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Amaury Samalot-Rivera
The College at Brockport, asamalot@brockport.edu

Lauren j. Lieberman
State University of New York College at Brockport, llieberman@brockport.edu

Pamela Haibach
State University of New York College at Brockport, phaibach@brockport.edu

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have low vision. While you are enjoying these stories of successful teaching, consider how your own teaching successes might be shared with readers in a future Practice Perspectives.

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Jane N. Erin, Ph.D., *associate editor for practice,* JVIB, *and retired professor, Department of Special Education, Rehabilitation, and School Psychology, College of Education, University of Arizona, P.O. Box 210069, Tucson, AZ 85721; e-mail: <jerin@u.arizona.edu>.*

Teaching Two Critical Locomotor Skills to Children Who Are Blind or Have Low Vision

Amaury Samalot-Rivera,
Lauren J. Lieberman, and Pamela Haibach

Alexandria has retinopathy of prematurity. While attending elementary school, she received the services of a teacher of visually impaired students, an adapted physical education teacher, and an orientation and mobility instructor. Her instructors praised her running and never provided any constructive feedback on the movement patterns of her running, so Alexandria assumed that she was running with proper form.

It was not until Alexandria advanced to middle school that a physical educator informed her that she had a shuffling gait and needed to swing her arms while running. Through tactile modeling and physical guidance, Alexandria's gait improved dramatically; however, she was embarrassed that her form was not corrected at a younger age.

Table 1
Locomotor developmental sequence.

Locomotor skill	Age of onset
Running	6 months after walking
Jumping	2 years
Galloping	2–3 years
Hopping	3–4 years
Sliding	3–4 years
Skipping	4–7 years

Alexandria's story is not uncommon. The purpose of this report is to highlight the importance of the development of locomotor skills at a young age in children with visual impairments (that is, those who are blind or have low vision). The authors of this paper have many years of experience teaching, coaching, and conducting research related to locomotor skills and sports with children who are visually impaired. The strategies outlined in this report have been used in physical education classes, clinics, early childhood programs, and sports camps.

Fundamental motor skills need to be developed during childhood to maximize a child's future performance and capability in sport and recreational activities. Children with visual impairments achieve motor milestones and walk independently at a significantly older age than their sighted peers. The developmental sequence for locomotor skills is running, jumping, galloping, hopping, sliding, and skipping. Table 1 presents the typical age of onset for each of these skills in children.

Children with visual impairments often have delays in the performance of motor skills in comparison with their sighted peers. Significant improvements in motor skills is typical in sighted children as they age; however, the literature reveals that older children with visual impairments performed at the same level as younger children with visual impairments (Haibach, Wagner, & Lieberman, 2014; Houwen, Visscher,

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Table 2
Teaching strategies to improve running related to each component of the run.

Task analysis	Common performance of students with visual impairments	Teaching strategies to improve performance
1. Keeps elbows bent	Often arms are straight down or extended out to the front	Have student feel the bent elbow of a peer as a tactile model.
2. Moves arms back and forth from shoulders (without crossing midline) in opposition to legs	Arms are stationary or have limited movement; are extended out front; or alternatively cross the midline	Using long poles, hockey sticks, or brooms, teacher and student face the same direction, with the teacher behind the student holding each end; the teacher moves the poles forward and back so the student can feel the running arm motion.
		Elliptical machines elicit the forward and back arm motion similar to running. Have the student utilize the motions on the elliptical to understand this motion.
3. Both feet are off the ground for a short period of time	Shuffling gait	Take two paper plates, put beans inside, and tape them together. The child holds them with both hands at waist level and starts marching with knees touching the plates. The timing should get faster as the child becomes more proficient at lifting his or her knees.
		Have the child use a treadmill at a speed just faster than a shuffle to help him or her grasp the idea of the flight phase. This should be done slowly, with caution, and a lot of verbal feedback to ensure comfort and safety.
4. Foot hits the ground lightly (landing between heel and midfoot) then quickly rolls forward (not flat footed)	Running with flat feet or "toe running"	Seated in a chair, explain to the student at the same time you provide physical guidance on the correct way to land feet when running (heel first, then roll forward). Then provide verbal prompts to the student so he or she can combine it with the technique mentioned in point three.
5. Support foot lands directly underneath the body with knee slightly bent	Unbalanced; body weight shifts laterally rather than forward; knee completely extended	Use tactile modeling (instructor allows the child to feel the correct position) so the child can feel how this part of the run is supposed to occur. Then have the instructor or a peer move the child in the correct position so the child understands the skill required.
6. Nonsupport leg is bent approximately 90 degrees	Knees are bent from 180–135 degrees (rarely bent to 90 degrees)	Use tactile modeling to show the student how the leg is supposed to bend during the run. Then have the child run on a treadmill at a speed that forces his or her leg to go to the 90-degree position.
		This should be done slowly, with caution and a lot of verbal feedback to ensure comfort and safety.
7. Head is kept up and straight	Head is tilted forward or to the side with eye gaze at the ground	Use tactile modeling and physical guidance techniques. Provide verbal reinforcement to maintain good posture.

Lemmink, & Hartman, 2008). Delays for children with visual impairments are often dependent upon the severity of the visual impairment, and the most significant delays have been found in children who are congenitally blind (Wagner, Haibach, & Lieberman, 2013).

In running, for example, many children with visual impairments do not perform any of the running components, including the period of time when both feet are off the ground (flight phase) (see Table 2) (Wagner et al., 2013). In essence, these children are not running at all, but rather are walking quickly. Running is considered a natural skill that develops with increased practice and speed (Ferrell, 2011), but the developmental delay

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in children with visual impairments emphasizes the importance of vision in the development of running. Many children with visual impairments are unable to observe and imitate the running form of other children and have a limited sense of their body position in space without additional tactile instruction (that is, tactile modeling or physical guidance) on how to propel the body off the ground for a brief period of time and how to land with the opposite foot.

Children with visual impairments may need some additional instruction in regard to swinging the arms in opposition to the legs. For example, some children may interpret arm swinging as moving the arms back and forth across the body as opposed to moving forward and backwards in the same plane as their legs.

This article provides strategies to teach the locomotor skills of running and sliding to children with visual impairments. Running is a foundation of many sports and sliding is a key skill used in blind sports such as goalball and beep baseball, as well as in popular sports such as basketball and wrestling.

Instructional strategies

Lieberman, Ponchillia, and Ponchillia (2013) concluded that children with visual impairments need increased opportunities to develop motor skills in comparison to their peers. An effective approach to teaching these skills is the whole-part-whole approach, which consists of: (a) presenting the entire activity first; (b) breaking down the activity into components (task analysis), which are demonstrated and practiced; and (c) then completing the whole activity or skill. For example, Alexandria, our student from the introductory scenario, was taught sliding during her physical education preteaching time with her paraeducator and her mobility instructor. (Preteaching is the time before a new unit of instruction, when the student is familiarized to court dimensions, equipment, terminology, scoring, and strategy.) She felt her paraeducator execute the entire skill at a slower pace through tactile modeling, then she was given several opportunities to practice the skill with the strategies described below.

Figure 1. A teacher uses physical guidance to instruct a child on how to place his foot and bend his knee on his support leg while running.

Tactile modeling occurs when a student with visual impairment feels and explores tactilely the body of an instructor or a peer executing a given movement (O'Connell, Lieberman, & Petersen, 2006). Other effective teaching strategies for children with visual impairments are coactive movements and physical guidance. A *coactive movement* occurs when the instructor or peer and the child complete a movement together, with the instructor facilitating the proper movement. In *physical guidance*, the instructor or peer moves the child through the proper movements. Each technique must be infused with verbal instruction and specific verbal cues.

Running

Running is one of the most basic of locomotor skills, after walking, and is a component of many games, sports, and recreational activities. Learning how to run appropriately will help children with visual impairments in many ways. Table 2 presents a task analysis for running, the common performance of children with visual impairments, and teaching strategies.

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Table 3
Teaching strategies to improve various components of the slide.

Task analysis	Common performance of students with visual impairments	Teaching strategies to improve performance
1. Step sideways with one foot and move the other foot next to the lead foot	Turns to one direction and does more of gallop motion than sideways slide motion	Help the child understand the weight distribution by cuing the side of the body where their weight should be,"weight to right together, weight to left together. . . ."
2. Both feet should be parallel throughout the movement	Cross following foot over leading foot, losing balance	Using the same approach, tell the student to feel the other foot moving closer to the leading foot or say "close scissors."
		Have a teacher or a peer face the student holding hands with toes touching. Tell the student to follow the movement of the leading foot. Verbal cues like "open scissors, close scissors" or "step-together-step" can be used as verbal cues.
		Students can also slide along a balance beam close to and facing a wall so they can keep their feet parallel.
3. Keep the upper body straight	Body is bent forward, impeding proper movement and ease of locomotion	Once the student knows and performs the first two steps, using tactile modeling, let the student feel your upper body posture when moving, then provide time to practice with verbal and physical prompts.
		Slide with the back to the wall and cue the student while the back maintains contact with the wall
4. There should be a period in which both feet are off the ground during the side steps	Drags following foot to meet with lead foot; sometimes the following foot is not parallel to the lead foot	Using a guide wire at waist level, instruct the child to slide while holding two rings on the wire. Instruct the child to slide progressively faster until he or she is sliding with a flight phase. If the child still does not understand the flight phase, try tactile modeling to illustrate this component.
		A coactive movement option is to use a hockey stick or broomstick with both the instructor and the child facing each other holding the stick. The instructor and student both hold onto the stick, alternating hands. The instructor slides with the movement going faster and faster until they reach a flight phase. The child should be able to feel the flight component of the instructor's or peer's slide.

Instructional strategies to teach running

When presenting the skill of running to a child with visual impairment, an instructor first invites the student to feel the arm motion of a classmate or the instructor, then the leg motion, while providing a verbal explanation of what he or she is feeling. Once the student has a sense of how running is performed, the student should be provided the opportunity to run. The student should be encouraged to keep his or her head up and straight while running. The instructor should offer feedback in the form of physical guidance (see Figure 1) and consistent cues must be provided.

Next, two cones should be positioned 50 feet apart and with at least 8 to 10 feet of clear space beyond the second cone for a safe stopping distance, and a portable sound source should be placed near the far cone. Students should be prompted to run with a "ready, set, go!" start, which can be repeated and practiced as needed. If using a guide wire, the guide wire should be tied to two multipurpose game standards (telescoping poles fixed to heavy bases that are used in sporting activities), and a knot should be placed at 50 feet, so the carabiner catches on it and the runner still has 10 feet of guide wire to stop before

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hitting a standard. (See Lieberman et al., 2013, for specific details about how to set up a guide wire.) If using a tether (short rope or shoelace), the instructor or peer holds the tether as a sighted guide needs to run at an appropriate pace in order to facilitate the targeted components of the run. Cues can be provided while running with this technique.

Sliding

Sliding is a very important locomotor skill that can help children with visual impairments participate in sports. In goal ball, for example, proper defensive blocking requires a player to drop down or slide into a position on his or her side on the playing floor as the ball approaches as he or she attempts to stop it. This skill is also commonly used in other sports for blind people like beep baseball for defense when trying to field a ball. Table 3 presents a task analysis of the skill, the common performance of children with visual impairments, and strategies to improve each part of the skill.

Instructional strategies to teach sliding

When an instructor is teaching sliding, he or she should begin with coactive movements: (a) teacher and child face each other, toes touching, holding hands, and sliding coactively on carpet squares; (b) the child slides along the wall mimicking Spider-Man, with his or her heels maintaining contact with the wall; (c) the child practices the slide on a guide wire as the teacher provides verbal instruction; and (d) the child lines up with classmates to slide during physical education class, using the guide wire to slide independently. Feedback and consistent cues need to be provided.

Conclusion

Children with visual impairments have the same potential to reach gross motor milestones as do their sighted peers. In order for such milestones to be met, these children need to be taught with specific instructional strategies and provided opportunities to perform physical skills like running or sliding. The strategies outlined in this article facilitate appropriate running and sliding techniques that can lead to more advanced locomotor skills. The self-esteem and confidence brought about by these improved motor skills can help children with visual impairments lead more active and better quality lives.

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Amaury Samalot-Rivera, Ph.D., *assistant professor, Department of Kinesiology, Sport Studies and Physical Education, The College at Brockport, State University of New York, 350 New Campus Drive, Brockport, NY 14420; e-mail: <asamalot@brockport.edu>.* ***Lauren J. Lieberman, Ph.D.,*** *distinguished service professor, Department of Kinesiology,*

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Sport Studies and Physical Education, The College at Brockport, State University of New York; e-mail: <llieberm@brockport.edu>. ***Pamela Haibach, Ph.D.,*** *associate professor, Department of Kinesiology, Sport Studies and Physical Education, The College at Brockport, State University of New York,; e-mail: <phaibach@brockport.edu>. Address all queries to Dr. Samalot-Rivera.*

A New Synthesis of Sound and Tactile Music Code Instruction in a Pilot Online Braille Music Curriculum

Virginia A. Jacko, Jin Ho Choi, Audrey Carballo, Brian Charlson, and J. Elton Moore

Employment opportunities for persons who are severely visually impaired (that is, those who are blind or have severe low vision) are often extremely limited (Crudden, Sansing, & Butler, 2005; Moore, Wolffe, & McDonnall, 2010). Music and music-related careers have served as viable employment for many persons who are visually impaired (Jacko, Cobo, Cobo, Fleming, & Moore, 2010). Given the wide array of issues facing students with visual impairments who want to pursue careers in music and the expansion of online distance education programs, there is an ongoing need to enhance the training curricula that is used for such programs.

Instruction in music is no longer as common as it once was because of limited budgets and other issues. Students who are blind, because of the lack of support for braille instruction, have been even more seriously affected by the erosion of music instruction. At a time when even the most basic braille instruction is becoming more elusive and evanescent, students who complete the braille music course have expressed their delight at being able to access the same information their sighted peers do from sheet music. The core curriculum for students who are visually impaired (that is those who are blind or have low vision) tends to strongly focus on functional skills, orientation and mobility, independent living, and career skills (Hatlen, 1996). Although music is undeniably one of the fine arts, music instruction is approached as a career skill by Miami Lighthouse. Alumni of the Miami Lighthouse Better Chance Music Production Program have gone on to careers in a variety of positions in the mainstream music industry and to higher education at music schools such as the Berklee College of Music and the New World School of the Arts.

In order to offer its comprehensive braille music course to a wider audience not limited by geography, Miami Lighthouse for the Blind and Visually Impaired, in collaboration with The Carroll Center for the Blind (CCB) in Newton, Massachusetts, began offering an online distance learning braille music curriculum in the summer of 2013. This first-of-its-kind online instruction for braille music was developed over a two-year period by a Miami Lighthouse instructor. This report describes how the new distance learning braille music program prepares students for further study and careers in the mainstream music industry.

Background

In standard musical notation, symbols, not letters, represent pitch, duration, key, volume, and other elements of critical information. For musicians who are visually impaired, music scores need to be transcribed into braille music notation by knowledgeable braille transcribers. Braille music is nothing new, Louis Braille himself included musical notation in his original tactile notation system. When braille was being developed in the early 19th century, reading music was as much a part of literacy as any kind of reading, since people often played music at home using sheet music and instruments.

The decipherment of music notation is a highly complex process, because the symbols and words included in it represent an art form that is subject to interpretation. The

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