

ICSC Culture Diversity Module 09

ICSC09 _Section 4_ Differently Abled Athlete

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I am Dr. Anne Sorrentino. I am a sports diplomat certified by the American chiropractic board of sports physicians and will be presenting this class for you. Special populations by definition are populations that require more healthcare or healthcare services than the general population. This need for greater healthcare services among these populations is generally more costly to the system, by maintaining good physical activity and keeping the body in tip-top shape or being aware of what we need to be looking for in these populations, we can help reduce healthcare costs and provide much better service to our patients.

There are several special populations considered in sport; paediatric adolescents, the female athlete, the senior athlete, the differently abled athlete, and there's also special disease states in sport and ultra-sports. In this lesson we are going to cover the differently abled athlete. The guidelines that we are using are the CCSP Program Guidelines, where we will cover the pre-exam a little bit in Special Olympics. We will not cover the pre-participation exam. That is a separate class, but we are also going to look at the overview of the different types of athletes we may encounter. Yes, you are seeing a picture of Nitro Circus out there and we will talk about that too. According to the Academy of Paediatrics, everybody should have the opportunity to participate and compete in sporting activities. Increased participation in those physical activities and competition still should exist for those that have physical challenges. There are several groups that exist to provide some form of competition for those special populations.

Sports participation benefits. If we compare the differently abled athlete with inactive peers, we will still see some incredible benefits. We have an athlete with paraplegia. They are going to see fewer pressure ulcers because they are moving around, perhaps in their wheelchair. Fewer infections because they are keeping their immune system high and then there is a lower likelihood of hospitalization. Athletes that have limb deficiencies, have improved proprioception because they are constantly challenging it with a sporting or a physical activity, and as a result of that, they keep their muscle strength high and can see an improved proficiency using whatever prosthetic devices they need to, whether working on balance or just your muscle strength.

You will see some of the same benefits that other athletes are going to have, with a differently abled athlete, just by some physical activity. They are going to see increased exercise endurance as they will be working aerobically, so we are going to see an improved cardiovascular function. Their muscle strength is going to be much better. Can you picture a wheelchair athlete constantly pushing that?

Many of these athletes will do a 26.2 marathon. That is a lot of upper body strength just to push that through in an amputee, but they will still be challenging their other leg and building muscle because that leg needs to carry them through if they are using one leg only. We have flexibility, balance, motor skills, but one of the most important things, and we see this through sporting activities for everybody is improved self-esteem. As we are learning, we can do things which therefore reduces our anxiety and depression. When realizing we can get out and participate in something to the best of our ability and have fun.

You may have heard a little bit about the Special Olympics and many of us may have even volunteered for the Special Olympics because they can be done regionally. They can be done in a state area and there is even National Special Olympics and we have the Paralympics, which is a division of the USOPC, and they have the governing rules and inclusion criteria for these events. The Special Olympics start with people at age 8.

I remember volunteering at Stony Brook University back when I was in high school. It was amazing what these children could do because I remember working with the 12-year-old age group and just the excitement of throwing a shot put or rolling a Croque ball or something like that. It was just so much fun.

They are so appreciative, but to participate in any of these events, PPEs, the Pre-participation Physical Examinations are required and for eligibility, they are required every 1 to 3 years.

We have International Paralympics, and these are athletes also with physical disabilities, but they are categorized into one of 10 eligible impairments and the IOC determines this. These are assigned numerical rank or grading to a level of disability for fairness because you have some people that have more challenges than others, so you must make the competition as fair as possible. In the International Paralympics, the competitions are every 4 years, there are 29 sports. They are usually held two weeks after the regular Olympics. We just finished the 2022 Beijing, the winter games and the Paralympics was a few weeks later and they have sit-skiing and they have some other competitions. I was very fortunate to work the Dew Tour Copper Mountain this year.

They had the adaptive ski course where the skiers would come down and it was a slalom-type course, and it was incredible to watch these athletes perform, some of them qualified for the Olympics through this because the Dew Tour happened to be an Olympic qualifier. There are 6 winter sports and there are also summer sports. I cannot remember her last name, but there was an athlete who was a dual competitive athlete. She would compete in cycling in the winter in the summer games and skiing in the winter games. Those are some cool things to watch, but there are national sports organizations for adaptive sports contacts, and I have put down their website on this slide for you, so you can go back and take a look and see if any of these are anywhere near you, where you can participate or volunteer.

Question 1.

We are going to set a timer. This is your first question to compete in the Special Olympics. How often must an athlete have a PPE? You have 10 seconds to think of the answer.

Answer: It is every 1 to 3 years. The differently abled athlete must go through a comprehensive screening, but similar to a PPE, you are going to cover all the regular systems that you need to go through. I believe there are 12 systems you need to check. However, you will also tailor it to the disability or condition, and you need to identify predisposing conditions or comorbidities, which is not unusual in this population, and you must provide a needs assessment. Is there something that can make it a little easier for them to move or handle the situation? There are new crutches coming out. There are new springs coming out for prosthetic devices. There are better wheelchairs being developed.

I have a patient who has Multiple Sclerosis, and I am inspired by what that wheelchair can do. Technology keeps improving for this population and we to determine what their physical ability and limitations are. What is something that is not going to happen? What is something that can be on the horizon? What is something that they can do right now?

We want to look at the range of motion, but the flexibility of the extremities in the trunk, if we have somebody that is very strong in the upper body, we know that we must keep that upper body strength because that is what is propelling them forward because perhaps the lower body is not functioning the way it needs to.

We need to make sure they have the strength and have symmetry going on with the strength. We do not want a gross difference between the right and the left arm, even though one side will be dominant. What is their strength? Can they stand on that one leg? Can they stand on the leg for 1 minute, 5 minutes, 10 minutes? Balance and equilibrium skills, postural discrepancies. If you have someone who has only one leg, you need to keep that leg in tip-top shape. Otherwise, you will start to see some mega problems, sensory discrimination, and circulation issues.

The athlete needs to be able to feel down to the joint, and make sure you are checking their pulses and those are within the normal range for that individual. You also want to look at rhythmic and coordination skills, and visual and auditory accuracy. Visual, we will discuss a little more, but it is critical that they can see, what they could see last time. Make a note if anything is starting to decline, and then inspect the

orthopedic and special appliances worn by the athlete. Is it time to get a new one? Is it time to upgrade? Because something new has come out, things you want to check.

There are common issues that need to be checked because 12% of the structural cardiovascular abnormalities are seen in this population, and there is a high risk for sudden cardiac death, so make sure you do a good cardiac exam. They may have decreased cardiorespiratory abilities even when there is not a congenital cardiac abnormality, an anomaly that is there. Double-check and make sure you put them through me good training for that. Because now, we have considered using the pulse oximeter as a vital sign.

Pulse oximeter has been more common since 2015, but now with COVID, everybody has a pulse oximeter. Make sure that it is working properly. You might want to test them when they are doing an activity and make sure their oxygen output is still high.

Then again, you will probably refer out for extra cardiovascular testing because you have covered your basics, not finding something, now go out to your scope. Send them to someone who is an expert in that field. Ocular function, 1/3 of this population have ocular issues, whether they have poor visual acuity, astigmatism, strabismus, basically just poor visual acuity. You need to make sure you are checking their eyes and running eye tests, smell tests on them, listening to the heart and you want to check their neurological function, compare side to side.

If there is no, second side, you have your baselines to determine what is there, a dermatologic function that is big with certain conditions. You have a genital and the musculoskeletal system, this book on this slide, the Paralympic Athlete was written in 2011. It has not been updated, but there are other books that have come out to help the Paralympic Athlete.

I think they wrote it in 2013, but they did just update it to 2021 sports nutrition for the Paralympic Athlete because you can imagine their protein needs are high, but you also have to maintain and watch with kidney function. Those are some books which you can get further information.

We will now look at what some of these populations are. We have amputations, blindness, visual impairment, cerebral palsy, dwarfism and we have spinal cord injuries.

When we review the disability and injury pattern, we are excited to say that this population is going to see similar injuries in similar sports to the non-differently abled athlete. In other words, if they are throwing the ball, they are probably going to have similar arm issues. You could be looking at tendonitis, shoulder issues or scapular mobility considerations, and they will see similar injury rates. It is not like they are going to get injured more, throwing a ball than someone else.

You can do your similar evaluations. Use those same ortho neuro tests. Now you might have to extend them a little bit and change it up, but for the most part, you can use those same evaluation forms. You are going to take a thorough history. Some of this is congenital, some was traumatic and you will use imaging as needed with amputations. We often see the same rules in their sports as the able-bodied athletes, but we must look at some considerations. There will be additional care needed for a residual stump, skin irritation from the prosthesis blisters and pressure-related ulcerations are a consideration and sometimes to keep in mind because they cannot really feel the area. They will not notice that something is forming, so you must check.

I have a couple of pictures coming. Phantom pain, we learned about this, any pain that is related to the residual limb. I do not know how long that is going to last. They may feel that that leg is there for a long, long time and they may not feel it at all, but it is a consideration.

What does the limb that is still there need? Based on your standard treatments, they can have soft tissue. You need to treat it the way it needs to be treated. One thing you really want to be careful of is heat-related illness because you are trying to make sure that if they are running out in the sun, they must really keep themselves powered up and they may have decreased sensory through that area. They may not realize that there's a heat situation on the horizon. These are some stumps, and you can see a

dermatosis through here that need to be treated, and these are some of the ulcerations and blisters that can form if it's not treated properly, and they may not even feel that due to a decreased sensation, that's why there must be a procedure for it to be checked.

Lower extremity conditions in amputees. Keeping in mind that these are going to pick up the ground transfer, ground reaction forces, and as a result, they will pick it up through direct and indirect load transfer because you have one leg that is hitting and the other one absorbing and one leg that is hitting and you will like them to be hitting equally which is the main consideration. It is not my field to really evaluate that, but that needs to be considered.

Muscular skeletal system, the evaluation of the strength of the commonly injured sites. You could see where you might end up with plantar fasciitis because you are doing so much work here, if the glute is not strong enough there to meet the demand. This glute needs to be strengthened, maybe on the other side too, you must evaluate stability and flexibility. Are you putting too much load on the sound limb? That all needs to be evaluated.

Blindness is a strong consideration because when you have blindness, you usually need someone else that is guiding them, and we see this in the skiing on the sit ski. They sometimes have people say, "Go right, go left, turn this way." It's nice because I have been on enough ski mountains where you see the person who is guiding the blind ski down. I just skied Whitefish, Montana, and they have a big adaptive program there. They had very visible bibs indicated clearly to stay away from certain people as they guided their way down the mountain. The last thing you want to do is cut off somebody that cannot see you coming. The guides are very good about making sure no one comes into the area, but because there is a lack of visual cues, the musculoskeletal system needs to be told what to do. That is why you need somebody with the visual impaired skier.

Sunburn is an issue because they may feel themselves getting hot, they will be getting hot way after the burn has occurred. Something to be careful of.

Question 2. Which differently abled athlete is most likely to experience phantom pain?

Answer: It is the amputee athlete. Cerebral palsy. When I was in the clinic way back in chiropractic college, back in the other decade, I had a patient who had cerebral palsy. She was so thrilled when she was able to do something. If they are walking and on a type of support, it is not unusual to have lower limb injuries at the ankle and the knee because they do not always transmit those ground forces the way an abled position would and that is due to the spasticity. I mean, I used to do a lot of soft tissue trying just to ease some of the spasticity with her and there was gate changes, which set up an unstable situation at the ankle and the knee.

They have very tight lower body musculature, especially the hams and the Gastrocnemius. You want to evaluate for flexibility and strength. You want to see what their active range of motion is and their passive, there will be an exaggerated stretch reflex. Sometimes you need to find the goldilocks approach "Getting it just right". When I looked to my MS patient, I cannot over-treat her, but I cannot undertreat her and every day is a different day whether related may make a major difference there. Goldilocks approach "not too much, not too little, just right".

Speech difficulties are an absolute consideration with these parts of this population. There may be decreased strength because they cannot build that muscle, or it is just so spastic shoulder, wrist, and hand issues are very common in wheelchair use and there is motor control and hand-eye coordination and depending. This one you can see there is a high-level functioning, he is on a tennis tour, but there are all sorts of other things that can happen. You must evaluate for the risk to others with a racket or with a stick because can they control that? Does the spasticity worsen with certain things, or does it fatigue? Those are all considerations you need to look at.

Down syndrome. When you were in chiropractic college, you learned about AAI, Atlanto-axial instability. It is an orthopedic variant in a down syndrome that carries the most serious potential concerns. It

presents in other conditions as well, but the down syndrome is where we think of it right away. As a result, that you need to screen these athletes for AAI because if they have it, they need to be restricted from sports that entail a high risk of head and neck trauma because that's going to create a catastrophic problem. Most contact sports are where they will be limited, such as soccer, football, basketball, but we also must consider things where they might flip even a forward role could be too much, you have to watch in gymnastics or diving or swimming.

One thing is to get in the pool and start to swim. It is more difficult when they must dive in because of the lack of control of the down syndrome, it is trisomy 21 and that is the most common version you will see.

Weightlifting is a great thing with AAI because 15% in down syndrome have Atlanto-axial stability and that is a ligamentous laxity and you have to be careful. How are you going to raise your clinical index of suspicion? Well, notice these things they are easily fatiguing. The gate is becoming abnormal or is abnormal there is in coordination and clumsiness. They have sensory deficits. We would expect to see spasticity, but there might be hyperreflexia or a clonus. Any of that, you absolutely must make sure that they undergo evaluation for Atlanto-axial instability.

Today, the average lifespan of a down syndrome child is now up to a down syndrome adult or senior at 60 years old, congenital heart disease is present in 40% to 50%, but there are other issues we must pay attention to, where there might be hearing loss, where there might be infections in the ear, vision problems. There may be mental retardation with it, orthopedic concerns. Epilepsy is a high concern with this and as a result with lack of movement and there is a greater risk for obesity. But there are other people at risk for that Atlanto-axial instability that we want to just look at rheumatoid arthritis, achondroplastic dwarfism, Klippel-Feil in an abnormal fusion. In other words, where we have more than two or equal cervical vertebrae.

You have three to four questions you going to ask with AAI, and if they are all answered, no, you may be good to go.

1. Does the athlete show signs of progressive myopathy?
2. Does the athlete have poor head or neck muscular control?
3. Are they bobbling or can they control it?
4. An important one, does the person's neck flexion allow them literally to just flop and rest on the chest? Yes. I can bring it down there with my mouth closed, but does it just fall there? You want to look at those risks for AAI.

I wanted to put up an x-ray so that you saw what this looked like. You can see in the normal cervical, everything looks lovely, and the minute we drop into flexion. Look at what happened. We just got a big gap in the ADI. We want to look at that. That is not good, so there we have AAI.

Question 3: Which differently abled athlete might you encounter speech difficulties?

Answer: I told you that my patient, I had was a cerebral palsy athlete and she had speech difficulties and it took a little bit till I understood her, and then I was clear with her. Just stay with it and you will be able to understand what they are saying.

Conditions for wheelchair racers. Well, wheelchair racers usually are going to be upper body strength and that is why they are in the wheelchair because maybe their lower bodies are not doing so much. What we are seeing, would be quite logical is a peripheral nerve entrapment for the upper extremities. Now, most common. We will see carpal tunnel syndrome, but let break it down. We are going to have some, all neuropathy at the wrist, and see Guyon canal syndrome, but we may also have median nerve deficits. We may also have radial nerve deficits and keep in mind, there is no rule that just because they are having a problem here that is what it is. Follow up the arm and see where it is crimping. It could be at the elbow or the shoulder. We might need to give them more scapular stabilization exercises. We

need to look for muscle atrophy, and signs of weakness in the hand, put them on a dynamometer, check their grip strength, check for specific sensory nerve deficits. Do we have circulation? Do we have a motor? Do we have sensory? All those things need to be compared side to side. Look at the intensity. If you have never seen a race like this, the intensity is incredible. These athletes are so great.

Dermatologic function. Keep in mind, they are going to get blisters on their hands. They will most likely be wearing gloves, but at some point, you will start to get blisters and abrasions and they fall in with the sit skis athletes as they tip over a lot. They will be slamming their hand and you could break a wrist with something like that. They are racing against others. There will make contacted with other chairs and be banging into each other.

Let us also consider pressure ulcers because they are sitting for long periods as well as sweating. Maybe, right after the match, they may have a beer with somebody, meaning that could be sitting in sweat for a long while. You may see some shearing and some ulcers from there and that is without even considering the prosthetic devices that they are working with.

Modified seat cushions may make a difference with this, but make sure you keep changing those. Even on my bicycle, there is a Tempurpedic bike cushion. Different cushions can make a difference for these athletes.

The urogenital system, they might have devices in, which are for drainage, and that needs to be confirmed.

The musculoskeletal, we will see tendonitis, rotator cuff issues, pec tightness, because they are in that forward position. We will lose that imbalance of A to P from the shoulder to the chest versus from the chest to the center of the back. You need to get their shoulders back and you encourage opening that up and strengthening the scapular stabilizers and the lats. You will need to evaluate stability, flexibility, and the commonly injured areas.

Spinal cord injuries, well trauma damage cells within the spinal cord. That is the most common one you will see. We can see spina bifida, determining where the cord injury determines the level of function. Just in terminology because this always gets confused with people.

Quadriplegia involves both lower extremities, but you still have some upper extremity involvement.

Paraplegia involves both lower extremities with little impairment above in the upper extremities. Down here on this slide, you can see where the spina bifida and they will need surgery to repair it, but that does not mean they are going to be able to walk.

Here on this slide, we have some wheelchair basketball athletes. Then we have somebody coming down, a slalom paralympic skier, and you can see the upper body is good. They are using their arms, look at the two skis on the arm and the sit ski has one ski on the bottom.

Pain, muscle spasms, and sensitivity to stimuli may develop. Of course, they may get muscle spasms. Absolutely because they are working so hard and sometimes load exceeds capacity. You may see secondary medical problems. There will be bladder issues, bowel issues, lung infections because they are not expanding everything and during this lesson we covered pressure sores and shoulder pain.

In closing I would like to tell you about Aaron Wheelz Fotheringham. I encourage you to Google him. https://en.wikipedia.org/wiki/Aaron_Fotheringham

Wheelz was born with spina bifida at age 8, and was living in an adoptive family. One of his brothers challenged him at the skate park to drop in. Wheelz always wanted to be a professional athlete and you can see him flipping.

Wheelz entered America's Got Talent recently and he had to crawl up the gigantic ramp. One of the men, Ricky, who is the athlete liaison for Nitro Circus was up at the top and carried Wheelz's wheelchair up

and Wheelz climbed up the whole thing, on his back, moving his arms all the way up. He rode the gigantic ramp down and he crashed.

It is not unusual for the athletes to crash sometimes on their first attempt, especially if they have not had enough practice, however Wheelz got up. Ricky went down and got his wheelchair and brought the wheelchair up because Wheelz said very clearly, "No, I am going up again and doing it. I am going to show you all I can do this." He got all the way up to the top and he rode the wheelchair down and he landed it perfectly, so perfectly that one of the judges was so impressed. She gave him the golden buzzer and sent him right to the finals for that much spirit.

It reminds me of a quote I saw in a hospital the other day that talked about exercising and it said,

"Rule number one is don't quit. Rule number two, never forget rule number one,"

Wheelz is an incredible guy. He is now 30 years old now and based in Las Vegas.

You will see that these differently abled athletes are not disabled. They might be a little challenged, however very impressive.

Thank you for your attention. I sincerely appreciate you and I wish you the best on your exams.

[END]