Acanthosis nigricans is one of the most common skin signs of obesity and hyperinsulinism and is a valuable predictor of insulin resistance in obese children. Patients with both obesity and acanthosis nigricans, compared with those with obesity alone, tend to have higher body mass indexes and increased fasting and evening insulin levels.

Early recognition and intervention are crucial to avoid complications of insulin resistance. The general pediatrician is in the best position to perform the initial assessment. Begin with measuring body mass index (BMI). Then evaluate the patient for the associated risk factors. If you diagnose acanthosis nigricans, screen the patient for associated conditions such as Cushing's syndrome, hypothyroidism, coexisting syndromes (including Prader-Willi, Bardet-Biedl, and Lepechaunism); lipodystrophy; or psychiatric disorders including depression or eating disorders.

Children with a BMI under the 85th percentile and no complications can be managed well by their pediatrician. Early intervention is key. Focus on healthful living, increased physical activity, and education of the family regarding associated conditions and the adverse effects that obesity can have on the child's health and quality of life.

The best strategy is to treat the underlying cause of acanthosis nigricans. Address obesity and any secondary insulin resistance because obesity is the No. 1 cause of acanthosis nigricans. Although topical keratolytic lotions or other topical therapies may be of some benefit, results are often disappointing. It is also important to involve the entire family in the treatment plan. If everyone is not ready for change, success will be limited. Because much embarrassment and stigma are often associated with obesity, discuss treatment, diet, and weight loss in an objective, nonjudgmental, and nonaccusatory fashion. Consider the family's schedule, financial situation, and lifestyle.

Educate patients and family members about appropriate weight for age and height, self-management skills, and a healthy, balanced diet with lower levels of carbohydrates and fats. It is easier for patients and parents to become discouraged, so institute changes gradually.

If a patient presents with obesity and acanthosis nigricans, evaluate the child for other insulin risk factors. These include a BMI above the 95th percentile, dyslipidemia, polycystic ovarian syndrome, hypertension, hyperglycemia, associated liver or gallbladder disease, abnormal waist-to-hip ratio, hypertension or diabetes, or insulin resistance in one of these conditions.

If the diagnosis of acanthosis nigricans is confirmed, referral to a pediatric dermatologist is recommended. Also refer a girl with suspected PCOS or hyperandrogenism and associated acne, which can be difficult to manage, as well as a girl with male-pattern hair loss.

The following criteria can warrant referral of the patient to a specialist other than a pediatric dermatologist:

- A child with a BMI at the 85th percentile or greater and any associated complications or any child with a BMI greater than the 95th percentile should be referred to a pediatric obesity treatment specialist, if available.
- Referral to a pediatric cardiologist may be needed if hypertension or dyslipidemia is present.
- Referral for a sleep study or for evaluation by a pediatric otolaryngologist may be indicated if signs of sleep disturbance suggest sleep apnea or obesity hyperventilation syndrome.
- Persistent headaches could indicate pseudotumor cerebi requiring neurologic evaluation.
- Referral to an endocrinologist would be indicated if Cushing's syndrome, type 2 diabetes, or hypothyroidism is suspected, or for girls with signs of PCOS or hyperandrogenism. The guidance of a pediatric endocrinologist may be required with certain medications, such as metformin, to decrease insulin resistance and hyperglycemia.
- Children with knee or hip pain and x-ray findings suggestive of slipped capital femoral epiphysis or Blount's disease (tibia vara) may need orthopedic evaluation.
- Children with abdominal pain may require referral to a pediatric gastroenterologist for evaluation of obesity-associated liver or gallbladder disease.

Regular monitoring of the overweight child with acanthosis nigricans is recommended. If initial screening is negative for type 2 diabetes or insulin resistance, the American Diabetes Association recommends repeating the screening every 2 years for at-risk children. Follow-up screening can also include thyroid studies to evaluate for hypothyroidism and hydroxypropionic acid, sulfur, and leucine nitrogen to follicle-stimulating hormone (LH/FSH) ratio to screen for hyperandrogenism.

Children with obesity and insulin resistance are at increased future risk for associated complications including orthopedic problems, fatty liver or gallbladder disease, infertility, hyperandrogenism, coronary artery disease and stroke, type 2 diabetes, predisposition to certain cancers, and Alzheimer's disease.

In addition to measurements of blood pressure, height, weight, and BMI, helpful laboratory studies include nonfasting lipid, hemoglobin A1c, and insulin and glucose levels. Fasting glucose, insulin, and lipid tests are especially recommended for a child whose BMI is at the 85th percentile or greater.

Conditions that can mimic acanthosis nigricans include postinflammatory hyperpigmentation; chronic eczema (especially in children with darker skin and secondary hyperpigmentation or lichenification); and confluent and reticulated papillomatosis of Gougerot and Cariveau (the plaques in this condition are very similar to acanthosis nigricans, but are more reticulated and located on the chest and back). Other conditions to consider in your differential diagnosis include linear epidermal nevus and retained keratin (which presents as brownish patches on the neck or postauricular areas that are easily removed with alcohol, but not with water).

If the differential diagnosis includes conditions that result in obesity or hyperandrogenism, the underlying cause of acanthosis nigricans is uncertain, referral to a pediatric dermatologist is recommended. Also refer a girl with suspected PCOS or hyperandrogenism and associated acne, which can be difficult to manage, as well as a girl with male-pattern hair loss.

The following criteria can warrant referral of the patient to a specialist other than a pediatric dermatologist:

- A child with a BMI at the 85th percentile or greater and any associated complications or any child with a BMI greater than the 95th percentile should be referred to a pediatric obesity treatment specialist, if available.
- Referral to a pediatric cardiologist may be needed if hypertension or dyslipidemia is present.
- Referral for a sleep study or for evaluation by a pediatric otolaryngologist may be indicated if signs of sleep disturbance suggest sleep apnea or obesity hyperventilation syndrome.
- Persistent headaches could indicate pseudotumor cerebi requiring neurologic evaluation.
- Referral to an endocrinologist would be indicated if Cushing's syndrome, type 2 diabetes, or hypothyroidism is suspected, or for girls with signs of PCOS or hyperandrogenism. The guidance of a pediatric endocrinologist may be required with certain medications, such as metformin, to decrease insulin resistance and hyperglycemia.
- Children with knee or hip pain and x-ray findings suggestive of slipped capital femoral epiphysis or Blount's disease (tibia vara) may need orthopedic evaluation.
- Children with abdominal pain may require referral to a pediatric gastroenterologist for evaluation of obesity-associated liver or gallbladder disease.

Regular monitoring of the overweight child with acanthosis nigricans is recommended. If initial screening is negative for type 2 diabetes or insulin resistance, the American Diabetes Association recommends repeating the screening every 2 years for at-risk children. Follow-up screening can also include thyroid studies to evaluate for hypothyroidism and hydroxypropionic acid, sulfur, and leucine nitrogen to follicle-stimulating hormone (LH/FSH) ratio to screen for hyperandrogenism.