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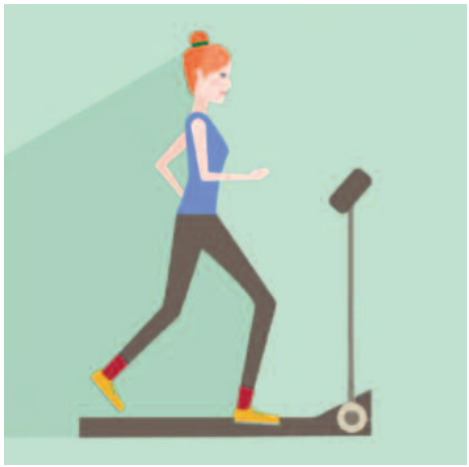
HEALTH-RELATED FITNESS PROGRAMS FOR ADOLESCENTS DIAGNOSED WITH AUTISM SPECTRUM DISORDER

BY YOCHEVED BENSINGER-BRODY PT, PHD, PCS, CHRISTOPHER EVANGELISTA, SPT AND DANA YEE, SPT

Children diagnosed with an Autism Spectrum Disorder (ASD) often receive physical therapy services from the time they are diagnosed (and sometimes even before!) through their school years. Typically, physical therapy goals are focused on helping these children achieve their gross motor milestones, such as walking and jumping, as well as improving quality of walking and balance. Despite receiving skilled gross motor-related services for so many years, many children diagnosed with ASD continue to have a high risk of obesity, starting in their pre-adolescent and adolescent years, which is a true health concern. According to the Center for Disease Control and Prevention (CDC), childhood obesity poses immediate health risks, including high blood pressure, Type 2 diabetes, asthma and musculoskeletal pain, and psychological problems such as depression and anxiety. Childhood obesity also poses lifelong risks of cardiovascular disease, Type 2 diabetes and certain cancers. While childhood obesity is surely an epidemic across the US for all children, children diagnosed with ASD are at greater risk than their typically developing peers. In fact, a recent study found that the rate of obesity in typically developing adolescents in the US is 13.1%, and the rate of obesity in adolescents diagnosed with ASD is 31.8%. This difference is astonishing, and, as such, understanding some of the reasons for this disparity is important.

Children diagnosed with ASD often have a limited repertoire of foods in their diet, either related to food preferences or GI dysfunction such as constipation and lactose or gluten intolerance. Additionally, some medications that children with ASD take, such as risperidone, are appetite stimulants. While these may be important contributors to the risk of obesity in this population, we will focus on the well documented problem of low physical activity level. The American Academy of Pediatrics (AAP) recommends that all children engage in 60 minutes per day of moderate to vigorous physical activity. However, compared to typically developing adolescents, adolescents with ASD engage in less physical activity overall, and it has been found that greater severity of autism is related to less physical activity and a higher risk of obesity.

The question is, why aren't children with ASD as active as typically developing children? One possibility is that during childhood physical activity involves complex motor play skills, like climbing on play structures or engaging in group sports. Children diagnosed with ASD often have less coordination and agility than their typically developing peers. Another consideration is that children with ASD may lack the social motivation to participate in group sports or physical exercise endeavors. Children require mobility and motor play skills to be able to engage in play activities with their peers, and play is the child's means of developing social connections. Early differences in play may limit development of social interactions, and this limited social motivation may limit later motivation for motor play, such as participation in sports.



Despite these barriers that children with ASD face, researchers have found that when they do participate in physical exercise, there are broad ranging benefits. Not only does exercise promote cardiovascular and musculoskeletal fitness, but it improves the ability to play with peers and socialize, and it decreases maladaptive behaviors. Specifically, when children with ASD engage in vigorous exercises, such as jogging and roller skating, they have decreased aggressive and self-injurious behaviors, and decreased hyperactivity.

Other activity specific benefits of exercise have been found as well. Jogging, horseback riding and martial arts have been shown to reduce stereotypic behaviors; horseback riding, martial arts, yoga, dance and swimming have been shown to improve social-emotional behavior; and jogging has been related to improved cognition and attention. Integrating exercise into the daily routine is helpful for school performance too, as when children with ASD participate in exercise before class they demonstrate improved academic performance, increased classroom participation, and reduced disruptive behavior during class time. When considering the cumulative evidence from these studies, it is exciting to note the range and variety of physical exercise activities that are beneficial for children with ASD, because this means that there is something that can be motivating to each child and that could work with each family's individual needs and resources.

The American Physical Therapy Association (APTA) has recognized the role that physical therapists should take in promoting fitness and wellness in children with special needs. Physical therapists uniquely have the combined education and expertise in exercise testing and exercise program development and in development as related to children with varied diagnoses. Physical therapists are therefore able to individualize exercise programs in an age-appropriate and diagnosis-appropriate manner for children diagnosed with autism, and should be integrating fitness and wellness programs into their plan of care.

When developing a well-rounded fitness program, a number of components need to be included, such as cardiovascular fitness, muscle strength, and flexibility, and it is important to schedule varied exercise activities during the week to address all of these areas. When developing a program for children with ASD, extra consideration needs to be taken to find activities that are motivating for that child and to develop the program in a structured way so that exercise is built into the child's daily schedule. Before initiating a fitness program, the child requires an examination by his/her physician to ensure that there are no underlying medical concerns. Once clearance is provided, a physical therapist can provide fitness testing to assess baseline performance and then help develop a fitness program that interests the child and that is feasible for the family. Since the overarching goal of a fitness and wellness program should be to integrate physical activity into the child's daily life for long-term health benefits, ideally the program should be implemented at home and in the community, with the physical therapist monitoring performance and helping progress the program over time.

Sherry's Fitness Program

Let's consider an example of a home-based and family-centered fitness program that was developed for Sherry, a 15-year-old girl diagnosed with ASD. Sherry's mother expressed concern that over the past two or three years Sherry had gained a significant amount of weight. She reported that Sherry has long days, as after school she has speech and applied behavioral analysis (ABA) therapy at home. When she is finished with her therapies she likes to watch videos and play games on her computer. Sherry has a large family and she enjoys being part of the commotion, so the family set up her computer in the living room. Mom wanted the PT to develop an exercise program for Sherry to help her improve her overall health-related fitness and to potentially help her lose some weight.

In order for this program to be feasible for Sherry and her family, the PT recognized that:

1. The program would have to take place at home.

2. The program would have to include activities that Sherry would be motivated to participate in.

3.The program would have to provide opportunities for Sherry to continue to have family interaction.

4. The program would have to be gradually worked into Sherry's daily schedule. With follow-up questioning, the PT found out that the family had a treadmill and stationary bike in the house. Sherry had previously attended yoga classes at her school and enjoyed them, and Sherry's ABA therapist was available to help implement the program so that it became part of her routine. The PT also learned that Sherry had previously succeeded in establishing new daily routines when a picture exchange communication system (PECS) was implemented. After the pediatrician performed a pre-exercise evaluation and gave Sherry the green light to participate in a fitness program, the PT scheduled the fitness assessment. During this session Sherry demonstrated decreased endurance, decreased flexibility, postural deficits, and decreased strength, all of which are important components of health related fitness.

The PT developed the following fitness plan for Sherry:

- *Cardiovascular endurance: Sherry would participate in treadmill-walking exercise while a family member would ride the stationary bicycle next to her. During her walking time, Sherry would be allowed to watch a video on her iPad.*
- *Flexibility and Posture: Sherry and her mother would perform yoga exercises to promote improved posture and muscular flexibility.*
- *Strengthening: Sherry and her brother would participate in simple resistive exercises together, ensuring proper form prior to adding resistive weight.*

The chart below illustrates a number of important components that were integrated into Sherry's exercise program:

1. *Each exercise session had a warm up and cool down time.*
2. *Each exercise session was at around the same time of day to help Sherry develop a sense of routine.*
3. *Each component of the program was slowly layered in, enabling Sherry to get used to one type of activity before adding another.*
4. *The time spent engaging in each exercise type was gradually increased to provide time for Sherry to build tolerance.*
5. *Sherry was provided with two days off during the week (Sherry and her family chose to take off on Fridays and Saturdays!) For the first eight weeks of the program the PT would come once a week*

SHERRY'S EXERCISE CHART

WEEKS 1 and 2 — 5:30 pm

SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY	SATURDAY
warm up	5 min			warm up	5 min			warm up	5 min		
treadmill	8 min			treadmill	8 min			treadmill	8 min		
rest	2-5 min			rest	2-5 min			rest	2-5 min		
treadmill	8 min			treadmill	8 min			treadmill	8 min		
cool down	5 min			cool down	5 min			cool down	5 min		

WEEKS 3 and 4 — 5:50 pm

warm up	5 min	warm up	5 min	warm up	5 min			warm up	5 min		
treadmill	15 min	treadmill	15 min	treadmill	15 min			treadmill	15 min		
rest	2-5 min	rest	2-5 min	rest	2-5 min			rest	2-5 min		
treadmill	10 min	treadmill	10 min	resistive training	10 min			resistive training	10 min		
cool down	5 min	cool down	5 min	cool down	5 min			cool down	5 min		

WEEKS 5 and 6 — 5:30 pm

warm up	5 min	warm up	5 min	warm up	5 min	warm up	5 min	warm up	5 min		
treadmill	15 min	treadmill	15 min	treadmill	15 min	treadmill	15 min	treadmill	15 min		
rest	2-5 min	rest	2-5 min	rest	2-5 min	rest	2-5 min	rest	2-5 min		
treadmill	10 min	treadmill	10 min	resistive training	10 min	treadmill	10 min	stretch/yoga	10 min		
cool down	5 min	cool down	5 min	cool down	5 min	cool down	5 min	cool down	5 min		

WEEKS 7+ — 5:30 pm

warm up	5 min	warm up	5 min	warm up	5 min	warm up	5 min	warm up	5 min		
treadmill	15 min	treadmill	15 min	treadmill	15 min	treadmill	15 min	treadmill	15 min		
rest	2-5 min	rest	2-5 min	rest	2-5 min	rest	2-5 min	rest	2-5 min		
treadmill	15 min	treadmill	15 min	resistive training	15 min	resistive training	15 min	stretch/yoga	15 min		
cool down	5 min	cool down	5 min	cool down	5 min	cool down	5 min	cool down	5 min		

to teach Sherry and her family the appropriate exercises to work on, to make sure that Sherry demonstrated safe alignment and body mechanics with her exercises and to monitor her performance and tolerance to the program. After the program was fully implemented, the PT would come to consult on a monthly basis to monitor Sherry's performance and to advance the exercises. During the early stages of program implementation, Sherry's ABA therapist helped develop pictorial representations of each exercise type and helped Sherry get used to the routine. Three months in, her mom reported that Sherry was doing well, and that each member of the family loved spending the one-on-one time with her while they participated in her exercise program.

As children diagnosed with autism grow up and head into adolescence it is important to think about promoting lifelong habits for health and wellness. Considering the many benefits of exercise and the flexible ways that health-related fitness programs could be implemented, it is something that all families with children diagnosed with autism should consider asking a physical therapist about! •

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