

Movement is essential to enhance infants' brain development and the establishment of neurological pathways. These practical ideas suggest ways to incorporate activities and toys into everyday caregiving routines.

On the Move: Environments That Stimulate Motor and Cognitive Development in Infants

Christy Isbell and Rebecca Temple Isbell

From the first moments of life, infants begin the exciting journey to gain control of their bodies. These beginning movements are an essential way of playing and learning for infants. During their first year, infants learn more motor skills than at any other time in their lives. Infants who are encouraged to experiment with different ways of moving gain essential information about their environment: objects, materials, and people (Thompson, 2001). Infants' growing motor abilities help expand their world in many domains, including cognition, social-emotional, sensory, and language (Schiller, 2003).

Brain research has revealed that the motor area of an infant's brain is developing at a rapid rate between birth and 2 years of age (Restak, 2001). Activity during this sensitive period provides the foundation for motor skills that will be used throughout life (Jensen, 2005).

It is essential for caregivers to understand the importance of movement and how it impacts infants' brain development and the establishment of neurological pathways (Leppo, Davis, & Crim, 2000). Babies who spend too much time in cribs, highchairs, swings, or other confining equipment will not develop adequately (Sorgen, 1998). Environments should be designed so infants are introduced to a variety of developmentally appropriate activities that will encourage their achievement of motor competency (Gallagher, 2005).

One of the ways that infants learn is by examining and handling objects. By trying different ways to move themselves to objects and to manipulate objects, infants begin their first experiments with cause and effect. At first, infants put their hands in their mouths, grasp their

Babies develop at their own rates.

feet, and blow "raspberries." With practice, they begin to bang, push, pull, and take objects apart.

Infants are learning many gross motor skills during the first year.

These are highlights of those milestones:

- In the first 2 months of life, many infants lift and turn their heads while lying on their stomachs.
- By 6 months of age, most infants sit independently and are able to roll.
- At 9 months, many babies are practicing the challenging movement of crawling.
- Next, infants learn to pull up, stand, and cruise along furniture or other objects.
- Accomplishing these motor skills is the foundation for independent walking, which the majority of babies achieve sometime after their first birthday

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Different floor heights encourage standing, pulling up, and cruising. Risers at appropriate heights enable infants to stand securely and cruise. Placing interesting objects on the carpeted riser provides another incentive for both cruising and manipulation.

(Alexander, Boehme, & Cupps, 1993).

- Most infants become mobile, able to move from one place to another between 6 and 14 months. During this period, infants may move in many different ways, including rolling, scooting, crawling, or cruising.

Infants should spend many of their waking hours on the floor.

Spaces That Encourage Motor Learning

When designing play spaces for infant care in groups, each infant's chronological and developmental age must be considered. Babies are at different levels of development, even if they are very close in chronological age.

For instance, Jeremiah may begin

cruising around furniture at 8 months of age, which is developmentally early, while another 8-month-old, Cassandra, may be rolling from place to place. Each of these infants needs different challenges in their spaces. To meet the needs of these two mobile infants, the motor space in an infant room should include a variety of surfaces and surface heights. Jeremiah needs a variety of heights to practice cruising, while Cassandra needs a soft, impact-absorbent surface where she can roll safely.

Babies develop at their own rates. The range of typical motor development and achievement of milestones is wide. Many genetic and environmental factors must be considered. Some infants are born with lean bodies and good muscle tone, which may encourage acquisition of motor skills. Other babies may be large and have more difficulty moving their bodies than the lean-bodied babies. In addition, infants tend to focus on one or two areas of development at

a specific time. For example, Lucas may concentrate on learning to crawl and be less interested in communicating with others. After he has conquered crawling, he may begin developing additional language skills (Isbell & Isbell, 2003).

Movement activities should be frequent parts of infants' daily routines. For example, well-informed caregivers sing while changing diapers and, after explaining what they are going to do, might move children's legs from side to side with the rhythm of the song. Or, with children's awareness of the activity, teachers could gently bend their knees to the beat of the music. At mealtime, place the food on a low table and encourage mobile infants to move themselves to the meal. Outside on the playground, a mound covered with grass facilitates safe rolling and crawling, both forward and backward.

During the day, it is critical that infants spend many of their waking hours on the floor, where they can move around and practice their motor skills. An open and safe floor area allows infants the freedom to move their bodies in many different ways. The space works best if it is large enough for a few infants and adults to move around at one time. It should be located away from cribs or sleeping areas, because movement encourages infants to make noise.

Follow infants' leads.

The space designated for motor learning should have a firm, impact-absorbent surface, to facilitate safe exploratory movements. Carpet, area rugs, and floor mats are excellent methods for adding cushioning to a floor. Blankets are another inex-



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An effective learning space provides infants with a variety of opportunities to practice their evolving motor skills repeatedly. Low, unbreakable mirrors on the wall allow babies to watch themselves move and enjoy repeating their actions.

pensive option that can provide comfortable and washable places for babies to have tummy time. Firm pillows of varying sizes and fabric coverings give infants soft spots to land. These pillows also may be stacked to expand challenges for infants who are crawling and standing.

Babies learn motor skills through repetition.

The motor space should include different floor heights to encourage standing, pulling up, and cruising. Risers at appropriate heights enable infants to stand securely and cruise. Placing interesting objects on the carpeted riser provides another incentive for both cruising and manipulation (Isbell & Isbell, 2003).

Babies learn each motor skill through repetition, which is often referred to as practice play (Piaget, 1963). For example, babies may practice pulling up on a couch or riser hundreds of times before they are able to accomplish this skill. Often, they will continue to repeat the movement, even after mastering the skill, perhaps to celebrate their success. An effective learning space provides infants with a variety of opportunities to practice their evolving motor skills repeatedly.

Low, unbreakable mirrors on the wall allow babies to watch themselves move and enjoy repeating their actions.

Suitable Toys Encourage Development

Safe and developmentally appropriate toys enable infants to manipulate these objects as they pull, push, climb, stand, cruise, and walk. These are some examples.

- Activity gyms, push and pull toys, and riding toys encourage gross motor skills and cause-and-effect learning opportunities.
- Large, squishy balls in a variety of sizes, such as beach balls or exercise balls, are open-ended and are favorites of many

mobile infants.

- Boxes, baskets, or large plastic containers for ball play extend infants' involvement and provide new challenges as they place balls into the containers and then empty them.
- Unusual materials, such as sticky-backed paper, pieces of shiny fabric, and small sheets of bubble wrap encourage touching and moving.
- Musical toys, and other toys that are responsive to infants' movements, provide an incentive for them to continue to explore while rewarding their involvement.

Carefully select a few developmentally appropriate toys or objects for mobile infants to play with at any one time. Avoid too many choices, which will overwhelm infants and discourage focused attention. When infants become accustomed to objects or materials in their environment, they may become disinterested and are less likely to participate in movement opportunities. Alternate toys and materials that are offered to babies during the week. Careful observation will determine each infant's interest and participation level so that new objects may be added when needed.

Offer open-ended motor experiences.

The positioning of toys and objects in the room also affects mobile infants' motor development. Placing toys slightly out of the reach of mobile infants encourages them to move to get the objects. For instance, if babies are beginning to pull to standing, place objects on

low tables. Observe as infants try to get the objects. If the toys are too far away, infants will give up. If they are too close, infants quickly become bored. If the challenge is just right, infants will want to repeat the tasks again and again. Follow infants' leads. When they tire of an activity, move on to something else.

Designing a Motor Learning Space

A Motor Learning Space is a carefully designed environment where materials and activities are grouped together. This area and equipment allows infants to explore with their bodies in ways that match their developing motor abilities. Mobile infants are able to move to learning spaces on their own, enabling them to influence their environment. The opportunity to make a personal selection of materials increases the possibility of focused attention and persistence on motor tasks. A Motor Learning Space gives infants adequate space and responsive objects to encourage their motor development in meaningful ways.

In a Motor Learning Space, infants have the opportunity to achieve objectives such as these:

- develop gross motor coordination
- enhance body strength
- increase exploration of the environment through movement and interactions
- repeat and refine skills
- learn the properties of objects and materials
- gain confidence in motor abilities

The Motor Learning Space should include activities and props that provide a “just right” challenge



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Encourage infants to look at the pictures and move an oatmeal container covered with familiar photos. This activity provides opportunities for infants to push and roll photos, while moving to view or retrieve the container.

for individual infants. These experiences should be open-ended, so they adapt and respond to the interests and needs of each infant. Children's families are usually happy to share ideas about the types of movement and equipment their children enjoy most at home, and these activities can also be incorporated into the space. These are a few examples of activities and props to include in a Motor Learning Space.

Bouncing Babies: Caregivers gently bounce an infant on their knees while singing or playing rhythmic music. Begin with easy,

rhythmic bouncing. When infants are ready, move toward more excited bounces. Include words to describe the movement such as, “bounce, bounce, and bounce” or “up and down.”

Light in the Box: Find a large cardboard box, iridescent self-stick paper, and a flashlight with an easy-to-operate switch such as a push button. Cut off one side of the box. Cover the inside of the box with the sticky paper. Show the infant how to turn the flashlight off and on. Place the flashlight inside the box. A mobile infant can move inside the

box and use the flashlight to make reflections. The beam of light also will respond to movement, encouraging activity.

Ball Play: Collect a number of soft rubber or plastic, lightweight balls of various sizes, such as beach balls, sponge balls, kick balls, nubby balls, or exercise balls. Sit on the floor a few feet away from one or more infants. Roll the ball to infants and ask them to roll it back or to each other. Sing or describe the play, "You roll the ball to me. I roll the ball to you."

At first, the ball may stick to their fingers or slip out of their hands. Encourage them to keep trying. If the ball rolls away, encourage infants to roll, crawl, or walk to get it. After retrieving the ball, resume the game. During this activity, infants use motor skills and learn about the properties of balls, which enhances both physical and intellectual development.

Rolling Photos: Collect a large oatmeal container with a lid, several photographs of the infants and/or their families, and both clear and colored self-stick paper. Cover the container and lid with colored paper. Securely tape pictures to the container. Cover the entire container with clear self-stick paper. Encourage infants to look at the pictures and move the container. This activity provides opportunities for infants to push and roll photos, while moving to view or retrieve the container.

Dangling Objects: Select objects that are suitable for hanging from the ceiling or a sturdy bookcase. Attach objects, such as beach balls, soft books, or scarves from the ceiling of the room with string, yarn, or elastic. Suspend objects close

enough to the floor so that infants can touch, pull, hit, and shake them. **Make sure the toys are slightly higher than the infants' heads, so they do not pose a choking or tripping hazard. Objects should be securely fastened to the ceiling and checked periodically for safety. Attentive adult supervision is essential at all times.** The hanging objects encourage infants' movements in new ways, as they visually focus on the moving target and watch the response.

Follow Up on Books: Many board books inspire movement (see sidebar). Share them with infants and encourage appropriate actions. After infants are familiar with the pictures, text, and movements, add the books to the Motor Learning Space. Infants can then experience the books and accompanying activities at their own pace.

Mobile infants want to move and enjoy participating in the process of everyday experiences. By designing and setting up an environment that encourages developmentally appropriate motor activity, infants become more competent in using their bodies, and expand their cognitive abilities at the same time. Providing carefully selected materials and open-ended props enables babies to make movement choices based on their individual preferences. Opportunities to select and move in individual ways build confidence and feelings of self-worth, while promoting movement skills that infants will use the rest of their lives.

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Children's Books That Inspire Movement

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Put These Ideas Into Practice!

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Subjects & Predicates

Play ball with infants (6-14 months)

Offer a variety of balls

- beach balls
- kick balls
- tennis balls
- nubby balls
- large exercise balls
- fabric balls
- rubber balls

Ways to use balls

Infants choose the balls that are of interest to them. Demonstrate how to move balls

- Roll back and forth
- Drop the ball
- Toss the ball
- Push the ball
- Roll on the ball
- Bounce on the ball

Use language to describe the balls and how their actions after movement of the balls

Encourage infants to participate in interactive ball play
Hang ball from ceiling, just above head height

Offer cardboard or plastic containers for children to

- put the balls in
- take the balls out
- dump the balls
- fill another container with balls
- stir the balls with arms
- climb in the balls

Motor skills that babies learn by moving

- Crawl • Creep • Push
- Pull • Carry • Roll • Toss
- Cruise • Hand to hand
(transferring objects from
one hand to the other)

Cognitive skills that babies learn through movement

- Knowledge about the properties of objects
- Cause and effect
- Similarities and differences among objects
- Responsiveness of materials
 - New vocabulary
 - Ability to influence environment
 - Confidence in abilities

Note: *Dimensions of Early Childhood* readers are encouraged to copy this material for early childhood students as well as teachers of young children as a professional development tool.