

# Pediatric Stroke Is Focus Of New AHA Guidelines

BY NANCY WALSH  
New York Bureau

The first comprehensive guidelines for the diagnosis and management of stroke in children are intended to provide a wide range of clinicians responsible for treating cerebrovascular disease in infants and children with evidence- and consensus-based recommendations, according to the American Heart Association.

The recommendations, written by a group of experts from the American Heart Association Stroke Council and the Council on Cardiovascular Disease in the Young, have been released online.

"Only a few centers in the country have a high level of expertise in dealing with stroke in children, and these guidelines share this concentrated knowledge with physicians who don't have access to that expertise," committee chair Dr. E. Steve Roach said in an interview.

One important message in the statement is that stroke in children is far more common than is generally realized. Data from the National Hospital Discharge Survey from 1980 to 1998 suggested that the overall risk of stroke from birth through 18 years is 13.5/100,000, and the rate of hemorrhagic stroke for term infants is 6.7/100,000 per year. Other recent investigations found that neonatal stroke occurs in about 1 in 4,000 live births, with about of those 80% being ischemic.

"Strokes actually are twice as common as brain tumors in children," said Dr. Roach, chief of neurology at Nationwide Children's Hospital and professor of pediatric neurology, Ohio State University, both in Columbus.

Strokes in children differ from those in adults in that few are associated with atherosclerosis, but they are similar in that once the stroke has occurred, no medicine can reverse it, Dr. Roach said. "However, an aggressive approach to finding out the cause of the stroke is your best chance for preventing [subsequent] strokes and the cumulative pileup of brain damage that will determine whether that child grows into a normally functioning adult."

Among the causes and risk factors for stroke cited in the statement are sickle cell disease and cervicocephalic arterial dissection (Circulation 2008 [doi:10.1161/strokeaha.108.189696]).

The guidelines offer detailed recommendations on primary and secondary stroke prevention in sickle cell disease. Management of acute ischemic stroke should include optimal hydration and correction of hypoxemia and hypotension. Periodic transfusions

are recommended for children aged 2-16 years with abnormal transcranial Doppler findings, and those with a confirmed cerebral infarction should be on a program of red cell transfusion with measures to prevent iron overload.

In sickle cell disease with acute cerebral infarction, exchange transfusion with the goal of reducing sickle hemoglobin to less than 30% of total hemoglobin is "reasonable," and hydroxyurea may be considered for children who are unable to continue on long-term transfusion.

Cervicocephalic arterial dissection is described as an important but underrecognized cause of stroke in children. For extracranial cervicocephalic arterial dissection, it is reasonable to institute unfractionated heparin or low-molecular-weight heparin as a bridge to oral anticoagulation. Anticoagulant therapy can continue for 3-6 months or longer for patients with recurrent symptoms, according to the guidelines.

For hemorrhagic stroke, recommendations include noninvasive testing and standard cerebral angiography if needed, along with stabilizing measures such as controlling hypertension and seizures and managing increased intracranial pressure. Surgical evacuation of a supratentorial intracerebral hematoma is not usually recommended, although in certain selected patients with developing brain herniation or very high intracranial pressure, surgery may be helpful.

With cerebral venous sinus thrombosis (CVST) in children, anticoagulation is reasonable, with the exception of neonates. "Until there is more evidence of safety and effectiveness, anticoagulation is not appropriate for most neonates with CVST," the authors wrote, adding that it may be considered in the context of severe prothrombotic disorders, multiple emboli, or radiologic evidence of propagating CVST despite supportive care.

Some recommendations, such as those that suggest using anticoagulation only for neonates with some evidence of progression of venous sinus thrombosis, are likely to cause controversy, said Dr. Heather J. Fullerton, who directs the pediatric stroke and cerebrovascular disease center at the University of California, San Francisco.

Nonetheless, "these are landmark comprehensive guidelines" for clinicians who have "struggled with how to manage these patients in the absence of more evidence," said Dr. Fullerton, who was not a member of the writing group. The guidelines are at [www.americanheart.org/presenter.jhtml?identifier=3003999](http://www.americanheart.org/presenter.jhtml?identifier=3003999). ■

## CLINICAL GUIDELINES FOR FAMILY PHYSICIANS

### Lipid Screening in the Pediatric Population

BY NEIL S. SKOLNIK, M.D., AND MEERA SHAH, D.O.

About 75% of children who have total cholesterol levels above the 90th percentile continue to have total cholesterol levels higher than 200 mg/dL when they are in their early twenties. Currently, about 12% of children in the United States have total cholesterol levels above 200 mg/dL. The American Academy of Pediatrics has issued guidelines for the screening and management of childhood lipids (Pediatrics 2008;122:198-208).

There are two approaches to decreasing pediatric cholesterol levels. In the population approach, dietary changes are not recommended for children younger than 2 years of age because they may need more fat in their diet for normal growth and development. For children older than age 2 years, a "prudent" low-fat diet is recommended, with an increase in the intake of fruits, vegetables, and fish and a commensurate decrease in the intake of fruit juices, high-salt foods, and sweetened sodas and foods. In addition, the importance of exercise and the achievement of appropriate body weight should be emphasized.

The individual approach involves screening for increased lipid levels in defined high-risk populations, and then deciding on treatment based on the individual's risk of developing cardiovascular disease (CVD).

#### Screening

Given the relationship of childhood cholesterol levels to the development of adult atherosclerotic disease, it is important that there be a clear approach to screening for abnormal cholesterol levels. The AAP recommends screening children who have a family history of dyslipidemia or have premature CVD or dyslipidemia; those whose family history is unknown; and those with other CVD risk factors, such as overweight or obesity (defined as a body mass index greater than the 85th and 95th percentiles, respectively), hypertension, tobacco use, and diabetes mellitus. The screening test in these children is a fasting lipid profile, conducted when the child is 2-10 years old and repeated every 3-5 years if the results are within the reference range.

#### Treatment

The population approach focuses on decreasing the proportion of the population that has elevated lipid levels by promoting a healthy lifestyle in children older than age 2 years.

The individual approach focuses on children identified through screening as having elevated lipid levels. The first step is to urge lifestyle modification via diet and exercise. The next is to emphasize a nonpharmacologic approach that includes high-soluble fiber intake and the addition of plant stanols and sterols to the diet to decrease the absorption of dietary cholesterol.

For children older than age 8 years whose LDL cholesterol levels remain above the recommended range even after lifestyle modification, a pharmacologic intervention is recommended. For children with no risk factors

for CVD, the LDL cholesterol cut point is greater than or equal to 190 mg/dL; for those at risk for obesity, hypertension, or tobacco use, or who have a family history of premature CVD, the cut point is greater than or equal to 160 mg/dL; and for those with diabetes mellitus, the cut point is greater than or equal to 130 mg/dL. In the three groups, the initial goal would be to lower LDL cholesterol levels to less than 190 mg/dL, less than 160 mg/dL, and less than 130 mg/dL, respectively.

In children younger than age 8 years, pharmaceuticals are recommended only for an LDL cholesterol level that is greater than 500 mg/dL, as can be seen in familial hypercholesterolemia.

#### Pharmacologic Therapy

The AAP has recommended several classes of drugs for treating dyslipidemia, with a strong preference for the use of statins based on their tolerability, safety, and efficacy.

Bile acid-binding resins lower cholesterol on average 10%-20% below baseline, although gastrointestinal side effects do limit their use in adolescents. Niacin is not recommended because of the high incidence of flushing, which is particularly poorly tolerated in this population.

Statins lower cholesterol 20%-50% below baseline. Clinical trials in this population have shown statins to be well tolerated, safe, and effective in lowering cholesterol concentrations. Pravastatin has been approved for children with familial hypercholesterolemia. Statins are not recommended in women who are pregnant, planning a pregnancy, or breastfeeding because they are potentially teratogenic.

Cholesterol-absorption inhibitors such as ezetimibe, which can lower LDL cholesterol by 20%, are potential first-line agents for treatment because of their limited side effects and small tablet size.

#### The Bottom Line

Selective screening for hypercholesterolemia should begin when the child is 2-10 years old; a fasting lipid profile should be done in those who have a higher-than-average risk for coronary artery disease. Initial treatment should be through diet and exercise. For selected children with LDL cholesterol levels of 160-190 mg/dL, drug therapy should be considered.



DR. SKOLNIK is an associate director of the family Medicine Residency Program at Abington (Pa.) Memorial Hospital. DR. SHAH is a second-year resident in the program.

*Guidelines are most useful when they are available at the point of care. A concise yet complete handheld computer version of this guideline is available for download, with the compliments of FAMILY PRACTICE NEWS, at [www.redi-reference.com](http://www.redi-reference.com).*