, and Web of Science) retrieved 508 abstracts after de-duplication. After the abstract and full-text screen, 40 studies were finally included for data extraction. Figure 1 below shows the PRISMA Flow-Diagram for the study selection.

Figure 1: PRISMA Flow-Diagram for Study Selection



Evidence tables for the local papers were organised under the headings of “definition and epidemiology”, “diagnosis and evaluation”, and “treatment and intervention” (refer Annex A to C). Due to the paucity of local evidence coming from intervention RCTs, we conducted a supplementary search of randomised controlled trials (RCTs) and systematic reviews specifically addressing sarcopenia as a diagnostic entity up to June 30, 2021 (refer Annex D).

4. Guided by the AWGS 2019 consensus, local evidence-base and best available evidence from recent systematic reviews, the workgroup developed twenty recommendations which span the areas of case detection, diagnosis, treatment, prevention, and future research. The workgroup then graded the strength and quality of each recommendation. In line with the GRADE Evidence to Decision (EtD) framework, the strength of evidence was graded as ‘strong’, ‘conditional’, or ‘no recommendation’. Quality referred to the overall certainty of the evidence for the effect and was ranked as ‘high’, ‘moderate’, ‘low’, or ‘very low’.⁸
5. The workgroup adopted a modified Delphi methodology to achieve consensus on the recommendations from an expert panel of 23 practising clinicians, comprising physicians (i.e., Geriatric Medicine specialists, non-geriatrician specialists, and family physicians); physiotherapists; and dieticians from the three healthcare clusters.
6. The survey was electronically administered to the panel members, and each rated the recommendations on a 5-point Likert scale (ranging from “1” being “strongly disagree” to “5” being “strongly agree”). Panel members could additionally provide comments on each recommendation if there were any. The consensus threshold was defined a priori as $\geq 75\%$ ‘agree’ or ‘strongly agree’ responses (4 or 5 on the Likert Scale) for all recommendations.
7. In Round 1, the response rate was 95.7% (n=22). Nineteen (95%) recommendations fulfilled the consensus threshold level of 75% or more. The single recommendation failing to achieve consensus had 54.6% “agree” or “strongly agree” responses.
8. In Round 2, we presented three recommendations modified according to the comments gathered from Round 1. One did not achieve consensus, whereas the remaining two did and were modified for clarity. The response rate was 100% (n=23). All three recommendations met the threshold for consensus (range: 78.3 to 100%).
9. In summary, twenty recommendations achieved consensus after two rounds of the modified Delphi process.

3. Recommendations

The final recommendations are summarised below. Because the workgroup adopted the AWGS 2019 definition of sarcopenia as an age-associated condition, these recommendations apply only to older adults aged 60 years and above.

1. Case Finding

1. We recommend case-finding instead of a universal screening approach for sarcopenia. **(Grade: conditional recommendation, low certainty of evidence)**
2. We recommend case-finding for sarcopenia in older adults aged 60 years and above, especially in high-risk populations with relevant co-morbidities (for instance, chronic lung, kidney, liver or heart disease; diabetes mellitus; stroke and Parkinson's disease; knee osteoarthritis; osteoporosis; and central obesity), history of falls, functional decline or limitation, and malnourished or at risk of malnourishment. **(Grade: conditional recommendation, low certainty of evidence)**
3. Case-finding for sarcopenia can be performed using the SARC-F questionnaire, calf circumference, or SARC-CalF. **(Grade: conditional recommendation, low certainty of evidence)**
4. Individuals screened as positive should be evaluated for 'possible sarcopenia' via the assessment of the handgrip strength or the 5-time sit-to-stand test. **(Grade: conditional recommendation, low certainty of evidence)**
5. Individuals with 'possible sarcopenia' should be evaluated for the presence of reversible causes and counselled on lifestyle modifications in diet and exercise. **(Grade: conditional recommendation, low certainty of evidence)**

2. Diagnosis

1. We recommend using the Asian Working Group for Sarcopenia (AWGS) 2019 algorithm for the diagnosis and grading of severity of sarcopenia. **(Grade: conditional recommendation, moderate certainty of evidence)**
2. We recommend the use of the Asian Working Group for Sarcopenia (AWGS) 2019 cutoffs to ascertain low lean mass and low levels of muscle strength and physical performance. **(Grade: conditional recommendation, low certainty of evidence)**
3. When it is necessary to determine low lean mass for a confirmatory diagnosis of sarcopenia, we recommend the use of dual-energy X-ray absorptiometry (DXA) as the imaging modality. **(Grade: conditional recommendation, low certainty of evidence)**
4. Muscle strength should be assessed using the standard protocol for Jamar or Smedley hand dynamometers. **(Grade: strong recommendation, moderate certainty of evidence)**
5. To measure handgrip strength, it is recommended to take the maximum reading (rather than the average reading) of at least two trials using the dominant hand. **(Grade: strong recommendation, moderate certainty of evidence)**
6. Physical performance should be assessed using the 5-time sit-to-stand test, 6-m usual gait speed, or Short Physical Performance Battery. **(Grade: strong recommendation, moderate certainty of evidence)**

3. Treatment

1. Older persons with sarcopenia should be encouraged to participate in resistance-based exercises to improve muscle strength and physical performance. (**Grade: strong recommendation, moderate certainty of evidence**)
2. Clinicians should advise older persons with sarcopenia on the importance of a quality diet with adequate caloric and protein intake. (**Grade: conditional recommendation, low certainty of evidence**)
3. Clinicians should consider nutritional intervention with protein supplementation for older persons with sarcopenia. (**Grade: conditional recommendation, low certainty of evidence**)
4. Nutritional intervention should be combined with physical exercise to improve muscle strength and physical performance in older persons with sarcopenia. (**Grade: conditional recommendation, low certainty of evidence**)
5. We do not recommend the prescription of pharmacotherapy for the specific management of sarcopenia in older adults. (**Grade: conditional recommendation, low certainty of evidence**)
6. Clinicians should consider Vitamin D supplementation for sarcopenic older adults with Vitamin D insufficiency (<30 micrograms/L). (**Grade: conditional recommendation, low certainty of evidence**)

4. Prevention

1. Regular physical activity and resistance-based exercise should be recommended to prevent sarcopenia in older adults. (**Grade: strong recommendation, moderate certainty of evidence**)
2. Older adults should be encouraged to have adequate protein intake of at least 1.0g/kg bodyweight/day to prevent sarcopenia. (**Grade: conditional recommendation, low certainty of evidence**)

5. Research

1. We encourage more local research in sarcopenia focusing specifically on local cutoffs by sex and ethnicity; community prevention programmes and interventional studies; impact on quality of life, cost-effectiveness and patient acceptability; and overlap syndromes such as sarcopenic obesity, osteosarcopenia, and osteosarcopenic obesity. (**Grade: N/A**)

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ACKNOWLEDGEMENT

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The workgroup would like to extend its appreciation to the following individuals:

- 1) Ms Yasmin Munro of LKCMedicine Medical Library for performing the literature search and assistance with related matters.
- 2) A/Prof Ding Yew Yoong, Executive Director, Geriatric Education and Research Institute (GERI), for his invaluable advice in the conduct of the modified Delphi consensus process.

PUBLISHED: 20 OCTOBER 2022

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