Therapy Is More Than Treatment

The recent statement by the Committee on Children With Disabilities concerning therapy services for children with motor disabilities provides useful information about how therapists function as well as prescription guidelines for pediatricians to follow. The publication is timely, because the number of children with motor disabilities remains at a steady level, and there is a strong demand for such services. Also, pediatricians in practice continue to have limited training, experience, and perspective in this area. Nevertheless, it is my view that the committee statement should have had a broader outlook beyond the single concept of treatment of the involved child.

I believe that, in addition, the pediatrician should be equally aware of the need for the family to have assistance in home management. The infant with motor disabilities often presents special problems in home care because of abnormal tone, posture, reflex behavior, and/or sensory deficits. Areas of concern include:

- handling
- positioning
- daily care (bathing, dressing, and feeding)

In each of these areas there are neurodevelopmental restrictions that confront the parent in care of the child. At the same time, these restrictions can limit response to the therapy program or a more appropriate growth process.

Home management assistance by therapists can help guide parents to more effective ways of dealing with the child that makes daily care easier and more efficient and is more closely related to therapy goals. It is of interest to note that one of the early studies of physical therapy highlighted home care assistance in management of the child as the only consistently statistically significant benefit.

Another byproduct of therapy involvement for children with motor disabilities is family support. The availability of a caring therapy professional with whom parents can communicate concerns, obtain information, receive encouragement, and develop a supportive relationship can, in itself, serve to greatly enhance the total therapeutic milieu in which families become immersed. It can serve as a buffer and point of reference from the often well-meaning suggestions and demands of family and friends. The supportive benefit of the therapy experience itself can also be a factor that positively affects family relationships.

Provision of therapy services for children with motor disabilities needs to go beyond treatment modalities alone and should focus as well on management assistance, especially for the very young child. It is suggested that pediatricians become better aware of the therapists’ capability to focus on management where indicated and to consult with therapists on how this can best be achieved. The pediatrician’s prescription for therapy should reflect concerns not only for treatment but for management assistance and family support. Helping pediatricians to understand this broader view could well be achieved through future guidance by the Committee on Children With Disabilities.

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Bone Health: It’s More Than Calcium Intake

The National Academy of Sciences has recommended that adequate dietary intake of calcium is necessary in children and adolescents for the development of peak bone mass and preven-
tion of fractures and osteoporosis later in life. The current recommended adequate intake for children 9 to 18 years of age is 1300 mg/day, which is higher than that in other developed countries. This recommended intake is based largely on the results of calcium-balance studies that show that in healthy children of this age, maximal net calcium balance is achieved with this intake. At higher levels of intake, additional calcium is mostly excreted. Peak calcium accretion is attained at the ages of 12.5 years in girls and 14.0 years in boys. Despite this, the percent of children achieving the recommended adequate calcium intake in the United States declines dramatically after the second year of life, reaching its nadir between 12 and 19 years of age, when documented intakes in this age group approximate only 700 to 1000 mg/day. In fact, only 10% of adolescent girls achieve the recommended adequate dietary intake of calcium. The article by Lanou et al in this issue, on careful review of the evidence, concludes that, by using measures of bone health (fracture rate and radiologic measures of bone mineralization and bone strength) rather than calcium-balance studies, an intake of 1300 mg/day is not warranted. Because the largest dietary source of calcium in the United States is dairy products (72%), these authors also maintain that increased consumption of dairy products, as currently promoted by industry and federal nutrition guidelines, is not indicated.

Lanou et al also point out that, by using radiologic measures of bone health, physical activity is the most important modifiable factor that determines increased bone growth and development in adolescents. This was confirmed recently by a 10-year longitudinal study in adolescents by the Penn State Young Woman’s Health Study. In 80 women who were followed from 12 to 22 years of age with an average daily calcium intake of 1058 ± 440 mg/day (range: 480–1958 mg/day), only exercise history (participation in sports), rather than calcium intake, was significantly correlated with bone mineral density and bone strength. It is well known that weight-bearing exercise plays a role in achieving maximal peak bone mass, but data to quantify the effect are limited. It is unclear, however, whether any given level of calcium intake influences the degree of benefit derived from exercise on bone mass or whether exercise alone, independent of calcium intake, improves bone mass. Although one could speculate that less-active people need more calcium in their diets than active ones, the Penn State study found no interaction between calcium intake and physical activity. This is in contrast to another recent report from the United Kingdom. In this cross-sectional study of 38 girls and 38 boys between 8 and 11 years of age, there was a synergistic effect on bone density of a calcium intake of 700 to 800 mg/day and vigorous exercise (25–40 minutes per day).

Getting to the bottom line, I agree with Lanou et al that there is no direct evidence that calcium supplements at any level in childhood or adolescent have any impact on long-term bone health in adults, including osteoporosis. Even when using radiologic measures of bone health rather than calcium-balance studies, it is difficult to show a positive effect of calcium intake alone on bone mineral over the short term, let alone long-term benefits; however, I do agree with the National Academy of Sciences that the immediate goal of pediatric health care providers is still to achieve maximum peak bone mass in our adolescent patients. What is the best way to achieve this goal? A calcium intake of 1300 mg/day will cause no harm that we know of, and the National Academy of Sciences has set an upper limit of 2500 mg/day for this age group. The easiest way to achieve this level of intake is to consume dairy products. In light of our ongoing concerns about pediatric obesity, low-fat dairy products would be preferred. In addition, with dairy products, many other beneficial nutrients will be supplied to our patients including vitamin D, generally not available from other dietary sources. It is interesting to note that longitudinal calcium intake has recently been negatively correlated with percent body fat in children. Pediatric care providers should continue to promote physical activity and optimal calcium intake in childhood and adolescence, with the anticipation that if these healthy lifestyle practices are instituted early in childhood, they will continue throughout a lifetime.

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Corticosteroids and Chronic Lung Disease: Time for Another Randomized, Controlled Trial?

Chronic lung disease (CLD) remains one of the most challenging diseases in neonatal medicine because there have been very few effective therapies for its prevention or treatment. Systemic corticosteroids, once thought to be the “silver bullet,” fell from grace because of a number of studies suggesting that the short-term benefits were outweighed by significant adverse long-term effects, namely an increased incidence of cerebral palsy (CP). However, the results of some studies were contradictory. Doyle et al1 use meta-regression analysis to review this somewhat confusing body of literature. This approach treats studies as subjects and tests the extent to which characteristics of study design contribute to variability in outcomes. The most critical characteristics in their report include the timing of treatment, the frequency of treatment of infants in the control group (“contamination”), and the incidence of CLD in the control group. Across all studies, they demonstrate no evidence of benefit (reduced mortality) and a trend toward harm (an increase in the risk of CP) among treated infants. However, they also demonstrate an inverse relationship between corticosteroid therapy and the baseline risk of CLD on the combined outcome of death or CP. The threshold of benefit based on their regression model is when the baseline risk of CLD is >50% (with the upper limit of the confidence interval of 65%).

The relationship among lung disease and its treatments, early signs of brain injury, and neurodevelopmental disability is complex and has been the subject of discussion and debate.2 Doyle et al hypothesize that, although corticosteroids have a direct toxic effect on the brain, this adverse effect may be balanced by an indirect benefit to the brain by improving lung function. We suggest an alternative or complementary explanation. The major contributor to CLD is inflammation, which may begin with uterine infection and evolve in some infants into a fetal inflammatory response.3,4 In the neonate, inflammation is exacerbated by ventilation and oxygen, which is usually confined to the lungs. However, under certain conditions, lung inflammation may be accompanied also by a systemic response.5 It is possible that high levels of proinflammatory mediators in the bloodstream, either as a result of fetal inflammation or because of the loss of compartmentalization of inflammation to the lung, may injure the brain. Corticosteroids may be beneficial in these infants, because they reduce the intensity of lung inflammation or the residua of a fetal inflammatory response and thereby decrease quantities of circulating mediators that injure the brain.

The critical question now is how the clinician should react to this very provocative publication. Let us hope that it does not provoke the widespread treatment of infants who are presumed to be at high risk for developing CLD. The findings of this study were based on investigations conducted some years ago. None of the studies reviewed used an a priori tool for determining CLD risk. None tested the relationship between baseline risk of CLD and benefit/harm of corticosteroid therapy as a primary hypothesis. As much as we all feel the need to treat or prevent what is arguably the most frustrating problem in neonatal medicine, a better alternative would be for this study to provoke the conduct of new randomized, controlled trials. Recently, given the acknowledged risks of corticosteroids, randomized, controlled trials have been difficult to justify on ethical grounds. The finding that there may be a population in which there is likely to be greater benefit than risk will permit the ethical conduct of placebo-controlled trials. The first step will be to develop a validated tool for predicting risk of CLD. This tool might include information about the inflammatory environment of the fetus and newborn. The trials should exclude the use of off-study treatment with corticosteroids. Therapies likely to confound or modify risk of CLD and CP should be standardized, and all aspects of long-term neurodevelopment should be evaluated. Only with results from trials with features such as these will the clinician be able to determine the balance between benefit and risk associated with corticosteroid therapy.

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