

Waist Circumference Threshold Values for Type 2 Diabetes Risk

Col. Karl E. Friedl, Ph.D.

Abstract

Adult gains in body weight, excess adiposity, and intra-abdominal fat have each been associated with risk for type 2 diabetes mellitus (T2DM), forming the basis for preventive medicine guidelines and actuarial predictions using practical indices of weight (e.g., body mass index [BMI]) and waist circumference (WC). As obesity-related disease spreads beyond affluent western countries, application of WC thresholds to other populations has highlighted issues of their generalizability. For example, U.S. national health goals based on BMI < 25 kg/m² and WC < 89 cm (women) and <102 cm (men) differ considerably with a recent law in Japan mandating intervention for older adults with WC exceeding 90 cm (women) and 85 cm (men). The U.S. military has also faced issues of generalizability of WC-based adiposity standards that are fair and achievable. Data from many studies indicate that WC is a reliable biomarker for T2DM risk, suggesting that, for adult men and women, action thresholds should be more stringent than current U.S. guidelines, and it would not be harmful to set worldwide targets somewhere below 90 cm for men and women, regardless of weight status. Medical technology has provided many great insights into disease, including modern imaging technologies that have differentiated fat depots that have the greatest influence on T2DM, but ultimately, an inexpensive measuring tape provides the most useful and cost-effective preventive measure for T2DM today. At some point in the future, a *Star Trek*-like abdominal body fat “tricorder” noninvasive assessment of tissue composition may provide an advantage over abdominal girth.

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Author Affiliation: Telemedicine and Advanced Technology Research Center, U.S. Army Medical Research and Materiel Command, Fort Detrick, Maryland

Abbreviations: (BMI) body mass index, (IMAT) intermuscular adipose tissue, (LBO) lower body obesity, (NHANES) National Health and Nutrition Examination Survey, (NHLBI) National Heart, Lung, and Blood Institute, (SAT) subcutaneous adipose tissue, (T2DM) type 2 diabetes mellitus, (UBO) upper body obesity, (VAT) visceral adipose tissue, (WC) waist circumference, (WHR) waist-to-hip ratio

Keywords: abdominal circumference, age, anthropometry, body composition, body fat standards, body mass index, epidemiology of diabetes, ethnicity, fat topography, gender, intra-abdominal fat, percent body fat, preventive medicine, public health policy

Corresponding Author: Col. Karl E. Friedl, Ph.D., Director, Telemedicine and Advanced Technology Research Center, U.S. Army Medical Research and Materiel Command (ATTN: MCMR-TT), Fort Detrick, MD 21702-5012