As rates of childhood obesity in the United States increase, it is important to understand how excess body fat stresses the body and makes children susceptible to disease. Dr. Sonia Caprio and her team studied the association between different degrees of obesity and three warning signs that the body is in distress including:

1. Incidence of metabolic syndrome (defined below);
2. Insulin resistance (a marker of pre-diabetes); and
3. Levels of substances in the blood thought to increase risk of heart problems in children and adolescents.

Metabolic syndrome was defined as having three or more of the following conditions:

- Obesity
- High cholesterol or triglycerides
- High blood pressure
- Impaired glucose tolerance (levels higher than normal)

A diverse group of normal weight, overweight and obese children and adolescents between the ages of 4 and 20 participated in the study. They received a standard glucose tolerance test, which measures the body’s response to consuming a sugary drink. They also provided body measurements and blood samples for testing.

Children who were more obese were more likely to have metabolic syndrome, insulin resistance, and blood levels of substances thought to predict heart problems. Incidence of metabolic syndrome reached 50% in the very obese youth.

**Bottom Line**
Metabolic syndrome increases with high levels of obesity, which places children and adolescents at greater risk for heart problems.

**CARE Tips**
- Increase physical activity by encouraging play and limiting TV.
- Eat healthy by reducing foods that have saturated fat, trans fat and cholesterol. Don’t buy “junk foods” and limit fast food.