

A Scoping Review of Clinical Practice Guidelines for the Assessment of Sarcopenia

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ABSTRACT

Background: Sarcopenia refers to the progressive loss of muscle mass. The adverse health effects of sarcopenia include body weakness, falls, and dependency. To reduce the complications of sarcopenia, comprehensive assessments are required for early detection and accurate diagnosis. Hence, this review aimed to synthesise clinical practice guidelines (CPGs) for sarcopenia and determine the key recommendations on instruments used for screening and diagnostic assessment. **Methods:** An extensive search was performed through the scientific electronic databases, namely Scopus, ScienceDirect, Cochrane and ProQuest Medical and Health. In addition, a grey literature search was conducted through Google Scholar to optimise the search and reduce the risk of missing CPGs. The literature search included a time frame ranging from 2016 to 2025. The CPGs were selected based on predetermined criteria. Due to the nature of the review, the findings were reported in narrative format. The protocol of this review was officially filed with the Open Science Framework. **Results:** Out of 1291 records, 8 records were included in the review for further analysis. The identified CPGs were from multiple countries, involving participation of health experts across various disciplines. Overall, the CPGs are consistent in emphasising the utilisation of SARC-F as a screening tool and assessments of muscle mass, strength, and physical function for the diagnosis and severity of sarcopenia. **Conclusion:** Screening questions can be used as a first step for screening sarcopenia and should be complemented with objective-based measures for accurate detection. The findings of this review allow clinicians and researchers to streamline the process of screening and diagnosing sarcopenia.

Keywords:

Sarcopenia; clinical practice guideline; screening; assessment

INTRODUCTION

Sarcopenia, also known as muscle atrophy or thinning of muscle tissue, is commonly occurs in the older population. It is a skeletal muscle syndrome, characterised by loss of muscle mass and strength (Sayer & Cruz-Jentoft 2022). The loss in muscle mass is mainly associated with the ageing process. As the age increases, the efficiency of metabolic pathways involved in protein synthesis in the muscle tissue declines, which leads to a reduction in muscle fibres and motor neurons (Cannataro et al., 2021). The progressive loss of muscle fibres may result in functional decline, independence and poor quality of life (Larsson et al., 2019).

Approximately 15% of older adults worldwide are affected by sarcopenia, and the prevalence is much higher, up to 70%, among those with illnesses (Yuan & Larsson 2023). With the global trend of an ageing population, its incidence may escalate significantly. Several regions with a rapidly ageing population have paid attention to the prevention and management of sarcopenia (Baek et al., 2023). Hence, systematic evaluation of sarcopenia is essential to ensure accurate detection and appropriate intervention.

In order to ensure accurate diagnosis of sarcopenia, a holistic assessment involving various health experts such as geriatricians, physicians, nurses, physiotherapists and nutritionists is required (Jia et al., 2025). Predominantly, the approaches of sarcopenia assessment can be broadly

categorised into objective-based measurements, which are based on performance tests, and subjective-based measurements, which do not require direct quantification (Guttikonda & Smith 2021; Ackermans et al., 2022; Tagliafico et al., 2022; Liu et al., 2024). Regardless of the nature of assessments, the selection of the instruments must be informed by evidence-based clinical standards and adhere to the clinical practice guidelines (CPGs).

Several CPGs have been established for sarcopenia. Amongst the most notable guidelines are the International CPGs for Sarcopenia (ICFSR), the Asian Working Group for Sarcopenia (AWGS), and the European Working Group on Sarcopenia in Older People (EWGSOP) (Dent et al., 2018; Liu et al., 2024). The CPGs provide a set of recommendations to standardise sarcopenia assessment and management. While there are several CPGs available in the literature, clinicians have difficulties in reviewing the guidelines due to time constraints, demanding workloads, inadequate resources, and the complex nature of the working environment (Wang et al., 2023; Verstraeten et al., 2024). To facilitate easier reference, there is a need for a review paper that provides a side-by-side comparison or a concise summary of the key recommendations on the sarcopenia assessments.

To date, there is no integrative review that summarises CPGs for sarcopenia assessment. Such a study is needed to compare, synthesise, and clarify any differences across assessment guidelines for easier clinical application. In addition, it helps to consolidate the most recent recommendations and evidence, ensuring clinical practice remains current. Hence, this scoping review aimed to collate CPGs of sarcopenia and synthesise the instruments used in the sarcopenia assessment.

MATERIALS AND METHODS

Study design

This scoping review was registered with the Open Science Framework Registry (Registration DOI: [10.17605/OSF.IO/FW5CY](https://doi.org/10.17605/OSF.IO/FW5CY)). The protocol of the review was guided by the Joanna Briggs Institute (JBI) guideline and Arksey and O'Malley framework (2005). To ensure transparency in reporting, the Preferred Reporting Items for Systematic Reviews and Meta-analyses extension for scoping reviews was employed (Tricco et al. 2018). Table 1 summarises the five steps involved in the protocol.

Table 1: Scoping Review Protocol suggested by Arksey and O'Malley framework

Steps	Components
1	Identifying the research question
2	Identifying relevant studies
3	Study selection
4	Charting the data
5	Collating, summarizing and reporting the results

Formulation of Research Question for the Review

The research question was formulated based on the 'population', 'concept', 'context' (PCC) framework (Peters et al. 2022). In this review, the 'population' was defined as the individuals with sarcopenia, the 'concept' is the assessment and screening instruments recommended by clinical practice guidelines, while the 'context' was the types, advantages and limitations. Hence, the review addressed two questions, which were 'What are the assessment tools used for screening sarcopenia as recommended by the clinical practice guidelines?' and 'What are the advantages and limitations of the instrument tools.'

Identifying Relevant Studies (Reports)

A systematic electronic search was conducted in October 2025 through four databases, namely Scopus, ScienceDirect, Cochrane and ProQuest Medical and Health. In addition, grey literature was employed through the Google Scholar database to optimise the search and to reduce the risk of any missing reports. The search strings were developed to identify the clinical practice guidelines for sarcopenia, using three main terms, which were 'Sarcopenia', 'Clinical guideline', 'Assessment' and 'Screening'. The search was performed by one researcher. The initial search results were imported, compiled and preliminarily screened through their title and abstract. Any irrelevant and duplicate studies were removed. The screening results were cross-checked and verified by another researcher.

Selection of Studies

This review includes only reports on clinical practice guidelines on sarcopenia. The reports were selected if they fulfilled the predetermined criteria, which were reports prepared by medical and health representatives, published in English, contained screening and/or assessment tools for sarcopenia and were published from 2016 onwards to ensure the relevance of the review

findings. The exclusion criteria were reports without full-text accessibility. Reports that fulfilled the criteria were exported to Excel for further analysis.

Charting and Reporting the Data

Data were systematically extracted from the included reports and were organised in a customised table. The data were categorised into metadata and key outcomes for synthesis. The recorded metadata were the characteristics of the clinical practice guidelines, including the name of the clinical practice guidelines, year of publication, country of origin, total number of screening and assessment instruments described in the reports, while the key outcomes were the names of the screening and assessment instruments, types of instruments, advantages of the instruments and limitations of the instruments. Finally, the data were narratively reported based on specific diagnosis criteria for sarcopenia as outlined in the sarcopenia diagnostic standards, set by international benchmarks.

RESULTS

Search Results

The electronic search yielded 1291 records, and 1280 records were excluded upon title and abstract screening. A total of 11 records were retrieved for full-text screening, and 8 records were eligible and were fully reviewed for final analysis. The flowchart for the selection of the records is shown in the PRISMA diagram below (Figure 1). The identified clinical practice guidelines (CPGs) were developed across multiple countries with participation from a wide range of experts, as outlined in Table 2. Across the CPGs, 7 of 8 CPGs recommended screening tests, and every guideline highlighted diagnostic assessment methods for sarcopenia detection.

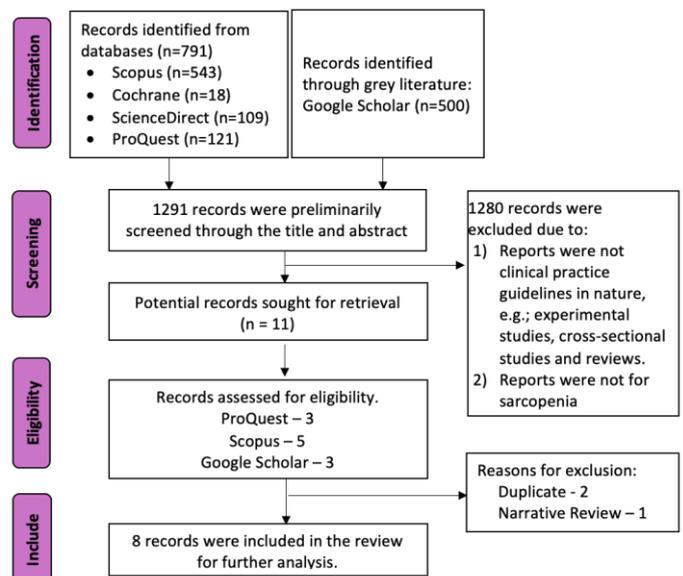


Figure 1: Prisma flow diagram.

Screening and assessment instruments for sarcopenia

The instruments were categorised into several domains, which were screening questionnaire, body composition assessment, muscle strength assessment and physical performance tests. Each of the instruments is described below, and the characteristics of the tools are outlined in Table 3.

This review found that the SARC-F questionnaire emerged as the screening tool that is most widely recommended by 7 CPGs (Kalra et al., 2025; Baek et al., 2023; Zanker et al., 2023; Lim et al., 2022; Chen et al., 2019; Cruz-Jentoft et al., 2019 & Dent et al., 2018). It is a simple instrument developed to identify individuals at risk of sarcopenia. It assesses five aspects, which are strength, walking assistance, rising from a chair, climbing stairs, and a history of falls. Another available screening tool for sarcopenia is the Ishii screening tool. This tool, however, is recommended by only one CPG (Cruz-Jentoft et al. 2019), probably due to the nature of the tool is more technical than SARC-F, as the instrument requires hand and arm circumference measurements.

Regarding body composition analysis, 7 CPGs in this review recommended bioelectrical impedance analysis (BIA) (Kalra et al. 2025, Baek et al., 2023; Zanker et al., 2023; Daly et al., 2022; Lim et al., 2022; Chen et al., 2019 & Cruz-Jentoft et al., 2019), while 8 CPGs endorsed dual-energy X-ray absorptiometry (DEXA) for sarcopenia detection (Kalra et al., 2025; Baek et al., 2023; Zanker et al., 2023; Daly et al., 2022; Lim et al., 2022; Chen et al., 2019; Cruz-Jentoft et al., 2019 & Dent et al. 2018). BIA offers a rapid, portable, and non-invasive estimation of muscle mass, while DEXA provides more precise and detailed measurements of

muscle mass, as it is an imaging-based approach. Due to the high accuracy of DEXA, it has been considered as the gold standard for body composition analysis. Nevertheless, BIA is more practical for large-scale screening or routine monitoring, particularly for community settings. Both methods, however, are essential for confirming sarcopenia after initial screening.

Calf circumference emerged as the only anthropometric measurement for sarcopenia assessment and was highlighted in 7 CPGs (Kalra et al., 2025; Baek et al., 2023; Zanker et al., 2023; Daly et al., 2022; Lim et al., 2022; Chen et al., 2019 & Cruz-Jentoft et al., 2019). It is used as a simple marker to assess leg muscle mass. This assessment approach is quick, inexpensive, and non-invasive. It helps to identify individuals at risk of sarcopenia, especially when sophisticated equipment such as DEXA or BIA is not available.

In terms of muscle strength for sarcopenia assessment, handgrip strength and sit-to-stand were recommended by all CPGs (Kalra et al., 2025; Baek et al., 2023; Zanker et al., 2023; Daly et al., 2022; Lim et al., 2022; Chen et al., 2019; Cruz-Jentoft et al., 2019 & Dent et al., 2018). Handgrip

strength is used to assess upper limb strength, while the chair stand test assesses the strength and endurance of the leg muscles. Both approaches are simple, quick, and can be performed in the clinic or community, complementing muscle mass measurements for sarcopenia diagnosis. Moreover, these approaches are highly practical to be used to monitor sarcopenia progression, evaluate the effectiveness of interventions, and guide tailored exercise or nutritional programs.

The assessment of physical performance was also highlighted in all CPGs (Kalra et al., 2025; Baek et al., 2023; Zanker et al., 2023; Daly et al., 2022; Lim et al., 2022; Chen et al., 2019; Cruz-Jentoft et al., 2019 & Dent et al., 2018). Physical performance reflects how muscle loss affects mobility, balance, and daily functioning. Walking speed, the time up and go test, and the Short Physical Performance Battery were the three types of physical performance tests recommended by the CPGs. Walking speed is a simple indicator of mobility and fall risk, while the TUG test evaluates balance, agility, and lower limb strength. The SPPB, which combines balance, gait speed, and chair stand tests, offers a comprehensive assessment of overall physical function.

Table 2: Clinical Practice Guidelines for Sarcopenia

Authors	Clinical Practice Guidelines	Region	Methods	Expert Panels	Recommended Assessment
Kalra et al. (2025)	An Indian Consensus on Sarcopenia: Epidemiology, Etiology, Clinical Impact, Screening, and Therapeutic Approaches	India	Expert consensus	Experts with expertise in endocrinology, general medicine, pulmonology, intensive care, geriatric medicine, dietetics, oncology, and sports medicine	For screening (n = 1): <ul style="list-style-type: none"> • SARC-F questionnaire For assessment and diagnosis (n = 9): <ul style="list-style-type: none"> • DEXA, BIA, CT, MRI • Handheld dynamometer • Calf Circumference • Ultrasound • Gait speed • 5-chair stand test
Baek et al. (2023)	Korean Working Group on Sarcopenia Guideline: Expert Consensus on Sarcopenia Screening and Diagnosis by the Korean Society of Sarcopenia, the Korean Society for Bone and Mineral Research, and the Korean Geriatrics Society	Korea	Two rounds of Delphi process	Geriatricians, endocrinologists, physical medicine, rehabilitation specialist, oncologist, orthopaedic surgeon, family medicine, exercise physiologist, nutritionist, healthcare policy experts, and healthcare industry experts	For screening (n = 6): <ul style="list-style-type: none"> • SARC-F • Calf circumference • Chair stand (5-time or 30-second) • Handgrip strength • Gait speed (4 meter or 6 meter) • Time up and go test For assessment and diagnosis (n= 8): <ul style="list-style-type: none"> • DEXA • BIA • Handgrip strength • Short Physical Performance Battery • Gait speed (4 meter or 6 meter), • Time up and go test • Chair stand (5-time or 30-second) • 400 meter walk test
Zanker et al. 2023	Consensus guidelines for sarcopenia prevention, diagnosis and management in Australia and New Zealand	Australia and New Zealand	Four-phase modified Delphi process	Dietitian, physiotherapist, geriatrician, nurse, chiropractor, endocrinologist, exercise physiologist, geriatrician/rheumatologist, hepatologist/gastroenterologist, occupational therapist, physician,	For screening (n = 1): <ul style="list-style-type: none"> • SARC-F questionnaire For assessment and diagnosis (n = 10): <ul style="list-style-type: none"> • Handgrip strength test • Chair sit to stand test • DEXA • BIA

				psychiatrist, rehabilitation	<ul style="list-style-type: none"> • CT • MRI • Usual gait speed • Timed-up-and-go test • Short Physical Performance Battery • 400 meter walk test
Daly et al. (2022)	Screening, Diagnosis and Management of Sarcopenia and Frailty in Hospitalized Older Adults: Recommendations from the Australian and New Zealand Society for Sarcopenia and Frailty Research (ANZSSFR) Expert Working Group	Australia and New Zealand	Expert consensus	Geriatrics, gerontology, dietetics, exercise physiology, occupational therapy, and intensive care	<p>For screening (n = 0): None</p> <p>For assessment and diagnosis (n = 14):</p> <ul style="list-style-type: none"> • DEXA • BIA • CT • MRI • Ultrasound • Calf circumference • Hand dynamometer • Chair stand tests • Usual gait speed • Time up and go test • Short Physical Performance Battery • 6-minutes walk test • 400 meter walk test • Stair climb test
Lim et al. (2022)	Singapore Clinical Practice Guidelines For Sarcopenia: Screening, Diagnosis, Management and Prevention	Singapore	Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach, involving two rounds of the modified Delphi process	Geriatricians, non-geriatrician specialists, family physicians, physiotherapists, dieticians, representation from the three local healthcare clusters, namely National Healthcare Group (NHG), National University Health System (NUHS) and Singapore Health Services (SingHealth)	<p>For case-finding (n = 5):</p> <ul style="list-style-type: none"> • SARC-F questionnaire • Calf circumference • SARC-Calf • Handgrip strength • 5-time chair strength <p>For assessment and diagnosis, follow AWGS, 2019 (n = 6):</p> <ul style="list-style-type: none"> • DEXA • BIA • Handgrip strength • 5-time chair stand • 6 meter usual gait speed

Chen et al. 2019	Asian Working Group for Sarcopenia (AWGS)	Asia countries	Grading of Recommendations 66 Assessment, Development and Evaluation (GRADE) approach	Members of Asian Working Group for Sarcopenia – not specify the field of expertise	<ul style="list-style-type: none"> • Short Physical Performance Battery For screening (n = 3): <ul style="list-style-type: none"> • Calf circumference • SARC-F questionnaire • SARC-Calf For assessment and diagnosis (n = 6): <ul style="list-style-type: none"> • Handgrip strength • 5 times chair stand test • 6-metre walk • Short Physical Performance Battery • DEXA • BIA
Cruz-Jentoft et al. (2019)	Sarcopenia: revised European consensus on definition and diagnosis	European countries	Expert consensus	Members of European Geriatric Medicine Society (EuGMS) – not specify the field of expertise	For screening tools (n = 2): <ul style="list-style-type: none"> • SARC-F questionnaire • Ishii screening tool For assessment and diagnosis (n = 9): <ul style="list-style-type: none"> • Grip strength test • DEXA • BIA • CT • MRI • Gait speed • Short Physical Performance Battery • Timed-up-and-go test • 400-meter walk
Dent et al. (2018)	International Clinical Practice Guidelines For Sarcopenia (ICFSR): Screening, Diagnosis And Management	Not specified	Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach	Geriatricians, gerontologists, musculoskeletal physiologists, allied health professionals, and community dwelling older adults	For screening (n = 2): <ul style="list-style-type: none"> • SARC-F questionnaire • Gait speed For assessment and diagnosis (n = 3): <ul style="list-style-type: none"> • DEXA • Gait speed • Grip strength

AWGS - Asian Working Group for Sarcopenia; BIA - Bioelectrical impedance analysis; CT - Computed tomography; DEXA - Dual-energy X-ray absorptiometry; MRI - Magnetic resonance imaging; SARC-F - Strength, ambulation, rising from a chair, stair climbing and history of falling.

Table 3: Screening and Assessment Tools of Sarcopenia Recommended by Included CPGs

Tools	Equipment required	Advantages	Limitations	Cut-off point (Reference)
Questionnaire				
SARC-F questionnaire	<ul style="list-style-type: none"> Paper-based administration: Pen, paper and clipboard or writing surface administration Electronic administration: A tablet or any electronic device 	<ul style="list-style-type: none"> Inexpensive Requires no special equipment or training Not involve physical effort Ideal for patient who has physical constraint 	<ul style="list-style-type: none"> Requiring cognitive engagement Potential for response bias due to self-reported responses 	<p>≥ 4</p> <p>(Chen et al. 2019)</p>
Anthropometric measurement				
Calf circumference	Measuring tape and marker	<ul style="list-style-type: none"> Inexpensive Easy to administer Not require specialize training Useful in settings lacking advanced tools 	<ul style="list-style-type: none"> Less accurate in individuals with obesity or significant peripheral oedema Does not directly measure the quality of muscle 	<p>M: <34cm</p> <p>F: <33cm</p> <p>(Chen et al. 2019)</p>
Body composition analysis (muscle mass)				
Bioelectrical impedance analysis	Bioelectrical impedance analysis device	<ul style="list-style-type: none"> Can provide estimates of fat mass, fat-free mass, and muscle mass Only minimal training required for the clinicians The device is portable and easy to operate The procedure is painless and no discomfort to the patient 	<ul style="list-style-type: none"> Accuracy affected by hydration status, recent food intake, exercise, and skin temperature The device requires periodically calibration to ensure accuracy Limited ability to differentiate between muscle quality versus quantity 	<p>M: < 7.0 kg/m²</p> <p>F: < 5.7 kg/m²</p> <p>(Chen et al. 2019)</p>
Dual-energy X-ray absorptiometry	Dual X-ray Absorptiometry device/machine	<ul style="list-style-type: none"> High accuracy and precision for measuring muscle mass Provides detailed regional and whole-body composition analysis 	<ul style="list-style-type: none"> Exposure to low-dose ionizing radiation and not suitable for repeated measurements Expensive equipment and requires specialized facility 	<p>Height adjusted:</p> <p>M: < 7.0 kg/m²</p> <p>F: < 5.4 kg/m²</p> <p>(Chen et al. 2019)</p>

		<ul style="list-style-type: none"> • Can differentiate between bone, fat, and lean tissue • Widely considered a gold standard for body composition assessment 	<ul style="list-style-type: none"> • Less portable, typically available in hospitals or clinics • Requires trained personnel to operate the machine 	BMI adjusted: M: < 0.789 F: < 0.512 (Studenski et al. 2014)
Muscles strength				
Handgrip strength	Handheld dynamometer	<ul style="list-style-type: none"> • Simple and quick to perform • Inexpensive to administer • Minimal training required for test administration • The device is portable and suitable for any settings • Good indicator of overall muscle strength and functional status 	<ul style="list-style-type: none"> • Measures only upper limb strength, may not reflect the actual whole-body muscle strength • Results can be influenced by patient motivation and effort • Does not directly measure muscle mass • Not suitable for patients with cognitive impairment, upper limb dysfunction or inability to follow instructions 	M: <28kg F: <18kg (Chen et al. 2019)
Sit to stand test	Chair and timer	<ul style="list-style-type: none"> • Simple and quick to perform • Inexpensive to administer • Minimal training required for administration • Reflects real-life activities and relevant for daily function • Provides objective measure for muscle endurance and power 	<ul style="list-style-type: none"> • Performance can be influenced by balance, joint pain, or cardiovascular fitness • Less useful in severely frail or non-ambulatory patients • Does not directly measure muscle mass or quality 	5 times sit to stand: > 10 (Yamada et al. 2022) 30 seconds: M: < 17 F: < 15 (Sawada et al. 2021)
Physical performance				
Gait speed	Timer, cone, tape measure and space to walk	<ul style="list-style-type: none"> • Simple and quick to perform • Inexpensive to administer 		4-m walk test: Non-completion or ≥ 6 minutes for

		<ul style="list-style-type: none"> • Minimal training required for test administration • Reflects real-life activities, relevant for daily function • Provides objective measure of muscle endurance and power 	<ul style="list-style-type: none"> • Performance can be influenced by balance, joint pain, or cardiovascular fitness • Less useful in severely frail or non-ambulatory patients • Does not directly measure muscle mass or quality 	<p>completion (Chen et al. 2019)</p> <hr/> <p>≥ 12 seconds (Jung et al. 2022)</p>
Time up and go test				
Short Physical Performance Battery	Timer, cone, chair, tape measure and space to walk	<ul style="list-style-type: none"> • Comprehensive assessment of lower extremity function • Combines balance, gait speed, and chair stand tests • Strongly predictive of disability, hospitalization, and mortality • Easy to administer in clinical and community settings • Only requires minimal equipment • Useful for tracking functional changes over time 	<ul style="list-style-type: none"> • Requires some physical ability and may not be feasible for severely frail or disabled individuals • Takes longer to perform than single tests like handgrip strength or gait speed alone • Performance can be influenced by motivation, pain, or cognitive status • May be affected by comorbidities such as arthritis or neurological conditions • Requires training for standardized administration and scoring • Does not directly measure muscle mass or quality 	<p>≤ 9 points (Chen et al. 2019)</p>

DISCUSSION

The screening tool for sarcopenia aims to identify individuals at high risk of developing sarcopenia. However, the most recommended SARC-F screening tool is subjective in nature and has limited sensitivity, which may cause false-negative results in detecting sarcopenia at its early stages (Piotrowicz et al. 2021). While SARC-F is recommended to be used as a first step to assess sarcopenia before further diagnostic assessment, the evaluation should be complemented with other instruments that are more objective and precise. Some studies recommended bypassing sarcopenia screening and proceeding directly to diagnostic assessment, especially among high-risk individuals (Voelker et al. 2021, Daly et al. 2022)

Anthropometric measurement refers to the measurement of the human body, used to assess body size, shape, and composition (Wang et al. 2024). In this review, calf circumference has been recommended by all CPGs. Studies have shown that a smaller calf circumference is associated with decreased muscle mass and strength, as well as an increased risk of sarcopenia (Kiss et al. 2024, Sato et al. 2024). Although this method is suitable for screening in the field or clinics with limited resources, it has limitations as it is affected by subcutaneous fat, oedema, and hydration status (Kiss et al. 2024). Therefore, calf circumference should be used in conjunction with other measures to improve the accuracy of sarcopenia diagnosis.

Bioelectrical impedance analysis (BIA) plays an important role in the assessment of sarcopenia because it estimates body composition objectively using the electrical resistance of body tissues (Sales et al. 2024). This method is used to calculate the skeletal muscle mass index, which helps identify muscle mass loss. Other than BIA, dual-energy X-ray absorptiometry (DEXA) is considered the alternative standard in the assessment of muscle mass for the diagnosis of sarcopenia. This method uses two different X-ray energies to accurately distinguish between bone, fat, and muscle tissue. DEXA allows the measurement of the total lean muscle mass in the body (Messina et al. 2020). Compared to BIA, DEXA offers greater accuracy, high reliability and is less affected by hydration status or body temperature. However, both BIA and DEXA only measure muscle quantity, not quality or function. Therefore, it needs to be combined with other assessments, such as muscle strength and physical function, for a comprehensive and accurate diagnosis of sarcopenia.

It has been reported that weakness, falls, and slow walking are the important clinical signs of sarcopenia (Cruz-Jentoft et al. 2019). Studies show that a decline in muscle strength occurs earlier than loss of muscle mass (Gustafsson & Ulfhake 2024), making it a more sensitive marker of physiological changes. In this review, grip strength and the chair stand test are widely recognised by CPGs as indicators of neuromuscular performance, while physical function, which is frequently measured either by walking speed, the time up and go test or the Short Physical Performance Battery (SPPB) test, reflects an individual's ability to maintain mobility and balance. Therefore, assessing strength and physical function is essential to determine the severity of sarcopenia, predict the risk of morbidity, and plan effective rehabilitation and exercise interventions.

To our best knowledge, it is the first review to systematically analyse and collate the content of Clinical Practice Guidelines (CPGs) related to sarcopenia screening and assessment instruments from various regions. The findings of this review provide guidance to clinical practitioners and researchers in improving approaches to screening and diagnosing sarcopenia more systematically, comprehensively and effectively. One limitation of this review is that the design of this scoping review did not aim to incorporate quantitative data, as the main objective was to organise and synthesise the existing evidence without undertaking a complex quantitative synthesis. Hence, this review did not assess the accuracy of the sarcopenia assessment methods recommended in each CPG.

CONCLUSION

This review has synthesised clinical practice guidelines (CPGs) related to sarcopenia assessment, providing a comprehensive overview of recommended approaches for sarcopenia detection. The findings show that all CPGs in this review are consistent in emphasising the utilisation of SARC-F as a screening tool and assessments of muscle mass, strength, and physical function for the diagnosis and severity of sarcopenia. This consistency facilitates standardisation of clinical practice across diverse geographical contexts. Overall, this review allows clinicians and researchers to streamline the process of screening and diagnosing sarcopenia.

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REFERENCES

- Ackermans, L. L. G. C., Rabou, J., Basrai, M., Schweinlin, A., Bischoff, S. C., Cussenot, O., Cancel-Tassin, G., Renken, R. J., Gómez, E., Sánchez-González, P., Rainoldi, A., Boccia, G., Reisinger, K. W., Ten Bosch, J. A., & Blokhuis, T. J. (2022). Screening, diagnosis and monitoring of sarcopenia: When to use which tool?. *Clinical nutrition ESPEN*, *48*, 36–44. <https://doi.org/10.1016/j.clnesp.2022.01.027>
- Arksey, H., & O'malley, L. (2005). Scoping studies: Towards a methodological framework. *International journal of social research methodology*, *8*(1), 19 – 32.
- Baek, J. Y., Jung, H. W., Kim, K. M., Kim, M., Park, C. Y., Lee, K. P., Lee, S. Y., Jang, I. Y., Jeon, O. H., & Lim, J. Y. (2023). Korean Working Group on Sarcopenia Guideline: Expert Consensus on Sarcopenia Screening and Diagnosis by the Korean Society of Sarcopenia, the Korean Society for Bone and Mineral Research, and the Korean Geriatrics Society. *Annals of geriatric medicine and research*, *27*(1), 9–21. <https://doi.org/10.4235/agmr.23.0009>
- Cannataro, R., Carbone, L., Petro, J. L., Cione, E., Vargas, S., Angulo, H., Forero, D. A., Odriozola-Martínez, A., Kreider, R. B., & Bonilla, D. A. (2021). Sarcopenia: Etiology, Nutritional Approaches, and miRNAs. *International journal of molecular sciences*, *22*(18), 9724.
- Chen, L. K., Woo, J., Assantachai, P., Auyeung, T. W., Chou, M. Y., Iijima, K., Jang, H. C., Kang, L., Kim, M., Kim, S., Kojima, T., Kuzuya, M., Lee, J. S. W., Lee, S. Y., Lee, W. J., Lee, Y., Liang, C. K., Lim, J. Y., Lim, W. S., Peng, L. N., Sugimoto, M., Tanaka, T., Won, C. W., Yamada, M., Zhang, T., Akishita, M., Arai, H. (2020). Asian Working Group for Sarcopenia: 2019 Consensus Update on Sarcopenia Diagnosis and Treatment. *Journal of the American Medical Directors Association*, *21*(3), 300–307.e2. <https://doi.org/10.1016/j.jamda.2019.12.012>
- Cruz-Jentoft, A. J., Bahat, G., Bauer, J., Boirie, Y., Bruyère, O., Cederholm, T., Cooper, C., Landi, F., Rolland, Y., Sayer, A. A., Schneider, S. M., Sieber, C. C., Topinkova, E., Vandewoude, M., Visser, M., Zamboni, M., & Writing Group for the European Working Group on Sarcopenia in Older People 2 (EWGSOP2), and the Extended Group for EWGSOP2 (2019). Sarcopenia: revised European consensus on definition and diagnosis. *Age and ageing*, *48*(1), 16–31. <https://doi.org/10.1093/ageing/afy169>
- Daly, R. M., Iuliano, S., Fyfe, J. J., Scott, D., Kirk, B., Thompson, M. Q., Dent, E., Fetterplace, K., Wright, O. R. L., Lynch, G. S., Zanker, J., Yu, S., Kurrle, S., Visvanathan, R., & Maier, A. B. (2022). Screening, Diagnosis and Management of Sarcopenia and Frailty in Hospitalized Older Adults: Recommendations from the Australian and New Zealand Society for Sarcopenia and Frailty Research (ANZSSFR) Expert Working Group. *Journal of Nutrition, Health and Aging*, *26*(6), 637–651. <https://doi.org/10.1007/s12603-022-1801-0>
- Dent, E., Morley, J. E., Cruz-Jentoft, A. J., Arai, H., Kritchevsky, S. B., Guralnik, J., Bauer, J. M., Pahor, M., Clark, B. C., Cesari, M., Ruiz, J., Sieber, C. C., Aubertin-Leheudre, M., Waters, D. L., Visvanathan, R., Landi, F., Villareal, D. T., Fielding, R., Won, C. W., Theou, O., Vellas, B. (2018). International Clinical Practice Guidelines for Sarcopenia (ICFSR): Screening, Diagnosis and Management. *The journal of nutrition, health & aging*, *22*(10), 1148–1161. <https://doi.org/10.1007/s12603-018-1139-9>
- Gustafsson, T., & Ulfhake, B. (2024). Aging skeletal muscles: what are the mechanisms of age-related loss of strength and muscle mass, and can we impede its development and progression?. *International journal of molecular sciences*, *25*(20), 10932.
- Guttikonda, D., & Smith, A. L. (2021). Sarcopenia Assessment Techniques. *Clinical liver disease*, *18*(4), 189–192. <https://doi.org/10.1002/cld.1111>
- Jia, Q., Pan, Y., Pan, D., Xia, Y., & Wu, J. (2025). Application of Comprehensive Geriatric Assessment in Assessment, Management and Prognosis of Older Adult Patients with Sarcopenia: A Review of Research Progress and Practice. *Gerontology*.
- Jung, H. W., Kim, S., Jang, I. Y., Shin, D. W., Lee, J. E., & Won, C. W. (2020). Screening value of timed up and go test for frailty and low physical performance in Korean older population: the Korean Frailty and Aging Cohort Study (KFACS). *Annals of geriatric medicine and research*, *24*(4), 259.
- Kalra, S., Shaikh, I. A., Shende, S., Kapoor, N., Unnikrishnan, A. G., Sharma, O. P., Tiwaskar, M. H., Vora, A., Verma, S. K., Kantroo, V., Mehta, P., Lovesley, D., Sivakumar, N., Kukreja, B. B., Kulkarni, K., & Deora, A. (2025). An Indian Consensus on Sarcopenia: Epidemiology, Etiology, Clinical Impact, Screening, and Therapeutic Approaches. *International journal of general medicine*, *18*, 1731–1745. <https://doi.org/10.2147/IJGM.S510412>

- Kiss, C. M., Bertschi, D., Beerli, N., Berres, M., Kressig, R. W., & Fischer, A. M. (2024). Calf circumference as a surrogate indicator for detecting low muscle mass in hospitalized geriatric patients. *Aging clinical and experimental research*, 36(1), 25. <https://doi.org/10.1007/s40520-024-02694-x>
- Larsson, L., Degens, H., Li, M., Salviati, L., Lee, Y. I., Thompson, W., Kirkland, J. L., & Sandri, M. (2019). Sarcopenia: Aging-Related Loss of Muscle Mass and Function. *Physiological reviews*, 99(1), 427–511. <https://doi.org/10.1152/physrev.00061.2017>
- Lim, W. S., Cheong, C. Y., Lim, J. P., Tan, M. M. Y., Chia, J. Q., Malik, N. A., & Tay, L. (2022). Singapore clinical practice guidelines for sarcopenia: screening, diagnosis, management and prevention. *The Journal of frailty & aging*, 11(4), 348-369.
- Liu, D., Wang, S., Liu, S., Wang, Q., Che, X., & Wu, G. (2024). Frontiers in sarcopenia: Advancements in diagnostics, molecular mechanisms, and therapeutic strategies. *Molecular aspects of medicine*, 97, 101270.
- Messina, C., Albano, D., Gitto, S., Tofanelli, L., Bazzocchi, A., Olivieri, F. M., Guglielmi, G., & Sconfienza, L. M. (2020). Body composition with dual energy X-ray absorptiometry: from basics to new tools. *Quantitative imaging in medicine and surgery*, 10(8), 1687–1698. <https://doi.org/10.21037/qims.2020.03.02>
- Peters, M. D. J., Godfrey, C., McInerney, P., Khalil, H., Larsen, P., Marnie, C., Pollock, D., Tricco, A. C., & Munn, Z. (2022). Best practice guidance and reporting items for the development of scoping review protocols. *JBME evidence synthesis*, 20(4), 953–968. <https://doi.org/10.11124/JBIES-21-00242>
- Piotrowicz, K., Głuszewska, A., Czesak, J., Fedyk-Łukasik, M., Klimek, E., Sánchez-Rodríguez, D., Skalska, A., Gryglewska, B., Grodzicki, T., & Gąsowski, J. (2021). SARC-F as a case-finding tool for sarcopenia according to the EWGSOP2. National validation and comparison with other diagnostic standards. *Aging clinical and experimental research*, 33(7), 1821–1829. <https://doi.org/10.1007/s40520-020-01782-y>
- Sales, W. B., Mâcedo, S. G. G. F., Gonçalves, R. S. D. S. A., de Andrade, L. E. L., Ramalho, C. S. T., de Souza, G. F., & Maciel, Á. C. C. (2024). Use of electrical bioimpedance in the assessment of sarcopenia in the older adults: A scoping review. *Journal of Bodywork and Movement Therapies*, 39, 373-381.
- Sato, R., Sawaya, Y., Hirose, T., Shiba, T., Yin, L., Tsuji, S., ... & Urano, T. (2024). Measurement of the calf muscle circumference is useful for diagnosing sarcopenia in older adults requiring long-term care. *Annals of Geriatric Medicine and Research*, 29(1), 58.
- Sawada, S., Ozaki, H., Natsume, T., Deng, P., Yoshihara, T., Nakagata, T., Osawa, T., Ishihara, Y., Kitada, T., Kimura, K., Sato, N., Machida, S., & Naito, H. (2021). The 30-s chair stand test can be a useful tool for screening sarcopenia in elderly Japanese participants. *BMC musculoskeletal disorders*, 22(1), 639. <https://doi.org/10.1186/s12891-021-04524-x>
- Sayer, A. A., & Cruz-Jentoft, A. (2022). Sarcopenia definition, diagnosis and treatment: consensus is growing. *Age and ageing*, 51(10), afac220.
- Studenski, S. A., Peters, K. W., Alley, D. E., Cawthon, P. M., McLean, R. R., Harris, T. B., Ferrucci, L., Guralnik, J. M., Fragala, M. S., Kenny, A. M., Kiel, D. P., Kritchevsky, S. B., Shardell, M. D., Dam, T. T., & Vassileva, M. T. (2014). The FNIH sarcopenia project: rationale, study description, conference recommendations, and final estimates. *The journals of gerontology. Series A, Biological sciences and medical sciences*, 69(5), 547–558. <https://doi.org/10.1093/gerona/glu010>
- Tagliafico, A. S., Bignotti, B., Torri, L., & Rossi, F. (2022). Sarcopenia: how to measure, when and why. *La Radiologia medica*, 127(3), 228–237.
- Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMA ScR): Checklist and Explanation. *Ann Intern Med*. 2018;169:467–473
- Verstraeten, L. M., van Wijngaarden, J. P., Meskers, C. G., & Maier, A. B. (2024). High sarcopenia awareness contrasts a lack of clinical implementation among geriatric rehabilitation health care professionals in the Netherlands: EMPOWER-GR. *Journal of Geriatric Physical Therapy*, 47(2), 67-76.
- Voelker, S. N., Michalopoulos, N., Maier, A. B., & Reijnierse, E. M. (2021). Reliability and concurrent validity of the SARC-F and its modified versions: a systematic review and meta-analysis. *Journal of the American Medical Directors Association*, 22(9), 1864-1876.
- Wang, T., Tan, J. B., Liu, X. L., & Zhao, I. (2023). Barriers and enablers to implementing clinical practice guidelines in

primary care: an overview of systematic reviews. *BMJ open*, 13(1), e062158.

Wang, M., Song, Y., Zhao, X., Wang, Y., & Zhang, M. (2024). Utilizing anthropometric measurements and 3D scanning for health assessment in clinical practice. *Physical activity and health*, 8(1), 182-196.

Yamada, M., Lim, J. Y., Assantachai, P., Tanaka, T., Kim, M., Lee, S. Y., Lim, W. S., & Arai, H. (2022). Five-repetition sit-to-stand test: End with the fifth stand or sit?. *Geriatrics & gerontology international*, 22(4), 362–364. <https://doi.org/10.1111/ggi.14358>

Yuan, S., & Larsson, S. C. (2023). Epidemiology of sarcopenia: Prevalence, risk factors, and consequences. *Metabolism*, 144, 155533.

Zanker, J., Sim, M., Anderson, K., Balogun, S., Brennan-Olsen, S. L., Dent, E., Duque, G., Girgis, C. M., Grossmann, M., Hayes, A., Henwood, T., Hirani, V., Inderjeeth, C., Iuliano, S., Keogh, J., Lewis, J. R., Lynch, G. S., Pasco, J. A., Phu, S., Reijnierse, E. M., ... Scott, D. (2023). Consensus guidelines for sarcopenia prevention, diagnosis and management in Australia and New Zealand. *Journal of cachexia, sarcopenia and muscle*, 14(1), 142–156. <https://doi.org/10.1002/jcsm.13115>