Calf Circumference 'how to' guide

Calf circumference can be used as a marker of muscle mass in clinical practice

Materials required:

- Flexible tape measure (or piece of string and ruler if you do not have access to a tape measure)

Procedure:

- Have the participant seated with knees at 90^{o} angle and feet flat to the floor OR standing with feet flat on the ground.
- Legs apart and relaxed.
- Calf exposed.

How to measure:

- Place tape measure/string around the calf and move up and down without compressing subcutaneous tissue to locate the maximum circumference.
- Take the measure to the nearest 1 mm. If using a string and ruler, measure the length of the string along the ruler to get the measurement.
- Complete 3 measurements on each side. The largest measurement is used for the assessment.

Example Cut Points:

At risk of sarcopenia/malnutrition:

Female	≤33 cm
Male	≤34 cm

Adjustments for BMI:

BMI	Adjustment
18.5-24.9kg/m2	0 cm
25-29kg/m2	-3 cm
30-39kg/m2	-7 cm
>39kg/m2	-12 cm

Note: BMI-adjustment should not be applied to individuals with a BMI <18.5kg/m2 who are suspected to have weight or muscle losses, as low muscle mass could be hidden if the adjustment factor is applied.

Frequently asked questions:

Q: Should calf circumference be measured sitting or standing?
A: Calf circumference can be measured either sitting or standing.

Q: Should the participant take their shoes off?
A: Flat soled shoes can remain on.

Key references:

- Centers for Disease Control and Prevention. National Center for Health Statistics (NCHS). National Health and Nutrition Examination Survey questionnaire (or examination protocol, or laboratory protocol). 2006. Available from: https://wwwn.cdc .gov/nchs/data/nhanes/1999-2000/manuals/bm.pdf
- Gonzalez, M. C., Mehrnezhad, A., Razaviarab, N., Barbosa-Silva, T. G., & Heymsfield, S. B. (2021). Calf circumference: cutoff values from the NHANES 1999–2006. *The American Journal of Clinical Nutrition*, *113*(6), 1679-1687
- Prado CM, Landi F, Chew STH, Atherton PJ, Molinger J, Ruck T, Gonzalez MC. Advances in muscle health and nutrition: A toolkit for healthcare professionals. Clin Nutr. 2022 Oct;41(10):2244-2263.