

# Embedding Physical Activity and Nutrition in Early Care and Education Programs

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**T**he infant and toddler years provide a window of opportunity to establish healthy habits as part of children's daily routines and activities. Infants enter child care as early as 6 weeks of age and may spend as many as 40 hours a week there until they reach school age. With the growing number of children in child care (Cubed, 2002), early care and education settings have enormous potential to help infants and toddlers develop healthy lifestyles and combat the trend of rising rates of childhood obesity.

For young children, caregivers should focus on developing healthy habits and preventing overweight. Energy balance (the energy expended vs. the energy consumed)

determines whether weight is gained, lost, or stays the same. Infants and toddlers need a slightly positive energy balance to grow. Physical activity (energy output) in infants and toddlers promotes growth and development and provides the foundation for enjoying physical activity later in childhood (Heinzer, 2005). Nutrition (energy input) during the first 3 years of life, along with genetics and other health conditions, determines children's growth patterns and body weight (Stunkard, Berkowitz, Schoeller, Maislin, & Stallings, 2004). Eating habits established during these years may help children develop preferences that influence adolescent and adult choices about food and nutrition (Mennella, Ziegler, Briefel, & Novak, 2006).

## Daily Routines

**A**DAILY SCHEDULE helps caregivers of infants and toddlers know who will do what and when they will do it. Adults must develop a schedule that coordinates the caregiving for each infant and toddler and takes into consideration the child's individual needs. Much of the time

spent providing care for infants and toddlers is made up of routines such as changing diapers or toileting, preparing meals, giving bottles, and helping infants and toddlers settle down for a nap. Routines give infants and toddlers a sense of security and trust, as their most basic needs are being met in a consistent caring manner. Routines are part of the learning environment. They offer opportunities for spending time with a particular infant or toddler. Daily routines also provide the most appropriate time to build in regular opportunities for structured physical activity and for learning nutrition and healthy eating patterns. As patterns of behavior are repeated day after day, they become internalized (Butterfield, 2002) and increase the likelihood that children will continue to practice good habits later in life.

## Physical Activity and Motor Development

**T**HE FOUNDATION for curriculum is play. For infants and toddlers to fully engage in play, their stability must be ensured so they can explore, manipulate toys,

and move effectively. The goal is for infants and toddlers to develop fundamental motor skills and the joy of being active for life. Active babies expend more energy, which decreases their potential for becoming overweight, increases their opportunities for skill development, and improves their health status (Heinzer, 2005). Maturation alone does not ensure the development of motor skills.

There are three fundamental motor skill themes that infants and toddlers need: *locomotor*, *nonmanipulative*, and *manipulative* (Graham, Holt-Hale, & Parker, 2005).

- Locomotor skills are movement patterns that allow movement from one place to another. Crawling, walking, and running are examples of locomotor skills.

## Abstract

**The infant and toddler years provide a window of opportunity to establish healthy habits as part of daily routines and activities that prevent childhood obesity. Early care and education programs have the opportunity to make a significant impact on physical development when they promote healthy eating and physical activity in their daily routines. This article provides suggestions that caregivers can use to encourage active play, teach young children about nutrition, and create healthy habits in the earliest years.**

- Nonmanipulative skills are movement patterns in which the body operates from a stable base while different body parts move. Balancing, turning, pushing up while prone (on stomach), stretching, and reaching are examples of nonmanipulative skills.
- Manipulative skills are movement patterns that support gross and fine muscle contact with objects. For infants and toddlers, manipulative skills include grasping and releasing, throwing, kicking, catching, and collecting (Graham et al., 2005). Infants and toddlers need developmentally appropriate opportunities to practice these skills on a regular basis.



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Just as early childhood educators schedule, plan for, and provide learning support or scaffold literacy, they need to schedule, plan for, and scaffold motor skill development. To refine motor skills, infants and toddlers need the opportunity to practice. They also need instruction and coaching (Pica, 1995). Two-year-olds who do not bend their knees and crouch down before jumping will not be skillful jumpers. If caregivers provide instruction, modeling, and opportunities to practice, the 2-year-olds become more proficient.

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### *Infants should interact with parents and caregivers in daily physical activities that promote the exploration of their environment.*

The National Association for Sport and Physical Education (NASPE) classifies children's physical activity as either structured or unstructured. Structured physical activity for young children is "planned and directed by the parent, caregiver, or teacher and is designed to accommodate the infant, toddler, or preschooler's developmental level" (NASPE, 2002, p. 18). When physical activity is adult directed, children obtain significant amounts of moderate and vigorous physical activity (Ward, Saunders, & Pate, 2007). Adults can also coach children to increase their skill level. Unstructured physical activity is "child-initiated physical activity that occurs as the child explores his or her environment" (NASPE, 2002, p. 18). Both structured and unstructured physical activities are important components of motor skill development.

Most infants and toddlers acquire fundamental movement skills in unstructured physical activity. These early skills provide

the foundation on which later skills are built. Children who lack proficient motor skills often choose not to participate in physical activities as they get older and games become competitive (Graham et al., 2005). Instruction and positive reinforcement during this time help to ensure that children develop age-appropriate motor skills before entering school (NASPE, 2002).

There are no official recommendations for the amount of physical activity infants need but the NASPE (2002) guidelines suggest that infants need settings that facilitate physical activity and do not restrict movement for prolonged periods of time. Furthermore, infants should interact with parents and caregivers in daily physical activities that are dedicated to promoting the exploration of their environment. NASPE (2002) recommends that toddlers should accumulate at least 30 minutes daily of structured physical activity and at least 60 minutes to several hours per day of unstructured physical activity and that they should have safe indoor and outdoor space to practice skills. They should develop movement skills such as running, jumping, and climbing, which are building blocks for more complex movement tasks. Caregivers should be aware of the importance of physical activity and provide structured and unstructured physical activities scheduled daily and embedded in routines.

Because the developmental changes during the first 3 years of life are so major, the following techniques for embedding motor skills in child care settings are divided into three age groups: young infants (birth to 9 months), mobile infants (8 to 18 months), and toddlers (16 to 36 months). The overlapping ages reflect individual differences in development (Lally et al., 1997).

#### ***Young Infants: Birth to 9 Months***

Infants differ in the rate at which they acquire motor skills on the basis of genetics and the

ability to practice. However, the pattern and progression of development is typically the same.

Diaper-changing routines offer opportunities to incorporate physical activity. For example, after changing the diaper and washing hands, caregivers can take the opportunity to massage the young infant's hands and arms or feet and legs (checking first with parents to ensure this appropriate for each infant). Caregivers can begin "baby yoga," or gentle stretching to encourage range of motion, by gently taking the infant's arm and moving it past her midline to the other side. The same thing can be done with her legs. These cross-lateral (moving across the center of the body) movements also help encourage using both sides of the body and will be important for later skills such as crawling and walking. Talking or singing to an infant during interactions also provides language stimulation and promotes a warm and responsive relationship. Holding a small toy that squeaks where the infant can kick at it while encouraging her to "kick, kick, kick" and squeak the toy helps her discover the joy of having an effect on her world.

After completion of the diapering process, this may be a good time to introduce some "tummy time" so she can practice developing her muscles in that position. Infants who do not have enough tummy time may have delayed motor development and fail to participate in age-appropriate physical activity (Majnemer & Barr, 2005). By 2 months of age, infants should accumulate at least 30 minutes of tummy time daily during his or her waking hours. Caregivers can facilitate play in this position by providing interesting things for infants to look at and touch while on their tummy.

To support nonmanipulative skills during tummy time (e.g., pushing up on extended arms or pivoting on the stomach), place a desired object slightly out of reach so that the

infant has to stretch to reach it. Placing the object to one side encourages the infant to transfer weight to one hand or arm to reach with the other. Using scrunches, bright socks, or commercially purchased wrist and ankle bands can increase arm and leg activity. When an infant can sit up, place toys where they have to stretch, bend, and balance to reach to further encourage trunk control and coordination.

Caregivers can encourage manipulative skills by giving young infants a variety of objects that have different shapes, sizes, weights, and textures. Include some objects that make interesting noises. Older infants may be able to grasp large, soft toys with two hands. Asking infants to give back what they have grasped helps them learn to release. Give infants toys that are safe to drop and throw, and encourage them to do so.

The goal of embedding physical activity into young infants' routines is to give them the opportunity to build foundational motor skills, which are precursors to the more complex skills they will develop later. It also ensures that the adults in the infants' environment see opportunities for motor development as an essential part of the curriculum for infants.

### ***Mobile Infants: 8 to 18 Months***

From about 8 to 18 months is the exploratory stage: The focus is on movement (Lally & Mangione, 2006). Mobile infants are programmed to be active explorers who are captivated by what they see. Motor skills emerge and are refined with practice. Infants' motor skills need to be used and progressively challenged. They need practice in movements that challenge all areas of the body to develop age-appropriate motor skills. Think of planning for motor development as variations on a theme. The theme of movement is constant, but adults vary the experience by providing different toys and equipment to challenge the mobile infant, thus broadening his base of fundamental motor skills. Taking materials outside expands learning by providing different surface areas and the opportunity to move faster for longer periods. Enter into the infant's experience, and either increase the level of physical activity or increase the duration of the experience.

Support emerging motor skills in unstructured play by providing crawlers with moving toys that can be pushed and toys that move so they can creep or crawl after them. Support emerging walkers with pull toys and toys that give them some support as they walk, such as heavy baby carriages. Provide balls to push, kick, and retrieve. Put a wide tape line on the floor and encourage toddlers to walk it. Cue them to hold their arms out for balance. Adult participation makes structured physical

activity even more enjoyable and more likely to engage the children. For example, caregivers can have a "dance party" and provide suggestions for movement ("Can you move your arms like this?") while twirling around the room. Mobile infants can increase body and spatial awareness when they sway from side to side and front to back, and twist and turn to the music. Easy games of mirroring and "follow the leader" can encourage toddlers to stretch high, reach low, and jump up. Capitalize on toddler's love of imitation and their pleasure in your attention and active participation.

Manipulative skills develop as older infants and toddlers have experiences with finger foods, large crayons, large wooden beads, and "dump-and-fill" activities. Motor planning skills develop by precisely picking up and releasing objects; as part of rolling, kicking, and throwing large balls; and when building with cardboard blocks. Children at this age still explore objects by mouth-ing, so manipulative objects and toys should be large enough to prevent a choking hazard. However, small pieces of food, such as bits of cereal, provide safe opportunities to support fine motor skill development of the hands and fingers during mealtimes.

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### ***Toddlers: 16 to 36 Months***

If children become proficient at a particular skill such as riding a tricycle, they are more likely to engage in the activity. Thus, caregivers should ensure that toddlers are exposed to a wide variety of experiences that provide opportunities to develop motor skills. If young children do not develop these skills, they may avoid activities that require them as they get older (Graham et al., 2005). If toddlers are to acquire 30 minutes of structured moderate to vigorous physical activity, the daily schedule should reflect this commitment. There are a variety of ways to do this. For example, full-day programs can schedule 10 to 20 minutes of creative movement each day and also schedule four to seven times for planned energetic play of approximately 3 minutes each. Music and adult participation maintain the energy level.

Maturation plays a role in whether toddlers are capable of performing an activity, but they also need practice and coaching to attain effective motor skills (Pica, 1995).



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Safe physical challenges give the satisfaction and love of movement. Toddlers also learn cognitive concepts about *how* they are moving (fast, slow; high, low; forward, backward; stopping, going) and *where* they are moving (over, under; up, down; in front of, behind). They can carry large toys as they walk, walk a wide line, walk on tiptoes, and run. Toddlers need a developmentally appropriate environment to practice these skills and adult scheduling and facilitation to become more skillful.

Toddlers also need to practice nonmanipulative or stability skills. Muscle and joint stability is a prerequisite for control of fine motor skills. It is difficult for toddlers to perform fine motor tasks, such as buttoning or using crayons or markers, without the necessary trunk stability. Toddlers need many experiences with turning, twisting, bending, and stretching to develop these skills. Games such as "follow the leader" can encourage toddlers to stretch as high as they can and wave like a tree in the breeze, bend their knees so their hands touch the ground (crouch), then spring like a tiger. Other simple routines that use these skills include twisting to music, rolling like a log (keep legs together, arms overhead or close to chest), or doing yoga designed for young children, which encourages toddlers to stretch and balance on different body parts.

Toddlers are developing new manipulative skills. To practice manipulative skills, toddlers need to play with balls and other materials that differ in size, weight, shape, texture, and other relevant qualities. This allows them to extract the underlying principles of effort: how the body moves and the effect of that movement (Graham et al., 2005).



PHOTO: ANDREA BOOTHER

## Healthy Eating Habits

**T**HE INFANT and toddler years provide the opportunity to target nutritional messages and develop healthy eating habits (Mennella et al., 2006). Infants under 1 year old get most of their needed nutrients from breast milk or formula, although solid food provides important supplements in the latter part of the first year (Gavin, Dowshen, & Izenberg, 2004). From about 12 to 21 months, infants and toddlers try to put everything in their mouths, making it a great time to learn to accept and enjoy healthy foods. By 24 months, toddlers can recognize, eat, and enjoy 100 to 200 healthy foods (Roberts & Heyman, 2000).

To help children establish healthy eating habits, adults should choose meals and snacks wisely. A healthy diet for children under 3 years of age includes fruits; vegetables; whole grain foods and bread; fluid milk products; and meat and meat alternatives, including some unsaturated fat (U.S. Department of Health and Human Services & U.S. Department of Agriculture, 2005). These foods give children the nutrients necessary for growth and brain development, as well as healthy weight maintenance. In the real world, children as young as age 2 are more likely to choose foods they have seen advertised on television (Henry J. Kaiser Family Foundation, 2004). The most common food advertisements during children's shows are for presweetened breakfast cereals and high-sugar foods (Byrd-Bredbenner, 2002). The 2002 Feeding Infants and Toddlers Study (Fox, Pac, Devaney, & Jankowski, 2004) found that 18% to 33% of infants and toddlers consumed no discrete servings of fruits or vegetables on a given day. French fries were the most common vegetables

consumed by toddlers. According to the study, some type of dessert, sweet, or sweetened beverage was consumed by almost half of 7- to 8-month-olds, and this percentage increased with age.

Most nutrition interventions for infants and toddlers target caregivers and changing feeding practices and children's diet (e.g., Horodyski, Hoerr, & Coleman, 2004). When educators embed nutrition information and healthy eating practices into daily play and eating experiences, infants and toddlers can increase their nutritional knowledge and improve self-regulation skills. Early care and education programs can help mobile infants and toddlers identify and eat healthy food when caregivers provide healthy choices of foods and beverages and allow toddlers to choose how much and what to eat. Caregivers can also talk to toddlers about the food they are eating during the daily routines of snacks and meals, as well as during play. A program of parent education can encourage parents to promote healthy eating at home.

Between-meal snacks provide about 25% of toddlers' daily energy intake (Skinner, Ziegler, Pac, & Devaney, 2004). Combinations of foods high in nutrients and low in calories, such as fruits, whole wheat crackers, nonfat or low-fat cheese cubes, or yogurt are good choices for snack time. Milk and water are good beverage choices. Caregivers should provide fruit juice in moderation because of the high sugar content. Older infants and toddlers enjoy fun snacks such as dipping small pieces of fruit into low-fat yogurt or spreading low-fat cream cheese or hummus on a plain rice cake or whole-wheat cracker and then making faces with small cut up pieces of fruit (be sure to cut grapes in half to avoid choking). Snacks and meals

should have balance, variety, contrast, color, and eye appeal. They are also an opportunity to introduce new foods. The variety of fruits that infants and toddlers eat predicts acceptance of fruit variety when they reach school age (Skinner, Carruth, Bounds, Ziegler, & Reidy, 2002).

Eating is also about relationships. Family-style meals teach toddlers how to serve themselves as they sit at tables with their caregivers and peers. They learn to pour a small amount of liquid in their cup and take the designated amount of food for their meal or snack. They learn about portion size and rules for "seconds," as well as table manners. Snack-time talk helps toddlers learn about fruits, vegetables, and grains and helps them enjoy the snacks they eat and how to talk with each other.

Caregivers can also use play to teach healthy habits. For example, using music and songs while washing plastic fruits and vegetables in a water table or basin helps toddlers learn about washing fruits and vegetables before eating them:

*This is the way we wash our fruit,  
Wash our fruit, wash our fruit,  
This is the way we wash our fruit before  
we're going to eat it.*

As they gain experience, the children can help wash the fruits and vegetables for meals. Children's literature provides another opportunity to talk about foods. Choose books with colorful pictures of food or themes that address eating and food (e.g., *The Very Hungry Caterpillar* or *Bread and Jam for Frances*).

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***[Embedding] nutrition information and healthy eating practices into daily play and eating experiences can increase their nutritional knowledge and improve self-regulation skills.***

Toddlers are ready to learn to classify foods. Rather than teach children that certain foods are "bad," explain how frequently different types of foods should be eaten. The U.S. Department of Health and Human Services and the National Institutes of Health (2005) classifies foods as **GO** foods (eat almost anytime), **SLOW** foods (eat sometimes, at most several times a week), and **WHOA** foods (eat only once in a while or for special treats).

Caregivers can teach this concept by taking photographs of the foods that the tod-

children eat or cut pictures of them out of food circulars. Then, make a green sign for GO foods, a yellow sign for SLOW foods, and a red sign for WHOA foods. Help children and their parents identify and then classify the foods they eat by placing the pictures into the different categories. Use this list to classify meals and snacks served at the early care and education setting as well. Children can also sort these photographs by types and colors of food, and older toddlers can count the fruits and vegetables or make patterns with them.

## Conclusion

**E**ARLY CARE AND EDUCATION settings provide an opportunity to practice and teach healthy patterns of exercise and nutrition, but there are challenges. Some cultural beliefs support and prefer chubby babies. Some people do not believe that prevention programs should start with infants and toddlers. There is also concern that caregivers might begin to water down formula for infants who are thought to be overweight.

Other challenges revolve around the adults in the child's environment. Two thirds of adults are overweight, and half of those who are overweight are obese (Flegal, Carroll, Ogden, & Johnson, 2002; Centers for Disease Control and Prevention, 2007) Although they may believe in the prevention of early childhood obesity, they may find it difficult to get down on the floor (and back up) to play with babies on their tummies. They may find it challenging to model vigorous physical activity (e.g., dancing or running for several minutes) for children because this is taxing for them. Supporting healthy eating for infants and toddlers may encourage caregivers and parents to reflect on their own diet and that of their family and the long-term changes they may need to make in their own lifestyle. These are very personal and difficult issues that require resources and ongoing support.

Program directors should be aware of these challenges and think about creative ways of supporting staff and parents as they support infants and toddlers in moving more and eating healthier foods. Rather than think-

ing only about how to support healthy habits for infants and toddlers, we may also need to consider how the health and well-being of those who care for very young children also affects children's care and development. ♣

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## Learn More

### WE CAN! INITIATIVE OF THE NATIONAL INSTITUTES OF HEALTH

[www.nhlbi.nih.gov/health/public/heart/obesity/wecan/whats-we-can/resources\\_parents.htm](http://www.nhlbi.nih.gov/health/public/heart/obesity/wecan/whats-we-can/resources_parents.htm)

The National Heart, Lung, and Blood Institute (NHLBI) Obesity Education Initiative focuses on the prevention of overweight and obesity in both children and adults through community action, strategic partnership development, and national outreach. The National Institutes of Health has developed materials for families and communities, including a curriculum that teaches parents and caregivers about the do's and don'ts of "Energy Balance"; a community toolkit for program planners with steps for offering We Can! in their communities; and a program Web site that offers the program materials to the public.

### I'M NOT A BABY ANYMORE: TIPS FOR FEEDING TODDLERS

2004. 11 min (\$69.95 VHS and DVD).

Produced by Lemon-Aid Films, 85 Rangeway Road, Building One, North Billerica, MA 01862. Tel.: 978-667-3335. Web site: [www.lemonaidfilms.com](http://www.lemonaidfilms.com).

This video is designed to educate parents about the importance of feeding toddlers a healthy and varied diet. Viewers will learn which foods, and how much, make up a well-balanced toddler diet. They will also learn about mealtime do's and don'ts, the best way to introduce new foods, and which beverage choices are the healthiest for toddlers. Interviews with three moms from diverse cultural backgrounds are woven throughout the video. English, Spanish, and Vietnamese versions available

### BEVERAGE BASICS: FOR HEALTHY FAMILIES

2006. 8 min (\$69.95 VHS and DVD).

Produced by Lemon-Aid Films, 85 Rangeway Road, Building One, North Billerica, MA 01862. Tel.: 978-667-3335. Web site: [www.lemonaidfilms.com](http://www.lemonaidfilms.com).

From toddlers to teens, many of today's children now consume too many sugary soft drinks, juice drinks, and sports drinks and not enough water, lowfat milk, and other calcium-rich beverages. Drinking too many high-calorie beverages may be a contributing factor in the rising rates of obesity and overweight among children and adults. This video offers some practical tips for weaning babies from the bottle, outlines the latest portion

size guidelines for juice and milk, and illustrates the amount of sugar in common beverages.

### THE WEIGHT OF OBESITY ... A BALANCED REALITY

2005. 57 min (\$229 VHS; \$249 DVD).

Produced by Mickey Freeman. Available from Fanlight Productions, 4196 Washington Street, Boston, MA 02131. Tel.: 800-937-4113. Fax: 617-464-4999. Web site: [www.fanlight.com](http://www.fanlight.com).

This documentary takes an accessible, nonclinical approach that communicates the serious consequences of obesity while offering strategies for change. It explores several aspects of the crisis.

- (a) **The Family Meal:** Pressured by fast-paced jobs and the need for two wage earners to raise a family, parents spend less and less time with their children. One of the first casualties of our economy's pressures on families is the nurturing connection provided by the traditional family meal.
- (b) **Self-Esteem:** The effect of negative messages in the media, in social situations, and from family.
- (c) **Nutrition and Exercise:** Providing good information about eating habits and finding pleasurable physical activities.
- (d) **Television:** The benefits of turning off the television.

## References

- BYRD-BREDBENNER, C. (2002). Saturday morning children's television advertising: A longitudinal content analysis. *Family and Consumer Sciences Research Journal*, 30(3), 382-403.
- BUTTERFIELD, P. M. (2002). Child care is rich in routines. *Zero to Three*, 22(4), 29-32.
- CENTERS FOR DISEASE CONTROL AND PREVENTION. (2007). *Overweight and obesity: Trends*. Retrieved June 13, 2007, from [www.cdc.gov/nccdphp/dnpa/obesity/trend/](http://www.cdc.gov/nccdphp/dnpa/obesity/trend/)
- CUBED, M. (2002). *The national economic impacts of the child care sector*. Washington, DC: National Child Care Association. Retrieved January 30, 2007, from [www.nccanet.org/NCCA%20Impact%20Study.pdf](http://www.nccanet.org/NCCA%20Impact%20Study.pdf)
- FLEGAL, K. M., CARROLL, M. D., OGDEN, C. L., & JOHNSON, C. L. (2002). Prevalence and trends in obesity among U. S. adults, 1999-2000. *Journal of the American Medical Association*, 288, 1723-1727.
- FOX, M. K., PAC, S., DEVANEY, B., & JANKOWSKI, L. (2004). Feeding Infants and Toddlers Study: What foods are infants and toddlers eating? *Journal of the American Dietetic Association*, 104(1), 22-30.
- GAVIN, M. L., DOWSHEN, S. A., & IZENBERG, N. (2004). *Fit kids: A practical guide to raising active and healthy children—from birth to teens*. New York: DK Publishing.
- GRAHAM, G., HOLT-HALE, S. A., & PARKER, M. (2005). *Children moving: A reflective approach to teaching physical education* (7th ed.). New York: McGraw-Hill.
- HEINZER, M. M. (2005). Obesity in infancy: Questions, more questions, and few answers. *Newborn and Infant Nursing Reviews*, 5(4), 194-202.
- HENRY J. KAISER FAMILY FOUNDATION. (2004). *The role of media in childhood obesity* (Issue Brief). Menlo Park, CA: Author.
- HORODYNSKI, M. A., HOERR, S., & COLEMAN, G. (2004). Nutrition education aimed at toddlers: A pilot program for rural, low-income families. *Family and Community Health*, 27(2), 103-113.
- LALLY, J. R., GRIFFIN, A., FENICHEL, E., SEGAL, M., SZANTON, E., & WEISSBOURD, B. (1997). Development in the first three years of life. In S. Bredekamp & C. Copple (Eds.), *Developmentally appropriate practice in early childhood programs* (Rev. ed., pp. 55-69). Washington, DC: National Association for the Education of Young Children.
- LALLY, J. R., & MANGIONE, P. (2006). The uniqueness of infancy demands a responsive approach to care. *Young Children*, 61(4), 14-20.
- MAJNEMER, A., & BARR, R. G. (2005). Influence of supine sleep positioning on early motor milestone acquisition. *Developmental Medicine and Child Neurology*, 47, 370-376.
- MENNELLA, J. A., ZIEGLER, P., BRIEFEL, R., & NOVAK, T. (2006). Feeding Infants and Toddlers Study: The types of foods fed to Hispanic infants and toddlers. *Journal of the American Dietetic Association*, 106(Suppl. 1), S96-S106.
- NATIONAL ASSOCIATION FOR SPORT AND PHYSICAL EDUCATION. (2002). *Active start: A statement of physical activity guidelines for children birth to five years*. Reston, VA: National Association for Sport and Physical Education Publications.
- PICA, R. (1995). *Experiences in movement with music, activities and theory*. Albany, NY: Delmar Publishers.
- ROBERTS, S. B., & HEYMAN, M. B. (2000). How to feed babies and toddlers in the 21st century. *Zero to Three*, 21(1), 24-28.
- SKINNER, J. D., CARRUTH, B. R., BOUNDS, W., ZIEGLER, P., & REIDY, K. (2002). Do food-related experiences in the first 2 years of life predict dietary variety in school-aged children? *Journal of Nutrition Education and Behavior*, 34(6), 310-315.
- SKINNER, J. D., ZIEGLER, P., PAC, S., & DEVANEY, B. (2004). Meal and snack patterns of infants and toddlers. *Journal of the American Dietetic Association*, 104(1), 65-70.
- STUNKARD, A. J., BERKOWITZ, R. I., SCHOELLER, D., MAISLIN, G., & STALLINGS, V. A. (2004). Predictors of body size in the first 2 years of life: A high-risk study of human obesity. *International Journal of Obesity*, 28(4), 503-513.
- U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES & U.S. DEPARTMENT OF AGRICULTURE. (2005). *Dietary guidelines for Americans 2005*. Retrieved June 22, 2007, from [www.health.gov/dietaryguidelines/dga2005/document/](http://www.health.gov/dietaryguidelines/dga2005/document/)
- U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES AND THE NATIONAL INSTITUTES OF HEALTH. (2005). Live it: Go, slow, and whoa foods. Retrieved June 29, 2007, from [www.nhlbi.nih.gov/health/public/heart/obesity/wecan/live-it/go-slow-whoa.htm](http://www.nhlbi.nih.gov/health/public/heart/obesity/wecan/live-it/go-slow-whoa.htm)
- WARD, D. S., SAUNDERS, R. P., & PATE, R. R. (2007). *Physical activity interventions in children and adolescents*. Champaign, IL: Human Kinetics.