OBESITY[5,6]

Guidelines for Determining BMI & Waist Circumference

Body Mass Index [BMI] = weight (kg) / height^2 (m^2) = weight (lbs) x 703 / height^2 (in^2)

Waist circumference

To measure waist circumference, locate the upper hip bone and the top of the iliac crest. Place a measuring tape in a horizontal plane around the abdomen at the level of the iliac crest. Before reading the tape measure, ensure that the tape is snug, but does not compress the skin, and is parallel to the floor. The measurement is made at the end of a normal expiration.

Classification of Weight

Table 4 – Classification of overweight and obesity by BMI, waist circumference, and associated disease risk for type 2 diabetes, hypertension, and CVD

	BMI (kg/m^2)	Obesity Class	Disease risk (relative to normal weight and waist circumference)	
			Low-risk	High-risk†
Underweight	<18.25		-	-
Normal	18.5-24.9		-	-
Overweight	25.0-29.9		Increased	High
Obesity	30.0-34.9	I	High	Very high
	35.0-39.9	II	Very high	Very high
Extreme obesity	≥40	III	Extremely high	Extremely high

†A High-risk waist circumference for women is > 35 in (>88 cm)

Clinical judgment must be used in interpreting BMI. In the presence of edema, high muscularity, muscle wasting, and individuals who are limited in stature, BMI may not be accurate. The relationship between BMI and body fat content varies with age, gender, and possibly ethnicity, because of differences in the composition of lean tissue, sitting height, and hydration state. Women may have more body fat for a given BMI than men. However, these circumstances do not markedly influence the validity of BMI in classifying patients as overweight or obese.

Note: Increased waist circumference can also be a marker for increased risk even in persons of normal weight

[1]Framingham Heart Study. National Heart, Lung, and Blood Institute. Dec. 2002.
[2]The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. U.S. Department of Health and Human Services. May, 2003.
[3]Standards of Medical Care in Diabetes. American Diabetes Association. Diabetes Care 28:S4-S36, 2005.
[4]Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III). National Heart, Lung, and Blood Institute. Sept. 2002.
[5]Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults: The Evidence Report. National Heart, Lung, and Blood Institute. Sept. 1998. NIH Publication No. 98-4083.
[6]The Practical Guide: Identification, Evaluation, and Treatment of Overweight and Obesity in Adults. National Heart, Lung, and Blood Institute. Oct. 2000.

THE heart TRUTH — CARDIOVASCULAR DISEASE RISK ASSESSMENT TOOL

FRAMINGHAM RISK SCORING[1]

Step 1

Age	
Years	Points
30-34	-9
35-39	-4
40-44	0
45-49	3
50-54	6
55-59	7
60-64	8
65-69	8
70-74	8

Step 2

Total Cholesterol		
(mg/dl)	(mmol/L)	Points
<160	<4.14	-2
160-199	4.15-5.17	0
200-239	5.18-6.21	1
240-279	6.22-7.24	1
≥280	≥7.25	3

Key	
Color	Risk
green	Very low
white	Low
yellow	Moderate
rose	High
red	Very high

Step 3

HDL - Cholesterol		
(mg/dl)	(mmol/L)	Points
<35	<0.90	5
35-44	0.91-1.16	2
45-49	1.17-1.29	1
50-59	1.30-1.55	0
≥60	≥1.56	-3

Step 4

Blood Pressure					
Systolic (mmHg)	Diastolic (mmHg)				
	<80	80-84	85-89	90-99	≥100
<120	-3 pts				
120-129		0 pts			
130-139			0 pts		
140-159				2 pts	
≥160					3 pts

Note: When systolic and diastolic pressures provide different estimates for point scores, use the higher number

Step 5

Diabetes	
	Points
No	0
Yes	4

Step 6

Smoker	
	Points
No	0
Yes	2

Risk estimates were derived from the experience of the NHLBI's Framingham Heart Study, a predominantly Caucasian population in Massachusetts, USA

Step 7 (sum from steps 1-6)

Adding up the points	
Age	.....
Total Cholesterol	.....
HDL Cholesterol	.....
Blood Pressure	.....
Diabetes	.....
Smoker	.....
Point Total	.....

Step 8 (determine CHD risk from point total)

CHD Risk	
Point Total	10 Yr CHD Risk
≤-2	1%
-1	2%
0	2%
1	2%
2	3%
3	3%
4	4%
5	4%
6	5%
7	6%
8	7%
9	8%
10	10%
11	11%
12	13%
13	15%
14	18%
15	20%
16	24%
≥17	≥27%

Step 9 (compare to women of the same age)

Comparative Risk		
Age (years)	Average 10 Yr CHD Risk	Low* 10 Yr CHD Risk
30-34	<1%	<1%
35-39	1%	<1%
40-44	2%	2%
45-49	5%	3%
50-54	8%	5%
55-59	12%	7%
60-64	12%	8%
65-69	13%	8%
70-74	14%	8%

*Low risk was calculated for a woman the same age, normal blood pressure, total cholesterol 160-199 mg/dL, HDL cholesterol 55 mg/dL, non-smoker, no diabetes

HYPERTENSION[2]

CVD risk is continuous, consistent, and independent of other risk factors

Guidelines for Measuring Blood Pressure

Average of two or more seated BP readings on each of two or more office visits, taken 5 minutes apart.

- Patients should be seated in a chair rather than the exam table.
- Feet should be on the floor, and the arm supported at heart level.
- Cuff should encircle the arm at least 80%.
- Verify blood pressure readings from one arm in the other arm.

Classification of Blood Pressure

	Systolic	Diastolic
Normal	<120	<80
Prehypertension	120-139	or 80-89
Stage 1 hypertension	140-159	or 90-99
Stage 2 hypertension	≥160	or ≥100

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DIABETES[3]

Guidelines for Diagnosing Diabetes

Criteria for the diagnosis of diabetes in nonpregnant adults are shown in Table 1. Each method must be confirmed on a subsequent day unless unequivocal symptoms of hyperglycemia are present. Fasting plasma glucose (FPG) is the preferred diagnostic test, and the 75-g oral glucose tolerance test (OGTT) is rarely performed in practice. The use of the A1C for the diagnosis of diabetes is not recommended at this time.

Table 1 - Criteria for the diagnosis of diabetes

Method #1	symptoms of diabetes + casual plasma glucose = 200 mg/dl (11.1 mmol/L)	• The classic symptoms of diabetes include polyuria, polydipsia, and unexplained weight loss • Casual is defined as any time of day without regard to time since last meal
Method #2	FPG = 126 mg/dl (7.0 mmol/L)	• Fasting is defined as no caloric intake for at least 8 hours
Method #3	2-h plasma glucose = 200 mg/dl (11.1 mmol/L) during an OGTT	• The test should be performed as described by the World Health Organization, using a glucose load containing the equivalent of 75-g anhydrous glucose dissolved in water

Hyperglycemia not sufficient to meet the diagnostic criteria for diabetes is categorized as either impaired fasting glucose (IFG) or impaired glucose tolerance (IGT), depending on whether it is identified through a FPG or an OGTT:

IFG: FPG = 100 mg/dl - 125 mg/dl (5.6 mmol/l - 6.9 mmol/l)

IGT: 2-h plasma glucose = 140 mg/dl - 199 mg/dl (7.8 mmol/l - 11.0 mmol/l)

Recently, IFG and IGT have been officially termed "pre-diabetes." Both categories are risk factors for future diabetes and cardiovascular disease (CVD).

Classification of Diabetes

Diabetes is classified into four clinical classes:

- Type 1 diabetes (results from ß-cell destruction, usually leading to absolute insulin deficiency).
- Type 2 diabetes (results from a progressive insulin secretory defect on the background of insulin resistance)
- Other specific types of diabetes (due to other causes, e.g., genetic defects in ß-cell function, genetic defects in insulin action, diseases of the exocrine pancreas, and drug or chemical induced).
- Gestational diabetes mellitus (GDM) (diagnosed during pregnancy)

CHOLESTEROL[4]

Guidelines for Determining Lipids

A fasting lipoprotein profile including major blood lipid fractions (i.e., total cholesterol, LDL cholesterol, HDL cholesterol, and triglyceride) should be obtained at least once every 5 years in adults age 20 and over in low-risk patients. In patients with multiple risk factors (see Table 2), lipoprotein measurement should be done at shorter intervals. If the testing opportunity is nonfasting, only the values for total cholesterol and HDL cholesterol will be usable. In such a case, if total cholesterol is >200 mg/dL or HDL is <40 mg/dL, a followup lipoprotein profile is needed for appropriate management based on LDL. The relationship between LDL cholesterol levels and CHD risk is continuous over a broad range of LDL levels from low to high.

Table 2 - Major independent risk factors for dyslipidemia

Cigarette smoking
Hypertension (BP ≥ 140/90 mmHg or on antihypertensive medication)
Low HDL cholesterol (< 40 mg/dL)
Family history of premature CHD (CHD in male first-degree relative <55 years; CHD in female first-degree relative <65 years)
Age (men ≥45 years; women ≥55 years)

If a person has a high HDL cholesterol (≥60 mg/dL), one risk factor is subtracted from the count. If the person has type 2 diabetes, this person is classified as having a CHD risk equivalent (see below)

Classification of Lipids

Table 3 - ATP III Classification of LDL, Total, and HDL Cholesterol and Serum Triglycerides (mg/dL)

LDL Cholesterol		Total Cholesterol		HDL Cholesterol		Serum Triglycerides	
<100	Optimal	<200	Desirable	<40	Low	<150	Normal
100-129	Near optimal/ above optimal	200-239	Borderline high	≥60	High	150-199	Borderline high
130-159	Borderline high	≥240	High			200-499	High
160-189	High					≥500	Very high
≥190	Very high						

Note: LDL cholesterol goals are modified for different risk categories. For a person with zero to one risk factor, it is reasonable for LDL to be below 160. Patients with multiple (2+) risk factors require an LDL goal <130. For a person with known coronary heart disease or equivalent*, the LDL goal is <100.

*Coronary heart disease includes a history of acute myocardial infarction, evidence of silent myocardial infarction or myocardial ischemia, history of unstable and stable angina pectoris, and history of coronary procedures (coronary angioplasty and coronary artery surgery). CHD risk equivalent includes peripheral arterial disease, abdominal aortic aneurysm, carotid artery disease (symptomatic or >50% stenosis), Type II Diabetes, multiple risk factors and 10-year risk for CHD > 20% Based on 10-year risk assessment using Framingham scoring