

**NDEP Diabetes Corner**  
**International Campaign to Reduce the Incidence of DKA**  
**By Francine Kaufman, MD, California**

The International Diabetes Federation (IDF), in collaboration with the International Society for the Study of Diabetes in Adolescence and Pediatrics (ISPAD), is encouraging worldwide initiatives to raise awareness of the warning signs of type 1 diabetes to avoid unnecessary loss of life in children and adolescents. These initiatives also aim to increase the number of children supported by the IDF *Life for a Child* program that provides children in developing countries with life-saving medications and medical care.

**Diabetes in children and adolescents**

Diabetes is one of the most common chronic diseases of childhood and strikes children at any age. It is estimated that worldwide, 440,000 children are living with diabetes and that 70,000 children under 15 develop type 1 diabetes each year (Atlas International Diabetes Federation, 2003 & EURODIAB Ace Study Group, 2000). Type 1 diabetes is growing globally at three 3 percent per year in children and adolescents and at an alarming five 5 percent per year among children five 5 years of age and under, including in the United States (Atlas International Diabetes Federation, 2003 & EURODIAB Ace Study Group, 2000). Type 2 diabetes, once known as an adult disease, is growing rapidly among children worldwide and is expected to increase by up to 50 percent over the next 15 years. Despite treatment, over 50 percent of children with diabetes develop complications about 12 years after diagnosis. With early diagnosis, appropriate care, access to medication, education, and support, children with diabetes can live full, healthy, and productive lives.

**Diabetic Ketoacidosis (DKA)**

In the United States, DKA occurs at onset of diabetes in 25 to 40 percent of cases. DKA is the leading cause of death and disability in children with type 1 diabetes. In 2001, the DKA death rate among people aged 45 years and younger (25.2 per 100,000 diabetic population) was about three times that of those aged 65-74 years (8.0 per 100,000 diabetic population). In 2001, there were 1871 deaths due to DKA (CDC, 2005).

DKA becomes life threatening when there is a misdiagnosis or delay in diagnosis. Diagnosis need not be complicated if the right questions are asked and if the person best-placed to make the diagnosis is looking for diabetes. The flu season is a time for School Nurses to be particularly vigilant and to promote awareness of DKA warning signs. Even in children with diagnosed diabetes, the stress of illness, trauma, and/or surgery often cause glycemic control to worsen and may precipitate DKA (ADA, 2004). The symptoms of type 1 diabetes shown in Table 1 usually develop over a short period of time.

### **Worldwide Initiatives**

The impetus for the IDF campaign to reduce DKA came from an initiative in Parma, Italy, where nocturnal enuresis was reported as the first sign of diabetes by 89 percent of parents of children with diabetes. From 1991 to 1998, information promoted in schools and pediatrician offices focused on nocturnal enuresis. By placing pamphlets and the poster shown in Figure 1 throughout schools, child care centers, and pediatric offices during the eight year period, the DKA rate dropped from 78 percent at diagnosis to 12.5 percent. With the posters still in place, DKA remains as low today (Vanelli, Chiari, Ghizzoni, et al., 1999). A tool box is being developed that contains posters and pamphlets about the signs and symptoms of diabetes in infants, children, and youth that can be used around the world in schools, clinics, doctor's offices, and with the media. The goal is to have this culturally appropriate, multilingual tool box ready for worldwide dissemination at the International Society for Pediatric and Adolescent Diabetes and IDF meetings in 2009.

### **Life for a Child Program**

The IDF's Life for a Child program was created in 2000 in partnership with Diabetes Australia-NSW and Hope Worldwide. It currently supports over 700 children with diabetes in 15 developing countries. The IDF is working hard to double the size and scope of this program over the next two years.

Over 240,000 children currently have diabetes in developing countries where many die soon after diagnosis, or have poor control and quality of life and develop early and devastating

complications. For just one U.S. dollar a day, the neediest children can receive appropriate care and treatment. The program provides insulin, syringes, monitoring equipment, education, and training at recognized diabetes centers. Proceeds from sales of a diabetes pin go directly to support the program. The pin can be obtained through the [www.worlddiabetesday.org](http://www.worlddiabetesday.org).

### **School Nurse Involvement**

School Nurses in the United States are encouraged to:

- Create a simple poster similar to that in Figure 1 and distribute copies to area schools, parents, day-care centers, and pediatrician offices.
- Use and distribute the toolbox when it is completed in 2009.
- Promote the *Life for a Child* program.

### **References:**

Atlas International Diabetes Federation (IDF) world atlas of diabetes, 2003.

[www.eatlas.idf.org](http://www.eatlas.idf.org)

EURODIAB ACE Study Group. Variation and trends in incidence of childhood diabetes in Europe. *Lancet* 2000;355:873-6.

National Surveillance Data Mortality due to DKA, 2005. Centers for Disease Control and Prevention National Center for Chronic Disease Prevention and Health Promotion, Division of Diabetes Translation. [www.cdc.gov/diabetes/statistics/complications\\_national.htm](http://www.cdc.gov/diabetes/statistics/complications_national.htm)

American Diabetes Association: Hyperglycemic crisis in diabetes. *Diabetes Care* 27 (Supl.1):S94-102, 2004.

Vanelli M, Chiari G, Ghizzoni L, et al. Effectiveness of a prevention program for diabetic ketoacidosis in children. *Diabetes Care* 1999;22:7-9.

### **Bio Box:**

**Francine Kaufman, M.D.**

*Professor of Pediatrics*

Childrens Hospital of Los Angeles and the Keck School of Medicine of USC

Francine is also the Vice Chair of the NDEP Diabetes in Children and Adolescents Work Group.

### **Table 1. Symptoms of Type 1 Diabetes**

Early symptoms include:

- Frequent urination
- Excessive thirst
- Increased hunger
- Weight loss
- Tiredness
- Lack of interest and concentration
- Blurred vision

As diabetes process progresses, these more severe symptoms can be seen:

- Signs of dehydration
- Vomiting and stomach pain
- Shortness of breath, rapid breathing
- Change in the level of consciousness progressing from lethargy to coma