

BMI Calculator (Body Mass Index and BSA)

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Evidence to Action: Official Journal of MDCalc

Vol. 012025, Issue 01, 2025

Article Information

Keywords: BMI, bmi calculator, bmi calculator for women, BSA, Height and Weight, Physical activity, Weight range, Lose weight, Muscle mass, Body surface area, body mass index, body mass calc, body mass score, body index, surface area of body, bsa calc, bsa score, bmi calc, bmi score, body mass, body mass obese, body mass obesity, body mass calculator, body mass index calc, body mass underweight, body mass normal, body mass nl, body mass nml, rule out obesity, height weight, height weight calc, height weight obese, height weight score, height weight index, height weight underweight, height weight ratio normal, height weight nl, height weight nml, height weight ratio, body surface normal, body surface area, surface area obesity, body surface area weight, body surface height, body surface area calc, body SA, body SA calc, height weight surface, height weight surface area, surface area weight, SA weight, surface area height, sa height

<https://doi.org/10.65357/001c.154434>

Submitted: February 17, 2025 EST

Accepted: March 15, 2025 EST

Published: March 17, 2025 EST

I. HOW TO USE

When to Use

- **BMI:** This calculation is routinely used during clinical evaluations to estimate the appropriateness of an individual's weight relative to their height, serving as a preliminary step in identifying patients who are underweight or overweight.
- **BSA:** This formula estimates an individual's total external surface area, aiding in calculating dosages

Abstract

Calculates body mass index and body surface area, which can aid in dosing of some medications.

for medications, such as chemotherapy, and measuring cardiac index.

Pearls / Pitfalls

- Always use the most recent height and weight measurements to ensure accuracy.
- Remember that both BMI and BSA are part of a larger clinical context and should be used in conjunction with other assessments and patient history.

BMI

- Does not distinguish between fat and muscle mass.
- Tends to overestimate body fat in individuals with very high muscle mass who are otherwise healthy, and can underestimate it in older adults due to age-related muscle loss.
- The typical classification may underestimate the risk of cardiovascular disease associated with obesity in Asian populations. Organizations like the World Health Organization (WHO) and National Institutes of Health (NIH) recommend lower BMI thresholds for these individuals. Please see Evidence for more details.
- BMI is based primarily on data collection from non-Hispanic white populations, making its generalizability prone to inaccuracy.
- Some organizations, such as the [AMA](#), have recognized the importance of using a variety of measures to determine an appropriate risk assessment and advise clinicians to eliminate the use of BMI as a sole indicator of risk.
- BMI should be utilized in conjunction with measurements of visceral fat, body adiposity index, waist circumference and other metabolic/genetic factors when diagnosing obesity ([Rubino et al 2025](#)).

BSA

- Multiple formulas for BSA are available. This tool utilizes the Mosteller formula.
- May be less precise for neonates and infants, as well as for individuals at extreme values of height and weight.

Why Use

BMI provides a quick estimate of adiposity, while BSA calculation helps estimate an individual's total external surface area, which is difficult to measure directly.

II. NEXT STEPS

Advice

- For patients identified as having a diagnosis of underweight or overweight, consider further nutritional or physical assessments and referrals as appropriate.
- Individuals with a diagnosis of overweight or obese should be counseled on diet and exercise.
- In cases involving drug dosing, especially chemotherapy, regular monitoring and dose adjustments based on changes in BSA are necessary to optimize therapeutic outcomes.

Management

Management depends not on BMI or BSA measurements alone, but in conjunction with other body measurements and the clinical picture.

Critical Actions

Diagnosis of obesity can be made with BMI measurement of $>30 \text{ kg/m}^2$ alone, and no further confirmative testing/measurement is required ([Rubino et al 2025](#)).

III. EVIDENCE

Formula

Body mass index, $\text{kg/m}^2 = \text{weight, kg} / (\text{height, m})^2$
 Body surface area (the Mosteller formula), $\text{m}^2 = [\text{Height, cm} \times \text{Weight, kg} / 3600]^{1/2}$

Facts & Figures

LITERATURE

Original/Primary

<https://www.ncbi.nlm.nih.gov/pubmed/16768059>

Gadzik J. 'How much should I weigh?' Quetelet's equation, upper weight limits, and BMI prime. *Connecticut Medicine*. (2006). 70 (2): 81–8. PMID 16768059.

Validation

https://www.who.int/bmi/index.jsp?introPage=intro_3.html

BMI Classification. Global Database on Body Mass Index. World Health Organization. 2006. Retrieved July 27, 2012.

Other References

Recent AMA recommendation from 6/14/2023 with regard to BMI measurement and alternate measures for the diagnosis of obesity:
<https://www.ama-assn.org/press-center/press-releases/ama-adopts-new-policy-clarifying-role-bmi-measure-medicine>

Up-to-date recommendation on diagnostic methods for obesity: <https://pubmed.ncbi.nlm.nih.gov/39824205/>

Rubino, Francesco et al. Definition and diagnostic criteria of clinical obesity. *The Lancet Diabetes & Endocrinology*, (March 2025) Volume 13, Issue 3, 221 – 262

BMI, kg/m ²	Weight	
<18.5	Underweight	
18.5–24.9	Normal weight	
25.0–29.9	Overweight*	
30.0–34.9	Obese*	Class 1
35.0–39.9		Class 2
≥40.0		Class 3

*Since the typical classification may underestimate the risk of cardiovascular disease associated with obesity in Asian populations, organizations like WHO and NIH recommend lower BMI thresholds for these individuals. In this context, “overweight” is defined as a BMI of 23–24.9 kg/m² and “obesity” as a BMI of ≥25 kg/m².