Access to Fitness for Children with Visual Impairments

Running techniques

- **Guidewire**
    - The guidewire system can be set up on a track, in a gym, or along a child's backyard or driveway. The rope must be pulled taught and attached to an eyehook in a gym, or attached to short poles outside; a carabineer, key ring, or 4 inch PVC tube can be placed around the rope so the child does not have to hold directly onto the rope. There must be a warning knot at least 2 feet from the end, and a difference in floor texture so the child does not run into the wall or the end poles.
    - **Advantages.** (A) A child can run whenever he/she desires. (B) Running gait can be efficient with almost full arm swing with both arms. (C) The child can run in relays, and perform locomotor skills independently beside sighted peers.
- **Sighted guide**
    - In the sighted guide technique the child holds the guide runners' elbow with the thumb out. The child may also choose to hold onto the runners' shoulder; they could hold hands, or the child could just follow the runner if he/she wears a bright shirt. The sighted guide should be trained in guiding, communication techniques, and appropriate running terrain. In addition, the guide runner should be able to run faster than the runner who is blind so the guide does not hold back the runner.
    - **Advantages**. (A) Fear is decreased because of the guide. (B) Running gait can be efficient with almost full arm swing with both arms. (C) Socialization can be increased because of running with a peer or another individual.
- **Tether**
    - The tether is a short rope, towel, or shoelace, held between the guide and the individual with a visual impairment. It can be wrapped around each person's hand for security so it does not slip. If an area of danger appears, the guide pulls the runner closer to avoid injury. For this technique, the guide must also be able to run faster than the runner who is blind must.
    - **Advantages**. Advantages to running with a tether are the same as running with a sighted guide. An additional advantage (A) Runner has some space. (B) Runner often feels more independent than with other guiding techniques.
- **Caller**
    - This technique requires a runner who is blind to run towards a caller's voice. The runner is not restricted to holding on to anything and runs freely. The caller can stand at the other end of the gymnasium or track for a short run, or can run behind, beside, or in front of the runner running distances holding a bell, keys, or using verbal instruction.
    - **Advantages**. (A) Runner is not restricted so arm motion can be full and natural. (B) Runner has the feeling of being independent. (C) Runner can run as fast as desired without worrying.
- **Running with no assistance on a track**

- This can be set up with a child with low vision on a track that is dark with bright lines. It works best when the track is not crowded and recommended that the child not run alone.
    - **Advantages**. (A) The child can run with full arm swing and potentially efficient biomechanical gait. (B) The child can run independently. (C) The child can run side-by-side with a friend.
- **Running on a treadmill**
    - Any child with or without a visual impairment can run on a treadmill. Treadmills are common and accessible to children with visual impairments. It is recommended that the child start out slowly to get a feel for the motion.
    - **Advantages**. (A) The child can run with full arm swing. (B) The child can keep track of speed and distance. (C) The child can run on his/her own without need for a guide. (D) Treadmills are found in gyms and fitness centers around the country. (E) Children can learn age appropriate and functional skills to be utilized after school age in making a lifetime commitment to an active lifestyle.

Note: Above information was modified from: Craft & Lieberman, 2011 and Lieberman, Butcher and Moak, 2001

Bicycling

- **Independently**
    - Individuals who have some usable vision may be able to ride a bicycle independently in a quiet park or around a track. It is always safer if there are peers or individuals with sight to ensure safety if this is the chosen mode of fitness.
    - **Advantages**: Allows participant to ride alone and have a feeling of independence. This will also free up caregivers and teachers.
- **Tandem bicycles**
    - Tandem bikes allow the sighted participant to ride in the front of the bike, while the participant who is visually impaired or blind rides in the back. The person in front is responsible for steering, peddling and stopping. The person in the back is responsible for peddling. Tandem bikes can be purchased through most bicycle stores and range from $400-$2,000. Be sure to try out several bikes before you purchase one. If you are not sure who to ride with, contact your local bicycling club, university, or deaf club. When riding be sure to develop specific signals for turning, stopping, or emergencies.
    - **Advantages:** (A) This is a safe and healthy way for individuals with visual impairments to gain fitness. (B) They can ride with no fear of being in an accident. (C) Increases socialization.
- **Surrey or duo bikes**
    - Surrey or duo bikes are bikes where the participants ride side by side. The sighted participant is responsible for steering and stopping. This is more conducive to communication for individuals who are visually impaired or blind because the riders are side-by-side. The purchase of these bikes usually takes place through specialty bike stores. Your local bike store will give you directions about where to get a catalogue for these neat bikes.
    - **Advantages:** (A) The riders are side-by-side and can talk and communicate during the ride. In addition, because of this configuration, any child who is deafblind and

who uses sign can communicate effectively during the ride. (B) The stability of a three or four-wheeled bike helps stability and comfort levels.

- **Stationary bicycles**
    - These bicycles can be used independently by anyone who has some functional use of their legs. Many stationary bikes will read the distances traveled and amount of time ridden. These can be purchased for $100-$1,000 in most sporting goods stores. Be sure that you have a way to record the distance traveled if this interests you. You may also wish to ride for a certain period of time.
    - **Advantages:** (A) Stationary bikes are found in health clubs, at schools and in the home. Using a stationary bike as a means of exercise is normal and well understood. (B) The participant does not have to worry about weather or having a sighted guide.
- **Bicycle stand**
    - Bicycle stands can turn an ordinary ten speed into a stationary bike. These are now similar to stationary bicycles and can be purchased for under $100 from any sporting goods stores.
    - **Advantages:** (A) The advantages of a bicycle stand are the same as for a stationary bicycle.

Swimming

Swimming is one of the best activities for individuals who are visually impaired or blind. There are few barriers, and the swimmer can move freely without worrying too much about obstacles. Water can aid in range of motion, muscle strength, balance, stability, locomotion, and socialization. A few adaptations for the aquatic area include:

- **Flotation devices**
    - Utilize a variety of flotation devices when needed. An individual can still receive an aerobic workout with a flotation device. If the individual is afraid to swim in the deep end without a flotation device, that is fine. He/she can swim laps with the flotation device if this makes them more comfortable. Kickboards are helpful because the board hits the side of the pool before your head does!
- **Trailing**
    - Use the wall and lane lines as guides for lap swimming the length of the pool.
- **Distance traveled**
    - Use some type of counter devices such as flip cards, counters, or rings to assist in understanding of distance traveled or number of laps.
- **Improved skills**
    - The pool is a wonderful medium for teaching locomotor and object control skills because water provides full-body support and balance is naturally enhanced.
- **Beginner swimmers**
    - Utilize a lot of physical guidance and tactile modeling the instructor for beginners (Lieberman & Cowart, 2011)
- **Tread water**
    - For individuals who do not feel comfortable swimming laps, treading water is a good aerobic workout and you don't have to worry about bumping your head on the wall of the pool!

Fitness in Community

Fitness/Exercise Training in a Health Club

This section will discuss the bulk of a fitness program, the exercise phase, specifically focusing on techniques for teaching individuals who are visually impaired or blind muscular strength and endurance training. The safest way to perform muscular strength and endurance training is to utilize a circuit of stationary machines. The machines may consist of a bench press, or a leg flexion-extension machines, a sit-up board, or a universal machine.

The following are some strategies to introduce and instruct circuit training.

1) Allow time for exploration: When introducing an individual to a machine allow time for tactile and/or visual exploration.

2) Demonstration: The instructor should demonstrate the movement and link the movement to language, including the name of the exercise and muscle involved.

3) Option to perform: The individual is encouraged to try everything yet, it is important that they understand that they can decline.

The following are some adaptations to the physical environment:

1) Pictorials/Braille instructions: Allow time for the person to look at performance pictorials and/or the opportunity to read about it.

2) Visual/Tactual perimeter: For safety, mark the perimeter of the exercise machines with rope or contrasting colored tape on the floor.

3) Adaptations to equipment: Use large print, hi-mark and braille on/off switches. Vibrating timers can be worn around the neck or in the pocket.

4) Number stations: Use large print, hi-mark and braille each piece of equipment with a designated number. You could also have a rope, tape or tactile guide from one piece of equipment to the next one.

5) Record performance: The participant should have some way of recording number of repetitions and weight on each exercise so improvement can be documented and shared with physician.

Aerobics

The term aerobics means literally "with oxygen" or the "steady state transport of oxygen to the working muscles" (Shephard, 1990 p. 5). The fitness activity called aerobics involves sustained physical activity to a point where the body is utilizing oxygen. This means that the body has to utilize 60%-80% of its maximum heart rate over a period of time. To determine your working heart rate, subtract your age from 220, then multiply that number by .60, .70, or .80 depending upon how hard you want to work. For example, Nancy, who is 32, wants to work at 60% of her maximum heart rate. She would take 220-32=188x.60=112.8. This means that Nancy's working heart rate is 110-120 beats per minute. To ensure that Nancy is working up to this level, she would sustain an activity such as aerobic dancing, cycling, or jogging in place for 5-10 minutes. While continuing this activity, she would take her pulse for 6 seconds, then add a 0 to her pulse score and compare that to 120. If she came up with 14, that translates to 140 heartbeats per minute and she should slow down a little. If she came up with 10, that translates to 100 beats per

minute and she needs to step up the pace a little to maintain her desired heart rate. Try to sustain the working heart rate for over 15 minutes, preferably 30 minutes. Remember to start out slowly.

Some examples of aerobic activities include:

- **Step aerobics:** This is sustained stepping on and off a 4, 6 or 8 inch high platform at varying tempos and in different directions. This type of activity is adaptable to any level of ability. If an individual cannot step onto a step he/she can do the same activities without a step.
- **Low impact aerobics:** sustained activity keeping one foot on the ground at all times. You can march with high knees, kick to the front, bring your knee up and clap under your leg, march in place and bring your arms up and down, do toe touches to the front, right and left, or just walk briskly around the room. As long as the individual is moving and keeping his/her heart rate up this activity can be executed successfully by anyone who is ambulatory.
- **High Impact aerobics:** This is sustained activity with both feet leaving the floor at some point during the movement. You can do jumping jacks, kicks to the front, jog in place, bring your knee up and clap under your leg with a jump with the other leg, pendulum leg swings out to the sides, side jumps and front jumps alternating directions, etc..... An individual obviously has to be in condition to sustain this activity for a long amount of time.
- **Wheelchair aerobics:** This is aerobics done in a wheelchair. The individual moves his/her arms up in the air, out to the sides, punches down, or twists at the hips for eight counts or more to elevate the heart rate. If the individual can move his/her legs they can move their legs at the same time as their arms. The idea is to increase the heart rate and amount of energy expenditure. Any amount of movement can elevate the heart and if this is continued for over 5 minutes it is considered aerobic. Make sure the point is to elevate the heart rate and have fun!
- **Others:** Any activity which brings your heart rate up for a sustained period of time is considered an aerobic activity. Cycling, running, swimming, walking, or aerobics can accomplish this.

Physical guidance and/or Tactile Modeling (Lieberman & Cowart, 2011)

This can be used when the individual does not have enough vision and/or hearing to understand the movement. Physical guidance and tactile modeling should to be explained so the participant will know what is going to happen. The instructor can then simplify all the moves to one touch cue or a sign cue that the participant will understand. An example would be if the instructor wants the participant to march in place as part of a low impact aerobics routine. Once the concept is understood the instructor does the sign for soldier, or taps the individual's knee to signal marching. The participant now knows he will march for eight counts then a new cue will be given for the next move.

The instructor can also set up routines so that one eight count move is always followed by the next eight count move and so on. This will depend upon the ability and level of condition of the participant. Once the moves are understood the instructor should try to fade out the touch cues for physical guidance and tactile modeling to promote independence. These activities can be enjoyed with or without music. It is much easier to practice them without music first, then add that variable when you so desire.

Fitness in the home

Many individuals who are blind or deafblind have a difficult time getting out into the community to access recreation and fitness activities. In addition, they often have a hard time finding a sighted guide to aid in running, walking or tandem bicycling. Accessing fitness and recreation activities in the home can be an easy, safe and rewarding endeavor for the participant and the family.

Jump rope:

- Jump rope can aid in agility, balance, endurance and muscular endurance. It can be done slowly with no impact, or fast with high impact. It can be done to your favorite music, or to no music. Jump rope can be done in the driveway, in the yard, or in a clear garage. It can be done fast or slow, to a count or for time. It can be done with family and friends and can be improved upon with participation.

Weight training:

- Weight training can improve bone density, muscular strength, and flexibility. It can consist of light hand weights (2-5 lbs.), or heavy barbells and a weight bench. Participants can also purchase a chin-up bar to hang in the doorway. It can be done in the living room, garage, television room, or in the back yard. It can be done with family and friends, and can be improved upon with continued participation.

Stationary bike:

- The benefits of riding a stationary bike are improved endurance, muscular strength, and muscular endurance. The advantages can be found in the previous section. It can be done in the home with no modifications, and can be measured by miles or time ridden.

Yoga:

- The life of an individual with a visual impairment is often very stressful. Yoga has many advantages including weight loss, muscular strength, flexibility, and most importantly, relaxation. Yoga can be learned in a class, by reading a book, or from a video. Once yoga moves are learned the participant can train in the home or yard alone or with friends and family. This is an inexpensive way to improve fitness and gain much needed relaxation.

Aerobics:

- As described previously, aerobics can be done at home with a video or with music. The initial routine may have to be taught or described by a helper, but after that the participant can participate independently. The participant can include an 8 count or a 4 count routine and combine different moves. Aerobics can be done with family and friends of all ages.

Basketball:

- Basketball is a fun and accessible sport whether the participant has a basket or not. Participants can use regulation women's or men's balls, balls with bells, or beach balls. If alone, participants can practice dribbling sitting, walking or running. They can practice shooting by following the sound of the ball when it rebounds. The location of the basket can be found with a bell on a string (string tied to a bell on basket pulled by participant), or a metronome behind the basket. If participants have a family member or peer to play with they can practice bounce passes, chest passes, and catching. Bounce

passes are easiest to catch. See the book "Games for People with Sensory Impairments" by Lieberman and Cowart through Human Kinetics for more ideas about basketball and many other sports and games.

Recommendations

Professional Preparation

These findings should be shared with colleagues in higher education to educate future teachers on best practices to teach physical activity to individuals who are visually impaired and blind. Professional preparation programs for teachers of the visually impaired, adapted physical education, physical education, early intervention, and therapeutic recreation specialists must encourage their students to try different physical activity modes so they can make effective decisions when they have the opportunity. In addition, these options must be taught to physicians so they do not unnecessarily issue blanket excuses from physical activity just because a person is visually impaired or blind. These are safe and effective techniques so every person can be an active participant in and out of school.