

( )

WHtR WHR WC

BMI

mg/dL ≤

mg/dL ≤

ADA

%

Delong

./ / / /

BMI WHR WC WHtR

WHtR

(p< / / / ) BMI

WHtR

BMI

> BMI kg/m

BMI

≤ BMI kg/m

WHtR

: \_\_\_\_\_

BMI

/ / :

/ / :

/ / :

:

(WC)

(WHR)

(WHtR)

( )

( )

WHtR

( ) ( ) WC

WC WHR

(BMI)

WHtR

WHR

/

%

HDL-C

$\beta$

mg/dL  $\leq$

<

mg/dL

$\leq$  : mg/dL  $\leq$  mg/dL  
 (IGT)  
 (IFG) mg/dL  
 mg/dL  
 JNC VII  
 mmHg  $\leq$   
 mmHg  $\leq$   
 ) ( :  
 ) / SPSS  
 ( :  
 ) / t  
 /

( = )	( = )	( )
/ ± / †	/ ± /	BMI (kg/m)
/ ± / †	/ ± /	WC (cm)
/ ± / †	/ ± /	WHR
/ ± / †	/ ± /	WHtR
/ ± / †	/ ± /	HDL (mg/dL)
± †	±	(mg/dL)
( / ) †	( / )	
( / ) †	( / )	
†		*
( / ) †	( / )	
( / ) †	( / )	
†		†
( / )	( / )	
( / )	( / )	

: † / mmHg ≤ \*  
 .p < / †



/

WHtR	WHR	WC	BMI	
			/	BMI
		/	/	WC
	/	/	/	WHR
/	/	/	/	WHtR

(p < / ) %

**BMI**

kg/m	BMI ≥	kg/m	BMI <	
	/		/	/
	/		/	BMI
	/		/	WC
	/		/	WHR
	/		/	WHtR

BMI

p

BMI

BMI

WHtR

(p < / / / )

WHtR

WHR WC

WHR WC

WHtR

(BMI )

BMI

WHR WC

BMI

WHtR .

kg/m

WHtR

kg/m ≤ BMI

WHtR

(WHtR WHR WC)

---

(IGT)

WHtR

WHtR

WHtR

WHtR

kg/m

kg/m

kg/m

kg/m

WHR

WHtR

## References

1. Bermudez OI, Tucker KL. Total and central obesity among elderly Hispanics and the association with Type 2 diabetes. *Obes Res* 2001; 9: 443-51.
2. Berber A, Gomez-Santos R, Fanghanel G, Sanchez-Reyes L. Anthropometric indexes in the prediction of type 2 diabetes mellitus, hypertension and dyslipidaemia in a Mexican population. *Int J Obes Relat Metab Disord* 2001; 25: 1794-9.
3. Rexrode KM, Buring JE, Manson JE. Abdominal and total adiposity and risk of coronary heart disease in men. *Int J Obes Relat Metab Disord* 2001; 25: 1047-56.
4. Beegom R, Beegom R, Niaz MA, Singh RB. Diet, central obesity and prevalence of hypertension in the urban population of south India. *Int J Cardiol* 1995; 51: 183-91.
5. Okosun IS, Liao Y, Rotimi CN, Choi S, Cooper RS. Predictive values of waist circumference for dyslipidemia, type 2 diabetes and hypertension in overweight White, Black, and Hispanic American adults. *J Clin Epidemiol* 2000; 53: 401-8.
6. Berber A, Gomez-Santos R, Fanghanel G, Sanchez-Reyes L. Anthropometric indexes in the prediction of type 2 diabetes mellitus, hypertension and dyslipidaemia in a Mexican population. *Int J Obes Relat Metab Disord* 2001; 25: 1794-9.
7. Fryzek JP, Schenk M, Kinnard M, Greenston JK, Garabrant DH. The association of body mass index and

- pancreatic cancer in residents of southeastern Michigan, 1996-1999. *Am J Epidemiol.* 2005; 162: 222-8.
8. Must A, Lipman RD. Childhood energy intake and cancer mortality in adulthood. *Nutr Rev* 1999; 57: 21-4.
  9. Mokdad AH, Serdula MK, Dietz WH, Bowman BA, Marks JS, Koplan JP. The continuing epidemic of obesity in the United States. *JAMA* 2000; 284: 1650-1.
  10. de Onis M, Blossner M. Prevalence and trends of overweight among preschool children in developing countries. *Am J Clin Nutr* 2000; 72: 1032-9.
  11. World Health Organization. Obesity epidemic puts millions at risk from related diseases. Press Release WHO/46 (online) 1997 ; [www.who.int/inf-prp/1997/en/pr97-46.html](http://www.who.int/inf-prp/1997/en/pr97-46.html).
  12. Wei M, Gaskill SP, Haffner SM, Stern MP. Waist circumference as the best predictor of noninsulin dependent diabetes mellitus (NIDDM) compared to body mass index, waist/hip ratio and other anthropometric measurements in Mexican Americans--a 7-year prospective study. *Obes Res* 1997; 5: 16-23.
  13. Janssen I, Katzmarzyk PT, Ross R. Body mass index, waist circumference, and health risk: evidence in support of current National Institutes of Health guidelines. *Arch Intern Med* 2002; 162: 2074-9.
  14. Esmailzadeh A, Mirmiran P, Azizi F. Waist-to-hip ratio is a better screening measure for cardiovascular risk factors than other anthropometric indicators in Tehranian adult men. *Int J Obes Relat Metab Disord* 2004; 28: 1325-32.
  15. Snijder MB, Zimmet PZ, Visser M, Dekker JM, Seidell JC, Shaw JE. Independent and opposite associations of waist and hip circumferences with diabetes, hypertension and dyslipidemia: the AusDiab Study. *Int J Obes Relat Metab Disord* 2004; 28: 402-9.
  16. Hsieh SD, Yoshinaga H. Waist/height ratio as a simple and useful predictor of coronary heart disease risk factors in women. *Intern Med* 1995; 34: 1147-52.
  17. Molarius A, Seidell JC. Selection of anthropometric indicators for classification of abdominal fatness--a critical review. *Int J Obes Relat Metab Disord* 1998; 22: 719-27.
  18. Gallagher D, Visser M, Sepulveda D, Pierson RN, Harris T, Heymsfield SB. How useful is body mass index for comparison of body fatness across age, sex, and ethnic groups? *Am J Epidemiol* 1996; 143: 228-39.
  19. Pishdad GR. Overweight and obesity in adults aged 20-74 in southern Iran. *Int J Obes Relat Metab Disord* 1996; 20: 963-5.
  20. Sarraf-Zadegan N, Sayed-Tabatabaei FA, Bashardoost N, Maleki A, Totonchi M, Habibi HR, et al. The prevalence of coronary artery disease in an urban population in Isfahan, Iran. *Acta Cardiol* 1999; 54: 257-63.
  21. Azizi F, Rahmani M, Emami H, Mirmiran P, Hajipour R, Madjid M, et al. Cardiovascular risk factors in an Iranian urban population: Tehran lipid and glucose study (phase 1). *Soz Praventivmed* 2002; 47: 408-26.
  22. American Diabetes Association. Diagnosis and classification of diabetes mellitus. *Diabetes Care* 2004; 27: Suppl 1:S5-10.
  23. Chobanian AV, Bakris GL, Black HR, Cushman WC, Green LA, Izzo JL Jr, et al; National Heart, Lung, and Blood Institute Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure; National High Blood Pressure Education Program Coordinating Committee. The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: the JNC 7 report. *JAMA* 2003; 289: 2560-72.
  24. DeLong ER, DeLong DM, Clarke-Pearson DL. Comparing the areas under two or more correlated receiver operating characteristic curves: a nonparametric approach. *Biometrics* 1988; 44: 837-45.
  25. Sargeant LA, Bennett FI, Forrester TE, Cooper RS, Wilks RJ. Predicting incident diabetes in Jamaica: the role of anthropometry. *Obes Res* 2002; 10: 792-8.
  26. Carey VJ, Walters EE, Colditz GA, Solomon CG, Willett WC, Rosner BA, et al. Body fat distribution and risk of non-insulin-dependent diabetes mellitus in women. The Nurses' Health Study. *Am J Epidemiol* 1997; 145: 614-9.
  27. Passos VM, Barreto SM, Diniz LM, Lima-Costa MF. Type 2 diabetes: prevalence and associated factors in a Brazilian community--the Bambui health and aging study. *Sao Paulo Med J* 2005; 123: 66-71.
  28. Stevens J, Couper D, Pankow J, Folsom AR, Duncan BB, Nieto FJ, et al. Sensitivity and specificity of anthropometrics for the prediction of diabetes in a biracial cohort. *Obes Res* 2001; 9: 696-705.
  29. Wang Y, Rimm EB, Stampfer MJ, Willett WC, Hu FB. Comparison of abdominal adiposity and overall obesity in predicting risk of type 2 diabetes among men. *Am J Clin Nutr* 2005; 81: 555-63.
  30. Huang KC, Lee MS, Lee SD, Chang YH, Lin YC, Tu SH, et al. Obesity in the elderly and its relationship with cardiovascular risk factors in Taiwan. *Obes Res* 2005; 13: 170-8.
  31. Sanchez-Castillo CP, Velazquez-Monroy O, Berber A, Lara-Esqueda A, Tapia-Conyer R, James WP. Encuesta Nacional de Salud (ENSA) 2000 Working Group. Anthropometric cutoff points for predicting chronic diseases in the Mexican National Health Survey 2000. *Obes Res* 2003; 11: 442-51.
  32. Folsom AR, Kushi LH, Anderson KE, Mink PJ, Olson JE, Hong CP, et al. Associations of general and abdominal obesity with multiple health outcomes in older women: the Iowa Women's Health Study. *Arch Intern Med* 2000; 160: 2117-28.
  33. Ohlson LO, Larsson B, Svardsudd K, Welin L, Eriksson H, Wilhelmsen L, et al. The influence of body fat distribution on the incidence of diabetes mellitus. 13.5 years of follow-up of the participants in the study of men born in 1913. *Diabetes* 1985; 34: 1055-8.
  34. Pua YH, Ong PH. Anthropometric indices as screening tools for cardiovascular risk factors in Singaporean women. *Asia Pac J Clin Nutr* 2005; 14: 74-9.
  35. Han TS, Feskens EJ, Lean ME, Seidell JC. Associations of body composition with type 2 diabetes mellitus. *Diabet Med* 1998; 15: 129-35.
  36. Lear SA, Chen MM, Frohlich JJ, Birmingham CL. The relationship between waist circumference and metabolic risk factors: cohorts of European and Chinese descent. *Metabolism* 2002; 51: 1427-32.
  37. Lin WY, Lee LT, Chen CY, Lo H, Hsia HH, Liu IL, et al. Optimal cut-off values for obesity: using simple anthropometric indices to predict cardiovascular risk factors in Taiwan. *Int J Obes Relat Metab Disord.* 2002; 26: 1232-8.
  38. Hsieh SD, Yoshinaga H, Muto T. Waist-to-height ratio, a simple and practical index for assessing central fat distribution and metabolic risk in Japanese men and women. *Int J Obes Relat Metab Disord* 2003; 27: 610-6.
  39. Sayeed MA, Mahtab H, Latif ZA, Khanam PA, Ahsan KA, Banu A, et al. Waist-to-height ratio is a better obesity index than body mass index and waist-to-hip

- 
- ratio for predicting diabetes, hypertension and lipidemia. *Bangladesh Med Res Counc Bull* 2003; 29: 1-10.
40. Lopatynski J, Mardarowicz G, Szczesniak G. A comparative evaluation of waist circumference, waist-to-hip ratio, waist-to-height ratio and body mass index as indicators of impaired glucose tolerance and as risk factors for type-2 diabetes mellitus. *Ann Univ Mariae Curie Sklodowska* 2003; 58: 413-9.
  41. Tulloch-Reid MK, Williams DE, Looker HC, Hanson RL, Knowler WC. Do measures of body fat distribution provide information on the risk of type 2 diabetes in addition to measures of general obesity? Comparison of anthropometric predictors of type 2 diabetes in Pima Indians. *Diabetes Care* 2003; 26: 2556-61.
  42. Ko GT, Chan JC, Chow CC, Yeung VT, Chan WB, So WY, et al. Effects of obesity on the conversion from normal glucose tolerance to diabetes in Hong Kong Chinese. *Obes Res* 2004; 12: 889-95.
  43. Bergstrom RW, Newell-Morris LL, Leonetti DL, Shuman WP, Wahl PW, Fujimoto WY. Association of elevated fasting C-peptide level and increased intra-abdominal fat distribution with development of NIDDM in Japanese-American men. *Diabetes* 1990; 39: 104-11.
  44. Willett WC, Dietz WH, Colditz GA. Guidelines for healthy weight. *N Engl J Med* 1999; 341: 427-34.