

Diabetes is a chronic condition which occurs either when the pancreas cannot produce insulin or the body is unable to properly use the insulin that the pancreas does produce (U.S. Department of Health and Human Services, National Institutes of Health [NIH], 2008a). Under normal circumstances, insulin is produced by the pancreas in order to regulate the body's metabolism. When food is digested, it is broken down into glucose. The glucose molecules enter the bloodstream, causing a rise in blood sugar levels. Soon thereafter, the pancreas secretes insulin via the pancreatic beta cells. Insulin is responsible for facilitating the transfer of glucose from the bloodstream to the inside of the body's cells. Once glucose enters the cells it can then be used immediately for energy or stored for later use. It is when the insulin pathway becomes disrupted that diabetes develops (NIH, 2008b).

Eight percent of the American public has diabetes. 17.5 million Americans have been medically diagnosed with diabetes and it is estimated that another 6.6 million have diabetes that is undiagnosed (American Diabetes Association [ADA], March 2008). Additionally, 57 million U.S. adults over the age of 20 have pre-diabetes characterized by elevated blood sugar levels (U.S. Department of Health and Human Services, Centers for Disease Control and Prevention CDC, 2008). There are three primary types of diabetes and several less common forms.

### TYPES OF DIABETES

**Type 1 diabetes**, previously known as insulin-dependent diabetes mellitus or juvenile-onset diabetes, is the most severe form of the disorder. It is an autoimmune disease that develops when the body begins to destroy its insulin-producing pancreatic beta cells (NIH, 2008a). The resulting shortage of insulin causes glucose to remain in the bloodstream instead of entering the cells to be converted into energy. Type 1 diabetes typically affects children and young adults and is the number one cause of diabetes in children; however, its onset can occur at any age. In order to survive, the patient must receive daily injections of insulin (National Diabetes Education Program [NDEP], 2008).

**Type 2 diabetes**, previously referred to as non-insulin dependent diabetes mellitus or adult-onset diabetes, is the most common form of diabetes. It accounts for 90 to 95 percent of the documented cases of diabetes (CDC, 2009). While the exact etiology of type 2 diabetes is unknown, studies indicate that the disorder begins in the form of insulin resistance. The pancreas produces sufficient insulin but the body cannot properly use the insulin to transport glucose into the cells. The pancreas responds to the resultant high blood sugar level by producing more insulin. Over time, the pancreas loses the ability to produce the amount of insulin needed to transport glucose into cells. Ultimately, the pancreas becomes permanently damaged due to the continual elevation of insulin production (NIH, 2008a).

**Gestational diabetes** is diagnosed when any degree of glucose intolerance or high blood sugar is first discovered during pregnancy. This type of diabetes occurs in approximately 3-8 percent of all pregnancies and usually disappears during the postpartum period (NIH, 2008a).

**Maturity Onset Diabetes of the Young (MODY)** occurs in individuals less than 20 years old and is considered a form of type 2 diabetes. MODY is known to be the result of genetic mutation and can be passed from parent to child. Several different gene mutations have been identified but each mutation results in lack of insulin production by the pancreas. Approximately 1-5 percent of all cases of diabetes in the U.S. are MODY (NIH, 2007).

**Pre-diabetes** is the state where a patient's blood glucose level is higher than normal but not high enough to be considered diabetes. This condition may also be referred to as impaired fasting glucose (IFG) or impaired glucose tolerance (IGT) depending on which test was used to measure the blood sugar level (NIH, 2008b).

### DETECTION

Diabetes is detected by tests that measure the amount of glucose in the blood. There are three different tests that can be used and each usually must have the same result on different days to confirm the diagnosis. (1) The fasting plasma glucose (FPG) test, where the glucose is measured after at least eight hours of not eating, is the preferred method for diabetes screening according to the American

Diabetes Association (2008). FPG values of 126 mg/dl or higher indicate diabetes. (2) The oral glucose tolerance test (OGTT) measures the blood sugar level two hours after ingesting a specified amount of glucose. Values of 200 mg/dl or higher are diabetic. (3) A casual (done anytime regardless of meal schedule) plasma glucose test reading of 200 mg/dl or higher, together with symptoms of hyperglycemia (high blood sugar) also indicate diabetes (American Diabetes Association [ADA], 2010).

## SYMPTOMS

Many of the symptoms of diabetes are the same regardless of the type and may include any of the following: fatigue, frequent urination, blurred vision, tingling or numbness in hands and feet, very dry skin, slow-healing sores, increased incidence of infections, unexplained weight loss, and excessive hunger and thirst. In type 1 diabetes the symptoms usually develop over a short period of time with an identifiable beginning. Type 2 diabetes is usually slow to develop and the symptoms may be ignored or, in some cases, there may be no symptoms at all. Many women presenting with gestational diabetes also may have no symptoms (NIH, 2008a).

## RISK FACTORS

It is estimated that by the year 2050, the prevalence of diabetes in the United States will increase 165 percent from today's levels (NIH, 2008a). The CDC also estimates that one third of those born today will be affected by diabetes (CDC, 2009). Factors that increase the likelihood of developing diabetes include:

- ◆ **Ethnicity.** Type 1 diabetes occurs more often in whites than non-whites. Type 2 diabetes is more prevalent in non-whites. In 2005, African Americans aged 20 years or older were 1.8 times as likely to have diabetes as non-Hispanic whites of similar age. Hispanic populations also appear to have a higher incidence of diabetes, almost double that of their non-Hispanic white peers. Mexican Americans, the largest Hispanic/Latino subgroup, are 1.7 times as likely to develop diabetes as non-Hispanic whites. American Indians and Alaska Natives experience the highest risk of becoming diabetic; they are 2.2 times as likely as non-Hispanic whites.
- ◆ **Age.** Likelihood of developing diabetes increases with age (40 and older).
- ◆ **Obesity.** Almost 90 percent of type 2 diabetics are overweight.
- ◆ **Family History.** The chances of developing diabetes increase 40% by having a first-degree family member (parent or sibling) with the disease.
- ◆ **Gestational Diabetes.** Having had gestational diabetes or giving birth to a child weighing over 9 pounds increases risk.
- ◆ **Hypertension.** Blood pressure is 140/90 mm Hg or higher. 64% of Texans with diabetes also had hypertension in 2005 (versus 21% of non-diabetics).
- ◆ **Dyslipidemia.** Low high-density lipoprotein (HDL) cholesterol level (35 or lower) or a high triglyceride level (250 or higher).

- ◆ **Sedentary.** Exercise less than three times per week.
- ◆ **Pre-diabetes.** History of previous impaired glucose tolerance (IGT) or impaired fasting glucose (IFG)
- ◆ **Polycystic ovarian syndrome.** Results in insulin resistance.

(CDC, 2005; CDC, 2008; National Library of Medicine, 2008; NIH, 2008a; Texas Department of State Health Services [TDSHS], 2009a; Votey, 2009).

The American Diabetes Association (2010) recommends that all adults who are overweight and have any of the risk factors listed above be tested for pre-diabetes and diabetes. If none of the risks are present, testing for diabetes should begin at age 45. For children, the ADA recommends testing every two years beginning at age 10 if the child is overweight and has two of the listed risk factors.

## REDUCING THE RISK

Reducing the risk of diabetes has been the focus of many studies. The Diabetes Prevention Program (DPP), reported that "people aged 60 or older who made lifestyle changes lowered their chances of developing diabetes by 70 percent (NIH, 2008b, p.4)." Participants taking oral medication (Metformin) therapy also reduced their risk by 31 percent. The DPP showed that simple lifestyle changes were the best treatment for pre-diabetes and insulin resistance:

- ◆ **Diet.** A low-fat, low-calorie diet will significantly reduce cholesterol levels and blood pressure.
- ◆ **Exercise.** As little as 30 minutes a day of walking, or other moderate intensity activity, five days a week is sufficient to make a difference.
- ◆ **Weight Loss.** Losing 5-7 percent of body weight (as little as five or ten pounds) improves insulin function.

Many of the test subjects who followed the lifestyle recommendations were able to return their blood glucose level to the normal range. No drug has been approved by the Food and Drug Administration specifically for treatment of insulin resistance or pre-diabetes (NIH, 2008a; NIH, 2008b).

## TREATMENT

No cure for diabetes exists as of yet. Diabetes treatment therefore consists of various measures to control, or manage, the disease. Treatment of diabetes today focuses largely on adopting and maintaining a healthier lifestyle in addition to glucose monitoring, oral medications and/or insulin injections (NIH, 2008b).

Type 1 diabetics do not produce any insulin and must receive insulin injections. There are four basic types of insulin available that differ in how long it takes to begin working, at what point it is at its peak, and the duration of its effectiveness (ADA, n.d.). Individual therapy depends on many factors including how the blood glucose level fluctuates throughout the day (MayoClinic.com, 2008).

Type 2 diabetes is managed through a combination of diet, exercise, and medication if needed. Blood glucose

level, blood pressure and cholesterol levels should be monitored regularly. A patient participates in the treatment by monitoring the **ABCs of diabetes:**

**A is for A1C.** This blood test shows a three month average blood glucose level and is recommended for all diabetics at least twice a year. Many individuals with type 2 diabetes need to monitor their blood glucose on a daily basis using one of a number of monitoring devices as recommended by the physician. Schneider’s Children’s Hospital (n.d.) reports that lowering blood glucose level reduces the risk of eye disease by 76%, nerve disease by 69% and kidney disease by 54%. Target values are:

- ◆ A1C – below 7 percent –1% reduction equates to 40% reduced risk for eye, nerve, and kidney disease
- ◆ Blood glucose level before meals – 90 to 130 mg/dL
- ◆ Blood glucose 1-2 hours after meals – < 180 mg/dL

**B is for Blood Pressure.**

- ◆ Target value is below 130/80 mm Hg.
- ◆ 10 millimeter reduction in systolic (top number) pressure results in 12% reduction in complications.

**C is for cholesterol.** Target values include:

- ◆ LDL (bad cholesterol) under 100 mg/dL
- ◆ Triglycerides under 150 mg/dL
- ◆ HDL (good cholesterol) above 40 (men) or 50 (women) mg/dL
- ◆ 20-50% reduction in cardiovascular complications when cholesterol is adequately controlled

(CDC, 2008; NIH, 2005)

According to the American Diabetes Association, “the implementation of the standards of care for diabetes has been suboptimal in most clinical settings. A recent report indicated that only 37% of adults with diagnosed diabetes achieved an A1C of <7%, only 36% had a blood pressure <130/80 mmHg, and just 48% had a total cholesterol <200 mg/dl. Most distressing was that only 7.3% of people with diabetes achieved all three treatment goals” (ADA, 2010).

**COMPLICATIONS OF DIABETES**

**Heart disease and stroke.** High blood glucose levels will eventually damage the blood vessels leaving the individual at high risk for heart disease and stroke:

- ◆ 2-4 times higher rate of heart disease/stroke than those without diabetes
- ◆ Leading cause of death in diabetics – 68% of deaths in people with diabetes in 2004
- ◆ 22% of people with diabetes in Texas also had cardiovascular disease in 2005 (versus 5% of non-diabetics)
- ◆ 10% of people with diabetes in Texas also had a stroke in 2005 (versus 2% of non-diabetics)

(CDC, 2008; NIH, 2005; Texas Diabetes Council [TDC], 2008; TDSHS, 2009a)

**Neuropathies.** Nerve damage resulting from diabetes may involve any organ system such as the digestive track and heart as well as the extremities:

- ◆ 60-70% of diabetics have some form of nerve damage

- ◆ Risk increases with duration of diabetes
  - ◆ Major contributing factor in lower-limb amputations
  - ◆ Nerves to the foot are the most frequently affected
    - 30% of diabetics aged 40 and older have impaired sensation in the feet
    - 60% of all nontraumatic amputations occur in diabetics – approximately 86,000 per year
- (CDC, 2008; NIH, 2008, February)

**Retinopathy.** Damage to the blood vessels in the retina due to diabetes is the leading cause of blindness among adults:

- ◆ Four progressive stages
  - ◆ 40-50% of diabetics have some stage of diabetic retinopathy
  - ◆ 12,000 to 24,000 new cases of blindness each year
  - ◆ 34% of people with diabetes in Texas also had eye disease in 2005 (versus 22% of non-diabetics)
- (CDC, 2008; NEI, 2009; TDSHS, 2009a)

**Kidney disease.** Diabetes is the leading cause of kidney failure requiring either dialysis or transplantation:

- ◆ 44% of new cases due to diabetes
  - ◆ Damage occurs between 15 to 25 years of duration of diabetes
  - ◆ Hypertension is major factor as both a cause and an effect of kidney disease
- (CDC, 2008; NIH, 2008, January)

**Complications of pregnancy.** Poorly controlled diabetes before conception and during the first trimester of pregnancy causes major birth defects in 5-10% of all pregnancies and spontaneous abortions in 15-20% of pregnancies.

(CDC, 2008; TDSHS, 2009a)

**PREVALENCE IN TEXAS**

It is estimated that the number of people in the U.S. diagnosed with diabetes is growing by approximately one million per year. The most recent data shows that 8% of the national population has diabetes. Diabetes currently affects almost 10% of the population in Texas and it is expected that the total number of diabetes cases will increase by 77% over the next 30 years from 1.3 million in 2005 to almost 2.3 million in 2040 (CDC, 2009; CDC, 2007). The chart below shows the current prevalence in adults by age and ethnicity:

**2008 Diabetes Prevalence in Texas**

Age Group	White, non-Hispanic	Black, non-Hispanic	Hispanic	Other
18 - 44	2.9%	3.0%	4.3%	1.4%
45 - 64	10.4%	23.8%	20.9%	13.9%
65+	17.0%	33.5%	34.8%	28.7%
Overall	8.3%	13.0%	11.1%	8.1%

(TDSHS, 2009a)

Additionally, it is estimated that 1 in every 400-600 children in Texas has type 1 diabetes and about 75% of all

new cases of type 1 diabetes are diagnosed in children under the age of 18. The number of children with type 2 diabetes has increased at an alarming rate during recent years because 10-15% of children and teens are overweight (TDSHS, 2009a; TDC, 2009). Reliable statistics for this age group are not yet available, but it has been noted that the percentage of children presenting with “type 2 diabetes has increased from less than 5% before 1994 to 30 to 50 percent in subsequent years” (Greenburg, Gallivan, & Warren-Boulton, 2004, p.20).

Diabetes is the sixth leading cause of death in the nation as well as in Texas. In 2006, there were 5,180 deaths attributed directly to diabetes but it is estimated that the mortality rate in Texas is 26.5 per 100,000. Diabetes is believed to be significantly under-reported as the cause of death where death occurs as a result of a complication of the disease such as heart disease or kidney failure. The reported mortality rate for Bexar County in 2006 is 32.4 per 100,000, significantly higher than the state rate (TDC, 2009; TDSHS, 2009b).

**ECONOMIC COST**

The American Diabetes Association has conducted in-depth studies of the economic costs of diabetes in the U.S. beginning in 2003 (ADA, 2008, March). Findings for 2007 include:

- ◆ \$174 billion – total national cost of diabetes
- ◆ Direct medical costs -- \$116 billion
  - \$27 billion direct diabetes treatment
  - \$58 billion treatment of diabetes-related chronic complications
  - \$31 billion excess general medical costs
- ◆ Indirect costs – \$58 billion
  - Work-related absenteeism – 15 million work days
  - Reduced work performance – 120 million work days
  - 107 million work days lost due to unemployment disability
  - 6 million reduced productivity days for those not employed
  - \$26.9 billion lost productivity due to premature death (284,000 deaths in 2007)

In essence, one out of every five dollars spent on healthcare is used to care for someone with diabetes (ADA, 2008, March).

A recent cost analysis for Texas reported that the total cost of hospitalizations attributed to diabetes in Texas was estimated to be \$3.6 billion in 2003 (TDC, 2008).

Diabetes poses a source of economic strain for both individuals and the state. Individuals with diabetes spent approximately 2.3 times more on medical care than those without diabetes but there exists a significant disparity in access to health care (CDC, 2009). People with diabetes were more likely to defer or avoid treatment due to cost than those without diabetes. Of those diagnosed with diabetes, there were a disproportionate number of Hispanic/Latinos that reported not having access to medical care:

	Hispanic/ Latino	Non- Hispanic Black	Non- Hispanic white	All Diabetics in Texas
Do not have healthcare coverage 2007	38%	18%	11%	22%
Could not see doctor due to cost 2007	39%	28%	17%	n/a

(TDC, 2008)

State and federal diabetes expenditures in Texas also included almost \$2.7 million for Medicaid and Children’s Health Insurance Program (CHIP) claims related to diabetes in children and approximately \$5.7 million for the activities of the Department of State Health Services Diabetes Program (2007) which provides education and outreach community-based programs for children and adults with or at risk for diabetes (TDC, 2008).

**RESEARCH**

Numerous organizations help fund studies to increase understanding of diabetes, including, but not limited to, the National Diabetes Education Program (NDEP), the American Diabetes Association (ADA), the National Institute of Health (NIH), the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), the National Eye Institute, the Center for Disease Control and Prevention (CDC), the Texas Diabetes Council, and the Texas Department of State Health Services.

The city of San Antonio is home to several research organizations including, but not limited to, the University of Texas Health Science Center at San Antonio, the Texas Diabetes Institute, the South Texas Health Research Center, and the Southwest Foundation for Biomedical Research. These organizations have participated in and share access to a number of long-term studies focused on diabetes and heart disease including:

- ◆ *Veterans Administration Genetic Epidemiology Study (VAGES)*. 1,800 family members from 300 families with a Mexican American individual with type 2 diabetes and one or more affected siblings, one affected parent, and one other sibling for genotyping.
- ◆ *San Antonio Family Diabetes Study (SAFDS)*. 1,000 family members from 39 Mexican American extended families phenotyped for diabetes traits.
- ◆ *San Antonio Family Heart Study*. 1,400 individuals from 42 families over four generations undergo clinic exam every five years including tests for diabetes.

Recently in 2007, the San Antonio Metropolitan Health District was selected to pilot a test of *Hemoglobin A1C Prevalence of Abnormal Lab Values*. “Ongoing analysis will be used to direct prevention and intervention programs for the San Antonio community, and to determine regional and state policy” (Guerra and Berlanga, n.d.).

## REFERENCES

- American Diabetes Association (ADA). (2008, March). Economic Costs of Diabetes in the U.S. in 2007. *Diabetes Care*, 31:596-615. Retrieved January 3, 2010, from <http://care.diabetesjournals.org/content/31/3/596.full.pdf+html>
- American Diabetes Association (ADA). (2010). Standards of Medical Care in Diabetes – 2010. *Diabetes Care* 33:S11-S61. Retrieved January 6, 2010, from [http://care.diabetesjournals.org/content/32/Supplement\\_1/S13.full](http://care.diabetesjournals.org/content/32/Supplement_1/S13.full)
- American Diabetes Association. (n.d.) *The Basics of Insulin*. Retrieved January 1, 2010, from <http://www.diabetes.org/type-1-diabetes/basics.jsp>
- Greenburg, R., Gallivan, J., & Warren-Boulton, E. (2004). *Update on Type II diabetes in children and adolescents*. Retrieved January 6, 2010, from <http://www.schoolnursesnews.org/BackIssues/2004/0104/diabetes0104.pdf>
- Guerra, F.A. and Berlanga, J. (n.d.). *Health profiles 2006: San Antonio Metropolitan Health District*. Retrieved January 6, 2010, from <http://www.sanantonio.gov/health/Profiles/HP2006/HP06%2019.doc>
- MayoClinic.com. (2008). *Diabetes treatment: Using insulin to manage your blood sugar*. Retrieved January 5, 2010, from <http://www.mayoclinic.com/health/diabetes-treatment/DA00010>
- National Eye Institute. (2009). *Diabetic retinopathy*. Retrieved January 6, 2010, from <http://www.nei.nih.gov/health/diabetic/retinopathy.asp>
- National Library of Medicine. (2008, March 7). *Diabetes*. Retrieved January 1, 2010, from <http://nihseniorhealth.gov/diabetes/printerFriendly.html?selectedTopics=selectTopic&causesandprevention=Risk+Factors+and+Prevention&print=Confirm+print+selection>
- Schneider's Children's Hospital. (n.d.). *The diabetes control and complications trial*. Retrieved January 6, 2010, from [http://www.schneiderchildrenshospital.org/sch\\_endo\\_dcct.html](http://www.schneiderchildrenshospital.org/sch_endo_dcct.html)
- Texas Department of State Health Services (TDSHS). (2009a) *Diabetes and disparity: A plan to prevent and control diabetes in Texas, 2010-2011*. Publication No. 45-10524. Retrieved January 6, 2010, from <http://www.dshs.state.tx.us/diabetes/PDF/TDC%20State%20Plan%201011.pdf>
- Texas Department of State Health Services (TDSHS). (2009b). *ICD-10 death statistics for the State of Texas: Diabetes Mellitus year 2006*. Retrieved January 5, 2010, from <http://soupfin.tdh.state.tx.us/death10.htm>
- Texas Diabetes Council. (2008). *The burden of diabetes in Texas*. Retrieved January 6, 2010, from <http://www.dshs.state.tx.us/diabetes/PDF/data/Diabetes%20Burden%20Report.pdf>
- Texas Diabetes Council (TDC). (2009). *Texas diabetes fact sheet, 2009*. Retrieved January 6, 2010, from <http://www.dshs.state.tx.us/diabetes/PDF/data/2009%20Diabetes%20Fact%20Sheet.pdf>
- U.S. Department of Health and Human Services, Centers for Disease Control and Prevention (CDC). (2005). *National diabetes fact sheet: general information and national estimates on diabetes in the United States, 2005*. Retrieved January 6, 2010, from [http://www.cdc.gov/diabetes/pubs/pdf/ndfs\\_2005.pdf](http://www.cdc.gov/diabetes/pubs/pdf/ndfs_2005.pdf)
- U.S. Department of Health and Human Services, Centers for Disease Control and Prevention (CDC). (2007). *Chronic disease indicators: State profile: Texas compared with United States*. Retrieved January 5, 2010, from <http://apps.nccd.cdc.gov/cdi/SearchResults.aspx?IndicatorIds=12,61,34,31,24,19,38&StateIds=45,46&StateNames=Texas,United%20States&FromPage=HomePage&Print=true>
- U.S. Department of Health and Human Services, Centers for Disease Control and Prevention (CDC). (2008). *National diabetes fact sheet: general information and national estimates on diabetes in the United States, 2007*. Retrieved January 6, 2010, from [http://www.cdc.gov/diabetes/pubs/pdf/ndfs\\_2007.pdf](http://www.cdc.gov/diabetes/pubs/pdf/ndfs_2007.pdf)
- U.S. Department of Health and Human Services, Centers for Disease Control and Prevention (CDC). (2009). *Diabetes: Successes and opportunities for population based prevention and control*. Retrieved January 6, 2010, from [http://www.cdc.gov/chronicdisease/resources/publications/aag/pdf/diabetes\\_success.pdf](http://www.cdc.gov/chronicdisease/resources/publications/aag/pdf/diabetes_success.pdf)
- U.S. Department of Health and Human Services, National Institutes of Health (NIH). (2005). *Diabetes, heart disease, and stroke*. Retrieved January 1, 2009, from [http://diabetes.niddk.nih.gov/dm/pubs/stroke/DM\\_Heart\\_Stroke.pdf](http://diabetes.niddk.nih.gov/dm/pubs/stroke/DM_Heart_Stroke.pdf)
- U.S. Department of Health and Human Services, National Institutes of Health (NIH). (2007). *Monogenic Forms of Diabetes*. Retrieved January 1, 2010, from <http://diabetes.niddk.nih.gov/dm/pubs/mody/mody.pdf>
- U.S. Department of Health and Human Services, National Institutes of Health (NIH). (2008a). *Diabetes overview*. Retrieved January 4, 2010, from <http://diabetes.niddk.nih.gov/dm/pubs/overview/DiabetesOverview.pdf>
- U.S. Department of Health and Human Services, National Institutes of Health (NIH). (2008b). *Insulin resistance and pre-diabetes*. Retrieved January 4, 2010, from <http://diabetes.niddk.nih.gov/dm/pubs/insulinresistance/insulinresistance.pdf>
- U.S. Department of Health and Human Services, National Institutes of Health (NIH). (2008, January). *Kidney disease*. Retrieved January 1, 2010, from <http://kidney.niddk.nih.gov/kudiseases/pubs/pdf/kdd.pdf>
- U.S. Department of Health and Human Services, National Institutes of Health (NIH). (2009, February). *Diabetic neuropathies*. Retrieved January 6, 2010, from <http://diabetes.niddk.nih.gov/dm/pubs/neuropathies/neuropathies.pdf>
- Votey, Scott R. (2009). *Diabetes mellitus, Type 2—A review*. Retrieved January 6, 2010, from <http://www.emedicine.com/emerg/topic134.htm>