ESTIMATING MUSCLE LOSS USING CALF CIRCUMFERENCE

Calf circumference (CC) is a validated, low-cost, quick and easy indirect measure of skeletal muscle mass.[1] It is widely used in clinical settings to not only aid in the diagnosis of malnutrition and sarcopenia but also as a predictor for falls, frailty, length of hospital stay and mortality[2]

MEASURING CALF CIRCUMFERENCE

Calf circumference measurements can be taken on either the left or right leg, but the right is preferred.[3] It should be taken using an inextensible and flexible plastic tape.[1] The measurement should be taken on the widest part of the calf, and the tape should fit snugly to the skin, taking care not to suppress the calf.[3]

Calf circumference measurements can be taken in a standing position, or in a seated or supine position - with the leg at a 90 degree angle: [3-5]

STANDING POSITION
For patients who are capable of standing

SEATED POSITION
For patients unable to stand

SUPINE POSITION
For patients in bed who are unable to sit or stand

Read and accurately record the measurement. Probable sarcopenia can be identified using the below cut-offs: [6]

Calf Circumference cut-off	Males	Females
Moderately low CC	34 cm	33 cm
Severely low CC	32 cm	31 cm

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ADJUSTING CALF CIRCUMFERENCE MEASUREMENTS FOR EXCESS WEIGHT AND OEDEMA

Taking calf circumference measurements in some patients can be challenging in some circumstances. Measurements therefore need to be adjusted for some patients, such as:

Those with excess weight - excess adipose tissue (body fat) may lead to falsely normal values.[2]

Patients with oedema - build-up of fluid in the body can lead to swelling, which may artificially increase the measurement.[7,8]

ADJUSTING MEASUREMENTS FOR EXCESS BODY WEIGHT

For individuals with a BMI ≥ 25 kg/m^2, take the measurement as normal, then make the following adjustments, and compare to the cut-off table on page one.[2]

BMI 25-29.9 kg/m^2:
Subtract 3 cm
from measured CC

BMI 30-39.9 kg/m^2:
Subtract 7 cm
from measured CC

BMI ≥40 kg/m^2:
Subtract 12 cm
from measured CC

ADJUSTING MEASUREMENTS FOR PATIENTS WITH OEDEMA

Take the measurement as normal, then make the following adjustments, and compare to the cut-off table on page one.[8]

For men:
Subtract 2 cm from the measured CC

For women:
Subtract 1.6 cm from the measured CC

Calf circumference percentiles can also be adjusted for age/gender. Visit ProConnect using the QR code below to find out more.

ProConnect

For more information on calf circumference measurement, as well as other ways to screen for malnutrition and/or loss of muscle/muscle function, visit ProConnect

References: 1. Martone AM *et al. Journal of Cachexia, Sarcopenia and Muscle* 2023:10.1002/jcsm.13286. 2. da Costa Pereira JP *et al. Nutrition* 2024;112505. 3. Todorovic VE. Mafrici B. *A Pocket Guide to Clinical Nutrition* 2018. 5th edition 2.35-2.36. 4. Piodena-Aportadera M. *et al. Ann Geriatr Med Res* 2022;26(3):215-224. 5. Selvaraj K *et al. J Family Med Prim Care*. 2017;6(2):356-359. 6. Gonzalez, MC *et al. Am J Clin Nutr* 2021 Jun 1;113(6):1679-1687. 7. Lent-Schochet D & Jialal I. *StatPearls Publishing* 2024. Available from: https://www.ncbi.nlm.nih.gov/books/NBK537065/. 8. Ishida Y *et al. Geriatrics and Gerontology International* 2019;19(10).