AMERICAN ACADEMY OF PEDIATRICS

Task Force on Prolonged Infantile Apnea

Prolonged Infantile Apnea: 1985

Knowledge regarding the etiology and optimal management of prolonged infantile apnea and its relationship to sudden infant death syndrome (SIDS) is tentative. Consequently, infantile apnea is a controversial subject; professional discussion and media attention are often emotional and even erroneous.

Prolonged apnea is defined as cessation of breathing for at least 20 seconds or as a briefer episode of apnea associated with bradycardia, cyanosis, or pallor. Brief episodes of apnea are a normal occurrence in infants, but prolonged apneic episodes may lead to morbidity and rarely mortality. The vast majority of infants with prolonged apnea are not victims of SIDS; most SIDS victims were never observed to have had prolonged apnea prior to the terminal event. The risk of death from SIDS is somewhat greater in the group of infants with prolonged apnea than in the general population. Infants with sleep apnea who have required active intervention, such as positive pressure "resuscitation," may be at significant risk.

Apnea of undetermined etiology that occurs in the premature infant between the actual date of birth and the original due date is apparently not predictive of SIDS. There is, however, indication that preterm infants as a group and perhaps siblings of infants who were victims of SIDS are at somewhat increased risk.

Infants who have had an episode of prolonged apnea are perceived by parents and physicians as having experienced a life-threatening event and being at risk for another. Prolonged apnea can be a symptom of many disorders including infection, seizures, airway abnormalities, hypoglycemia or other metabolic problems, anemia (in preterm infants), gastroesophageal reflux, impaired regulation of breathing during sleeping and feeding, and abuse.

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Diagnostic procedures should include electronic cardiorespiratory monitoring with assessment during sleeping, feeding, and alert phases. Study findings that are normal do not exclude the possibility of subsequent apneic events.

When a specific cause has not been determined and apneic events continue, electronic cardiorespiratory monitoring is appropriate in the hospital and might be considered for the home if prolonged hospitalization seems otherwise likely. If, with treatment of a specific cause, apneic episodes do not recur, monitoring is not indicated.

There are differences of opinion concerning the use of home monitors following a single prolonged apneic event and an evaluation that does not reveal a specific cause. Physicians must evaluate and treat each case individually. Those who believe there is a relationship between prolonged apnea and SIDS and/or that home monitoring may be helpful should prescribe monitoring; those who do not are not obligated to prescribe monitoring and should not feel pressured to do so. All should recognize and communicate that monitoring cannot guarantee against SIDS.

Appropriate treatment for the asymptomatic infant who is a member of a group thought to be at increased risk of SIDS (eg, very small premature infants and subsequent siblings of SIDS victims) is also controversial. Asymptomatic infants may be candidates for home monitoring, but as yet there are no reliable tests to identify specific infants at risk. Management should be individualized.

Monitoring in the hospital or home should be prescribed by a physician who should also provide a specific plan for periodic review and termination. Medical and technical support staff should always be available for direct or telephone consultation. If monitoring is to be used at home, parents and other care givers must be trained in observation techniques, operation of the monitor, and infant cardiopulmonary resuscitation. Psychosocial assistance and respite personnel should also be available.

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Many different monitors are available, and it is the physician's responsibility to prescribe equipment with demonstrated reliability. Most authorities feel that both cardiac and respiratory activity should be monitored simultaneously; some feel cardiac monitoring alone may be sufficient. A care plan including periodic reassessment of historical, physical, developmental and laboratory data, as well as the need for continued monitoring and other intervention is necessary. Long-term follow-up of neurodevelopmental status is advised. Conclusive data from long-term follow-up are not yet available.

Resources necessary for the evaluation and management of infants with prolonged apnea include medical, nursing, social service, and technical assistance personnel. Access to a hospital with laboratory, roentgenographic, and EEG facilities is necessary. A resource for recording and evaluation of respiratory patterns for extended periods should be available.

Primary physicians are encouraged to evaluate and treat these infants if appropriate consultative expertise and resources are locally available. If not, referral to a specialized infant evaluation center may prove to be best. Hence, support for programs organized on a regional basis is recommended.

When counseling parents, health personnel should emphasize normal development so that the baby can be enjoyed and nurtured as family interaction is strengthened. While the consultant may focus on prolonged apnea, the primary physician must emphasize ongoing health supervision as well. Because there is a significant psychological impact on all members of the family of an infant with prolonged apnea, the entire family including siblings should be evaluated and supported whether or not monitors are used.

Finally, state and local health agencies, SIDS information and counseling programs, apnea evaluation projects, health professionals, and parents are requesting the latest information on research and treatment, including use of monitors. As there is limited evidence, but no conclusive proof, that monitors may have a role in selected cases, monitors should not be used or advertised in a fashion that implies that sure protection is provided. There have been unscrupulous attempts to profit from the situation and these are condemned.

In the above discussion, the 1978 statement of the AAP Task Force on Prolonged Apnea has been revised. The Task Force emphasizes the following major points:

1. Physicians must be responsible for all evaluation and management of infants with prolonged apnea.

2. A thorough initial evaluation to determine possible treatable causes of apnea is mandatory.

3. Asymptomatic infants, including those with previous apnea or those with statistically increased risk of SIDS, may be candidates for home monitoring, but there are no tests that will reliably determine risk status. Physicians should prescribe monitoring if they feel that that method of management is in the best interest of their patient.

4. Monitoring technology is still being developed and refined. Most authorities feel that both cardiac and respiratory functions should be monitored electronically. Some feel monitoring cardiac function alone is equally effective. Ability to produce a permanent record, when needed, is desirable.

5. When home monitoring is elected, parents should be advised that monitors cannot guarantee against SIDS. A plan for periodic reevaluations and termination of monitoring should be developed and explained to parents.

6. Because the etiology and optimal management of prolonged apnea are not clear and because a causal relationship between prolonged apnea and SIDS has not been established, continued research is essential.

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BIBLIOGRAPHY

American Academy of Pediatrics: Task Force on Prolonged Apnea. *Pediatrics* 1978;61:651–652

Ariagno RL, Guilleminault C, Korobkin R, et al: 'Near-miss' for sudden infant death syndrome infants: A clinical problem. *Pediatrics* 1983;71:726–730

Avery ME, Franz ID: To breathe or not to breathe: What have we learned about apneic spells and sudden infant death? (editorial). *N Engl J Med* 1983;309:107–108

Brooks JG: Apnea of infancy and sudden infant death syndrome. *Am J Dis Child* 1982;136:1012–1023

Cain LP, Kelly DH, Shannon DC: Parents' perceptions of the psychological and social impact of home monitoring. *Pediatrics* 1980;66:37–41

Duffty P, Bryan MH: Home apnea monitoring in 'near-miss' sudden infant death syndrome (SIDS) and in siblings of SIDS victims. *Pediatrics* 1982;70:69–74

Frogatt P, Lynas MA, Marshall TK: Sudden death in babies: Epidemiology. *Am J Cardiol* 1968;22:457–468

Guntheroth WG: *Crib Death: Sudden Infant Death Syndrome.* Mount Kisco, NY, Futura Publishing, 1982

Hodgman JE, Hoppenbrouwers T, Geidel S, et al: Respiratory behavior in near-miss sudden infant death syndrome. *Pediatrics* 1982;69:785–792

Kelly DH, Shannon DC: Periodic breathing in infants with near-miss sudden infant death syndrome. *Pediatrics* 1979;63:355–360

Kelly DH, Shannon DC: Treatment of apnea and excessive periodic breathing in the full-term infant. *Pediatrics* 1981;68:183–186

Nelson NM: But who shall monitor the monitor? (letter) *Pediatrics* 1978;61:663–664

Peterson DR, Chinn NM, Fisher LD: The sudden infant death syndrome: Repetitions in families. *J Pediatr* 1980;97:265–267

Shannon DC, Kelly DH: Sudden infant death syndrome and near death syndrome. *N Engl J Med* 1982;306:959–965, 1022–1028

Shannon DC, Kelly DH, O'Connell K: Abnormal regulation of ventilation in infants at risk for sudden-infant-death syndrome. *N Engl J Med* 1977;297:747–750

Southall DP: Home monitoring and its role in the sudden infant death syndrome. *Pediatrics* 1983;72:133–138

Southall DP, Richards JM, Rhoden KJ, et al: Prolonged apnea and cardiac arrhythmias in infants discharged from neonatal intensive care units: Failure to predict an increased risk for sudden infant death syndrome. *Pediatrics* 1982;70:844–851

Southall DP, Richard JM, de Swiet M, et al: Identification of infants destined to die unexpectedly during infancy: Evaluation of predictive importance of prolonged apnea and disorders of cardiac rhythm or conduction. First report of a multicentred prospective study into the sudden infant death syndrome. *Br Med J* 1983;286:1092–1096

Steinschneider A, Weinstein SL, Diamond E: The sudden infant death syndrome and apnea/obstruction during neonatal sleep and feeding. *Pediatrics* 1982;70:858–863

Valdes-Dapena M, Steinschneider A: Sudden infant death syndrome (SIDS), apnea, and near miss for SIDS. *Emerg Med Clinic North Am* 1983;1:1, 27–44

Weinstein S, Steinschneider A: The effectiveness of electronic home monitoring programs in preventing SIDS, in Tildon JT, Roeder LM, Steinschneider A (eds): *Sudden Infant Death Syndrome.* New York, Academic Press Inc, 1983

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