

AU InforMed

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November is ...



American Diabetes Month

Diabetes Awareness:

- It is estimated that over 18 million Americans have diabetes mellitus, of which only two-thirds have been diagnosed.
- The annual economic burden of diabetes mellitus is estimated at over 130 billion U.S. dollars.
- The FDA has approved insulin, as well as 6 classes of oral anti-diabetic medications (biguanides, sulfonylureas, thiazolidinediones [TZD's], α -glucosidase inhibitors, meglitinides, and a dipeptidyl peptidase-4 inhibitor) to help control hyperglycemia and other associated symptoms.

For more information on diabetes, take a look at these resources:

<http://www.diabetes.org/home.jsp> - This website is sponsored by the American Diabetes Association (ADA). The mission of this organization is to prevent and cure diabetes and to improve the lives of all people affected by diabetes. This is a very good resource to refer patients to.

http://care.diabetesjournals.org/cgi/reprint/29/suppl_1/s4 - This is the link to the most current ADA treatment guidelines for diabetes.

<http://www.cdc.gov/diabetes/> - This website is a part of the National Center for Chronic Disease Prevention and Health Promotion, the Center for Disease Control and Prevention, and the U.S. Department of Health and Human Services. It provides information from clinical trials and incorporates it into clinical and public health practices.

<http://www.nlm.nih.gov/medlineplus/diabetes.html> - This website brings together information from the National Library of Medicine, the National Institutes of Health, and other government agencies and health related organizations to assist in locating the latest health news.

http://www.webmd.com/diseases_and_conditions/diabetes.htm - This website provides health information, tools for managing your health, and support to those who seek information. This is a very good resource to refer patients to.

Diabetes Mellitus (DM) Overview:

Etiology:

- **Type 1 DM** develops most commonly in children and young adults. It accounts for up to 10% of all cases of DM, and develops as a result of the synergistic effects of genetic, environmental, and immunological factors that ultimately destroy pancreatic beta cells.
- **Type 2 DM** accounts for up to 90% of all cases of DM, and results from impaired insulin secretion, peripheral insulin resistance, and excessive hepatic glucose production.

Diagnostic Tests:

- Symptoms of diabetes (polyuria, polydipsia, and unexplained weight loss) and a casual plasma glucose ≥ 200 mg/dl. **OR**
- Fasting plasma glucose reading ≥ 126 mg/dl. **OR**
- Two-hour plasma glucose ≥ 200 mg/dl during an oral glucose tolerance test (OGTT).



Criteria for diagnosis must be confirmed on a subsequent day unless unequivocal symptoms of hyperglycemia are present

Complications:

- Retinopathy – diabetes mellitus is the leading cause of blindness in adults 20 to 74 years of age
- Nephropathy – diabetes mellitus is the leading contributor to end-stage renal disease
- Neuropathy – occurs in approximately 50% of individuals with long-standing diabetes mellitus
- Cardiovascular Disease – coronary heart disease is 2 to 4 times more prevalent in patients with diabetes mellitus
- Lower Extremity Complications – diabetes mellitus accounts for more than 80,000 lower extremity amputations each year
- Gastrointestinal/Genitourinary Dysfunction – diabetes mellitus commonly causes gastroparesis, cystopathy, and sexual dysfunction



Treatment:

- **Type 1 DM:**
 - ♦ Insulin – lowers blood glucose (BG) levels by promoting peripheral uptake of glucose into cells, as well as inhibiting hepatic glucose synthesis
- **Type 2 DM:**
 - ♦ Biguanides (metformin) – decreases hepatic glucose production and improves insulin sensitivity



- ♦ Sulfonylureas (glipizide, glyburide, glimepiride, etc.) – stimulates insulin release from the pancreatic beta cells
- ♦ Thiazolidinediones (pioglitazone and rosiglitazone) – improves insulin sensitivity
- ♦ α -Glucosidase Inhibitors (acarbose and meglitol) – pancreatic α -amylase and intestinal α -glucosidase inhibitor
- ♦ Meglitinides (nateglinide and repaglinide) – stimulates insulin release from the pancreatic beta cells
- ♦ Dipeptidyl Peptidase-4 Inhibitor (sitagliptin) – see **New Drug** below
- ♦ Insulin

Goals:

- A1C < 7%
- Fasting plasma glucose 90 – 130 mg/dl
- Post-prandial plasma glucose < 180 mg/dl
- BP < 130/80 mmHg
- LDL < 100 mg/dl
- TG < 150 mg/dl
- HDL > 40 mg/dl



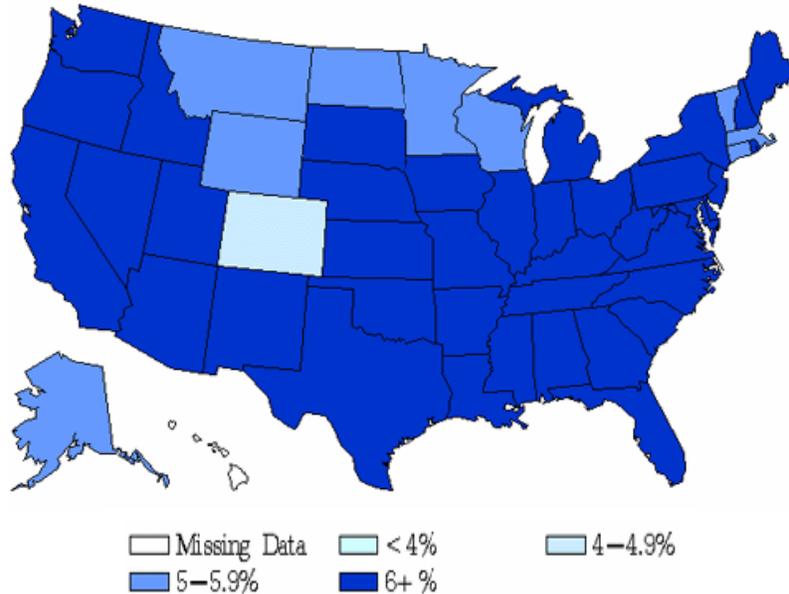
1. Triplitt CL, Reasner CA, Isley WL. Diabetes Mellitus. In: Dipro JT, Talbert RL, Yee GC, Matzke GR, Wells BG, Posey LM, editors. Pharmacotherapy. 6th ed. New York: McGraw-Hill; 2005. p. 1333-67.
2. Powers AC. Diabetes Mellitus. In: Kasper DL, Braunwald E, Fauci AS, Hauser SL, Longo DL, Jameson JL, editors. Harrison's Principles of Internal Medicine. 16th ed. New York: McGraw-Hill; 2005. p. 2152-80.
3. American Diabetes Association. Standards of Medical Care in Diabetes–2006. Diabetes Care. 2006;29(1):S4-S42.

FROM THE HEADLINES...

New Drug(s) ... On October 17th, 2006, the U.S. FDA announced the approval of Januvia™ (sitagliptin phosphate), the first diabetes treatment approved in a new class of drugs known as the dipeptidyl peptidase-4 inhibitors. A DPP-4 inhibitor is believed to exert its actions in patients with type-2 diabetes by slowing the inactivation of incretin hormones (glucagon-like peptide-1 [GLP-1] and glucose dependent insulinotropic polypeptide [GIP]), thereby increasing and prolonging the action of these hormones. When blood glucose concentrations are normal or elevated, GLP-1 and GIP increase insulin synthesis and release from pancreatic beta cells. GLP-1 also lowers glucagon secretion from pancreatic alpha cells, leading to reduced hepatic glucose production. By increasing and prolonging active incretin levels, Januvia™ increases insulin release and decreases glucagon levels in circulation in a glucose dependent manner. Januvia™ has been approved as monotherapy or in combination with metformin or a PPAR γ agonist. Januvia™ is manufactured by Merck & Co., Inc. This is in addition to the three new drugs for diabetes approved in 2005; pramlintide acetate (Symlin by Amylin), exenatide (Byetta by Amylin) and insulin detemir (Levemir by Novo Nordisk).³

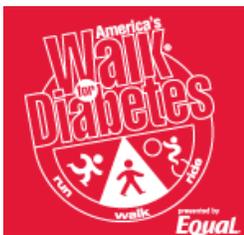
1. FDA approves new treatment for diabetes. FDA News. 2006 Oct 17; P06-169. <http://www.fda.gov/bbs/topics/NEWS/2006/NEW01492.html>.
2. Januvia™ [package insert]. Whitehouse Station, NJ: Merck & Co., Inc. October 2006. Available at http://www.merck.com/product/usa/pi_circulars/j/januvia/januvia_pi.pdf. Accessed on October 24, 2006.
3. CDER new molecular entity (NME) drug and new biologic approvals in calendar year 2005. <http://www.fda.gov/cder/rdmt/nmecy2005.htm>

2004 Diabetes Prevalence



The number of people with diabetes is increasing due to population growth, aging, urbanization, and increasing prevalence of obesity and physical inactivity. An estimated 17.7 million people in the U.S. had diabetes in 2000, placing the U.S. third in ranking worldwide. For 2030, it is estimated that the U.S. will have 30.3 million people with diabetes.

1. Wild S, Roglic G, Green A, Sicree R, King H. Global prevalence of diabetes: estimates for the year 2000 and projections for 2030. *Diabetes Care*. 2004;27(5):1047-53.
2. Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention. Available at <http://www.cdc.gov/diabetes/statistics/prev/state/fPrev1994and2004.htm>. Accessed Oct. 31, 2006.



America's Walk for Diabetes is the largest annual fundraiser for the American Diabetes Association (ADA). Learn more about this event at 1-888-DIABETES (1-888-342-2383).

1. http://walk.diabetes.org/site/PageServer?pagename=AWD_homepage



The last "dose" ...

"It don't make any difference who's carrying the ball, it don't make any difference who's catching it, who's rushing the passer, who's making the tackles... just as long as he's got a blue jersey on."

-- Patrick Fain Dye (Auburn vs. Alabama 1989)



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