TESTING FOR DIABETES

1. Testing for diabetes should be considered in all adults who are overweight (BMI ≥25 kg/m²*) and have additional risk factors:

- physical inactivity
- first-degree relative with diabetes
- members of a high-risk ethnic population (e.g., African American, Latino, Native American, Asian American, Pacific Islander)
- have delivered a baby weighing >9 lb or have been diagnosed with GDM
- women with PCOS
- HDL cholesterol level <35 mg/dl and/or a triglyceride level >250 mg/dl
- are hypertensive (≥140/90 mmHg or on therapy for hypertension)
- IGT or IFG on previous testing
- other clinical conditions associated with insulin resistance (e.g., acanthosis nigricans)
- history of CVD and severe obesity

2. In the absence of the above criteria, testing for pre-diabetes and diabetes should begin at age 45 years.

3. If results are normal, testing should be repeated at least at 3-year intervals, with consideration of more frequent testing depending on initial results and risk ststus.

*May not be correct for all ethnic groups.

PREVENTION/DELAY OF TYPE 2 DIABETES

Counsel individuals at high risk for developing diabetes of the benefits of weight loss and regular physical activity.

In those identified as having pre-diabetes (IGT and/or IFG):

- Refer to an effective ongoing support program for weight loss of 5–10% of body weight and increasing physical activity to 150 min per week.
- Screening for diabetes should be performed every 1–2 years.
- Close attention and appropriate treatment should be given for other CVD risk factors (e.g., tobacco use, hypertension, dyslipidemia).

LIPID AND BLOOD PRESSURE GOALS (For nonpregnant adults)

Blood Pressure (mmHg)		Lipids (mg/dl)	
Systolic	<130	LDL-C	<100*
Diastolic	<80		

*Individuals with overt CVD, a lower LDL cholesterol goal of <70 mg/dl (1.8 mmol/l), using a high dose statin is an option.

DIAGNOSTIC CRITERIA FOR PRE-DIABETES

	Fasting	Casual or 2-h Glucose Tolerance Test
Impaired fasting glucose	≥100–125 mg/dl	—
Impaired glucose tolerance	—	≥140–199 mg/dl

NUTRITIONAL RECOMMENDATIONS

- Individuals, who have pre-diabetes or diabetes should receive individualized MNT.
- Weight loss is recommended for all overweight or obese individuals who have, or are at risk for diabetes.
- Saturated fat intake should be <7% of total calories.
- Intake of trans fat should be minimized.
- Limit sodium to less than 2300 mg/day.
- Include fruits, vegetables, whole grains, legumes, and low-fat milk for good health.
- Monitoring carbohydrate, whether by carbohydrate counting, exchanges, or experience based estimation, remains a key strategy in achieving glycemic control.
- For individuals with diabetes, the use of the glycemic index and load may provide a modest additional benefit for glycemic control over that observed when total carbohydrate is considered alone.

2009 CLINICAL PRACTICE RECOMMENDATIONS

For more information, please visit the American Diabetes Association's web site **(www.diabetes.org)** or call:

Diabetes Information:	**1-800-DIABETES**
Membership, health professionals:	**1-800-232-3472**
Membership, people with diabetes:	**1-800-806-7801**

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CRITERIA FOR THE DIAGNOSIS OF DIABETES MELLITUS

1. Fasting plasma glucose (FPG) ≥126 mg/dl (7.0 mmol/l). Fasting is defined as no caloric intake for at least 8 h.

OR

2. Symptoms of diabetes plus casual plasma glucose concentration ≥200 mg/dl (11.1 mmol/l). Casual is defined as any time of day without regard to time since last meal. The classic symptoms of diabetes include polyuria, polydipsia, and unexplained weight loss.

OR

3. 2-h PG ≥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.

In the absence of unequivocal hyperglycemia, these criteria should be confirmed by repeat testing on a different day. The OGTT is not recommended for routine clinical use but may be required in the evaluation of patients with IFG or when diabetes is still suspected despite a normal FPG. Different criteria are used to diagnose gestational diabetes in pregnant women.

RECOMMENDATIONS FOR GLYCEMIC CONTROL

A1C	**<7.0%***
Preprandial capillary plasma glucose	**70–130 mg/dl**
Peak postprandial capillary plasma glucose†	**<180 mg/dl**

Key concepts in setting glycemic goals:

- A1C is the primary target for glycemic control.
- Goals should be individualized and based on:
  - duration of diabetes
  - age/life expectancy
  - hypoglycemia unawareness
  - individual patient considerations
  - known CVD or advanced microvascular complications
- More or less stringent glycemic goals may be appropriate for individual patients.
- Postprandial glucose may be targeted if A1C goals are not met despite reaching preprandial glucose goals.

* Referenced to a nondiabetic range of 4.0–6.0% using a DCCT-based assay.
† Postprandial glucose measurements should be made 1–2 hours after the beginning of a meal, generally peak levels in patients with diabetes.

CORRELATION OF A1C WITH AVERAGE GLUCOSE

	Mean plasma glucose	
A1C (%)	**mg/dl**	**mmol/l**
6	126	7.0
7	154	8.6
8	183	10.2
9	212	11.8
10	240	13.4
11	269	14.9
12	298	16.5

Estimates based on ADAG data of ~2,700 glucose measurements over 3 months per A1C measurement in 507 adults with type 1, type 2, and no diabetes. Correlation between A1C and average glucose: 0.92 (42). A calculator for converting A1C results into eAG, in either mg/dl or mmol/l, is available at http://professional.diabetes.org/eAG.

DETERMINING BODY MASS INDEX (BMI) FROM HEIGHT AND WEIGHT

	Body Mass Index (kg/m2)													
	19	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**35**	**40**
Height (in.)	**Body Weight (lb.)**													
58	91	96	100	105	110	115	119	124	129	134	138	143	167	191
59	94	99	104	109	114	119	124	128	133	138	143	148	173	198
60	97	102	107	112	118	123	128	133	138	143	148	153	179	204
61	100	106	111	116	122	127	132	137	143	148	153	158	185	211
62	104	109	115	120	126	131	136	142	147	153	158	164	191	218
63	107	113	118	124	130	135	141	146	152	158	163	169	197	225
64	110	116	122	128	134	140	145	151	157	163	169	174	204	232
65	114	120	126	132	138	144	150	156	162	168	171	180	210	240
66	118	124	130	136	142	148	155	161	167	173	179	186	215	247
67	121	127	134	140	146	153	159	166	172	178	185	191	223	255
68	125	131	138	144	151	158	164	171	177	184	190	197	230	262
69	128	135	142	149	155	162	169	176	182	189	196	203	236	270
70	132	139	146	153	160	167	174	181	188	195	202	207	243	278
71	136	143	150	157	165	172	179	186	193	200	208	215	250	286
72	140	147	154	162	169	177	184	191	199	206	213	221	258	294
73	144	151	159	166	174	182	189	197	204	212	219	227	265	302
74	148	155	163	171	179	186	194	202	210	218	225	233	272	311
75	152	160	168	176	184	192	200	208	216	224	232	240	279	319
76	156	164	172	180	189	197	205	213	221	230	238	246	287	328

Body mass index, or BMI, is the measurement of choice to determine obesity. BMI is a formula that takes into account both a person's height and weight. BMI is a person's weight in kilograms divided by height in meters squared (BMI = kg/m^2). To determine BMI, find the appropriate height in the left-hand column. Move across the row to the given weight. The number at the top of the column is the BMI for that height and weight.

BMI classification: overweight 25–29.9; obese ≥30. Obesity is an indication for further clinical evaluation.

The BMI measurement poses some of the same problems as weight-for-height tables. BMI does not provide information on a person's percentage of body fat or take into consideration the person's body fat distribution.

KEY TESTS/EXAMS

Test/Exam	Frequency
A1C	• Quarterly if treatment changes or not meeting goals • At least 2 times/year if at goal and treatment stable
Dilated eye exam	Yearly
Comprehensive foot exam	Yearly (more often in patients with high-risk foot conditions)
Lipid profile	Yearly (less frequently if normal)
Microalbumin measurement	Yearly
Serum creatinine (with calculated GFR)	Yearly
Blood pressure	Each regular diabetes visit
Weight	Each regular diabetes visit