



# American Academy of Pediatrics



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## Growth and Development: Birth to 6 Months

Watching a young child grow is a wonderful and unique experience for a parent. Learning to sit up, walk and talk are some of the major developmental "milestones" your child will achieve. But your child's growth is a complex and ongoing process. Young bodies are constantly going through a number of physical and mental changes.

Although no two children develop at the same rate, they should be able to do certain things at certain ages. As a parent, you are in the best position to note your child's development, and you can use the milestones described below as guidelines.

At the ages noted, observe your child for 1 month. (This lets you take into account any days when your child may be acting differently because he or she is sick or upset.) Use the milestones listed for each age to see how your child is developing.

Remember a "no" answer to any of these questions does not necessarily mean that there is a problem. Every child develops at his or her own pace and may sometimes develop more slowly in certain areas than other children the same age. Keep in mind these milestones should be used only as guidelines.

Plan to talk about these guidelines with your pediatrician during your next office visit if you note the following:

- major differences between your child's development and the "milestones"
- your child does not yet do many of the things usually done at his or her age

### 3 Months

When your baby is lying on his back, does he move each of his arms equally well? Check "no" if your child makes jerky or uncoordinated movements with one or both of his arms or legs, or uses only one arm all the time.

Does your child make sounds such as gurgling, cooing, babbling, or other noises besides crying?

Does your baby respond to your voice?

Are your child's hands frequently open?

When you hold your child in the upright position, can he support his head for more than a moment?

### 6 Months

Have you seen your baby play with her hands by touching them together?

Does your child turn his head to sounds that originate out of his immediate area?

Has your baby rolled over from her stomach to her back or from back to stomach?

When you hold your baby under his arms, can he bear some weight on his legs? Check "Yes" only if he tries to stand on his feet and supports some of his weight.

When your child is on his stomach, can he support his weight on outstretched hands?

Does your baby see small objects such as crumbs?

If you have any questions, plan to discuss them with your pediatrician. Pediatricians are trained to detect and treat developmental problems in children. Many problems, if detected early, can be treated by your pediatrician and successfully managed.

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## Environmental Tobacco Smoke: A Hazard to Children Committee on Environmental Health

**ABSTRACT.** Results of epidemiologic studies provide strong evidence that exposure of children to environmental tobacco smoke is associated with increased rates of lower respiratory illness and increased rates of middle ear effusion, asthma, and sudden infant death syndrome. Exposure during childhood may also be associated with development of cancer during adulthood. This statement reviews the health effects of environmental tobacco smoke on children and offers pediatricians a strategy for promoting a smoke-free environment.

### Effects of Tobacco Smoke on Children

In 1992, 48 million American adults (26.5%) currently smoked cigarettes. [1] A recent national survey indicated that 43% of children 2 months to 11 years of age live in homes with at least one smoker. [2] Because many young children spend a large proportion of their time indoors, [3] they may have significant exposure to environmental tobacco smoke.

Environmental tobacco smoke from cigarettes, cigars, and pipes is composed of more than 3800 different chemical compounds. [4] Concentrations of respirable suspended particulate matter (particulates of  $<2.5 \mu\text{m}$ ) can be two to three times higher in homes with smokers than in homes with no smokers. [5] Cigarette smoking is the most important factor determining the level of suspended particulate matter and respirable sulfates and particles in indoor air. [6,7]

Passive smoking has a harmful effect on the respiratory health of children. [4,8,9] This statement reviews the evidence that children exposed to environmental tobacco smoke have higher rates of lower respiratory illness during their first year of life, higher rates of middle ear effusion, and higher rates of sudden infant death syndrome. In addition, children with asthma whose parents smoke have more severe symptoms and more frequent exacerbations.

### Passive Smoking and Lower Respiratory Illness

The first effect of passive smoking to be documented in children was an increased rate of illnesses affecting the lower respiratory tract. Cameron [10] reported a positive correlation between the presence of a smoker in the home and the incidence of perceived disease in children.

Harlap and Davies [11] interviewed pregnant women to determine their smoking habits and then studied hospital admissions for infants younger than 1 year. The infants whose mothers smoked were 38% more likely to be admitted to the hospital for bronchitis and pneumonia than were those whose mothers did not smoke. This increased likelihood was mainly among infants 6 to 9 months of age; admissions increased with the number of cigarettes smoked by the infants' mothers.

Rantakallio [12] showed that, among children younger than 1 year, those with mothers who smoked cigarettes were almost four times as likely to be hospitalized as were the infants of nonsmoking mothers, and the number of hospitalizations increased with the number of cigarettes the mother smoked per day. During the first 5 years of life, pneumonia and bronchitis were about

twice as likely and acute nasopharyngitis and sinusitis in the upper respiratory tract were about 1.5 times as likely to develop in children whose mothers smoke.

Colley et al [13] found a consistent gradient in the incidence of pneumonia and bronchitis in the child's first year of life in relation to the parents' smoking habits. Infants with two parents who smoked were more than twice as likely to have had pneumonia and bronchitis as were infants with parents who did not smoke.

Fergusson et al [14] showed that pneumonia and bronchitis in an infant's first year of life increased with increasing maternal smoking in an approximately linear manner: increases of five cigarettes a day resulted in an increase of 2.5 to 3.5 incidents of lower respiratory illness per 100 children at risk.

### **Passive Smoking and Serious Infectious Illnesses**

Berg and colleagues [15] determined that among children 3 to 59 months of age, passive smoking was associated with an almost fourfold risk of a serious infectious illness requiring hospitalization.

### **Passive Smoking and Middle Ear Effusions**

After a case-control study of risk factors for persistent middle ear effusions in Seattle, Kraemer and colleagues [16] reported that children who lived in households where more than three packs of cigarettes were smoked per day were more than four times as likely to be admitted to the hospital for tympanostomy tube placement than were children whose parents did not smoke.

Iversen and colleagues [17] studied children up to 7 years of age in Danish day care centers and demonstrated that middle ear effusion as measured by tympanometry was about 60% more likely to develop in children whose parents smoked. They estimated the overall fraction of middle ear effusion attributable to passive smoking to be 15%.

To determine risk factors for glue ear (serous otitis media), Black [18] performed a case-control study of 150 children 4 to 9 years old undergoing myringotomy in Oxford, England. Children undergoing myringotomy were about 50% more likely to have lived in households where someone smoked than were control children.

Hinton [19] studied 115 children undergoing ear tube insertion for otitis media with effusion and a control group of 36 children from an orthoptic clinic. Children admitted for ear operations were more likely to have at least one parental smoker at home than the children in the control group.

Etzel et al [20] studied 132 children in a day care center to determine whether passive smoking was associated with an increased risk of middle ear effusion during the 18-month period between 6 and 24 months of age. In this study, the children were classified as exposed or not exposed to cigarette smoke on the basis of serum cotinine concentrations at 1 year of age. Middle ear effusion was diagnosed with the use of pneumatic otoscopy. The 45 children exposed to environmental tobacco smoke had an average of 7.1 episodes of middle ear effusion between 6 and 24 months of age, whereas the 87 children unexposed to environmental tobacco smoke had 5.8 episodes during that period. The average duration of middle ear effusion was 28 days among those in the exposed group and 19 days among those in the unexposed group. An estimated 8% of the middle ear effusions were attributed to exposure to environmental tobacco smoke.

Strachan et al [21] studied the relationship between passive smoking and middle ear effusion in 736 7-year-old school children in Edinburgh. In this study, investigators used objective measures of passive smoking and middle ear effusion, salivary cotinine concentrations, and impedance tympanometry. Children with type B tympanograms in one or both ears were categorized as

having middle ear effusions. The results of this study indicated that detectable salivary cotinine was associated with type B tympanograms, even after adjustment for sex and the type of housing in which the children lived (rented versus owned). The authors estimated that at least one third of the cases of middle ear effusion among children in this age group may have been attributable to passive smoking.

Owen and colleagues [22] monitored 435 healthy children by tympanometry in the home every 2 to 4 weeks until 2 years of age. Of the children, 41% were exposed to household cigarette smoke. The authors found a significant association between the number of cigarettes smoked by household members and the frequency of otitis media with effusion during the second year of life.

Ey and colleagues [23] found that heavy maternal smoking (20 or more cigarettes per day) was a significant risk factor for recurrent otitis media during the first year of life. No association was found with paternal smoking.

### **Passive Smoking and Asthma**

Children with asthma whose parents smoke may have more frequent exacerbations and more severe symptoms. [24-35] In one of the few interventions reported in the literature, Murray and Morrison [30] demonstrated that if parents expose their children with asthma to less cigarette smoke, the asthmatic symptoms the children have will be less severe.

### **Passive Smoking and Sudden Infant Death Syndrome**

A growing body of evidence links exposure to environmental tobacco smoke to sudden infant death syndrome. [36-48] This relationship seems to be independent of birth weight and gestational age.

### **Passive Smoking and Lipid Profiles**

Passive smoking has also been reported to alter lipid profiles in adolescents. Feldman et al [49] studied 391 nonsmoking adolescent students and found that those with elevated plasma cotinine concentrations had an 8.9% greater ratio of total cholesterol to high-density lipoprotein cholesterol and 6.8% lower high-density lipoprotein cholesterol than those with lower plasma cotinine concentrations. This may shed light on the mechanism of increased risk of coronary heart disease in passive smokers.

### **Passive Smoking and Cancer**

Many studies link passive smoking to lung cancer in nonsmoking adults living with spouses who smoke. [50-57] The US Environmental Protection Agency [9] reviewed this subject and concluded that environmental tobacco smoke is a group A human carcinogen, the classification used when sufficient evidence from epidemiologic studies exists to support a causal association between exposure and cancer. A small number of studies have examined the relationship between exposure to environmental tobacco smoke during childhood and cancer risk. Sandler and colleagues [58] found that the overall cancer risk was greater for individuals with exposures to environmental tobacco smoke during both childhood and adulthood than for individuals with exposure during only one period. When specific cancer sites or types were considered, Sandler et al [58] found that leukemia and lymphoma among adults were significantly related to exposure to maternal passive smoke before 10 years of age. [59]

## **Conclusion**

Results of epidemiologic studies provide evidence that exposure of children to environmental tobacco smoke is associated with increased rates of lower respiratory illness and increased rates of middle ear effusion, asthma, and sudden infant death syndrome. Exposure during childhood to environmental tobacco smoke may also be associated with development of cancer during adulthood.

## **Breastfed Babies Need Vitamin D**

### Vitamin D Deficiency Clinical Report

#### **Patient FAQs**

Here are some commonly asked questions and answers on the recommendations in the AAP Clinical Report, "[Prevention of Rickets and Vitamin D Deficiency: New Guidelines for Vitamin D Intake](#)," that may be helpful for families.

1. **Q. Why do babies and older children need vitamin D?**  
**A.** Vitamin D is needed to help your body develop strong bones.
  
2. **Q: Why is it necessary to give vitamin D supplements to my breastfeeding baby? Doesn't human milk have all the essential nutrients for babies?**  
**A.** The AAP recommends breastfeeding of infants for at least 12 months and for as long thereafter as the mother and infant desire. However, human milk does not contain enough vitamin D to prevent rickets. Sunlight is the usual source of vitamin D production in the skin.
  
3. **Q: If my baby goes out in the sunlight every day or every other day for an hour or so, isn't that enough?**  
**A:** It may be enough sunlight exposure in some parts of the country throughout the year, but sunlight exposure is difficult to measure. Factors such as the amount of pigment in your baby's skin and skin exposure affect how much vitamin D is produced by your body from sunlight. In the more northern parts of the country during the winter, the amount of sunlight is not enough for any baby. Exposing infants and children's skin to sunlight has been shown to increase the risk for skin cancer later in life. We now recommend that infants and young children not be in direct sunlight when they are outside, particularly infants younger than 6 months of age. Sunscreens should be used on all children when in sunlight but it prevents vitamin D formation in the skin.
  
4. **Q: Do I need to give vitamin D supplements to infants who are fed infant formula?**  
**A.** No. All formulas sold in the United States have a sufficient amount of vitamin D that infants need as long as they are given about 16.9 ounces (pint) of infant formula per day.
  
5. **Q: When I take my baby outside, I always cover all of his skin with sunscreen, just as the AAP recommends. Isn't that enough to protect him from cancer and yet give him vitamin D?**  
**A:** No, the sunscreen prevents the skin from making vitamin D.
  
6. **Q: How do I give vitamin D to my infant?**  
**A:** Liquid multivitamin drops with vitamin D are available. If you give your baby the recommended amount from the dropper in the vitamin drops bottle, the baby will get all the vitamin D needed to prevent rickets.
  
7. **Q: When should I start giving the vitamin D drops?**  
**A:** You should start some time during the first 2 months of life.
  
8. **Q: How often do I give the vitamin D drops?**  
**A:** You should give the drops once a day, every day. But, if you forget one day, it is all right. The vitamin D is stored in the baby and there will be enough in the baby's body to prevent rickets.
  
9. **Q: If I give the vitamin drops to the baby, will the baby not want to breastfeed?**  
**A:** No, the drops will not interfere with breastfeeding. The amount is very small and giving a few drops from the dropper in to the corner of the baby's mouth toward the cheek will



not give the baby any problem with breastfeeding.

**10. Q: Don't the vitamin drops taste bad?**

**A:** Some vitamin drops do have a strong taste, especially the ones that contain vitamin B, but the triple vitamin drops that contain only vitamins A, C, and D taste all right.

**11. Q: Do babies need vitamins A and C also?**

**A:** Breastfed babies do not need vitamins A and C, but giving them these additional vitamins in this dosage is not harmful. At the present time there is no vitamin drop available with only vitamin D. In the near future, there may be vitamin D-only drops manufactured. When that is available, it would be the perfect vitamin to give to the breastfeeding baby. In some parts of Africa, there is deficiency in vitamin A and those babies may also need the vitamin A.

**12. Q: How long do I keep giving the vitamin D drops?**

**A:** You should keep giving it until your child has weaned from breastfeeding and is receiving at least a pint (16.9 ounces or 500 ml) of infant formula every day. The AAP recommends that "infants weaned before 12 months of age should not receive cow's milk feedings but should receive iron-fortified infant formula". Once your child begins drinking at least a full pint of vitamin D-fortified milk after 12 months of age, he/she does not need additional vitamin D drops or a tablet. If, however, your child drinks less than 17 ounces of regular milk, you should give him/her vitamin D drops or a tablet. This recommendation applies to children of all ages and even to adults.

**13. Q: How will I know if my baby or child has rickets from vitamin D deficiency?**

**A:** Rickets is a disease of the bones and is difficult to diagnose clinically without an X-ray before your infant begins to walk, at which time there will be excessive bowing of the legs. There may also be swelling of the wrists and ankles. Many infants with vitamin D deficiency will have slow growth. Some may have breathing and heart problems.

**14. Q: My older children do not drink any milk. How can they get extra vitamin D?**

**A:** There are the same concerns for protecting the skin of these children from direct sunlight exposure to prevent skin cancer later in life. Vitamin D-fortified milk is the sole dietary source of vitamin D. Any child who is not consuming at least a pint of vitamin D-fortified milk should receive vitamin D as part of a vitamin drop or pill to ensure adequate vitamin D intake. It is now recommended that even adults consume vitamin D in milk or vitamin pills.

## **Bathing Your Baby**

Your infant doesn't need much bathing if you wash the diaper area thoroughly during diaper changes. Two or three times a week during her first year is plenty. If she is bathed more frequently, it may dry out her skin.

### **Sponge Baths**

During her first week or two, until the stump of the umbilical cord falls off, your newborn should have only sponge baths. In a warm room, lay the baby anywhere that's flat and comfortable for both of you - a changing table, bed, floor or counter next to the sink will do. Pad hard surfaces with a blanket or fluffy towel. If the baby is on a surface above the floor, use a safety strap or keep one hand on her at all times to make sure she doesn't fall.

Have a basin of water, a damp, double-rinsed (so there is no soap residue in it) washcloth, and a supply of mild baby soap within reach before you begin. Keep your baby wrapped in a towel, and expose only the parts of her body you are actively washing. Use the dampened cloth first without soap to wash her face, so you don't get soap into her eyes or mouth. Then dip it in the basin of soapy water before washing the remainder of her body and, finally, the diaper area. Pay special attention to creases under the arms, behind the ears, around the neck, and, especially with a girl, in the genital area.

### **How to Give Your Baby a Bath**

Once the umbilical area is healed, you can try placing your baby directly in the water. Her first baths should be as gentle and brief as possible. She will probably protest a little; if she seems miserable, you should go back to sponge baths for a week or two and then try the bath again. She will make it clear when she's ready.

Most parents find it easiest to bathe a newborn in a bathinette, sink or plastic tub lined with a clean towel. If you're filling the basin from the tap, turn the cold water on first (and off last) to avoid scalding yourself or your child. In addition, make sure your hot water heater is set no higher than 120 degrees Fahrenheit.

Fill the basin with 2 inches of water that feels warm, not hot, to the inside of your wrist or elbow. Once you've undressed your baby, place her in the water immediately so she doesn't get chilled. Use one of your hands to support her head and the other to guide her in, feet first. Speak to her encouragingly, and gently lower the rest of her body until she's in the tub. Most of her body and face should be well above the water level for safety, so you'll need to pour warm water over her body frequently to keep her warm.

Use a soft cloth to wash her face and hair, shampooing once or twice a week. Massage her entire scalp gently, including the area over her fontanelles (soft spots). When you rinse the soap or shampoo from her head, cup your hand across her forehead so the suds run toward the sides, not into her eyes. Should you get some soap in her eyes, and she cries out in protest, simply take the wet washcloth and liberally wipe her eyes with plain, lukewarm water until any remains of the soap are gone, and she will open her eyes again. Wash the rest of her body from the top down.

When your infant comes out of the bath, baby towels with built-in hoods are the most effective way to keep her head warm when she's wet. Bathing a baby of any age is wet work, so you may want to wear a terry-cloth apron or hang a towel over your shoulder to keep you dry.

In the early months you may find it easiest to bathe your infant in the morning, when she's alert and the house is quiet and warm. By the time she graduates to the bathtub (usually when she's sitting up or outgrows the basin), you may want to shift to an evening schedule on the days she's bathed. The bath is a relaxing way to prepare her for sleep.

### **Bathing Supplies**

Make sure that supplies are on hand and the room is warm before undressing the baby. You'll need the same supplies that you used for sponge bathing but also a cup for rinsing with clear water. When your child has hair, you'll need baby shampoo too.

If you've forgotten something or need to answer the phone or door during the bath, you must take the baby with you, so keep a dry towel within reach. Never leave a baby alone in the bath, even for an instant.

If your baby enjoys her bath, give her some extra time to splash and explore the water. The more fun your child has in the bath, the less she'll be afraid of the water. As she gets older, the length of the bath will extend until most of it is taken up with play. Bathing should be a very relaxing and soothing experience, so don't rush unless she's unhappy.

Bath toys are not really needed for very young babies, as the stimulation of the water and washing is exciting enough. Once a baby is old enough for the bathtub, however, toys become invaluable. Containers, floating toys, even waterproof books make wonderful distractions as you cleanse your baby.

Excerpted from [\*Caring for Baby and Young Child: Birth to Age 5\*](#), Bantam 1999

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