

data provided evidence that the endocrine-metabolic state is primary rather than secondary in this process. These are provocative conclusions and, if applicable to other patient populations, suggest an important role for insulin sensitizers, such as metformin, in the prevention of PCOS. Most pediatric endocrinologists are encountering more patients with PCOS. Therapy often includes metformin, an androgen-receptor blocker, and/or oral contraceptives,

but the results are rarely satisfactory. Clearly, there is a need to prevent the development of this syndrome. The etiology may not be the same in all cases, but close follow-up is merited in all girls born with LBW, as well as all girls presenting with premature pubarche. It is not unreasonable to suggest preventive therapy in some of these children.

William L. Clarke, MD

## Improving Accuracy of Linear Growth Measurements

A survey study of pediatric and family primary care practices in 8 areas of the United States found that 70% employed inaccurate techniques for measuring children.<sup>1</sup> As follow-up, Lipman et al analyzed the effectiveness of an intervention aimed at improving the accuracy of linear growth measurements. From the 259 prior practice responders, 8 per geographic area were randomly recruited and divided into intervention and control arms of the trial of 55 practices (44 pediatric and 11 family practice). Practices cared for an average of 4000 children, and employed an average of 3.6 staff responsible for the measurements (21% RNs, 23% LPNs, 56% nurses' aides/medical assistants) with an average of 8.2 years experience. At baseline, correct overall measurement technique was demonstrated on 30% of measurements. Proper equipment was used in 58% of standing measured children and in 18% of recumbently measured children. The measurements differed by an average of 1.2 cm within the same child by study staff (differences ranged up to 12.1 cm). The intervention group received: a written pre-test of knowledge of growth measurement, a slide presentation and handouts on both proper measuring techniques and the physiology/pathophysiology of growth disorders, the installation of accurate measuring equipment and demonstration (plus return demonstration) on the correct measurement of height

and length, and a written post-test assessment. The control group received no intervention. Measurement techniques were re-evaluated after 3 and 6 months in both groups. Accurate measurement in the control group remained at 37% at 3 months and 34% at 6 months. The intervention group increased the accuracy of the measurements to 55% at 3 months and 70% at 6 months. At conclusion, the intervention group's mean difference in measurement from study staff decreased to 0.5 cm.

Lipman TH, Hench KD, Benyi T, et al. A multicentre randomised controlled trial of an intervention to improve the accuracy of linear growth measurement. *Arch Dis Child.* 2004; 89:342-346.

**Editor's Comment:** Growth is the single most important indication of a child's health.<sup>2</sup> Growth monitoring is an integral part of pediatric care. The American Academy of Pediatrics has recommended that height and weight be measured at least at birth; age 2-4 days; 1, 2, 4, 6, 9, 12, 15, 18 and 24 months; and yearly through age 21.<sup>3</sup> It is disheartening that Lipman et al found high prevalence of incorrect techniques among pediatric and family practices. Even more disheartening is that 10% of pediatric practices and 40% of family practices did not measure children at every well-child visit.<sup>1</sup> This is a worldwide problem with a lack of equipment or trained personnel, inaccurate plotting

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and misunderstanding of the reference curves.<sup>4</sup> Likewise, a study of an academic pediatric clinic found that 35% of well-child encounters failed to plot growth measurements and/or document a growth abnormality.<sup>5</sup> This study demonstrated that an intervention program can effectively improve the accuracy of growth measurement in clinical practices, and that the improvement increased with time. Thus, rather than forgetting the lessons learned, continued use of proper technique and proper equipment reinforced and improved performance. The most common reason for practices refusing to participate in this interventional study was “provider unwillingness due to low importance assigned to linear measurements.” The importance of proper technique and equipment cannot be overemphasized as lack of these may lead to missed or delayed recognition of growth failure or can lead to unnecessary investigation and

specialist referrals. As the authors pointed out, the current average inaccuracy exceeds the difference between the defined cut-offs for normal and abnormal growth velocities. (See Online Resources at [www.GGHjournal.com](http://www.GGHjournal.com) for links to growth charts.)

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## Stature and Psychosocial Adjustment in Adulthood

The Wessex Growth Study in the United Kingdom is a prospective, longitudinal school-based study that followed the physical and psychosocial development of short healthy students, and their average stature classmates from school until 18 to 20 years of age. This report represents the third in a series; the prior studies occurred when subjects were 7 to 9 and 11 to 13 years of age. The objective was to ascertain whether any psychosocial sequelae of short stature (during childhood or at the time of follow-up) could be detected in young adulthood. The short stature group (<−2 SDs score for height) was compared to classmates of average height (10–90<sup>th</sup> percentiles). There were 48 short normal (SN) and 66 control (C) subjects; these were statistically indistinguishable on multiple sociodemographic variables. Ulph and colleagues used the Adolescent to Adult Personality Functioning Assessment (ADAPFA) to measure social and interpersonal role performance in 6 domains: education and employment; love relationships; friendships; coping; social contacts; and negotiations. Critical behaviors related to education received beyond school, employment status, relationships with a partner, parenthood, drug taking, drinking, and involvement with violence—referred to as activities of daily living—were also assessed. The data were analyzed with respect to both height at recruitment (ages 7–9) and as adults (ages 18–20). The participants were classified into 3 height groups: <2<sup>nd</sup> percentile (n=19); 2<sup>nd</sup>–50<sup>th</sup> percentile (n=61); and >50<sup>th</sup> percentile (n=34). The middle group consisted of both initial SN and C participants.

Height at recruitment was not associated with ADAPFA scores. The mean ADAPFA scores on 3 domains were (nonsignificantly) higher in the SN group, indicating poorer adaptation. (Gender and SES were significant predictors of several domain scores validating ADAPFA sensitivity.) There was no effect of adult height on outcome measures, nor was there a significant difference in the proportion of 3 adult height groups that received scores falling within

the clinical range. ADAPFA score was highest in the shortest group and for 2 specific domains. The measure of activities of daily living did not differentiate participants by recruitment or adult height. The authors conclude that healthy short stature adults did not have compromised psychological, social, or educational adaptation when sociodemographic variables were taken into account.

Ulph F, Betts P, Mulligan J, Stratford RJ. Personality functioning: the influence of stature. *Arch Dis Child*. 2004;89:17–21.

**Editor’s Comment:** *The Wessex Growth Study is the first and only prospective longitudinal study of social, educational and psychological adaptation of physically healthy short children from a community sample that employs a methodologically sophisticated approach. Because study participants were selected from schools, the referral bias that stems from recruitment through pediatric endocrinology clinics was obviated. Previous findings demonstrated that stature was not a statistically significant predictor of self-concept, behavioral or emotional functioning, or academic performance, although those with short stature were less satisfied with their height.<sup>1,2</sup> These earlier observations were reinforced by the current findings that adult stature was not a predictor of psychosocial adaptation. Importantly, statistical analyses in all waves of the study controlled for the influence of sociodemographic variables that are well-recognized predictors of quality-of-life outcomes, and which can be confounded with stature.*

*The authors conspicuously failed to mention that this cohort had also been examined during adolescence.<sup>3</sup> At that time, short boys reported being more than twice as likely as average stature boys to be the object of teasing, and much more likely to say that this upset them and that they spent break time alone. Short stature may thus place the individual at increased risk for psychosocial stress. However, the association between negative experiences*