

## Background

### Cognitive Objectives

Upon completion of this module, the learner will be able to:

1. Define the terms *infant state*, *infant behavior*, *engagement cue*, and *disengagement cue*.
2. Describe the characteristics of infant temperament.
3. Identify and describe states of the term newborn, infant behaviors, reflexes and cues.
4. Describe factors that can influence states of the term newborn.
5. Describe caregiving implications for states of the term newborn and infant behaviors.
6. Discuss state modulation and its implications for caregiving.
7. Discuss changes in sleep and awake patterns during early infancy.
8. Explain self-regulation and readability and their implications for caregiving.
9. Describe nursing interventions for new parents.

### Expected Practice Outcomes

The learner who meets the objectives and understands the key concepts of this module can be expected to:

1. Use accurate terminology to describe temperament, states, behaviors, reflexes and cues.
2. Recognize characteristics of infant temperament.
3. Recognize and assess states of the term newborn, infant behaviors, reflexes and cues.

4. Incorporate knowledge about temperament, states, behaviors, reflexes and cues into caregiving behavior.
5. Assess parent understanding and assist parents in learning infant temperament, behaviors, reflexes and cues.

### Key Concepts

The material in this module will help the learner understand the following concepts:

Infants interact with caregivers through state, behaviors and cues. An understanding of and sensitivity to these interactions and to an infant's unique temperament form the foundation for mutual trust, which encourages attachment.

Temperament, states, behaviors, reflexes and cues have implications for caregiving.

Infant temperament is characterized by activity, rhythmicity, approach/withdrawal, adaptability, intensity, mood, persistence/attention span, distractibility and sensory threshold.

States of the term newborn are divided into sleep and awake states. Sleep states are quiet sleep and active sleep. Awake states are drowsy, quiet alert, active alert and crying.

States are characterized by body activity, eye movements, facial movements, breathing patterns and level of response.

State modulation allows the infant to adapt to and interact with his or her environment by controlling sensory input and responses to caregivers and the environment.

# Understanding the Behavior of Term Infants

## Background

Numerous factors can influence infant state. They include touch, visual stimuli, light/dark, auditory stimuli, proprioceptive factors, environmental temperature, sucking, stressful events, internal physiologic needs, pathologic conditions and drugs.

As newborns grow and mature, their sleep and awake patterns change. The major change is in the organization of sleep and in consolidation of sleep into nighttime hours, with increased awake time during the day.

Infant behavior is influenced by state, temperament and the ability of the infant to self-regulate.

Specific infant behaviors include alertness, visual response, auditory response, habituation, cuddliness, consolability and motor behavior.

As they vary in behavior, newborns also vary in the intensity of their reflexes. Newborn reflexes include rooting, sucking, Moro, grasping, stepping/walking, placing, truncal incurvation (Galant), and Babkin.

Self-regulation is the capacity to adapt to one's surroundings in a healthy and predictable way. Some infants are able to regulate themselves well from birth and are easily readable; others need more time and may require more assistance.

Infants provide cues that indicate engagement and disengagement.

A critical task of parents after the birth of their infant is to learn to correctly interpret their infant's behavior and understand their newborn's style. Nurses are in a position to assist parents in learning about their infant's unique characteristics.

## Authors' Acknowledgments

We want to acknowledge the March of Dimes Nurse Advisory Council and the Education and Health Promotion Department for seeing the vision and

supporting this pilot effort. A special thanks to Pam Harper who provided leadership and helped us gain understanding about how to author a Web-based product. Thanks to the infants and their families who have taught us so much in our careers.

Susan Bakewell-Sachs thanks her family, Jon, Andrew, and Evan for their love and tolerance of her work.

Susan Blackburn thanks her family for their support and Kathryn Barnard for first introducing her to the concept of infant states and cues.

## March of Dimes Acknowledgments

The March of Dimes acknowledges Mount Sinai Medical Center in New York City for allowing us to photograph in their hospital and the many families who so willingly allowed themselves and their infants to participate. We especially appreciate the efforts of the following Mount Sinai staff: Katie Leask Capitulo, DNSc, RN, FACCE, director of maternal child health, and Marjorie Ramirez, MA, EDM, CNA, RN, clinical coordinator of patient education and outreach; Diane Stanton, MS, RNC; Ronnie Evans, MS, CCE, RN; Joan Tracey, MS, RNC; Nancy Roth, MPS, RN; and Linda Faller, MBA, RNC.

The following individuals and institutions participated in the pilot testing of this nursing education module and provided valuable comments: Margaret Comerford Freda, Cassandra Cook, Karen Dubois, Mary Price, Kathleen Rice Simpson, Diane Stanton, Joanne Tzanis, and the nurses from the pilot test groups at St. John's Mercy Medical Center in St. Louis and Mount Sinai Medical Center in New York City.

The March of Dimes is grateful to Foxo Productions and BlueMissile for providing essential artistic and technical expertise.

## Introduction

We have intuitive feelings about certain infants:

- “That is an easy baby.”
- “This is an irritable baby.”

Each infant has his or her unique style of interacting with parents and other caregivers. The differences in style between infants affect the responses of caregivers.

Each infant is unique from the moment of birth and even before!

Part of the infant’s uniqueness is due to temperament (see the reading “Infant Temperament” ). Temperament refers to the basic biological dimensions of personality that are apparent early and continue to be demonstrated to some degree throughout life (Bates, 1989; Medoff-Cooper, 1993). It can be thought of as the infant’s style of behavior, how an infant responds behaviorally rather than the what of the behavior (Medoff-Cooper, 1993). An infant’s temperament therefore influences the infant’s behavior.

Other aspects of infant behavior that relate to temperament and are helpful in understanding interaction style are self-regulation, readability, and predictability. The more an infant is able to self-regulate (adapt to his or her surroundings in a positive and predictable way) and to behave in ways that the caregiver can understand (readable) and anticipate (predictable), the easier it is to care for the infant.

When parents are knowledgeable about temperament, they are better able to understand their infant’s behaviors, to match their expectations and parenting style to their infant’s behavior, and to assist in the relationship-building process between parents and infants. Awareness and understanding of temperament helps parents and staff respond to an infant on the basis of the infant’s individual personality and style of interacting. Understanding infant behavior is critical, for it forms the basis for early interactions between the infant and caregivers and the development of attachment between parents and infant.

Infants interact with their caregivers through specific behaviors in response to internal (hunger, pain, fatigue) and external (handling, temperature, caregiver’s voice) stimuli. These specific behaviors are called cues. Cues are behaviors that signal an infant’s status or needs. Infants differ in the clarity with which they make known their needs (readability). Caregivers must interpret infant cues within the context of what is going on to determine their meaning. For example, a yawn in an infant who is being held, talked to, and otherwise stimulated may be a cue that the infant is ready for a break. An infant may also yawn due to sleepiness or upon awakening. Infants also differ in the consistency of their sleeping, waking, and eating cycles (predictability). Some respond predictably in all areas; others, only in some areas; still others are often unpredictable. Regardless of how predictable infants are, most parents need help in learning to understand their infant’s cues.

# Understanding the Behavior of Term Infants

## Introduction

Infants interact with their caregivers through a variety of activities:

- **Infant state:** A group of characteristic behaviors and physiologic changes that recur together in a regular pattern
- **Behaviors:** Observable activities in the infant in response to external or internal stimuli in the environment
- **Engagement cues:** Types of behavior that signal the infant's readiness to interact with caregivers
- **Disengagement cues:** Types of behavior that signal the infant's need for time-out or a reduction in stimuli

An understanding of and sensitivity to state and to an infant's unique temperament and behaviors form the foundation for mutual trust, which encourages attachment as parents and newborns learn that they can rely on each other to respond appropriately and consistently in various situations. Nurses are in a position to help parents learn about their infant's unique characteristics, while at the same time removing some of the uncertainty about why infants act as they do.

This module includes five major sections:

- Infant temperament
- States of the term newborn
- Infant behavior, reflexes and cues
- Feeding the term infant
- Teaching parents about infant states and behaviors

## Infant Temperament

Temperament refers to the basic biologic dimensions of personality that are apparent early in life and continue to be demonstrated to some degree throughout life (Bates, 1989; Medoff-Cooper, 1993). Table 1 on the next page describes characteristics of infant temperament.

Researchers have identified three main clusters of temperament in infants:

- **Easy infant:** Mild mannered. Demonstrates regular sleeping and eating patterns, positive response to new situations (approachable), high adaptability to change, and positive mood.
- **Difficult infant:** Intense. Demonstrates irregular sleeping and eating patterns, negative response to new situations (withdrawal), difficulty adapting to change, irritability, and negative mood.
- **Slow-to-warm-up infant:** Mild mannered. Demonstrates slow adaptability after several attempts and negative mood.

Infants in each cluster differ in the characteristics they display.

### Goodness of Fit

An important consideration in the parent-child relationship is the contributions that each one brings to interactions (Chess & Thomas, 1977; Medoff-Cooper, 1993). Chess & Thomas (1977) refer to the importance of “goodness of fit” between parents and their children.

The health care professional seeks to help parents:

- Understand their child’s temperament without feeling responsible for having caused it.
- Develop appropriate expectations and awareness of the child’s individual differences.

When parents are knowledgeable about temperament, they are better able to understand their infant’s behaviors, to match their expectations and parenting style to their infant’s behavior, and to assist in the relationship-building process between parents and infants.

## Infant Temperament

**Table 1. Characteristics of Infant Temperament**

**Activity:** The amount of physical movement during eating, play, sleep, dressing, and bathing

**Rhythmicity:** Regularity of biologic cycles and physiologic functions such as sleep, hunger, and elimination

**Approach/Withdrawal:** The style of initial responses to new stimuli, including situations, people, places, and foods

**Adaptability:** The ease or difficulty with which reactions to stimuli can be modified

**Intensity:** The energy level of the child's responses

**Mood:** The usual disposition (amount of pleasant or unpleasant behavior) the child exhibits in different situations

**Persistence/Attention span:** The length of time a child pursues activities and sticks to difficult tasks

**Distractibility:** Effectiveness of environmental stimuli in interfering with ongoing behavior

**Sensory threshold:** The amount of stimulation, such as noise or light, needed to evoke responses from the child

*Adapted from Chess & Thomas, 1997; Medoff-Cooper, 1993.*

## States of the Term Newborn

State, also known as state of consciousness, powerfully influences the way infants respond at any given time. A state is a group of characteristic behaviors and physiologic changes that recur together in a regular pattern (Brazelton & Nugent, 1996; Wolff, 1966).

Characteristic behaviors seen in individual states include:

- Body activity
- Eye movements
- Facial movements
- Breathing pattern
- Level of response to external and internal stimuli

In addition to the different characteristic behaviors that occur with each state, physiological changes in heart rate, blood flow, muscle tone, and EEG patterns also occur. In the term infant who is not monitored, caregivers rely on characteristic behaviors to clinically assess the infant's state. In term infants, state can readily be determined by using only characteristic behaviors.

Each state is organized into a pattern that differs from any of the other states. States are divided into sleep and awake states (Table 2).

**Table 2. Sleep and Awake States**

Sleep States	Awake States
Quiet sleep	Drowsy
Active sleep	Quiet alert
	Active alert
	Crying

### Significance of Infant States

States provide a framework for observing and understanding ways in which infants interact with their caregivers. States are important in infant growth and development and in helping caregivers understand newborn behavior.

In each state, infants respond in a unique and predictable manner—not chaotically, but in an organized pattern. States allow infants to control how much and what kind of input they receive from their environments. Sleepy infants affect their parents differently than alert or crying infants do. Infants who have long periods of wakefulness will have more frequent opportunities to interact with their parents than infants who sleep most of the time.

# Understanding the Behavior of Term Infants

## States of the Term Newborn

**Figure 1. Quiet Sleep** (also called deep sleep)



Quiet sleep is restorative and anabolic. It is associated with an increase in cell mitosis and replication, lowered oxygen consumption, and the release of growth hormone. The threshold to sensory stimuli is very high during quiet sleep; only stimuli that are very intense and disturbing can arouse infants.

### Characteristics

<i>Body Activity</i>	Nearly still, except for occasional startle or twitch.
<i>Eye Movements</i>	None.
<i>Facial Movements</i>	None, except for occasional sucking movement at regular intervals.
<i>Breathing Pattern</i>	Smooth and regular.
<i>Level of Response</i>	The infant's threshold to stimuli is very high; only very intense and disturbing stimuli will arouse the infant.
<i>Caregiving</i>	<p>Caregivers trying to feed an infant who is in quiet sleep will probably find the experience frustrating. The infant will be unresponsive.</p> <p>Feeding will be a more pleasant experience if nurses and parents respect the infant's cycles and needs by waiting until the infant moves to a higher, more responsive state.</p> <p>Even if caregivers use disturbing stimuli, chances are the infant will arouse only briefly, then become unresponsive as he or she returns to quiet sleep.</p>

## States of the Term Newborn

**Figure 2. Active Sleep** [also called light sleep or rapid eye movement (REM)sleep]



Active sleep is associated with processing and storing of information and has been linked to learning. It accounts for the highest proportion of newborn sleep and usually precedes waking.

### Characteristics

<i>Body Activity</i>	Some body movements.
<i>Eye Movements</i>	Rapid eye movements (REM), fluttering of eyes beneath closed eyelids.
<i>Facial Movements</i>	May smile and make brief fussy or crying sounds.
<i>Breathing Pattern</i>	Irregular.
<i>Level of Response</i>	<p>In active sleep, infants are more responsive to internal stimuli (such as hunger) and external stimuli (such as handling) than they are in quiet sleep.</p> <p>When stimuli occur, infants may remain in active sleep, return to quiet sleep, or arouse.</p>
<i>Caregiving</i>	Due to brief fussy or crying sounds during this state, caregivers who are not aware that these sounds normally occur may try to feed infants before they are ready to eat.

## States of the Term Newborn

**Figure 3. Drowsy**



From the drowsy state, infants may return to sleep or awaken further.

### Characteristics

<i>Body Activity</i>	Variable activity level with mild startles interspersed from time to time. Movements usually smooth.
<i>Eye Movements</i>	Eyes occasionally open and close, are heavy-lidded or slit-like.
<i>Facial Movements</i>	May have some facial movements. Often none, and face appears still.
<i>Breathing Pattern</i>	Irregular.
<i>Level of Response</i>	Infants react to sensory stimuli, although their responses are delayed. A change to quiet alert, active alert or crying after stimulation is frequently noted.
<i>Caregiving</i>	To awaken infants, caregivers can provide something for infants to see, hear, or suck to arouse them to a more alert state.  If infants are left alone without stimuli, they may return to a sleep state.

# Understanding the Behavior of Term Infants

## States of the Term Newborn

**Figure 4. Quiet Alert**



During this state, infants are most attentive to their environment, focusing their attention on any stimuli that are present: nipple, voice, face, or moving objects.

### Characteristics

<i>Body Activity</i>	Minimal.
<i>Eye Movements</i>	Eyes brighten and widen.
<i>Facial Movements</i>	Attentive appearance.
<i>Breathing Pattern</i>	Regular.
<i>Level of Response</i>	During this state, infants are most attentive to the environment, focusing attention on any stimuli present.
<i>Caregiving</i>	<p>In the first few hours after birth, many newborns experience a period of intense alertness before going into a long sleeping period.</p> <p>As infants become older, they spend more and more time in this state.</p> <p>Providing something for infants to see, hear, or suck will often maintain a quiet-alert state or help them enter a quiet-alert state from either a drowsy or active-alert state.</p> <p>Infants in this state provide much pleasure and positive feedback to parents and other caregivers.</p> <p>This is often a good time to feed the infant, especially if the mother is breastfeeding on an ad lib schedule.</p>

## States of the Term Newborn

**Figure 5. Active Alert**



During active alert, infants' eyes are open, but their eyes and faces are not as bright as in quiet alert. Infants have more body activity in active alert than they do in quiet alert.

### Characteristics

<i>Body Activity</i>	Variable activity level with mild startles interspersed from time to time. Movements usually smooth.
<i>Eye Movements</i>	Eyes are open, with dull, glazed appearance.
<i>Facial Movements</i>	May have some facial movements. Often none, and face appears still.
<i>Breathing Pattern</i>	Irregular.
<i>Level of Response</i>	Infants react to sensory stimuli, although responses are delayed. With stimulation, the infant may change to quiet alert or crying.
<i>Caregiving</i>	<p>Infants may have periods of fussiness and become increasingly sensitive to disturbing stimuli (hunger, fatigue, noise, excessive handling).</p> <p>Infants may become more and more active and may change to a crying state.</p> <p>Fatigue or caregiver interventions often interrupt this state, allowing infants to return to a drowsy or sleep state.</p>

## States of the Term Newborn

**Figure 6. Crying**



Crying is the infant state that presents the greatest challenge to the caregiver. This state is characterized by intense crying for at least 15 seconds.

### Characteristics

<i>Body Activity</i>	Increased motor activity. Skin color darkens or changes to red or ruddy.
<i>Eye Movements</i>	Eyes may be tightly closed or open.
<i>Facial Movements</i>	Grimaces.
<i>Breathing Pattern</i>	More irregular than in other states.
<i>Level of Response</i>	Infants are extremely responsive to unpleasant external or internal stimuli.
<i>Caregiving</i>	<p>Crying is:</p> <ul style="list-style-type: none"><li>• A communication signal.</li><li>• A response to unpleasant stimuli from the environment.</li><li>• A response to internal stimuli such as fatigue, hunger, or discomfort.</li></ul> <p>Crying tells the caregiver that the infant's limits have been reached.</p> <p>Sometimes infants can console themselves and return to active or quiet alert, drowsy, or a sleep state; at other times, they need help from caregivers.</p>

# Understanding the Behavior of Term Infants

## States of the Term Newborn

### State Modulation

An important component of infant states is state modulation, which allows the infant to adapt to and interact with his or her environment by controlling sensory input and responses to caregivers and the environment. State modulation (Barnard, 1999) is the ability of the infant to:

- Make smooth transitions between states.
- Cycle between sleep states (see page 11).
- Arouse when appropriate (e.g., for feeding or playing).
- Sustain sleep states. (Barnard, 1999)

State modulation allows the infant to:

- Adapt to his or her environment by controlling sensory input and responses to the environment.
- Use state behaviors to guide caregiving.
- Modify social interactions. (Barnard, 1999)

During the early months of life, an important role of caregivers is to help the infant with state-modulation activities. An infant who is having difficulty with state modulation has problems regulating sensory input and responses (Barnard, 1999). Infants who cannot turn stimulation on or off may miss important input or become overloaded by stimuli. Problems with state modulation may originate from

the infant or environment (Table 3).

Although states may seem like a continuous spectrum from quiet sleep to crying, each state is qualitatively specific with its unique internal organization of physiologic and behavioral characteristics and level of central nervous system control.

Most infants flow smoothly between states, as if moving up and down a ladder one step or occasionally two steps at a time (Barnard, 1999; Nursing Child Assessment Training, 1978). However, not all infants flow smoothly between states. Some infants tend to jump from one state to another. These infants always seem to be sleeping or crying and spend little time in other states.

Caregivers can aid with state modulation by helping an infant to become alert [see the reading “Infant Behaviors, Reflexes and Cues”] or by soothing the infant.

### Factors Influencing Infant State

Infant states are influenced by internal physiologic needs, external environment, stressful events, and pathologic conditions (Table 4) (Hack, 1987).

**Table 3. Illustrative Infant and Environmental Factors That Affect State Modulation**

Infant Factors	Environmental Factors
Temperament	Noise
Immaturity	Vibration
Pain	Light
Stress	Temperature
Maternal substance abuse	Caregiver actions
Illness	

# Understanding the Behavior of Term Infants

## States of the Term Newborn

**Table 4. Factors Influencing Infant State**

<b>Factor</b>	<b>Stimuli</b>	<b>Effect of Stimuli</b>
Touch	Soothing and swaddling	Reduces activity during active alert and crying
	Handling (rubbing, stroking, holding)	Induces awakeness and activity
	Pain	Increases awakeness and activity; inactive infants most sensitive to pain
Visual factors	Pictures, objects, faces	Induces quiet alert in drowsy, crying, or active-alert infants; quiet alert prolonged by interesting visual stimuli
Light/Dark	Light	Reduces active sleep; reduces level of activity in fussy or crying babies
	Dark	Increases quiet sleep
Auditory factors (sound)	Variations in sound	Increases activity
	Rhythmic sound	Reduces activity; more sleep, less crying
	Continuous sound	Reduces activity in crying and fussy babies; less active sleep, more quiet sleep
Proprioceptive factors (sensations related to movement of the body)	Putting to shoulder and rocking in an upright position	Induces quiet alert in sleeping, active-alert, and fussy babies
Environmental temperature	Decreases	Increases motor activity; decreases quiet sleep
	Increases	Increases sleep

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# Understanding the Behavior of Term Infants

## States of the Term Newborn

*Figure 4 continued*

Sucking	Sucking on a pacifier or own finger or hand	Induces quiet alert in active-alert and crying infants; inhibits head movements and peripheral vision
Stressful events	Circumcision	Increases fussy crying; shorter time to fall asleep; increases quiet sleep; effects may last several days
	Repeated awakenings	Longer wakefulness; more sleep after the deprivation period; fussiness
Internal physiologic needs	Hunger	Increases activity, active alert, and crying
	Satiety	Quiets, induces sleep
	Need to stool	Waking activity
Pathologic conditions	Coma	Complete absence of state cycles and definable sleep
	Asphyxia	Poor sleep-cycle development and state modulation; decreases active sleep; increases quiet sleep
	Hydrocephalus or microcephalus	Increases amounts of wakefulness with less sleep; poor or absent sleep-state organization
	Maternal preeclampsia with intrauterine growth restriction	Poor sleep-state organization; disorganized quiet sleep with irregular respirations
	Jaundice	Decreases quiet-awake periods; increases sleep-cycle duration and active sleep
	Down syndrome	Increases awakenings; decreases active sleep

*continued on next page*

# Understanding the Behavior of Term Infants

## States of the Term Newborn

Figure 4 continued

Pathologic conditions ( <i>cont.</i> )	Biochemical disturbances (hypoglycemia, hypocalcemia, hypernatremia)	Hyperirritability or decreased wakefulness
Drugs	Meperidine (Demerol) and barbiturates	Decreases wakefulness, visual alertness, and active-sleep spontaneous behaviors
	Diazepam and barbiturates	Increases a state that looks like quiet sleep; decreases active sleep
	Heroin, methadone, and other opiates	Reduces quiet sleep; alters sleep cycles; increases irritability, hyperactivity, and wakefulness
	Cocaine and crack	Increases irritability; rapid fluctuations in states; altered sleep patterns

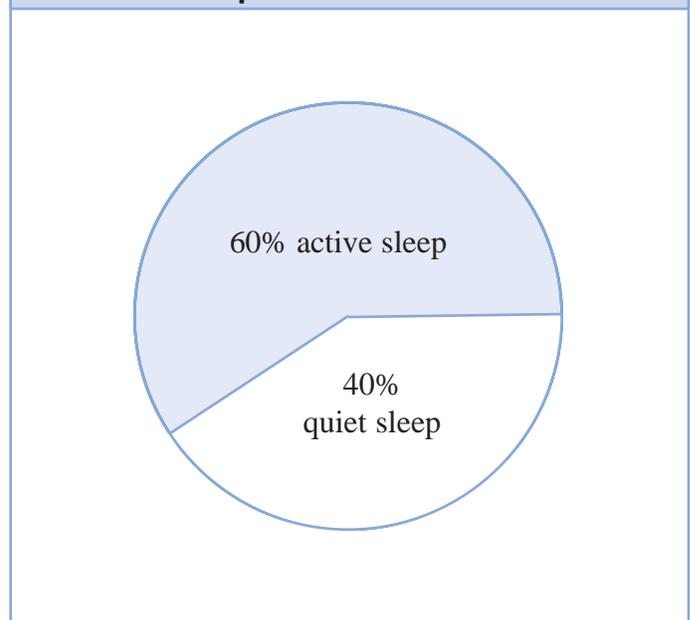
*Adapted from Hack, 1987.*

### Sleep Cycles

Periods of active sleep and quiet sleep alternate in a fixed pattern. A sleep cycle is the time from a period of active sleep, through a period of quiet sleep, to the beginning of the next active sleep period (Barnard, 1999). Infants spend approximately 60% of sleep time in active sleep and 40% in quiet sleep (Figure 7) (Barnard, 1999; Nursing Child Assessment Training, 1978).

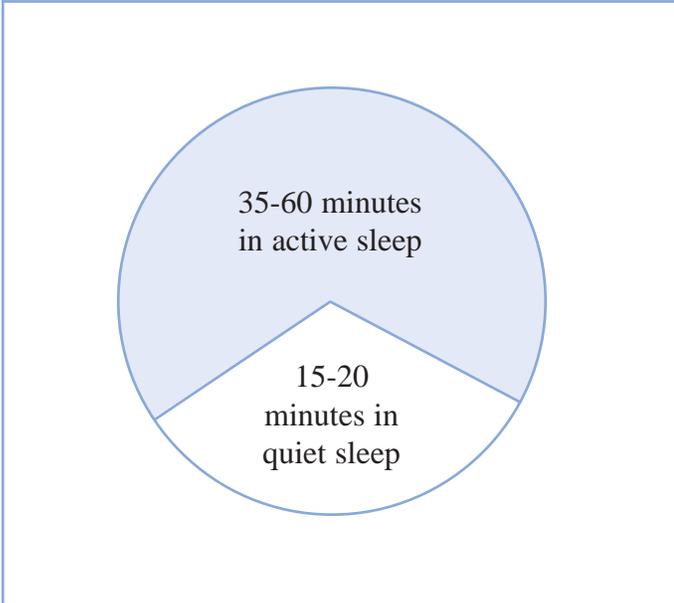
The average length of a sleep cycle in term infants is 50-80 minutes. During a sleep cycle, infants spend 35-60 minutes in active sleep and 15-20 minutes in quiet sleep (Figure 8) (Barnard, 1999; Nursing Child Assessment Training, 1978). For example, a sleep cycle might last 60 minutes, with infants spending 15 minutes in quiet sleep and the remaining time in active sleep. At the end of a sleep cycle, infants either begin another sleep cycle or start to arouse.

**Figure 7. Periods of Active Sleep and Quiet Sleep in the Term Infant**



## States of the Term Newborn

**Figure 8. Minutes of Active Sleep and Quiet Sleep in a Sleep Cycle of the Term Infant**



### Sleep and Awake Patterns

As newborns grow and mature, their sleep and awake patterns change (Table 5 on next page). The total amount of sleep per 24 hours does not change significantly over the first year. The major change is in the organization of sleep and in consolidation of sleep into nighttime hours, with increased awake time during the day.

Development of sleep and awake states during infancy reflects central nervous system (CNS) maturation and is important for growth, development, and learning. With maturation of the CNS, the infant is able to increasingly inhibit smooth muscle movements, reduce generalized responses, improve habituation, and develop increased attention ability. Quiet periods become longer during both sleep and

awake, and the states become more organized (Holditch-Davis, 1998).

### Co-Sleeping

Co-sleeping, where the infant is in the same bed or room with parents, is the focus of recent research and is controversial. Because of the risk of suffocation and injury, the American Academy of Pediatrics (AAP) opposes co-sleeping where the infant is in the same bed with adults. The Consumer Product Safety Commission (CPSC) and National Institute of Child Health and Human Development (NICHD) also do not support co-sleeping. The AAP acknowledges that the CPSC opposes bed sharing by an infant and an adult but recognizes that a significant portion of the U.S. population practices bed sharing between mother and infant to facilitate breastfeeding and that it is common for the father to also be in the bed.

Advocates of same-bed sharing cite benefits for breastfeeding, cultural continuation, close infant monitoring, and other potential physiological benefits being studied. Co-sleeping advocates advise against co-sleeping for families who smoke.

The information about sleep states in this module is based on research with infants who are in separate beds (i.e., are not co-sleeping).

In 2000, the AAP Task Force on Infant Sleep Position and Sudden Infant Death Syndrome (SIDS) concluded that there was insufficient evidence to conclude that bed sharing under carefully controlled conditions is clearly either hazardous or safe. Table 6 on page 14 presents highlights from the AAP guidance on co-sleeping.

## States of the Term Newborn

**Table 5. Changes in Sleep and Awake Patterns During Early Infancy**

- The infant sleeps 14 hours per day by 1 month.
- The total amount of sleep decreases to about 13 hours per day by 12 months.
- Decrease in sleep is accompanied by a steady increase in the amount of wakefulness.
- Awake times during daytime hours increase as the infant is able to put together two or more sleep cycles.
- The duration of individual sleep periods increases.
- The infant consolidates sleep periods into nighttime hours.
- The percentage of active sleep decreases, and the percentage of quiet sleep increases.
- Increased length of sleep at night is not related to the initiation of solid foods.

*Adapted from Barnard, 1999.*

### Assessment of Infant States

Learning to identify the state of an infant is a skill that most nurses find relatively easy to acquire with a little practice. Nurses can practice state identification with infants in the delivery, nursery, or postpartum areas.

Initially, nurses will need to make a conscious effort to assess an infant's state. They will need to ask themselves the following:

- In what state is the infant as I approach the bassinet and before the infant is handled?
- How does the infant's state change while being touched, diapered, and/or bathed?
- In what state is the infant while the mother or father is holding or feeding the infant, or when the infant is returned to the bassinet?

- Does the infant seem to move smoothly from one state to another, or does the infant jump from a sleep state, to crying, to drowsy?

With a little experience, identification of an infant's state becomes an automatic response so whenever the nurse is working with an infant, she or he can anticipate the way the infant may respond and what activities may be most appropriate with the infant at that time.

### Video Clips and Cases

Return to the online module "Understanding the Behavior of Term Infants" to view videos and cases related to this reading.

## States of the Term Newborn

**Table 6. Guidance on Co-Sleeping from the American Academy of Pediatrics**

In 2000, the AAP Task Force on Infant Sleep Position and Sudden Infant Death Syndrome (SIDS) concluded that there was insufficient evidence to conclude that bed sharing under carefully controlled conditions is clearly either hazardous or safe. This table presents highlights from the AAP guidance on co-sleeping.

- As an alternative to bed sharing, parents may consider placing the infant's crib near the parents' bed to allow for more convenient breastfeeding and parent contact.
- Mothers who choose to have their infants sleep in their beds to breastfeed should follow these guidelines:
  - Ensure that the infant is in a nonprone sleep position.
  - Avoid soft surfaces and loose covers.
  - To prevent entrapment, position the bed away from the wall and other furniture and avoid beds that present entrapment possibilities, such as two side-by-side mattresses.
- Adults other than parents, children, or siblings should avoid bed sharing with an infant.
- Parents who choose to bed share with their infant should not smoke or use substances such as alcohol or drugs that may impair their arousal.
- Overheating should be avoided. The infant should be lightly clothed and should not feel hot to the touch. The bedroom temperature should be kept comfortable for a lightly clothed adult.
- Some daily tummy time while the infant is awake and observed is recommended to encourage development and to help prevent flat spots on the occiput. To help prevent positional plagiocephaly, caregivers may place the infant to sleep with the head to one side for a week or so and then change to the other. Periodically changing the infant's orientation to outside activity (e.g., the door of the room) will encourage the infant to change head position.
- Devices to maintain sleep position or to reduce the risk of rebreathing are not recommended, because none has been tested sufficiently to show efficacy or safety.
- Electronic cardiac and respiratory monitors may be of value for home monitoring of selected infants who have extreme cardiorespiratory instability. However, there is no evidence that such home monitoring decreases the incidence of SIDS.

*Adapted from AAP, 2000.*

## Infant Behavior, Reflexes and Cues

Infant behavior is influenced by state, temperament and the ability of the infant to self-regulate. The manner in which infants respond to internal and external stimuli and to their caregivers depends upon the infants' state of consciousness. For example, an infant's response to being held (cuddliness) varies with the infant's state. An infant in quiet sleep may be very passive. In a crying state, the same infant may resist being held. In a quiet-alert state, this same infant might respond in a passive manner, resist holding, or relax and nestle

into the caregiver's arms. Table 7 describes specific infant behaviors.

Behaviors are often cues, activities that signal an infant's status or needs. Engagement cues are a type of behavior that signals the infant's readiness to interact with caregivers. Disengagement cues are a type of behavior that signals the infant's need for time-out or a reduction in stimuli. (Nursing Child Assessment Training, 1978)

**Table 7. Infant Behaviors**

**Alertness:** Widening and brightening of the infant's eyes and face as the infant focuses attention on stimuli (such as visual or auditory stimuli or objects to be sucked)

**Visual response:** The newborn's ability to react to objects or people with whom she or he makes contact

**Auditory response:** The newborn's ability to react to voices and other sounds in the environment

**Habituation:** The ability of infants to lessen their response to repeated stimuli

**Cuddliness:** The degree to which the newborn molds and nestles into the contours of the caregiver's body

**Consolability:** The ability of infants to bring themselves or to be brought by others to a lower state

**Motor behavior:** Spontaneous body activity and activity in response to stimuli

*Adapted from Brazelton & Nugent, 1996.*

## Infant Behavior, Reflexes and Cues

**Figure 9. Alertness (or Alerting Behavior)**



During the quiet-alert state, infants are most attentive to their environment, interacting socially and responding to their caregivers. Periods of alertness provide a way for infants to make contact with their environment and learn about the people around them.

*Description of Behavior*

The eyes widen and brighten. Infants focus attention on stimuli (visual, auditory, or objects to be sucked).

During waking states, when infants first hear a sound such as a voice or rattle, or see a bright object or face, their initial response is often “What’s that?” Ongoing behavior freezes (Brazelton & Nugent, 1996).

Infants, if sucking, stop sucking and widen their eyes, attempting to locate the source of the sound or to keep track of the face or object as it moves.

*Infant State*

Quiet alert

*Implications for Caregiving*

Infant state and timing are important. To help an infant achieve alertness, the caregiver may:

- Unwrap the infant (arms out at least)
- Place the infant in an upright position.
- Talk to the infant, varying the pitch and tempo of his or her voice
- Show his or her face to infants.
- Elicit the rooting, sucking, or grasp reflexes. (see page 13).

Being able to alert infants is important for caregivers as alert infants offer increased feedback to adults. Newborn alertness can be utilized in order to provide increased positive feedback from infants to caregivers.

## Infant Behavior, Reflexes and Cues

**Figure 10. Visual Responses**



Visual response is the newborn's ability to react to objects or people with whom she or he makes contact.

*Description of Behavior*

Newborns have pupillary responses to differences in brightness.

They can focus on objects or faces up to at least 2 ½ feet away, but attend best at 8-12 inches away.

Newborns prefer complex patterns, moving objects, and especially human faces.

They can follow moving objects with their eyes within a few hours of delivery or sometimes even sooner.

By 2-3 days of age, newborns can follow an object with their eyes and by turning their heads.

Newborns vary in their visual abilities. Most newborns alert, focus on an object, and follow it with their eyes. A few newborns have no response to a face or bright object.

Often infants will turn their heads to follow the object. They may lose the object, but find it again, and continue to follow it.

A few newborns will follow an object with their eyes and heads both horizontally and vertically.

*Infant State*

Quiet alert

*Implications for Caregiving*

Visual alertness provides opportunities for eye-to-eye contact with caregivers, an important source of interaction, pleasure, and recognition. Eye-to-eye contact establishes communication that enhances rapport and provides positive feedback between caregivers and infants.

*continued on next page*

## Infant Behavior, Reflexes and Cues

*Figure 10 continued*

Infants must be in a quiet alert state if the caregiver is to make a reliable observation of visual ability.

If an infant in a quiet-alert state does not at least brighten when presented with a bright object or face, this assessment should be repeated at another time. If the infant still does not respond, this observation should be discussed with the primary health care provider for further evaluation and appropriate referral.

Providing drowsy or active-alert infants with something to see will often bring them to a quiet-alert state.

Shading infants' eyes from overhead light will also help them alert so they can focus on a person or object in their environment.

Visual responses often are observed most easily when infants are held in a semi-upright position in someone's arms or held on someone's shoulder.

## Infant Behavior, Reflexes and Cues

**Figure 11. Auditory Responses**



Auditory response is the newborn's ability to react to voices and other sounds in the environment. Newborns use auditory stimuli to alert from drowsy or crying states.

*Description of Behavior*

Newborns react to a variety of sounds, especially in the human voice range.

They can hear sound and locate the general direction of sound, if the source is constant and continues coming from the same direction (such as continuous talking).

Neonates differentiate sounds and can distinguish their mother's voice.

They will pay attention to sounds of interest, particularly high-pitched and rhythmic, singsong vocalizations.

Most newborns brighten and widen their eyes, "freeze" their body activity, and shift their eyes in the direction of the sound.

Many newborns also turn their heads toward the sound.

A few newborns will consistently turn toward the sound and even move their eyes back and forth as they search for the exact location of the sound (Brazelton & Nugent, 1996).

*Infant State*

Drowsy, quiet alert, active alert.

*Implications for Caregiving*

Auditory stimuli can enhance communication between infants and caregivers. The fact that crying infants can often be consoled by voice demonstrates the value this stimulus has to infants (see page 8).

A few newborns do not respond to sound, but this is rare. These newborns should be reassessed. If the infant still does not respond, this observation should be discussed with the primary health care provider for further evaluation and appropriate referral.

It is an exciting experience for parents to see their newborn respond to the sound of their voices!

## Infant Behavior, Reflexes and Cues

**Figure 12. Habituation**



After birth, newborns must learn to respond appropriately to stimuli in the environment.

Newborns must not only be very responsive to significant stimuli, but also must learn to make minimal responses to extraneous stimuli around them. Habituation is the ability of infants to lessen their response to repeated stimuli.

If newborns constantly reacted to everything, they would have little time to learn about their world.

*Description of Behavior*

If a sound or stimulus is continually repeated, newborns will no longer respond to it in most cases.

*Infant State*

Quiet sleep, active sleep, also seen in drowsy.

*Implications for Caregiving*

Ability to habituate allows families to carry out normal activities without disturbing newborns.

Newborns can shut out most stimuli, similar to adults not hearing a dripping faucet after a period of time.

Habituation to repeated stimuli is an early form of learning (Brazelton & Nugent, 1996). For example, if the caregiver tries to elicit the Moro reflex (see page 13) several times in a row, newborns respond initially, but after several trials, the intensity of the reflex decreases, often becoming barely visible.

Habituation also can be seen in the lack of reaction by a number of infants to many of the noises that regularly occur in the hospital and home environments.

Some newborns have more difficulty than others learning to habituate and seem to react to everything that goes on around them. These infants may have difficulty sleeping in an active or noisy environment. Therefore, the caregiver may need to modify the environment to reduce light and sound stimuli or find a place for the infant to sleep in a quiet room away from other family activities.

## Infant Behavior, Reflexes and Cues

**Figure 13. Cuddliness**



Cuddliness is the degree to which the newborn molds and nestles into the contours of the caregiver's body. It is the infant's response to being held.

*Description of Behavior*

Most of the time, infants nestle and work themselves into the contours of the caregiver's body. Sometimes an infant may actively resist holding by stiffening, pushing away, or thrashing. Other times the infant may be passive, not resisting, but not participating either.

*Infant State*

Primarily in awake states.

*Implications for Caregiving*

Cuddliness is usually rewarding behavior for caregivers. It seems to convey a message of affection.

If infants consistently do not nestle and mold, it is wise to talk with the parents about their perception of the infant's behavior and to address any of their concerns. The nurse might explain that some infants like to hold themselves away from the caregiver's body so they can look around. If an infant does not cuddle, the parent might see if there are times when the baby does like to cuddle, such as during feeding or while falling asleep. The nurse should emphasize that just because a baby does not seem to like to cuddle doesn't mean that the baby does not like the parent, just that this baby has his or her own unique preferences.

Helping parents to understand cuddliness facilitates their feelings of competence. By accurately interpreting newborns' responses to being held, caregivers can adapt their approaches to newborns' individual needs.

## Infant Behavior, Reflexes and Cues

**Figure 14. Consolability**



Newborns vary considerably in the ease or difficulty with which they can console themselves or can be soothed by others.

*Description of Behavior*

Newborns who are fussing or crying can bring themselves or be brought by others to a lower state (see Tables 8 and 9 on page 10).

*Infant State*

The infant progresses from crying to active alert, quiet alert, drowsy, or sleep states.

*Implications for Caregiving*

Some newborns make few or very brief attempts to console themselves and always need outside intervention. Others try to console themselves, and their attempts may or may not succeed. These newborns can calm themselves at times, at least briefly, while at other times they need outside help.

A few consistently console themselves and need only minimal or occasional intervention. Most, however, need periodic help from others in consoling themselves.

Different consoling mechanisms may be necessary at different times. Caregivers need to try all methods of soothing to see what works best for an individual infant (see Table 9).

Crying presents the greatest challenge to caregivers. Often a parent's initial reaction is to pick up or feed a crying infant. But other actions can be just as effective. Some infants become quiet when they are talked to for a few minutes. Not all, however, become quiet at the sound of a voice.

*continued on next page*

## Infant Behavior, Reflexes and Cues

*Figure 14 continued*

Some parents fear spoiling their infants and may refrain from consoling them when infants need help to regain control. Culture may also influence parental expectations and caregiving; therefore, parenting practices and beliefs must also be assessed.

Success or failure in consoling significantly affects a parent's feeling of competence. Nurses should assist and encourage parents to observe how their newborns attempt to console themselves. Parents can also be helped to find additional ways to console their newborns (see Table 9).

Irritable infants are those who respond to external and internal stimuli with a great deal of fussing and/or crying (Brazelton & Nugent, 1996). These infants need more frequent consoling than placid infants.

Infants who are difficult to console require rigorous efforts. Caregivers may need to use a greater variety of methods to console these infants.

## Infant Behavior, Reflexes and Cues

### Consoling Maneuvers Used by Infants

When fussing or crying, most newborns initiate any of several maneuvers (Brazelton & Nugent, 1996) to regain control of themselves (self-consoling) and move to a lower state (Table 8). These activities are important in newborn self-regulation and state regulation.

Hand-to-mouth activity is an inborn response that can be triggered by stroking the newborn's cheek. This activity also occurs spontaneously as a comforting maneuver when the infant is upset.

Hand-to-mouth movements and sometimes sucking on fingers or hands are natural responses seen in

almost all newborns. Unfortunately, these movements may be upsetting to parents who disapprove of infants sucking on their fingers.

If caregivers are aware of self-consoling behaviors, they may allow infants the opportunity to gain control of themselves instead of immediately responding to their cues. This does not imply that newborns should be left to cry, but caregivers can assess if infants can quickly console themselves or if they need caregiver assistance.

When newborns are crying and do not initiate self-consoling activities, they need attention from caregivers (Table 9).

**Table 8. Maneuvers Used by Infants to Console Themselves**

- Moving the hands to the mouth
- Sucking on fingers, fist, or tongue
- Paying attention to voices or faces around them
- Changing position

**Table 9. Consoling Maneuvers Used by Caregivers**

When an infant cries, the caregiver may:

- Talk to the infant in a steady, soft voice
- Hold both of the infant's arms close to the body
- Swaddle the infant
- Pick up the infant
- Rock the infant
- Feed the infant
- Change a wet or dirty diaper

## Infant Behavior, Reflexes and Cues

**Figure 15. Motor Behavior**



Motor behavior is spontaneous body activity and activity in response to stimuli. The stimuli may be internal (hunger, pain, temperature changes) or external (handling, noise in the environment).

*Description of Behavior*

Most term newborns have smooth, rhythmical, spontaneous movements of the arms and legs, similar to the movements made when riding a bicycle, especially when in a quiet-alert state. Movements in response to stimuli (such as caregiving activities or noises) may be less symmetrical and jerky, depending on the infant's state and the intensity of the stimuli. Table 10 (see page 13) describes how a newborn responds when a caregiver elicits specific reflexes.

*Infant State*

The quality of motor behavior changes with infants' states (e.g., infants may have smooth, coordinated movements during alert periods, but may exhibit some jerky movements as they become more active).

*Implications for Caregiving*

When crying or awakening from a sleep state, infants may develop quivering of the chin or brief fine tremors of the extremities, or they may have occasional startles.

Some infants have occasional jerky movements or startles even during the awake states. These startles and jerky movements are due to the immaturity of the motor system. Parents sometimes need reassurance as they see these jerky movements and startles as responses to their caregiving; they may feel that they are frightening or hurting the infant. If an infant has consistent asymmetrical or jerky movements, the infant needs further evaluation by the primary care provider.

## Infant Behavior, Reflexes and Cues

### Reflexes

As they vary in behavior, newborns also vary in the intensity of their reflexes (Table 10 on the next page) and the ease with which these reflexes are elicited. Reflexes such as rooting, sucking, and grasping tend to bring in-fants into closer contact with their environment.

### Self-Regulation, Readability, and Infant Cues

Self-regulation is the “capacity to adapt to one’s surroundings in a healthy and predictable way” (Barnard, 1999, page 10). Some infants are able to regulate themselves well from birth and are easily readable; others need more time and may require more assistance.

Readability is the clarity of cues infants give through motor behavior, looking, listening, and behavior patterns during all states. Predictability is the extent to which caregivers can reliably anticipate behaviors that will occur from the immediately preceding behaviors. (Stratton, 1982)

Infants differ in the clarity with which they make known their needs and in the consistency of their sleeping, waking, and eating cycles. Some respond predictably in all areas, others only in some areas; still others are constantly unpredictable. Regardless of how predictable infants are, most parents need help in learning to understand their infant’s cues.

Infant cues are behaviors that signal an infant’s status or needs. Infants provide cues for their caregivers in a variety of ways.

Infant state and behavioral abilities are cues. Infant behaviors that indicate readiness for interaction are called engagement cues (Table 11 on page 14). Behaviors that indicate a need for some time out are called dis-engagement cues (Table 12 on page 14). (Nursing Child Assessment Training, 1978)

Several engagement or disengagement cues occurring together is more important than an isolated cue.

### Assessing Infant Behavior

Learning to identify and interpret infant behaviors is a skill that most nurses find relatively easy to acquire with a little practice. It is something nurses can practice with infants in the delivery, nursery, or postpartum areas. Initially, nurses will need to make a conscious effort to assess infant behaviors. They will need to ask themselves the following:

- How does this infant respond to visual (face) and auditory stimuli (talking to the infant)?
- Can the infant habituate to repetitive stimuli?
- How cuddly is this infant?
- How does the infant soothe herself or himself when upset? What caregiver actions help to soothe the infant?
- What cues does the infant demonstrate to indicate readiness for interaction?
- What cues does the infant demonstrate to indicate need for time-out or decreased stimuli?

With a little experience, identification of infant behaviors and cues becomes an automatic response, so whenever the nurse works with an infant, she or he can anticipate the way the infant may respond and what activities may be most appropriate with the infant at that time.

### Video Clips, Activities and Cases

Return to the online module “Understanding the Behavior of Term Infants” to view videos, activities and cases related to this reading.

## Infant Behavior, Reflexes and Cues

**Table 10. Newborn Reflexes**

**Rooting reflex:** Stroking the infant's cheek or corner of the mouth will cause the infant to turn the head toward the side stroked and open the mouth. This reflex is less prominent after one month of age.

**Sucking reflex:** Touching the infant's mouth will cause the infant to respond by opening the mouth and making sucking movements.

**Moro reflex:** This reflex is elicited by placing the infant in a semi-upright position, allowing the head to momentarily fall backward, with immediate resupport by the examiner's hand. The infant symmetrically extends and abducts the arms and opens the hands, then adducts and partially flexes the arms as if in an embrace. The fingers extend except for the index finger and thumb, which are often semiflexed forming a characteristic "C" position. Following the return of the arms toward the body, the infant may relax or cry.

### **Grasp reflex**

**Palmar:** Stroking the infant's palm with a finger will cause the infant to grasp the finger. The infant will tighten the grasp when his/her arm is drawn upwards. When the palmar grasp is tested in both hands, the term infant can be briefly lifted.

**Plantar:** Applying fingertip pressure to the ball of the foot will cause the infant to curl the toes and attempt to grasp the finger.

**Stepping/Walking:** Holding the infant upright so that the soles of the feet touch a flat surface will cause the infant to make alternate stepping movements. This reflex becomes more active 72 hours after birth.

**Placing reflex:** Holding the infant upright and touching the top of the foot to the underside of a horizontal surface will cause the infant to flex, then extend the leg and place the foot flat.

**Truncal incurvation (Galant) reflex:** This reflex is stimulated by suspending the infant ventrally, supporting the anterior chest wall in the palm of the hand. Firm pressure is applied along the spine in the thoracic area with thumb or cotton swab. The infant flexes the trunk and swings the pelvis toward the stimulus.

**Babkin reflex:** This reflex is elicited by gently holding the infant's hands between the thumb and index/middle fingers. Pressure is applied simultaneously to the palm and dorsum of both hands. The infant will open his mouth and drop his tongue to the floor of his mouth.

*Adapted from Carey, 1993; Haslam, 2000.*

# Understanding the Behavior of Term Infants

## Infant Behavior, Reflexes and Cues

**Table 11. Engagement Cues**

- Eyes becoming wide open and bright as the infant focuses on the caregiver.
- Alert face or an animated face with wide open, bright eyes, often accompanied by gently pursed lips as if the infant were saying “ooh.”
- Grasping or holding onto the caregiver or objects in the environment.
- Hand-to-mouth activity, often accompanied by rooting and sucking movements. The infant may also suck on his or her fingers.
- Smiling.
- Turning eyes, head, or body toward someone who is talking.
- Smooth motor movements.

*Adapted from Nursing Child Assessment Training, 1978.*

**Table 12. Disengagement Cues**

- Crying or fussing
- Hiccoughing
- Spitting up or gagging
- Jittery or jerky movements
- Frowning or grimacing
- Becoming red or pale
- Agitated or thrashing movements
- Falling asleep
- Averting the gaze (the infant moves her eyes or head away from the caregiver)

*Adapted from Nursing Child Assessment Training, 1978.*

## Feeding the Term Infant

### Introduction

Term newborns may be in the hospital only 24-48 hours if they were born vaginally and up to four days if they were born via cesarean delivery. This time period, though brief, is important for assessing the newborn's transition to extrauterine life. In addition, maternal-newborn nurses must think beyond the first several days in the hospital and consider the quality of infant feeding and infant cues, the ability of the mother and caregivers to read the infant's cues, risks such as hyperbilirubinemia, and health care after discharge.

Newborns transitioning to extrauterine life spend much of their first several days sleeping, with relatively short periods of alertness. Crying may be an indication of hunger, physical discomfort, overstimulation or another factor. The frequency of feeding and amount of intake will vary individually and be influenced by perinatal medical factors such as maternal medications, neonatal factors related to transition to extrauterine life and newborn health, as well as infant temperament.

Most hospitals no longer use strict feeding schedules, and many newborns room-in or spend significant time in their mothers' rooms, so a combination of infant demand and some offered feedings is common. Traditional practices of sterile- or dextrose-water test feedings have given way to infants being put to the breast soon after delivery, a practice that can benefit both mother and newborn.

Breastfed newborns should be put to breast 8-10 times per 24 hours or every 2-3 hours to receive colostrum and stimulate the mother's milk production. Some newborns will feed on demand every hour and a half, while others will need encouragement. Formula-fed infants may be offered

a bottle every 3-4 hours with wide variation in the amount taken. A feeding-on-demand approach allows the infant's cues to determine the feeding pattern. Additional feeding tips for parents are in Table 13 on the next page.

### Discharge and Follow-Through Considerations

- Verify follow-up by the primary care provider before discharge. Breastfeeding infants and infants with should be seen within two days of discharge. Any infant discharged while the bilirubin is still rising should be seen within 24 hours. All infants should be seen within two weeks to verify that the infant has regained birth weight, is otherwise healthy, and that the infant and family members are adapting to one another.
- Breastfeeding mothers should be connected with a lactation consultant so that breastfeeding support can continue uninterrupted following discharge.
- Some insurers and hospitals offer mothers a post-discharge home visit. This can be very useful in following up on infant feeding, hyperbilirubinemia, and maternal recovery from delivery; confirming primary care appointments; and assessing the home environment.

### Additional Information

For additional information about care of the term infant and breastfeeding, see the following March of Dimes print modules: *Assessment of Risk in the Term Newborn* and *Breastfeeding the Healthy Newborn: A Nursing Perspective*. Return to the online module "Understanding the Behavior of Term Infants" to view a case study about feeding.

## Feeding the Term Infant

**Table 13. Feeding Tips for Parents**

- Use reflexes such as rooting and Babkin to help the infant get organized and start to feed.
- Observe the rhythm of sucking, swallowing, breathing, and pauses.
- During breastfeeding, observe positioning of the infant, position of latching-on with nipple and areola in the infant's mouth, and ability of the infant to breathe. Light pressure on the breast may be required to allow for full clearance of the infant's nares.
- During bottle-feeding, DO NOT turn or pump the bottle to try to stimulate feeding. Sucking is a reflex. Stimulating the infant's mouth will confuse and will not allow the infant to provide cues to the caregiver.
- There is no need to stop a feeding to give the infant a break or to burp. Observe the infant for satiety cues or need for a break: slowing or stopping of sucking, release of suction on the breast or bottle, falling asleep.

### Teaching Parents About Infant States and Behavior

A critical task of parents after the birth of their infant is to learn to correctly interpret their infant's behaviors and understand their newborn's style. If nurses recognize and understand the newborn's states and behavior patterns, they can respond more appropriately to the infant and help parents recognize that their infant's behaviors are part of his or her unique personality, and not a reflection on the parent.

It is essential to elicit parents' perceptions and interpretations of their infant's behavior. A behavior one parent might perceive as positive may be interpreted negatively by another. For example, some parents might perceive an infant who resists cuddling as "strong and feisty," while others interpret this infant as difficult or rejecting them. Assessing parental perceptions and beliefs is important when responding to cross-cultural differences regarding infant temperament and behavior.

When parents understand the various states, they are better able to interpret infants' behaviors. There are many individual differences, and infants respond according to the state in which they are at any given moment. An understanding of and sensitivity to state and to an infant's unique characteristics and capabilities form the beginning of mutual trust.

Understanding their infant's behavior and cues encourages attachment as parents and newborns learn that they can rely on each other to respond appropriately and consistently in various situations.

Nurses are in a position to assist parents in learning about their infant's unique characteristics, while at the same time removing some of the uncertainty about why infants act as they do.

When the mother and infant are discharged soon after delivery, the nurse must assess the mother's knowledge of infant behavior and identify priorities for teaching.

Nurses can also help parents plan and evaluate the infant's sleep environment at home and in promoting sleep (Table 14 on the next page). The section "States of the Term Newborn" provides information on co-sleeping.

A community health nurse or a home follow-up nurse can provide additional assessment and teaching during a home visit.

Table 15 on page 3 describes interventions the nurse can use in helping parents to recognize their infant as a unique individual and to enhance their interactions and caregiving based on the infant's behaviors and abilities.

## Teaching Parents About Infant States and Behavior

**Table 14. A Safe Sleep Environment**

The following resources have information about a safe sleep environment, sleep position, and SIDS prevention.

**American Academy of Pediatrics** at [www.aap.org](http://www.aap.org). All AAP policy statements are located at the Web site. Click on policy statements and search or scan alphabetically.

American Academy of Pediatrics, Task Force on Infant Sleep Position and Sudden Infant Death Syndrome (2000). Changing concepts of sudden infant death syndrome: Implications for infant sleeping environment and sleep position (RE9946). *Pediatrics*, 105, 650-656. (<http://www.aap.org/policy/re9946.html>)

**U.S. Consumer Product Safety Commission** at [www.cpsc.gov](http://www.cpsc.gov). Search “baby AND safety” for a comprehensive list of recommendations, recalls, and safety tips in English and Spanish.

Consumer Product Safety Commission (1999). Recommendations revised to prevent infant deaths from soft bedding (Release #99-091). Washington, D.C.: Author. (<http://www.cpsc.gov/CPSCPUB/PREREL/PRHTML99/99091.html>)

The Consumer Product Safety Commission, the American Academy of Pediatrics, and the National Institute of Child Health and Human Development jointly released the recommendations contained in this news release.

- Place the baby on his or her back on a firm, tight-fitting mattress in a crib that meets current safety standards.
- Remove pillows, quilts, comforters, sheepskins, stuffed toys, and other soft products from the crib.
- Consider using a sleeper with no other covering as an alternative to blankets.
- If using a blanket, put the baby with his or her feet at the foot of the crib. Tuck a thin blanket around the crib mattress, only as far as the baby’s chest.
- Make sure the baby’s head remains uncovered during sleep. Do not place the baby on a waterbed, sofa, soft mattress, pillow, or other soft surface to sleep.

(See also the discussion of co-sleeping in “States of the Term Newborn.”)

## Teaching Parents About Infant States and Behavior

**Table 15. Nursing Interventions for New Parents**

- Clarify parents' perceptions and interpretations of their infant's behavior.
- Teach parents to recognize and use infant states in interacting with their infant.
- Help parents understand that their infant's behavior is a part of his or her individual temperament and level of maturity. It does not reflect their parenting abilities or mean that the infant "doesn't like them."
- Identify the normal course of development for state and state-related behaviors. Discuss discrepancies between expectations and reality and how behaviors will change over time.
- Identify the infant's abilities before, during and after the parents' interactions with the infant.
- Help parents recognize and adjust to the infant's inconsistencies. Teach them to watch for behavioral cues or changes that will help them respond appropriately.
- Demonstrate techniques (e.g., show parents how to alert a drowsy infant, to console a crying or irritable one, and to elicit visual and auditory attention).
- Teach parents to recognize infant engagement and disengagement cues and to respond appropriately.
- Place parents in situations where they will experience positive feedback from their infants, and point out positive infant responses to the parent's caregiving actions.
- Help parents observe which techniques are most effective in helping their infant interact, feed, alert, relax, and sleep.
- Avoid remarks that unfavorably compare how the infant responds to the parent with how he responds to the staff.
- Give parents copies of the handout "Things That Make Me ME!"

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## Glossary

### **Activity**

The amount of physical movement during eating, play, sleep, dressing, and bathing.

### **Adaptability**

The ease or difficulty with which reactions to stimuli can be modified.

### **Alertness**

Widening and brightening of the infant's eyes and face as he or she focuses attention on stimuli (such as visual, auditory, or objects to be sucked).

### **Approach/Withdrawal**

The style of initial responses to new stimuli, including situations, people, places, and foods.

### **Auditory response**

The newborn's ability to react to sounds, including voices, in the environment.

### **Babkin reflex**

This reflex is elicited by gently holding the infant's hands between the thumb and index/middle fingers. Pressure is applied to the palm and dorsum of the hands. The infant will open her mouth and drop her tongue to the floor of her mouth.

### **Behaviors**

Observable activities in the infant in response to external or internal stimuli in the environment.

### **Consolability**

The ability of infants to bring themselves or to be brought by others to a lower state.

### **Cuddliness**

The degree to which the newborn molds and nestles into the contours of the caregiver's body.

### **Cues**

Behaviors that signal an infant's status or needs.

# Understanding the Behavior of Term Infants

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## Glossary

### **Difficult infant**

Intense. Demonstrates irregular sleeping and eating patterns, negative response to new situations (withdrawal), difficulty adapting to change, irritability, and negative mood.

### **Disengagement cues**

Types of behavior that signal the infant's need for time-out or a reduction in stimuli.

### **Distractibility**

Effectiveness of environmental stimuli in interfering with ongoing behavior.

### **Easy infant**

Mild mannered. Demonstrates regular sleeping and eating patterns, positive response to new situations (approachable), high adaptability to change, and positive mood.

### **Engagement cues**

Types of behavior that signal the infant's readiness to interact with caregivers.

### **Galant reflex**

See "Truncal incurvation reflex."

### **Grasp reflex**

See "Palmar grasp reflex" and "Plantar grasp reflex."

### **Habituation**

The ability of infants to lessen their response to repeated stimuli.

### **Hand-to-mouth activity**

The infant brings the hands to the mouth area, often accompanied by rooting and sucking movements. The infant may also suck on his or her fingers.

### **Intensity**

The energy level of the infant or child's responses.

### **Mood**

The usual disposition—amount of pleasant or unpleasant behavior—the child exhibits in different situations.

# Understanding the Behavior of Term Infants

## Glossary

### **Moro reflex**

This reflex is elicited by placing the infant in a semi-upright position, allowing the head to momentarily fall backward, with immediate resupport by the examiner's hand. The infant symmetrically extends and abducts the arms and opens the hands, then adducts and partially flexes the arms as if in an embrace. The fingers extend except for the index finger and thumb, which are often semiflexed forming a characteristic "C" position. Following the return of the arms toward the body, the infant may relax or cry.

### **Motor behavior**

Spontaneous body activity and activity in response to stimuli.

### **Palmar grasp reflex**

Stroking the infant's palm with a finger will cause the infant to grasp the finger. The infant will tighten the grasp when his or her arm is drawn upwards. When the palmar grasp is tested in both hands, the term infant can be briefly lifted.

### **Persistence/Attention span**

The length of time a child pursues activities and sticks to difficult tasks.

### **Placing reflex**

Holding the infant upright and touching the top of the foot to the underside of a horizontal surface will cause the infant to flex, then extend the leg and place the foot flat.

### **Plantar grasp reflex**

Applying fingertip pressure to the ball of the foot will cause the infant to curl the toes and attempt to grasp the finger.

### **Predictability**

The ability of an infant to respond to the environment in a way that can be anticipated by the caregiver.

### **Readability**

The ability of an infant to demonstrate a behavior that is understood by the caregiver.

### **Rhythmicity**

Regularity of biologic cycles and physiologic functions such as sleep, hunger, and elimination.

# Understanding the Behavior of Term Infants

## Glossary

### **Rooting reflex**

Stroking the infant's cheek or corner of the mouth will cause the infant to turn the head toward the side stroked and open the mouth. This reflex is less prominent after one month of age.

### **Self-consoling behavior**

Activities of fussing or crying newborns to regain control of themselves.

### **Self-regulation**

The ability of an infant to adapt to his or her surroundings in a positive and predictable way.

### **Sensory threshold**

The amount of stimulation, such as noise or light, needed to evoke responses from the child.

### **Sleep cycle**

The time from a period of active sleep, through a period of quiet sleep, to the beginning of the next active sleep period.

### **Slow-to-warm-up infant**

Mild mannered. Demonstrates slow adaptability after several attempts and negative mood.

### **State**

A group of characteristic behaviors and physiologic changes that recur together in a regular pattern.

### **State modulation**

The ability of the infant to make smooth transitions between states, cycle between sleep states, arouse when appropriate (e.g., for feeding or playing), and sustain sleep states.

### **State organization**

The development of sleep and awake states, including increasing duration of sleep and awake periods, increasing periods of quiet alert, consolidation of sleep into nighttime hours, and maturation of the sleep states.

## Glossary

### **Stepping/Walking**

Holding the infant upright so that the soles of the feet touch a flat surface will cause the infant to make alternate stepping movements. This reflex becomes more active 72 hours after birth.

### **Sucking reflex**

Touching the infant's mouth will cause the infant to respond by opening the mouth and making sucking movements.

### **Temperament**

The basic biologic dimensions of personality that are apparent early in life and continue to be demonstrated to some degree throughout life.

### **Truncal incurvation (Galant) reflex**

This reflex is stimulated by suspending the infant ventrally, supporting the anterior chest wall in the palm of the hand. Firm pressure is applied along the spine in the thoracic area with thumb or cotton swab. The infant flexes the trunk and swings the pelvis toward the stimulus.

### **Visual response**

The newborn's ability to react to objects or people with whom she or he makes contact.

### **Withdrawal**

See "Approach/Withdrawal."

## Things That Make Me ME!



Hi, I'm 2 days old. I'm going to share with you some of the things that make me ME.

Babies are people, too. We enjoy many of the same things adults do: clean clothes, good food, and good company.

Like adults, no two of us are alike, not even twins. And although twins may look alike, the thing that makes each of them different is personality. Each of us is different from birth in what makes us laugh, cry, or feel better. Each of us responds differently to things and people around us. If we didn't, it would be a very dull world.

Take a look at me. What do you see? A face, two arms, two legs, a body. . .



Look more closely.

- What do I do when I'm asleep?
- How do you know when I'm angry, wet, tired, hungry, or bored?
- How do you know when I'm happy?
- And what sort of things do I do that make you feel good?

All parents learn to “read” their baby's needs. Before long, they have learned the difference between the cries we make when we're hungry and the ones that mean we're tired and sleepy. Parents quickly learn that what may have been just the thing to quiet one baby won't work for the other. They

learn to tell from the way we act when we want to play and respond and when we need some time to rest.

Parents and babies are in this together. Being part of a team is hard work. It requires that babies and parents learn to understand each other.

Did you know that babies have six very different levels of awareness? These levels are called *states*. Learning to know them can give you clues about what interests us.



**1. Quiet Sleep.** In quiet sleep or deep sleep, we are sound asleep. Our breathing is regular, and if you look closely, you'll notice that our eyes do not move under our lids. You will probably notice occasional twitches of our arms or legs, but for the most part, we are very still and sleep very soundly (after all this is quiet sleep!). In the early months, most of us spend about a third of our sleep time in this quiet-sleep state. During this state, we are the least likely to be disturbed by outside noises.



**2. Active Sleep.** In active or light sleep, we're still asleep, but we move about, make faces, yawn, or smile. Our breathing is irregular. You can see why they call this active sleep! Our eyes are closed, but you can often see them moving under our eyelids. Some parents think that this means we are waking up and begin to talk to us, or pick us up. But actually we are still asleep. In the early months, we spend about two-thirds of our time in this state. We are disturbed more easily during active sleep than we are in quiet sleep.

# Understanding the Behavior of Term Infants

## Things That Make Me ME!



**3. Drowsy.** In this state, we can go one of two ways: either wake up or go to sleep. Our eyes open and close, and we stretch, yawn and make some noises. If we wake up, we have three choices: quiet alert, active alert, or crying.



**4. Quiet Alert.** In the quiet-alert state, we are most able to pay attention to you and the world around us. We look at and follow your face or a bright, shiny object, or we turn our heads in the direction of your voice.

Try this with your baby when your baby is in a quiet-alert state. Hold your baby 8 to 10 inches in front of your face. When your baby looks at your face, the eyes will widen and the whole face will brighten. Your baby will look intently at you. If you slowly move your head from side to side or up and down, the baby's eyes may follow you. If the baby doesn't do this, try talking as the baby watches you. Some of us respond better if you show us your face and talk at the same time.

Some parents think we can't see or hear until we are several weeks old, but we can see and hear from birth. Try talking to your baby while the baby is lying on its back looking at the ceiling. Talk in one ear to the side of the baby, talking continuously. Watch as the eyes get wide and bright and the head begins to turn towards your voice. Now go to the other side of your baby and talk again.

The quiet-alert state is when most of us are sociable. We readily respond to voices and objects. While many baby books say that babies don't have social smiles for several weeks, we know better, don't we?



**5. Active alert.** In active alert, we have lots of body and facial activity, but our eyes lack the shiny quality of the quiet-alert state. During this state, we may even become a little fussy.



**6. Crying.** If we continue to fuss, we enter the crying or fussy state, and you have the opportunity to find out how we can calm ourselves or how you can help calm us. Why do we cry? Well, that's a way we communicate our needs.

At first, all of our cries may sound alike, but as you care for us, you will learn to recognize our different cries. We have cries for when we are hungry, bored, uncomfortable, in pain, tired, overstimulated or sick.

Sometimes when we enter a crying or fussy state, we calm ourselves without any outside help. Watch what we do. We may bring our hands to our mouth, suck on our fingers or fist, or just suck with nothing at all in our mouths. Bringing our hands to our mouths or sucking on them are important natural responses that help comfort us when we feel upset. Paying attention to voices or faces or changing position may also help us to regain control and quiet.

If we do not begin to calm down quickly, then we need your help right away! Even if we do not stop crying immediately, just knowing you are there and trying to help us is important. By helping us soon after we have started crying, you will find we are usually easier to comfort than if you wait until we are REALLY upset! Also, did you know that studies have shown that babies whose parents respond quickly to their crying in the first months, cry less

# Understanding the Behavior of Term Infants

## Things That Make Me ME!

later on? Picking us up and holding us close is the most common way of calming us, but have you ever tried or noticed these other ways?



**Talking.** Just get close to our crib and talk. Many of us will quiet to your voice.



**Touching.** Put your hands on your baby's stomach or chest, or gently hold the baby's arms and legs close to the baby's body. Most of us like the security we feel from being touched.

Holding our arms and legs close to our body helps us feel secure and adds to our comfort.



**Holding.** Holding is by far the most common way to comfort a crying or fussy baby. Most of us express our pleasure in being held by cuddling in close. A "cuddler" will mold into the curve of your neck or arm. Some of us may stiffen when held, or seem uncomfortable. If your baby doesn't like to cuddle, try seeing if there are special times for cuddling, such as during feeding or while falling asleep, and cuddle then. Some of us enjoy having you talk or sing to us. Remember, we are all individuals with our own likes and dislikes, and just because we may appear not to like to cuddle doesn't mean that we don't like you.



### **Wrapping us with a blanket.**

This may work well when your baby is feeling particularly upset or jittery. Make sure to keep our hands out of the blanket so we can suck on our fingers or fists if we want to.

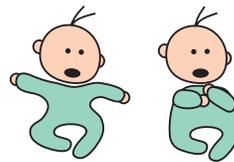


**Rocking.** Many of us enjoy the movement associated with rocking: either in your arms or in a rocking chair.

You can always use a combination of these comforting methods: for instance, rocking and talking or holding and rocking.

## Our Reflexes

Remember, we are still babies and not fully developed yet. We will continue to grow and develop for a number of years. Our reflexes (our natural responses) are one area that will change a lot in the first few months of life. As a result, we may sometimes appear jerky and uncoordinated.



### **The Moro or startle reflex.**

This is one of our most dramatic reflexes. Any sudden change in position or jarring of the crib can set it off. We usually fling our arms out away from our bodies, and then bring them back in, as if in a hug. A cry may follow.



**The grasp reflex.** Many parents know this reflex. If you stroke the palm of your baby's hand, the fingers will close into a fist. This can be a helpful reflex in getting

tiny hands through the sleeves of a shirt or sleeper. Try putting your finger through the sleeve, and get your baby to grasp your finger; then gently pull the hand and arm through the sleeve.

# Understanding the Behavior of Term Infants

## Things That Make Me ME!



**The Babkin reflex.** When we are awake, gently press the palms of both of our hands simultaneously. Watch what happens to our mouth!



**The rooting reflex.** Have you noticed how we turn in the direction of which cheek is touched? This is called the rooting reflex. This reflex is very helpful when feeding, since your baby will turn toward the nipple when you stroke the cheek nearest the nipple. But remember that we can become confused easily. If you stroke both cheeks at once, we don't know which way to turn!



**The sucking reflex.** Touch your baby's lips, and watch the sucking and swallowing motions that are made.

Some of our reflexes are also our defenses—coughing or sneezing, for example. When something covers our face, we make repeated swipes trying to remove it. This can be very helpful, but it can also be the reason we make such a fuss when a shirt is pulled on or off over our head.

### Habituation: Turning Things Off

Finally, we respond to light and sound. By a process called habituation, some of us quickly learn to ignore or get used to noise and light. Other babies have great difficulty. If your baby gets used to light and sound quickly, he or she will soon tolerate the normal hubbub of daily living. If your baby gets used to light and sound slowly, he or she may need quieter surroundings.



We all develop—at our own rate. And we all have our own personality. I hope I've helped you learn a little more about your baby.

## Clinical Application

The following activities will aid the learner in applying the concepts presented in this module:

Review your unit's or agency's teaching plan for parents. Does this include content on infant state and behavior? If yes, how complete and useful is the content? If not, how might you go about adding this content?

What strategies have you found effective in alerting a drowsy infant? In consoling an irritable infant?

What types of experience might you provide for new parents that demonstrate the newborn is a responsive individual?

How might you incorporate teaching parents about infant state and behavior into other care activities such as infant assessment or assisting parents with

feeding, bathing, diapering or other activities?

Is information about infant state and behavior, or parent concerns about state and behavior, periodically recorded in infant charts? If yes, how are these data utilized in planning care?

Recall the last three families that you cared for. How might each infant's state or behavior have affected the parents? Influenced how you responded to the infant? How did you utilize information on infant state and behavior in planning and providing care? In parent teaching? How might you have done this differently?

Select three families and ask the parents what they have noticed about their babies. What were their responses? How might you use this information in planning care?