

GROWTH

UPDATE

RECOGNIZING GROWTH PATTERNS

Recognizing and diagnosing growth disorders has always been an important part of providing primary medical care for infants and children, but in the past, intervention was limited. Growth disorders that were not caused by life-threatening diseases were for the most part "untreatable," and physicians could only give support and counseling to anxious children and their even more anxious parents.

In recent years, research into the various causes of growth disorders has led to the development of new treatment possibilities. Physicians are now able to monitor a child's growth and development carefully with the expectation of successfully treating any disorder.

Since 1985, when the first children were enrolled in the National Cooperative Growth Study (NCGS), results of treatment with biosynthetic human growth hormone have been collected for over 11,000 children (94,000 patient-years). The data are available to participating physicians.

Yet statistical centers in the United States estimate that of the tens of thousands of children with clinically significant short stature, only a small percentage are receiving treatment.

If growth disorders are to be treated before epiphyseal fusion is complete, recognition and assessment cannot be delayed. Earlier diagnosis allows for more treatment options and better chances of success.

The new treatment possibilities have created demands on primary care physicians, who are now expected to detect problems in a child's growth pattern, then make a preliminary investigation into possible causes.

Once a growth disorder has been recognized, diagnosis and treatment may involve consultation and referral to a pediatric endocrinologist. But it is crucial for the primary care physician to stay involved, managing the details of each child's care.

RECOGNIZING GROWTH DISORDERS

Certainly not all the children who fail to meet the "normal" height for their age will be found to have a specific etiology for a growth disorder. But for many children, "too short" or "too tall" stature has for too long been considered a "fact of life."

Any child between the ages of two and ten who moves away from an established growth pattern, in either direction, should be evaluated. Many abnormal growth patterns are recognizable by age three.

It is also important not to overlook the child of ten or twelve whose growth pattern is below the norm. In most cases, even though the child has entered puberty, treatment will still be possible, because many growth disorders also retard bone age development.

ASSESSING SHORT STATURE

Growth velocity, the rate a child grows per year, is a critical assessment, since measurements of height at any given age vary considerably among children. Children whose height is less than two standard deviations below the mean for their age have probably experienced less than desirable growth velocity for several years.

Keeping accurate growth charts and charting growth velocity will make it easy to assess a child's rate of growth over time. In addition, plotting growth on charts provides a sound basis of what can be expected in terms of future growth. Using standardized growth charts allows a comparison with the statistically based growth rate percentiles for children in each age group.

It is crucial that any medical staff members involved in keeping growth charts be instructed in proper use. *Measuring Up: Proper Height and Weight Measuring Techniques* video, showing the proper tools and

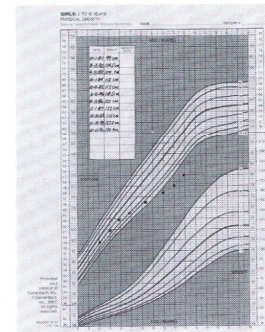
techniques for accurate measuring and monitoring, is available for instructional use. To order growth velocity and standardized percentile growth charts, please see the reply card enclosed with this newsletter.

GROWTH PATTERNS AND PRIMARY CARE

The recognition and monitoring of abnormal growth patterns depend upon your making constant, accurate measurements and plotting them on an appropriate growth chart.

Infants should be measured three or four times each year. After two years of age, children may be measured once or twice a year, but more frequent measurements will be necessary if any problem is suspected.

While growth is rapid from birth to age two, most children maintain a steady growth rate from ages three to ten, before they begin their pubertal growth spurt. Any child between the ages of three and ten growing less than five centimeters (two inches) per year should be scheduled for more frequent measurements.



In the past, expectations about height have influenced medical care. An analysis of data from both referral and treatment demographics reveals that females and minorities have not been proportionally represented. All children who experience changes in growth rate should be given equal attention. This may require educating parents who often think of short stature in girls as "cute," labeling the child "petite," without realizing the devastating effect that growth problems may signal.

ASSURING ACCURACY

Measuring a child's height seems simple and straightforward, but a slight error in technique can result in an inaccurate reading. A mistake of even one centimeter can hide a growth problem, or it can create a problem where none exists.

Be sure that your medical staff follows the appropriate procedures for measuring infants and standing children. By assigning one staff member the responsibility of making height measurements for all patients, you can avoid many of the variables that cause inaccuracies.

Don't use: the sliding arm on the weight scale, cloth or paper measuring tapes, or any measurement made with the child in incorrect position. These inaccurate methods can lead to dangerous oversights.

THE STADIOMETER

The instrument of choice for accurately assessing height is the stadiometer. The Accustat™ stadiometer combines a precise measuring tool with a flat vertical measuring surface and a movable, right-angle headplate. The Accustat stadiometer can be easily affixed to the wall and requires little maintenance. As with all precise instruments, regular calibration is recommended.



You may obtain an Accustat stadiometer free of charge by sending in the reply card enclosed with this newsletter.

MEASURING TECHNIQUES

Children must be positioned against the flat measuring surface of the stadiometer, or other flat measuring

surface. A wall with a baseboard will give an inaccurate measurement.

Shoes must be off. It is best to measure the child in underclothes, so the child's stance can be seen. If necessary, rearrange hairstyles to get an accurate measurement.

Ask the child to stand with heels close together, the legs and knees straight. Heels, buttocks, and shoulders must be touching the flat measuring surface.

The child must be looking straight, not raising or lowering the head. Arms should be at the side, relaxed, with the shoulders relaxed. The person taking the measurement may press gently against the abdomen to correct for spinal curvature, or may gently stretch the chin upwards to minimize postural height variations.

For safety, remove the headplate or place it at the highest position after completing a measurement. When beginning a measurement, loosen the knob and lower the headplate to approximately three inches above the head of the child being measured, then tighten the knob again.

After the child is positioned correctly, loosen the knob, ask the child to "stand tall, take a deep breath, and look straight ahead." Lower the headplate to rest against the crown of the head. Tighten the knob and take the measurement.

Measurements should be read to the nearest 0.1 cm or 1/8 inch. Record the measurement and plot it on the child's growth chart.

Infants must be measured while lying flat. Proper positioning of infants requires one person to hold the infant's head against a stable headboard. Another person gently stretches the infant, flattening the knees, and adjusts a movable footboard to make the measurement.

GROWTH CHARTS

The most accurate equipment and careful measuring techniques are of little use unless measurements are recorded immediately and then *plotted* on a growth chart. Avoid keeping notes in the patient's medical record, planning to go back and transfer them later. Even a six-month delay in noticing a change in growth pattern is too long. *Plot your patient's growth immediately on his or her growth chart.*

Keeping an appropriate growth chart in the child's medical file makes a simple procedure of recording and plotting. As soon as each measurement is taken, you can see the patient's progress over time, and you can also compare the patient's growth rate to the statistical standard measurements.

The sample charts provided with this newsletter are based on data from a large population of children collected by the National Center for Health Statistics (NCHS). The height and weight norms are shown as percentile lines, indicating the total range in height and weight for chronological ages three through eighteen years.

You may order a supply of both standardized percentile growth charts and growth velocity charts for both sexes by marking the appropriate boxes on the enclosed reply card.

WHEN TO CONSULT

When dealing with a potential growth disorder, it is better to consult early in the course of assessment. Some primary care physicians refer patients to a pediatric endocrinologist as soon as a growth problem is suspected. Others prefer working with the pediatric endocrinologist, comparing the patient's growth pattern with midparental target heights, evaluating bone age x-rays, and performing blood and laboratory testing before making the referral.

The pediatric primary care physician is really the frontline of medical care. With an awareness of growth disorders and knowledge of the possibilities for treatment, the primary care provider can detect abnormal growth patterns before the child's growth potential has passed.

STAYING IN CHARGE

Even after the pediatric endocrinologist has become involved, the primary physician needs to continue in the role of primary care provider, monitoring the success of growth therapy in relation to the child's whole health outlook. Psychosocial factors that often play a role in growth disorders may appear at any time, requiring the primary care provider's attention, as well as support and education for the child and the parents.

The pediatric primary care physician provides continuity and support, while maintaining all of the health care needs of the child.