

# AMERICAN ACADEMY OF PEDIATRICS

Committee on Quality Improvement, Subcommittee on Febrile Seizures

## Practice Parameter: Long-term Treatment of the Child With Simple Febrile Seizures

**ABSTRACT.** The Committee on Quality Improvement, Subcommittee on Febrile Seizures, of the American Academy of Pediatrics, in collaboration with experts from the Section on Neurology, general pediatricians, consultants in the fields of child neurology and epilepsy, and research methodologists, developed this practice parameter. This guideline provides recommendations for the treatment of a child with simple febrile seizures. These recommendations are derived from a thorough search and analysis of the literature. The methods and results of the literature review can be found in the accompanying technical report. This guideline is designed to assist pediatricians by providing an analytic framework for the treatment of children with simple febrile seizures. It is not intended to replace clinical judgment or establish a protocol for all patients with this condition. It rarely will be the only appropriate approach to the problem.

The technical report entitled "Treatment of the Child With Simple Febrile Seizures" provides in-depth information on the studies used to form guideline recommendations. A complete bibliography is included as well as evidence tables that summarize data extracted from scientific studies. This report also provides pertinent evidence on the individual therapeutic agents studied including study results and dosing information. Readers of this clinical practice guideline are urged to review the technical report to enhance the evidence-based decision-making process. The report is available on the *Pediatrics* electronic pages website at the following URL: <http://www.pediatrics.org/cgi/content/full/103/6/e86>.

### DEFINITION OF THE PROBLEM

This practice parameter provides recommendations for therapeutic intervention in neurologically healthy infants and children between 6 months and 5 years of age who have had one or more simple febrile seizures. A simple febrile seizure is defined as a brief (<15 minutes) generalized seizure that occurs only once during a 24-hour period in a febrile child who does not have an intracranial infec-

tion or severe metabolic disturbance. This practice parameter is not intended for patients who have had complex febrile seizures (prolonged, ie, >15 minutes, focal, or recurrent in 24 hours), nor does it pertain to children with previous neurologic insults, known central nervous system abnormalities, or a history of afebrile seizures.

### TARGET AUDIENCE AND PRACTICE SETTING

This practice parameter is intended for use by pediatricians, family physicians, child neurologists, neurologists, emergency physicians, and other health care professionals who treat children with febrile seizures.

### POSSIBLE THERAPEUTIC INTERVENTIONS

Possible therapeutic approaches to a child with simple febrile seizures include continuous anticonvulsant therapy with agents such as phenobarbital, valproic acid, carbamazepine, or phenytoin; intermittent therapy with antipyretic agents or diazepam; or no anticonvulsant therapy.

### BACKGROUND

For a child who has experienced a simple febrile seizure, there are potentially 2 major adverse outcomes that may theoretically be altered by an effective therapeutic agent. These are the occurrence of subsequent febrile seizures or afebrile seizures, including epilepsy. The risk of having recurrent simple febrile seizures varies, depending on age. Children younger than 12 months at the time of their first simple febrile seizure have approximately a 50% probability of having recurrent febrile seizures. Children older than 12 months at the time of their first event have approximately a 30% probability of a second febrile seizure; of those that do have a second febrile seizure, 50% have a chance of having at least 1 additional recurrence.<sup>1</sup>

Children with simple febrile seizures have only a slightly greater risk for developing epilepsy by the age of 7 years than the 1% risk of the general population.<sup>2,3</sup> Children who have had multiple simple febrile seizures and are younger than 12 months at the time of the first febrile seizure are at the highest risk, but, even in this group, generalized afebrile seizures develop by age 25 in only 2.4%.<sup>4</sup> No study has demonstrated that treatment for simple febrile seizures can prevent the later development of epilepsy. Furthermore, there is no evidence that simple febrile seizures cause structural damage and no evi-

The recommendations in this statement do not indicate an exclusive course of treatment or serve as a standard of medical care. Variations, taking into account individual circumstances, may be appropriate.

This clinical practice guideline was reviewed by the appropriate councils, committees and sections of the American Academy of Pediatrics including the Committee on Practice and Ambulatory Medicine, the Committee on Pediatric Emergency Medicine, the Committee on Drugs and sections on Emergency Medicine, Clinical Pharmacology, and Neurology. It was also reviewed by the Chapter Review Group, a focus group of practicing pediatricians representing each AAP district: Thomas J. Herr, MD, Gene R. Adams, MD, Charles S. Ball, MD, Diane E. Fuquay, MD, Michael J. Heimerl, MD, Donald T. Miller, MD, Lawrence C. Pakula, MD, William R. Sexson, MD, and Howard B. Weinblatt, MD.

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dence that children with simple febrile seizures are at risk for cognitive decline.<sup>5</sup>

Despite the frequency of febrile seizures (approximately 3%), there is no unanimity of opinion about therapeutic interventions.<sup>3</sup> The following recommendations are based on an analysis of the risks and benefits of continuous or intermittent therapy in children with simple febrile seizures. The recommendations reflect an awareness of the very low risk that a simple febrile seizure poses to the individual child and the large number of children who have this type of seizure at some time in early life.<sup>1,3-5</sup> To be commensurate, a proposed therapy would need to be exceedingly low in risks and adverse effects, inexpensive, and highly effective.

The expected outcomes of this practice parameter include the following:

1. Optimize practitioner understanding of the scientific basis for using or avoiding various proposed treatments for children with simple febrile seizures.
2. Improve the health of children with simple febrile seizures by avoiding therapies with high potential for side effects and no demonstrated ability to improve children's eventual outcomes.
3. Reduce costs by avoiding therapies that will not demonstrably improve children's long-term outcomes.
4. Help the practitioner educate caregivers about the low risks associated with simple febrile seizures.

#### METHODOLOGY

More than 300 medical journal articles reporting studies of the natural history of simple febrile seizures or the therapy of these seizures were reviewed and abstracted. Emphasis was placed on articles that differentiated simple febrile seizures from other types of febrile seizures, articles that carefully matched treatment and control groups, and articles that described adherence to the drug regimen. Tables were constructed from 62 articles that best fit these criteria. A more comprehensive review of the literature on which this report is based can be found in the technical report. The technical report also contains dosing information.

#### BENEFITS AND RISKS OF CONTINUOUS ANTICONVULSANT THERAPY

##### Phenobarbital

Phenobarbital is effective in preventing the recurrence of simple febrile seizures.<sup>6-8</sup> In a controlled, double-blind study, daily therapy with phenobarbital reduced the rate of subsequent febrile seizures from 25 per 100 subjects per year to 5 per 100 subjects per year.<sup>6</sup>

The adverse effects of phenobarbital include behavioral problems such as hyperactivity and hypersensitivity reactions.<sup>6,9-11</sup>

##### Valproic Acid

In randomized, controlled studies, only 4% of children taking valproate as opposed to 35% of control subjects had a subsequent febrile seizure. Therefore,

valproic acid seems to be at least as effective in preventing recurrent, simple febrile seizures as phenobarbital and significantly more effective than placebo.<sup>7,12,13</sup> Drawbacks to therapy with valproic acid include its rare association with fatal hepatotoxicity (especially in children younger than 3 years who also are at greatest risk for febrile seizures), thrombocytopenia, weight loss and gain, gastrointestinal disturbances, and pancreatitis.<sup>14</sup>

##### Carbamazepine

Carbamazepine has not been shown to be effective in preventing the recurrence of simple febrile seizures.<sup>9</sup>

##### Phenytoin

Phenytoin has not been shown to be effective in preventing the recurrence of simple febrile seizures.<sup>15</sup>

#### BENEFITS AND RISKS OF INTERMITTENT ORAL THERAPY

##### Antipyretic Agents

Antipyretic agents, in the absence of anticonvulsants, are not effective in preventing recurrent febrile seizures.<sup>6,16</sup>

##### Diazepam

A double-blind, controlled study in patients with a history of febrile seizures demonstrated that administration of oral diazepam (given at the time of a fever) could reduce the recurrence of febrile seizures. Children with a history of febrile seizures were given oral diazepam or a placebo at the time of fever. There was a 44% reduction in the risk of febrile seizures per person-year with diazepam.<sup>17</sup> A potential drawback to intermittent medication is that a seizure could occur before a fever is noticed. Adverse effects of oral diazepam include lethargy, drowsiness, and ataxia.<sup>17</sup> The sedation associated with this therapy could mask evolving signs of a central nervous system infection.

#### SUMMARY

The Subcommittee has determined that a simple febrile seizure is a benign and common event in children between the ages of 6 months and 5 years. Most children have an excellent prognosis. Although there are effective therapies that could prevent the occurrence of additional simple febrile seizures, the potential adverse effects of such therapy are not commensurate with the benefit. In situations in which parental anxiety associated with febrile seizures is severe, intermittent oral diazepam at the onset of febrile illness may be effective in preventing recurrence. There is no convincing evidence, however, that any therapy will alleviate the possibility of future epilepsy (a relatively unlikely event). Antipyretics, although they may improve the comfort of the child, will not prevent febrile seizures.

#### RECOMMENDATION

**Based on the risks and benefits of the effective therapies, neither continuous nor intermittent anti-**

**convulsant therapy is recommended for children with 1 or more simple febrile seizures. The American Academy of Pediatrics recognizes that recurrent episodes of febrile seizures can create anxiety in some parents and their children, and, as such, appropriate education and emotional support should be provided.**

#### ACKNOWLEDGMENTS

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