

Treadmill Procedures Used in Our Clinical Trial

- We began the treadmill training when an infant could sit independently for 30 seconds. In some cases this may have been a little too early since some infants did not step much for the first month. If we were to do the study over again, we would wait until the infant could support a little of their weight on their feet.
- We used specially designed infant- sized treadmills that cost us about \$1,000 each to build.
- Some parents have purchased inexpensive adult- sized treadmills at Walmart, Service Merchandise, and Sports Authority. Make sure you know that the treadmill belt speed is slow enough for an infant (see description of belt speed below).
- We placed a treadmill in the home and trained parents how to hold their infant during the exercise sessions.
- Parents were asked to exercise their infant 5 days per week for 8 minutes per day from entry into the study until they began to walk independently. Generally, infants began exercising for one- minute bouts followed by a one- minute rest. They continued this sequence until the infant received 8 minutes of exercise in a day. Parents gradually increased the length of the exercise bout prior to giving the infant a rest. All infants eventually exercised for 8 continuous minutes. This process gets easier as the child is willing and able to extend their legs and support their weight on their feet. Based on what we observed during this clinical trial, most infants with Down syndrome should be encouraged to be upright on their feet as early as possible after achieving good head control. Parents will need to support them in this posture until they develop adequate leg strength to support themselves. Leg strength is a critical prerequisite to stepping on the treadmill and walking independently. Many infants could have exercised for 10-12 minutes once they began to take a lot of steps (40 per minute).
- Any treadmill can be used, assuming the belt speed can be slowed to just under ½ mile per hour. The speed we used was 0.46 miles per hour (.2 meters per second).
- Locate a bench that can straddle the treadmill. Sit on the bench and hold your infant under their arms so they are facing you with their feet on the belt. It is important to try to keep your elbows on your knees or thighs while you are supporting the infant to

help reduce the strain on your back caused by the infant's body weight (see the attached picture below). If your elbows hurt your thighs place a towel under your elbows.

- As the treadmill belt moves away from the holder, pulling the infant's legs back, they should take an occasional step. In the event they do not step, reposition the infant's feet to the front of the belt while trying to keep your elbows in contact with your knees or thighs. It is the backward movement of the belt that appears to stimulate the stretching of the infant's leg muscles causing a spring-like step forward. All of our infants in the study improved their stepping performance over the first 6 weeks and got much better once they were able to support their weight on their feet. The first month or so is the most frustrating if they are not taking any steps.
- Frequently, parents would wear a cap with a small toy attached to the visor with velcro to stimulate the infant to reach for the toy and serve to distract them from watching their feet. Try to entertain the infant by singing and talking to them. It is a great time to reinforce their attempts at speech. Ask the speech therapist for ideas.
- It is important not to reinforce the infant when they try to hold their feet up off the belt. Also, it is important to take the infant off the treadmill when they are not fussing. If you always take the infant off the treadmill as soon as they get upset, they will quickly learn that all they have to do to stop this activity is to get upset. They learn quickly. Assuming you know that you are not hurting the infant, take them off the treadmill before they get fussy or after they settle down a bit. Some parents placed the infant treadmill in front of the TV and played a videotape of Barney which could be seen by the child over the parent's shoulders. Try to keep the child looking forward as much as possible to simulate the conditions of independent walking.
- As the child increases the number of steps they take to 30-40 per minute or more, begin to reduce the amount of physical support you give them. At some point, you should be able to hold them by their upper arms. Eventually, many parents progressed to the point of holding them by their 2 hands and then by one hand. By this time they should be walking on the floor while holding onto your hands. This activity is as good as the treadmill exercise and often is better since they will be more motivated to move around the room with your help.

