

# Toddler Development

Eve R. Colson, MD\* and Paul H. Dworkin, MD†

## IMPORTANT POINTS

1. Physical growth in toddlers occurs more slowly than in infants, but at a predictable rate.
2. The temper tantrum is a common manifestation of the toddler's struggle for autonomy and independence.
3. A toddler's behavior style, or temperament, is highly visible and influences all interactions.
4. Toddlers make the important transition from sensorimotor to preoperational thinking, as described by Piaget.
5. Language development, which occurs very rapidly during the toddler years, is a classic example of the preoperational use of symbols.

## Introduction

The toddler years (1 to 3 years of age) are ones of rapid change and can be among the most exciting and challenging for parents and pediatricians. The most dramatic advances occur in language and interpersonal skills, but progress is evident in all areas as development proceeds along the traditional lines of affective, motor, cognitive, and physical growth (Fig. 1).

Themes in affective development include the toddler's striving for autonomy and independence from caregivers, the continuing importance of attachment to family, and the initial work on achieving impulse control. In addition, the child's behavior style, or temperament, is highly evident and shapes all social interactions.

Cognitively, the toddler makes the transition in the second year from sensorimotor to preoperational thought, as defined by Piaget. The transition is characterized by the acquisition of language and the development of pretend play. The young toddler may know only a few words and relies primarily on motor skills to manipulate the environment. In contrast, the 3-year-old can speak in sentences and uses these verbal skills to communicate and achieve goals.

\*Clinical Instructor and Fellow, General Academic Pediatrics.

†Professor of Pediatrics; Head, Division of General Pediatrics, University of Connecticut School of Medicine, Farmington, CT.

Physical growth continues more slowly than during infancy, but at a predictable pace. In contrast, fine motor and gross motor skills progress quickly. The young toddler walks with a wide gait and somewhat hesitantly, but quickly will be running and jumping. The increasingly independent 3-year-old can manipulate a fork and pour from a pitcher.

Tables 1 through 5 provide specific milestones in these areas during toddlerhood. Familiarity with such developmental data will enable the clinician to monitor children's development more effectively during health supervision visits as well as address typical, stage-related behavioral and developmental issues with families.

## Physical Appearance

### GROWTH RATE AND APPEARANCE

Following the rapid growth of infancy, the speed of growth slows

in the toddler years. After age 2, toddlers gain about 5 lb in weight and 2.5 inches in height each year. Head circumference only increases by about 1 inch from 2 to 12 years. Growth does not increase steadily; rather, it often occurs in spurts. It is not unusual for a toddler's weight to remain the same for weeks at a time. Increases in height of the preschool child result primarily from growth of the lower extremities and, to a lesser extent, elongation of the trunk. Body proportions change, with upper-to-lower segment ratios ranging from 1.40 at age 2 years to 1.15 to 1.20 at age 5 years. Between the ages of 2 and 2.5 years, the child will have reached 50% of his or her adult height.

With a newly erect posture, the classic and endearing toddler pose includes lordosis and a protuberant abdomen. Growth of the lower extremities often is accompanied by tibial torsion and physiologic bowing of the legs, which usually corrects itself by age 3 years. The percentage of body fat steadily decreases from 22% at age 1 year to about 12.5% to 15% at age 5 years. By the end of toddlerhood, increased muscle tone and decreased body fat give the child the appearance of being more lean and muscular.

### GROSS MOTOR SKILLS

Gross motor skills develop rapidly during the toddler years. Complex gross motor patterns develop, while balance and coordination improve. Most children walk without assistance by 18 months. Soon, they begin to walk faster with few falls.

	18 Months	24 Months	36 Months
<b>Affective development</b>	<b>Temperament</b>		
	<b>Attachment</b>		
	<b>Autonomy / Independence</b>		
	<b>Impulse control</b>		
<b>Cognitive development</b>	<b>Sensory motor intelligence</b>	⋮	<b>Preoperational intelligence</b>
<b>Physical development</b>	<b>Motor development</b>		
	<b>Growth rate</b>		

FIGURE 1. Developmental themes during the toddler years. Modified from Telzrow RW. Anticipatory guidance in pediatric practice. *J Cont Educ Pediatr.* 1978;20:14-27.

**TABLE 1.**  
**Gross Motor Abilities**

<b>18 Months</b>
• Walking fast, seldom falling
• Running stiffly
• Walking up stairs with one hand held
• Seating self in a small chair
• Climbing into an adult chair
• Hurling a ball
<b>24 Months</b>
• Running well without falling
• Walking up and down stairs alone
• Kicking a large ball
<b>36 Months</b>
• Walking up stairs by alternating feet
• Walking well on toes
• Pedaling a tricycle
• Jumping from a step
• Hopping two or three times

At approximately age 2 years, the stiff, wide-leg gait of early toddlerhood becomes a flexible, steady walking pattern, with an adult-like heel-toe progression. By 36 months, they have developed their balance and can stand on one foot briefly. Toddlers delight in their new-found skills and often can be seen experimenting with them. As any person who has cared for a toddler can attest, they climb, they jump, and they run. Supervision is key to preventing injury because toddlers sometimes test their skills beyond their abilities in an attempt to learn and do more.

**FINE MOTOR SKILLS**

Increasing fine motor abilities during toddlerhood result from refinements in reaching, grasping, and manipulating small objects. The average 18-month-old can make a tower of four blocks. Just 1 year later, with practice and improved control, he or she can stack eight blocks (Fig. 2). Most 18-month-olds have developed an interest in crayons and, if given the opportunity, will hold the crayon in a fist and scribble spontaneously on paper

**TABLE 2.**  
**Fine Motor Abilities**

<b>18 Months</b>
• Making a tower of four cubes
• Releasing 10 cubes into a cup
• Scribbling spontaneously
• Imitating a vertical drawing stroke
• Piling three blocks on a formboard
<b>24 Months</b>
• Building a six to seven cube tower
• Aligning two or more cubes to form a train
• Imitating a horizontal drawing stroke
• Beginning circular strokes
• Inserting a square block into a performance box
<b>36 Months</b>
• Copying a circle
• Copying bridges with cubes
• Building a tower of 9 to 10 blocks
• Drawing a person's head

(or anywhere else). Only 1.5 years later, the toddler has developed the control and sophistication to pick up a crayon by placing the thumb at the left and fingers at the right of the shaft and make a circle; by age 3, the child even may begin to draw a primitive stick figure.

**Affective Development**

**AUTONOMY AND INDEPENDENCE**

Fostered by improved motor skills, the transition from infancy to toddlerhood is marked by a new drive for autonomy and independence. The child finds that he or she can move freely and easily away from the parent and begins to test boundaries and limits. Struggles over autonomy may occur daily. The toddler may refuse to eat unless allowed to feed him- or herself. In addition, the child no longer may be willing to try new foods, despite parental coaxing. The classic manifestation of the struggle for autonomy is the temper tantrum. The

**TABLE 3.**  
**Social/Emotional Skills**

<b>18 Months</b>
• Removing a garment
• Feeding self and spilling food
• Offering an empty plate
• Hugging a doll
• Pulling a toy
<b>24 Months</b>
• Using a spoon; spilling little food
• Verbalizing toileting needs
• Pulling on a simple garment
• Verbalizing immediate experiences
• Referring to self by name
<b>36 Months</b>
• Showing concern about the actions of others
• Playing cooperatively in small groups
• Developing the beginnings of true friendships
• Playing with imaginary friends

toddler develops unbridled opinions and preferences about everyday activities. If he does not get his way, he may cry, hit, or throw himself on the ground.

**IMPULSE CONTROL**

Toddlers also begin to develop impulse control, which may be described as “the process of becoming civilized.” The 18-month-old may have minimal impulse control and display several temper tantrums each day. Two-year-olds typically exhibit wide variations in impulse control, with the degree of control often varying with the struggle for autonomy. Most 3-year-olds have mastered some degree of self-control, in part because they are developing the ability to delay gratification. From experience, they learn that sometimes they must wait for rewards.

Impulse control, improved motor skills, and the struggle for autonomy are highly evident during toilet training. Successful toileting usually

**TABLE 4.**  
**Intellectual Abilities**

<b>18 Months</b>
• Pointing to named body parts
• Developing an understanding of object permanence
• Beginning to understand cause and effect
<b>24 Months</b>
• Forming mental images of objects
• Solving problems by trial and error
• Understanding simple time concepts
<b>36 Months</b>
• Asking "why" questions
• Understanding daily routine
• Appreciating special events, such as birthdays
• Remembering and reciting nursery rhymes
• Repeating three digits

occurs toward the end of the third year. At this time, the necessary physical skills (ie, controlling the sphincter, walking to the bathroom, undressing, and getting onto the potty) come together with the emotional willingness to participate. Although toilet training may be introduced at an earlier age, success with consistent daytime dryness usually is not achieved until about 2.5 years of age.

**ATTACHMENT**

Although toddlers strive for autonomy, issues of attachment remain important developmental themes. Attachment refers to the bond that forms in time between an infant and a caregiver. A secure bond is important in both social and emotional development during infancy and the preschool years. The toddler who seeks autonomy and independence relies on secure parental ties for the confidence to venture out and explore the environment. Although he or she may wander, the toddler always is cognizant of the caregiver's presence and intermittently returns for reassurance. If the care-

**TABLE 5.**  
**Language Skills**

<b>18 Months</b>
• Looking selectively at a book
• Using 10 to 20 words
• Naming and pointing to one picture card
• Naming a test object (eg, ball)
• Following two-directional commands
<b>24 Months</b>
• Discarding jargon from speech
• Using two to three word sentences
• Using "I," "me," "you"
• Naming three picture cards
• Naming two test objects
• Knowing four-directional commands
<b>36 Months</b>
• Using four to five word sentences
• Telling stories
• Using plurals
• Recognizing and naming most common objects

giver cannot be found, the toddler likely will become distressed.

Disorders of attachment may result from inconsistent caregiving and are more common in the presence of family stressors, such as poverty, drug use, or emotional illness. Affected toddlers may not show interest in exploring the environment, may display separation problems, or may distrust the primary caregiver. It should be particularly worrisome when a 2-year-old does not seek out the primary caregiver for reassurance in a stressful situation, such as during a physical examination or painful procedure.

**TEMPERAMENT**

How a child approaches a given situation is influenced by his or her behavioral style, also known as temperament. Pediatric clinicians are acutely aware of the wide variability in behavioral style among toddlers during health supervision visits.

Some 2-year-olds sit close to their parents and shy away from the approaching stethoscope. Others bounce all over the room, showing a fleeting, although intense, interest in their surroundings but wanting no part of the physical examination. Then there are those who sit on the floor, methodically flipping the pages of their cardboard book, nearly unfazed by the examination. Temperament has strong genetic elements and often is apparent during earliest infancy. By the toddler years, the child's behavioral style is generally evident and predictable.

Temperament influences all toddler interactions. Chess and Thomas followed more than 100 children from birth into adulthood, focusing on nine characteristics of temperament, among them a child's adaptability, activity level, quality of mood, and distractibility. They found these characteristics to define three temperamental constellations: "difficult," "easy," and "slow-to-warm-up." About 10% of children were generally less adaptable, had increased activity levels, and tended to be emotionally negative. These children were considered "difficult." "Easy" children, about 40% of the group, had regular eating and sleeping schedules, adapted well to new situations, and tended to have positive moods. A third group, compris-



*FIGURE 2. A 24-month-old demonstrates fine motor skills by stacking blocks. By this age, most children can build a tower of seven blocks.*

ing about 15% of the sample, was characterized as “slow-to-warm-up.” These children tended to be quiet and take longer to adapt to new situations.

Conflict, stress, and behavior difficulties may result when a toddler’s temperament conflicts with caregivers’ expectations and parenting style. For example, conflict may arise between a “slow-to-warm-up” 2-year-old and an out-going parent who expects the child to adapt quickly to social situations. A positive social environment is created when a child’s temperament is compatible with the caregiver’s style and expectations, a situation referred to as “goodness of fit.”

Families benefit from understanding the concept of temperament and realizing that, to a large extent, behavioral style is an intrinsic characteristic of a child. Parents should not feel that they have “created” a difficult child, particularly during the “terrible twos,” when the struggle for autonomy may be accentuated by such temperamental traits as poor adaptability and negative mood.

### **Cognitive Development**

Toddlers make the transition from sensorimotor to preoperational thinking, as outlined by Piaget. During the sensorimotor period, the infant primarily learns about the world by touching, looking, and listening. Preoperational thought is marked by the development of symbolic thinking, as the child becomes capable of forming mental images and begins to solve problems by mental trial and error. This progression from sensorimotor to symbolic thought occurs typically between 18 and 24 months of age. The child’s recognition that one object can represent another becomes highly evident during play. A block conveniently serves as a car and a bucket becomes a hat. At this age, the toddler also uses symbols or actions to imitate past events. For example, hours after watching his father do the dinner dishes, he might begin imitating the event with his own makeshift sink and pans. In addition, he now has developed complete object permanence, finding an

object, such as a ball under a blanket, despite not seeing it hidden.

The older toddler continues to develop symbolic thinking. By 3 years, she can draw primitive figures that represent important people in her environment. In addition, she develops elaborate play and imagination. At this age, however, she still has a number of limitations in cognitive skills. She remains unable to take the viewpoint of another person, continuing to see the world egocentrically and assuming that others think and feel as she does. In addition, she can attend only to one aspect of a problem at a time, as illustrated by Piaget’s classic conservation experiment: When shown equal volumes of colored water, and one is poured into a tall, thin container and the other into a short, fat one, the 3-year-old always will pick the tall, thin container as having more water because it appears “bigger” to her.

### **LANGUAGE**

Language is the classic example of the preoperational use of symbols. Beginning around age 2 years, toddlers use language to convey their thoughts and needs (such as hunger and pain) (Fig. 3). Language skills develop at an extraordinary pace. The average 18-month-old has a vocabulary of at least 20 words,



*FIGURE 3. This toddler demonstrates language skills by naming a picture. Most children begin naming pictures at about 18 months of age.*

consisting primarily of the names of familiar caregivers and favorite foods and activities, and may be starting to put two words together. His receptive language skills will be somewhat more advanced than the expressive skills; he will understand the meaning of more complex instructions.

Over the next few months, this child will experience a burst in vocabulary. He begins to put together phrases but often omits pluralization, prepositions, and adjectives. These early sentences are referred to as “telegraphic speech.” At this point, 50% of what the child says should be intelligible to strangers. By the age of 3 years, the vocabulary increases to about 500 words, and 75% of speech is understandable to strangers. He begins to make complete sentences and experiments with speech and language, varying word usage and changing the intensity, as well as intonation, of speech. He typically now begins a myriad of daily “why” questions, so characteristic of the preschool years.

Progress in language development is influenced by environmental factors as well as by innate abilities. Bilingual children, for example, may mix languages initially but ultimately will “catch up” in their language skills by 2 to 3 years of age. Parents can be encouraged to provide an environment that will foster language growth. For example, parents or other caregivers can read aloud to toddlers every day. Libraries often offer story hours for young children.

### **Developmental Monitoring and Anticipatory Guidance**

Pediatricians can monitor toddler development both during scheduled health supervision visits and during all other office encounters. The goal of developmental monitoring is early identification of problems to provide appropriate services at a young age. Monitoring can be accomplished best by eliciting parental concerns, making skilled observations, and taking a developmental history. Over time, the child’s skills, interests, and behaviors are considered within the context of overall well-being, rather than

viewed in isolation during a test. Recording developmental observations at all opportunities is particularly important during the toddler years, when change is rapid but scheduled health supervision visits may occur only once a year. This longitudinal approach to monitoring development is known as developmental surveillance.

If, during developmental surveillance, the pediatrician suspects developmental delay, an appropriate screening test can be chosen as a second stage of evaluation. A comprehensive review of developmental screening and testing can be found in Gilbride's article in the September 1995 issue of *Pediatrics in Review*. In general, screening tests are useful in providing objective information about the child's development for both the clinician and parents. When screening tests confirm suspicions of delay, the pediatrician should refer appropriately for a more extensive developmental assessment. Depending on local regulations and the child's age, referral may be made to a state Birth-to-Three program or to the regional school system.

In addition to monitoring development, pediatricians can use their knowledge of themes in toddler development to provide parents with age-appropriate anticipatory guidance. During the 12-month visit, for example, the pediatrician might explain that the child soon will begin to experience struggles over autonomy and independence. More

frequent temper tantrums can be expected in the second year of life, as the toddler inevitably encounters frustration while seeking autonomy, despite remaining heavily dependent on caregivers.

### Summary

The toddler years are ones of exciting and challenging changes in cognitive, affective, and physical growth. Physical growth is particularly remarkable for the child's increasing skills and ability to navigate the environment. Affective development is marked by the push for autonomy and independence and the highly visible nature of the child's temperament or behavioral style. The toddler also enters the wonderful years of imagination and pretend play. Perhaps most noteworthy is the child's dramatic increase in ability to communicate with others through speech and language, as evidence of the progression to symbolic thinking. The dynamic changes in children's development during the toddler years have important implications for child health supervision. Familiarity with toddler development will enable the pediatrician to monitor children's development effectively and to address common, stage-related behaviors with families during anticipatory guidance.

### SUGGESTED READING

- Brazelton TB. A child-oriented approach to toilet training. *Pediatrics*. 1962;29:121-128
- Coplan J. Normal speech and development: an overview. *Pediatrics in Review*. 1995;16:91-100
- Dixon S, Stein M. *Encounters with Children*. St Louis, Mo: Mosby-Yearbook; 1992
- Dworkin PH. British and American recommendations for developmental monitoring: the role of surveillance. *Pediatrics*. 1989;84:1000-1010
- Fraiberg S. *The Magic Years*. New York, NY: Charles Scribner's Sons; 1959
- Gilbride K. Developmental testing. *Pediatrics in Review*. 1995;16:338-346
- Ginsburg H, Opper S. *Piaget's Theory of Intellectual Development*. Englewood Cliffs, NJ: Prentice-Hall, Inc; 1979
- Levine M, Carey W, Crocker A, eds. *Developmental-Behavioral Pediatrics*. Philadelphia, Penn: WB Saunders Company; 1992
- Parker S, Zuckerman B, eds. *Behavioral and Developmental Pediatrics*. Boston, Mass: Little, Brown and Company; 1995
- Thomas A, Chess S. *Temperament and Development*. New York, NY: Brunner/Mazel, Inc; 1977

### SUGGESTED READING FOR PARENTS

- Brazelton TB. *Touchpoints: Your Child's Emotional and Behavioral Development*. Reading, Mass: Addison-Wesley Publishing Company; 1992
- Leach P. *Your Baby and Child*. New York, NY: Knopf; 1989
- Shelov SP, ed. *The American Academy of Pediatrics Caring for Your Baby and Child: Birth to Age 5*. New York, NY: Bantam; 1993
- Turecki S, Tonner L. *The Difficult Child*. New York, NY: Bantam; 1989

### PIR QUIZ

- Which of the following would generally be considered beyond the developmental level of 18 months?
  - Has a vocabulary of 20 words.
  - Imitates a horizontal stroke of a crayon.
  - Makes a tower of 4 cubes.
  - Puts 10 cubes into a cup on request.
- Which of the following would generally be considered beyond the developmental level of 24 months?
  - Builds a tower of 7 cubes.
  - Copies a cross on demonstration.
  - Copies a vertical stroke of a crayon.
  - Makes a circular scribble with a crayon.
- Which of the following would generally be considered beyond the developmental level of 36 months?
  - Draws a stick figure that has eyes, nose, arms, and legs.
  - Puts together sentences of four to five words.
  - Rides a tricycle.
  - Stands momentarily on one foot.
- The transition during the toddler period from the sensorimotor to the preoperational level of development (Piaget) is exemplified best by:
  - The emerging struggle for autonomy.
  - Fine motor development.
  - Language development.
  - The relationship between temperament and social development.