

HANDBOOK

WHEELCHAIR SLALOM

2018

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I. INTRODUCTION TO WHEELCHAIR SLALOM (W-SLALOM)

W-Slalom Itself is a relatively new sport that has been designed particularly for people with motor disability, users of wheelchairs. There are several categories and levels of competition, depending on the level of motor disability of the person(s) participating; hence it's very inclusive. It is widely acknowledged that sport can be a powerful tool for transforming community attitudes and empowering individuals through the acquisition of new physical and social skills, regardless of individuals' physical or mental state. It is also important to remember that people with disability are not a homogeneous group and, therefore, have different needs and abilities. In that aspect, wheelchair slalom empowers people with motor disabilities that otherwise would not be able to practice other types of sports.

It is based in a circuit with different kind of obstacles, which the players must solve without mistakes and doing it as fast as possible.

The handbook main target is to provide a first guide to start working with the different W-Slalom skills and abilities, as well as a reference to the basic rules to be used in the early stages of the sports' implementation. In case of doubt, official CPISRA rules should be followed.

Main targets:

- ❖ To create basic motor skills allowing participants to perform different circuits with the less possible number of mistakes.

To show to the participants different technics to overcome each one of the distinctive obstacles that they will face during the circuit. To use adequate materials to develop W-Slalom and its basic skills (turns, accelerate, stroke, etc.)

To improve participants' ability and skills with their wheelchairs and the management of every of the obstacles on the circuits. To face every of the obstacle rightly and as fast as possible, while sustaining a complete overview and plan about the whole circuit.

To identify the order associated to the colours and the obstacle type all of the circuits.

To get acquainted with the rules through sports practice.

II. WHEELCHAIR SLALOM TRAINERS' TRAINING SESSION

A training session for wheelchair slalom trainers should include the following topics:

- 1. Characteristic of the participants**
- 2. Medical and sport functional classification (Summary)**
- 3. Wheelchair and blocking tapes**
- 4. Rules for application in the initiation stages of W-slalom as physical activity that enhances motor skills (Summary of the rules)**
- 5. Warm up**
 - Cardiovascular capacity activation through games
- 6. Physical condition through the games**
- 7. TECHNIQUE AND TACTICS - THE METHODOLOGICAL PRINCIPLES AND THEIR APPLICATION TO THE SPORT OF SLALOM [General Methodology of training]**
- 8. Circuit work out**
 - To practice the circuit mainly working the speed
 - To practice the circuit mainly working the penalties.
- 9. Warm down**
- 10. Example training sessions**
- 11. Planning examples**

The following ideas can be identified as the main topics to be presented and developed in each one of these domains.

1. CHARACTERISTICS OF THE PARTICIPANTS

W-slalom athletes must present the following characteristics: they must be wheelchair users; nevertheless, athletes with severely disabled legs, usually users of crutches, may also participate in w-slalom with a manual wheelchair.

DISABILITIES: child cerebral palsy, cerebral injury, dystrophy, medullar injury, degenerative illness, spina bifida, etc.

2. SUMMARY OF FUNCTIONAL CLASSIFICATION

The abovementioned functional groups will be submitted to sports classification, according to what is established in the W-slalom rules, where the following classes can be distinguished: (CPISRA, 2009)

- **WS Electric:** Athletes who use electric wheelchairs.
ELIGIBILITY: Athletes cannot move their wheelchair with their hands or feet.
 - **WS Manual A:** Athletes who use a manual wheelchair.
ELIGIBILITY: Athletes can move their wheelchair with their hands or feet. This group of athletes has difficulty in quickly moving the wheelchair. Their body cannot execute the turns. Their movements are slow, and they have difficulty starting and stopping quickly.
 - **WS Manual B:** Athletes who use manual wheelchair.
ELIGIBILITY: Athletes are able to move quickly using the wheelchair. Their body is involved in executing movements. They are able to start and stop quickly.
- In the next chapters, different exercises will be proposed and adapted for these specific functional groups.

3. WHEELCHAIR AND BLOCKING TAPES

MANUAL WHEELCHAIR: In order to improve the slalom, some adaptations and modifications to the wheelchairs are required.



FIGURE 1 – Wheelchair adjustments for W-slalom.

These are various types of electric wheelchairs. On the wheelchair on the right, it will be better to change the front wheels. The second type of wheelchair presents additional advantages since it can roll on the same axis.

BLOCKING TAPES: It is important to determine which body parts are not involved in the wheelchair's movement and secure them; a physical therapist should be consulted to ensure that these adaptations do not harm the child.

The use of gloves is recommended to ensure a better adherence to the wheel hoops.



FIGURE 2 – Gloves and secure movements.

4 - RULES FOR APPLICATION IN THE INITIATIONS STAGES OF W-SLALOM AS PHYSICAL ACTIVITY THAT ENHANCES MOTOR SKILLS (SUMMARY OF THE RULES)

The following description refers to basic rules to be used in the early stages of the sports' implementation. In case of doubt, official CPISRA rules should be followed (FEDPC, 2015 – CPISRA, 2009)

Age Range for the W-Slalom Practice:

- From 6 to 12 years old: This age group is going to participate in the games.
- From 13 to 18 years old: This age group is going to participate in both the games and the progressive start activities.

Equipment

- **Cylinders:** Red and white. Carpenters usually have cylinders on hand. If a carpenter is not an option, another way to start is with big, empty bottles of water filled with sand and painted red and white. The cylinders used during competition will be wooden with 10 cm diameter and between 1500 and 2.000 grams weight, coloured accordingly.
- **Tape:** Tape should have a 5cm width.
- **Ramp:** The best material for the ramp is wood. The ramp displayed below is divided in 3 pieces (Figure 3). To ease its transport, it may be assembled with 6 parts and a hinge (Figure 4). Note that the ramp in the picture is shaped as an “L”, and the pieces are placed in a straight line.

Handles to catch are also important to move the ramp more easily (Figure 5). The ramp may be covered with anti-slip rubber to prevent the wheelchairs from slipping (Figures 6).



FIGURE 3 – Ramp in 3 pieces.



FIGURE 4 – Hinge.



FIGURE 5 – Handle.



FIGURE 6 – Rubber cover.

In the places where the ramp meets the floor (beginning and end of the obstacle), you should be careful to ensure that the wood is both as thin as possible and as flush with the floor as possible. The wheels of the chair should have no difficulty ascending or descending from the ramp.

Upon constructing the ramp, ensure that all the parts are compact and secured safely. This is especially important for the electric wheelchairs, as they are heavy and move up the ramp with greater speed.

How to mark the obstacles

Materials:

- 2 wooden templates of 75 x 75cm and 1 wooden template of 10 x 10 cm (for the zig-zag and circled cylinder)
- Measuring tape (5m)
- Tape

Where to begin marking the circuit: Use the corner of the room as reference and measure 5m on both walls. From these points, measure 5m out into the room. Begin marking the circled cylinder and follow with the rest of the circuit.

The tape measure should be in the middle of the obstacle.

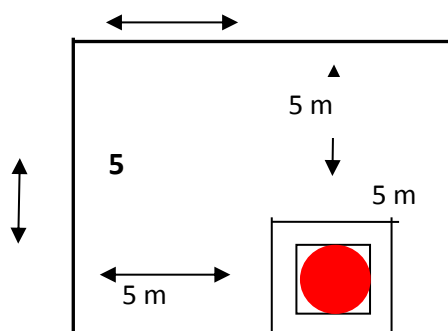


FIGURE 7 – Marking the first obstacle.

Type of Events

A - Timed Circuit

This is an obstacle circuit race with changes of direction. Penalties are awarded for mistakes.

Timed circuit is an individual race against the clock with six obstacles (Eight figure or zig-zag; 180° square; Circled cylinder; Reverse Gate; Ramp; 360° Square).

OBSTACLES FOR THE TIMED CIRCUIT

1. Eight Figure or Zig-Zag

- From 6 to 12 years old: The athletes do a zig-zag.
- From 13 to 18 years old: The athletes should complete a zig-zag forwards, turn, and complete another in the opposite direction (an entire eight figure).

2. 180° Square

The athletes should enter the square between the white cylinders. If they enter the square through the front, they should leave through the back. Conversely, if they enter the square from the back (typical for athletes who move with their feet), they should leave the square through the front.

3. Circled Cylinder

Athletes must manoeuvre around the cylinder in a closed circle.

4. Reverse Gate

Athletes approach the obstacle and cross through the cylinders in reverse.

5. Ramp

From 6 to 12 years old: The athletes do not go up the ramp. The athletes should surround the ramp, on the side they prefer.

From 13 to 18 years old: The athletes will use the ramp, going up on one side and down on the other.

6. 360° Square

The athletes' approach from the ramp and move inside the square. They should, then, make a complete turn within the square.

PENALTIES FOR THE TIMED CIRCUIT

- a) 1 second will be added to the overall time, in the following penalties:
- Touching or stepping on any cylinder or line with any part of the wheelchair, except when the athlete enters or leaves the obstacle.

Important - Athletes of the WS Manual A category can touch the lines and the cylinders with their feet without incurring any penalty.

- b) 2 seconds will be added to the overall time if the athlete knocks down a cylinder.
- c) 5 seconds will be added to the overall time for any obstacle done incorrectly.
- d) 10 seconds will be added to the overall time when the athlete changes the sequence order.
- e) If the athlete misses an obstacle within the sequence, the official will take the athlete to the mistake point to complete the sequence from that point on.

B - Individual Circuit

- Individual elimination consisting of two competitors completing equivalent circuits in an attempt to reach the finish line first.
- Penalties may be awarded in the form of additions to the final time.
- The competitor with the lowest final time, including penalties, is the winner.

OBSTACLES FOR THE TIMED CIRCUIT

1. Eight Figure or Zig-Zag

The athletes only go doing a zigzag. They do not complete the figure eight.

IMPORTANT: The rest of the obstacles are identical to the timed circuit.

PENALTIES FOR THE INDIVIDUAL CIRCUIT

- Penalties are the same as that of the timed circuit, with one exception: if the athletes move incorrectly through the sequence, the officials will not stop them and a 20 seconds penalty will be awarded.

C – Relays

It consists on the same mechanics as the individual elimination event, although it is conducted in the style of a relay race, where 4 athletes per team will be running the same circuit.

Optionally, more than two circuits can be set up parallel to each other in order to allow more participants to take part at the same time, depending on venue dimensions.

*In this circuit, there is a transfer area serving as the place where the athletes switch places with the next competing teammate.

With relays, we must consider the following points:

- 4 athletes will compete for each team, labelled from 1 to 4;
- The start and finish lines will be the same; when one athlete finishes the circuit, the next will be there, ready to begin;
- Athletes Nr.1 and Nr.3 will start from obstacle 1;
- Athletes Nr.2 and NR.4 will start from obstacle 6;
- Athletes waiting to relieve their teammates may only start the course after the athlete before them enters the transfer zone.

Team Composition

- a) The teams will be formed by a maximum of 6 members and a minimum of 4, two of them being reserve players;
- b) Just one player from category WS Manual B can be part of the team;
- c) At least one player must be from the WS Manual A category;
- d) A maximum of two electrical wheelchairs users may be on a team;
- e) At least one player must be female.

5. WARM UP

Firstly, before starting physical activity, athletes should do some exercises to prepare the body and avoid potential injuries.

Flexibility

In an upright seated position, turn head to one side, face front, and turn head the other way.

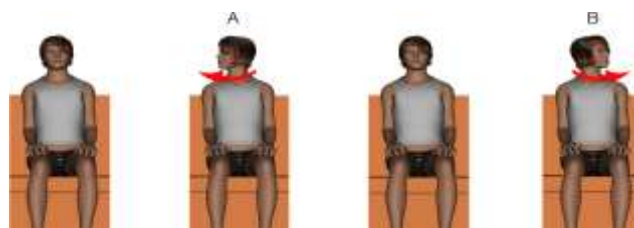


FIGURE 8 – Flexibility Exercise Nr.1.

In an upright seated position, with wrists parallel to arms of the chair, alternate between moving wrists in an upward and downward motion.

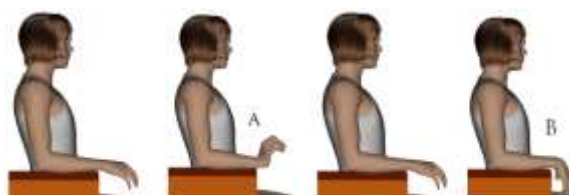


FIGURE 9 – Flexibility Exercise Nr.2.

In an upright, seated position with neck straight, alternate between bending the neck towards and away from the body.



FIGURE 10 – Flexibility Exercise Nr.3.

In an upright, seated position with relaxed shoulders, alternate between pushing shoulders up and down.

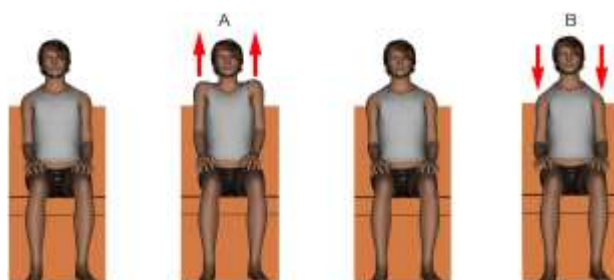


FIGURE 11 – Flexibility Exercise Nr.4.

In an upright, seated position with arms extended and hands overlapping, alternate between relaxing the wrists and moving them towards the body.



FIGURE 12 – Flexibility Exercise Nr.5.

For athletes who use the feet: In an upright seated position, with knees bent, alternate between extending the right and left legs. Additionally, consider flexing and extending the foot at the ankle.



FIGURE 13 – Flexibility Exercise Nr.6.

Beginning in an upright seated position, bend the torso to touch the toes and return to the initial position in order to rest.

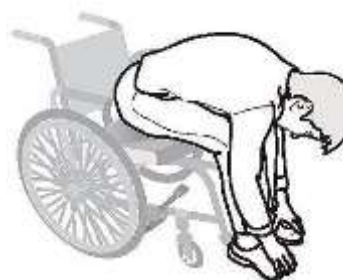


FIGURE 14 – Flexibility Exercise Nr.7.

In an upright seated position, begin a series of stretches by gripping the seat of the chair and turning the head from side to side.

Lift the arms so that each hand is holding the forearm of the opposite arm and twist the torso from side to side.

Return hands to seat of the chair, and alternate between extending the left arm and the right arm to the floor.

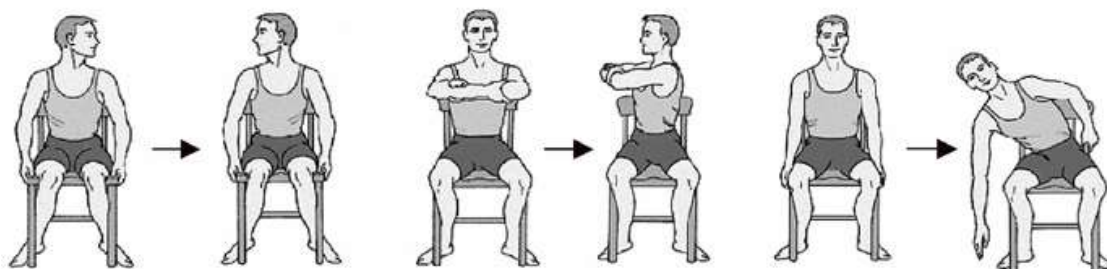


FIGURE 15 – Flexibility Exercise Nr.8.

In an upright, seated position with arms extended above the head holding an elastic band, alternate between pulling to stretch the band and returning to a relaxed position.



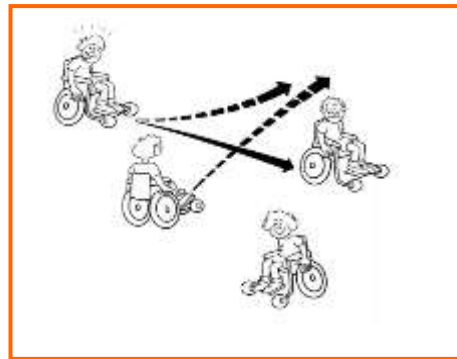
FIGURE 16 – Flexibility Exercise Nr.9.

Warm up by races

- Sneak up to the wall: one player positions her/himself facing the wall, with the other players behind her/him. The player pushes against the wall three times, and then turns around. While that first player is facing the wall, the remaining players behind her/him may rush to reach the first player. When the first player turns around, they must stop quickly. This continues until someone reaches the player facing the wall;
- Relays;
- Run a race in which the coach yells “Stop!” periodically, signalling for the players to stop quickly wherever they are;
- Mark a line on the floor; as the players move through the race, they must carefully stop before the line to practice avoiding the various lines of the obstacles;
- Race with the start line in various positions throughout the sequence;
- Progressive race: begin the race slowly and perform each subsequent obstacle at an increasing speed.

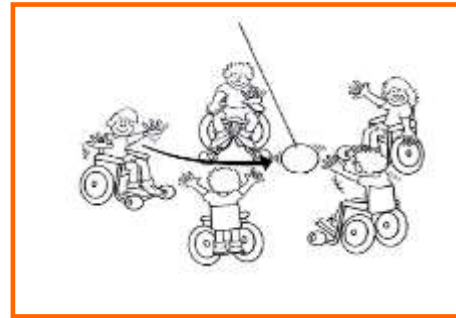
Warm up by games:

- **Colours game:** The players are in a circle with their eyes closed. The coach puts out various cones of different colours. The coach, then, shouts out the name of one of the colours, and all the players locate a cone of this colour, circle it, and return to the initial position as quickly as possible.
- **Groups:** The players move around the court at random. When the coach says a number, the players form groups of that number together as quickly as possible. (Rios Hernández, M & Blanco Rodríguez, A. 2006.)
- **Stop game:** In essence, “tag.” One designated player must attempt to catch one of the others on the court. When a player is caught, they must stop. Other players may attempt to touch this player, allowing them to move again, but they too may be caught if they fail.
- **Games with music:** The coach puts on music, and when the music stops, the players should stop their wheelchairs, or complete a circle and stop (up to the discretion of the coach).
- **Cut the line:** All players will be distributed around the court. There is a player that have to touch the rest of the players. The game starts when the player that have to touch the rest, choose another player shouting his name and go for him/her. The goal is to catch only this player, imagining a thread between the goal and who is touching. If any other player crosses between these two, by tapping the thread that joins them, it automatically becomes the target to pursue and the catching player has to go for him/her.
- **Tissue or serviette game:** Two teams on opposite sides of the court will compete to bring the tissue to their team’s zone. When one of the players catches the tissue, he can then be touched by the other player; this continues until the last one arrives to the security zone. Points will be added to the score whenever a team gets the tissue to their zone or when the team catches one of the opposing teams’ players before he arrives to their team zone. (Rios Hernández, M & Blanco Rodríguez, A. 2006.)



- **Circuit recognitions:** Mark with a tape all circuit and keep the cylinders in a box. The athletes should take the cylinders and leave them in a right position on the circuit.

- **Crazy Ball:** The game starts with a ball hanging in the middle of the circle of players around the ball. When the coach will swing the ball, the game starts. Then, all player have to hit the ball towards another mate to add penalties to the other players. Players receive penalties if the ball touches their body. Players can only touch the ball and hit it with their hands; they can move backwards, forwards, left or to the right to avoid the ball. At the end of the time, the player with fewer additional penalties will win.



6. PHYSICAL CONDITION TROUGH THE GAMES

Strength

The following suggested exercises will allow the athletes to enhance their strength.

Until 12 years old

- Ramps
- Propulsions* (see Figure 16).

* Work with the weight of the body

From 12 years old on:

- Work with a medicine ball – 1 kg

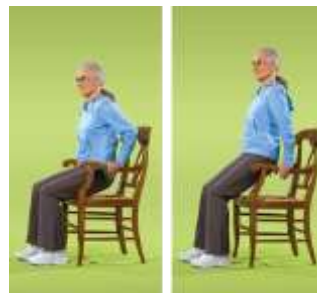


FIGURE 17 – Strenght Exercise



FIGURE 18 – Exercises with a medicine ball

- Front throw



FIGURE 19 – Front Throw

- Position two athletes with one in front of the other. Both should be facing the same direction. The athlete in the back should then pull the chair of the other. Switch positions.
- Work with elastic rubbers: both arms and legs



FIGURE 20 – Exercises with elastic rubbers.

- Ramps
- Propulsions (lift the torso out of the chair with the arms)
- Race with a resistance in the back; race with a resistance in front.
- Exercises with dumbbells



FIGURE 21 – Dumbbells

7. TECHNIQUE AND TACTICS - THE METHODOLOGICAL PRINCIPLES AND THEIR APPLICATION TO THE SPORT OF SLALOM [GENERAL METHODOLOGY OF TRAINING]

These are the main steps to take into consideration regarding training's general methodology:

- Decision-making work:** Generate training situations where you have to decide on a specific action: p. example: position on the start line.
- Regulation of sports performance intensity during the competition.
- Emotional autonomy:** To develop strategies to enhance and promote safety, self-esteem, motivation.

- d. Recording and viewing of the circuits made as a resource for the analysis, reflection and improvement in the accomplishment of the obstacles and / or circuit.
- e. **Registered accredited time**: Follow the evolution and detection of strong and weak points in the distribution of intensity.

7.1 SPECIFIC METHODOLOGY REGARDING THE RECOGNITION OF W-SLALOM'S CIRCUIT AND MATERIAL

These can be identified as the main steps on a specific methodology developed on how to work the recognition of the W-slalom circuit and necessary material, namely:

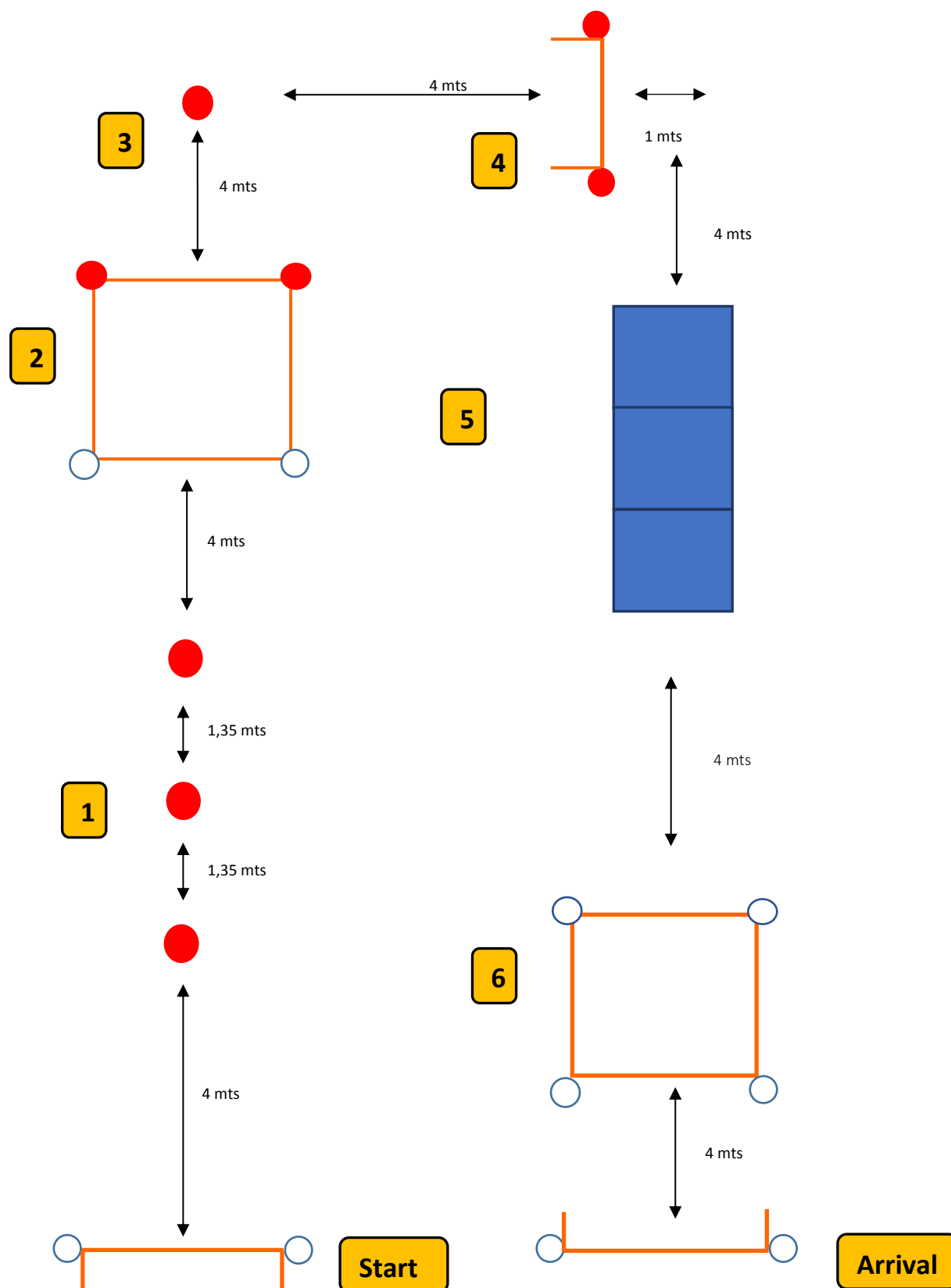
- a. Graphic representation / model;
- b. Do the circuit;
- c. Sequence of the circuit:
 - **1st phase**: First obstacle;
 - **2nd phase**: Obstacle 1 + zone between obstacles and 2nd obstacle
 - **3rd phase**: add 3rd obstacle

7.2 COMPETITION METHODOLOGY

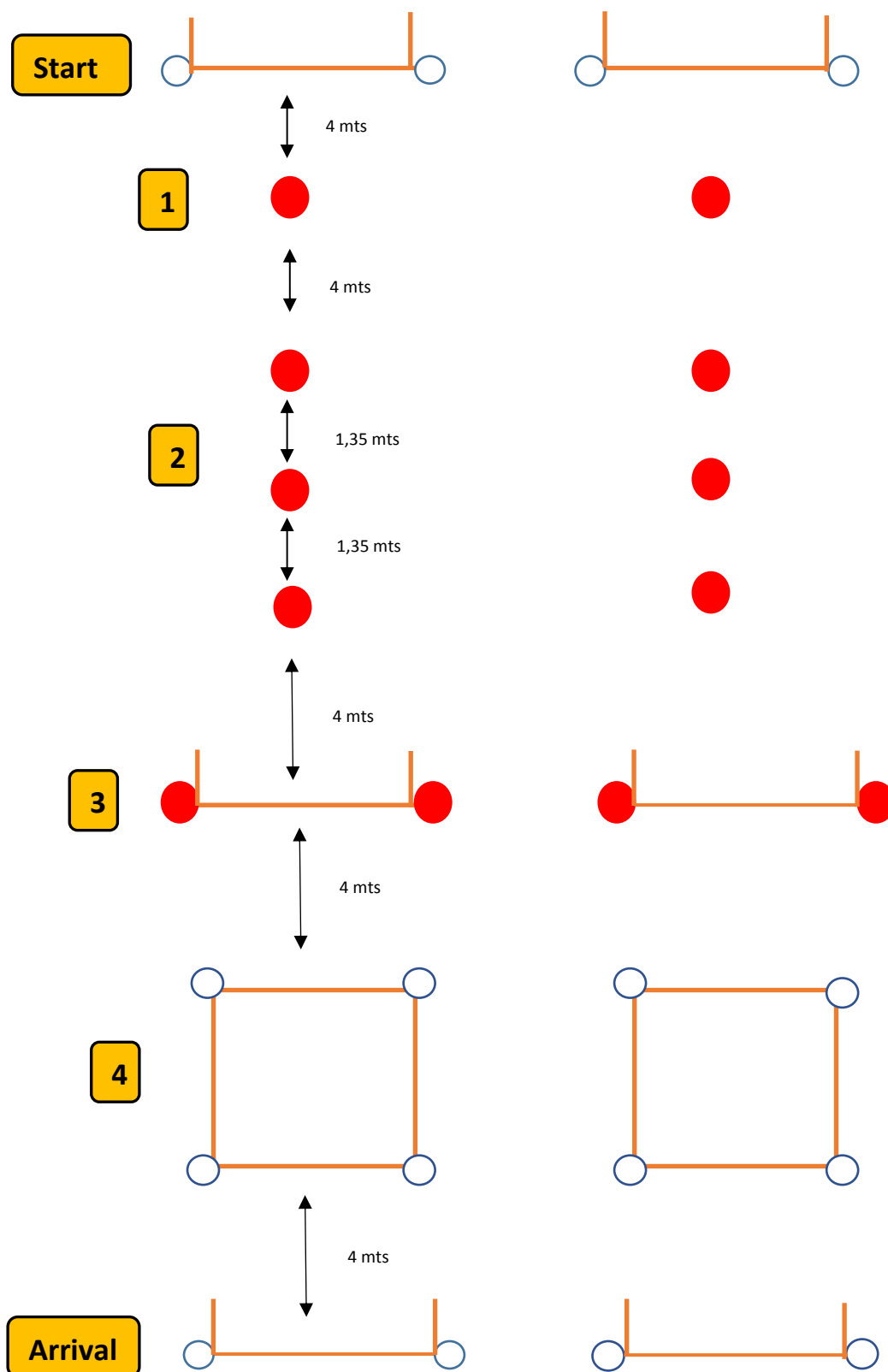
The following steps can be considered the milestones for an adequate circuit completion:

- a. Visualize the circuit;
- b. Emotional regulation: serenity, nerve management, adjustment of expectations;
- c. Ability to detect and solve the wrong situation [detect and rectify].
- d. Film the circuit in order to analyse mistakes.

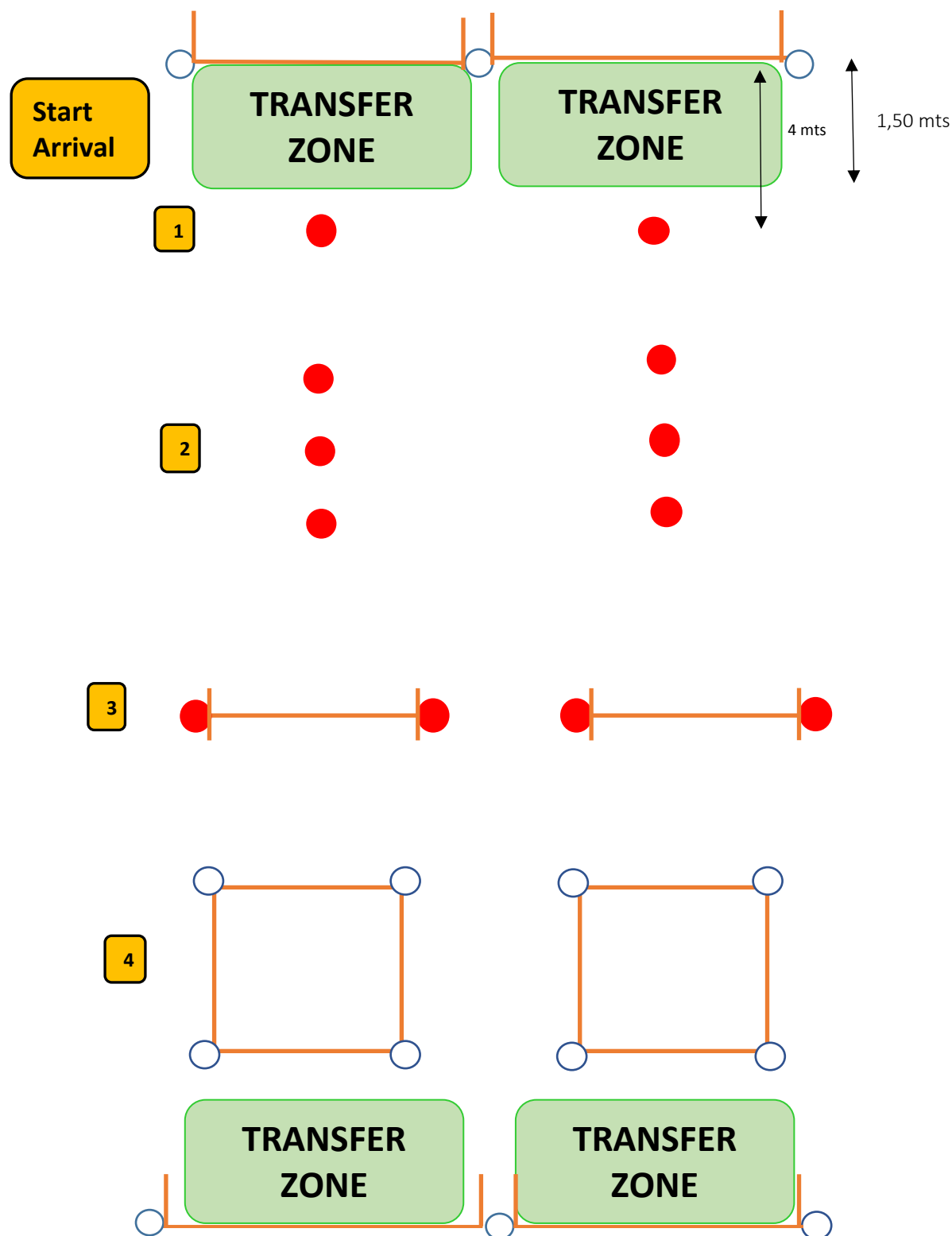
TIMED CIRCUIT: 4 meters between obstacles



INDIVIDUAL CIRCUIT: 4 meters between obstacles



RELAYS CIRCUIT:



7.3 MOVEMENT SKILLS FOR WHEELCHAIR SLALOM

On W-Slalom, movements and turn arounds are basic. Therefore, a part of properly working out the circuit and its obstacles will require facing as mandatory some movement skills.

A. DISPLACEMENTS AND TURNS

Firstly, it is important to research abilities to make direction and speed changes and braking the chair when it comes to making an obstacle. The skills can be promoted with the following exercises:

- To take a race ahead and to the signal it has to stop suddenly;
- Make a race ahead, signal back, and finish the race back;
- Group in pairs, trios, groups of people at the coach's announcement;
- Relays.

B. BETWEEN OBSTACLES

Secondly, it is vital to ensure control of the speed between obstacles, as well as control in the entrance and exit of each obstacle. To ensure that, the following suggestions should be taken into consideration:

1. Regulation of the intensity of the effort in different sections, bearing in mind both the following obstacle and the complete execution of the circuit;
2. Laterality;
3. Coordination.

START

1. Reaction speed;
2. Initial position.

C. HOW TO WORK THE OBSTACLES

ZIG-ZAG

Different topics/suggestions that can help improve to perform the zig-zag:

1. Knowledge and identification of penalties.
2. Requirements to get around each obstacle:
 - a. Laterality. Entrance to the obstacle in relation with the predominantly motor side.
 - b. Amplitude of turns between pivots and closure (consider the imaginary line that delimits the beginning and end of each obstacle).
 - c. The cylinder as a reference.

- d. Spatial organization.
- e. Coordination.
- f. Control of the execution speed in the obstacle

How?

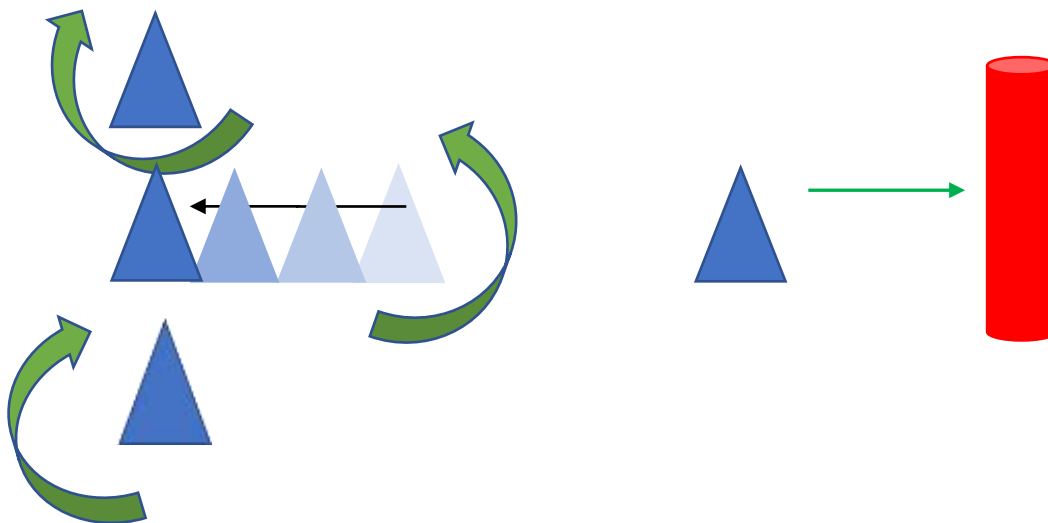
- ✓ Graphic representation. Drawing in the floor the correct way.
- ✓ Repeats and diversity in practical. Different measures and number of cylinders.
- ✓ Games with change of directions, speed move and execution

Example:

To prepare zig-zag obstacle, use 3 cones, placing the middle cone opened to work the obstacle zig-zag, put 3 cones, the middle one must be away from the other two wide open from the others. This distance will be shortened to the real required distance considering the athlete's gradual improvement of our athlete until the official distance is reached.



FIGURE 22 – Zig Zag



Variant:

Start with cones with a wider base, and, in the following exercises, the cones base can be reduced. In the end, the athlete will ready be ready to work with cylinders. In initial training stages, the distance between cones and cylinders can be longer than the official measure, and, progressively, the distance can be adjusted so that, further on, the athlete can work with the official measures

SQUARES

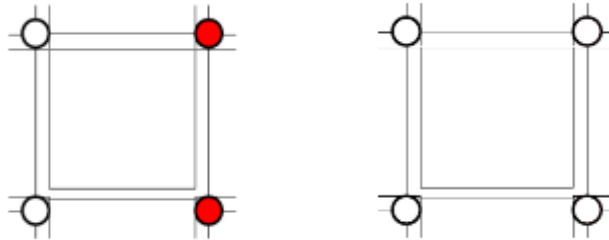


FIGURE 23 – Squares

Different topics/suggestions that can help improve to work the squares

1. Knowledge and identification of penalties.
2. Knowledge and positioning inside the obstacle based on the athlete's own axis of rotation.
3. Exercises for the correct execution of the obstacle:
 - Entrance: between cylinders, position inside the obstacle. This position depending of the wheelchair can be:
 - In the centre of square;
 - In a side.
 - Execution: initial position, references (cylinders/lines), laterality and coordination.
 - Exit: between cylinders and in a correct direction.
 - Without touching or causing any cylinder to fall.
 - Make sure that the front wheels of the wheelchair come out first to the exit 360° square, and the rear wheels in the 180° square.
4. Requirements to get around each obstacle:
 - a. Laterality. Entrance to the obstacle in relation with the predominantly motor side.
 - b. The cylinder like a reference.
 - c. Spatial organization.
 - d. Coordination.
 - e. Control the execution speed in the obstacle.

How?

- ✓ Graphic representation. Drawing in the floor the correct way.
- ✓ Repeats and diversity in the practical. Different measures and number of cylinders.
- ✓ Games with changing of directions, movement speed and execution.

Example:

Work with circles, to practice the turns.

Mark a circle of 1, 50m diameter on the floor and make the turn without touching the line.

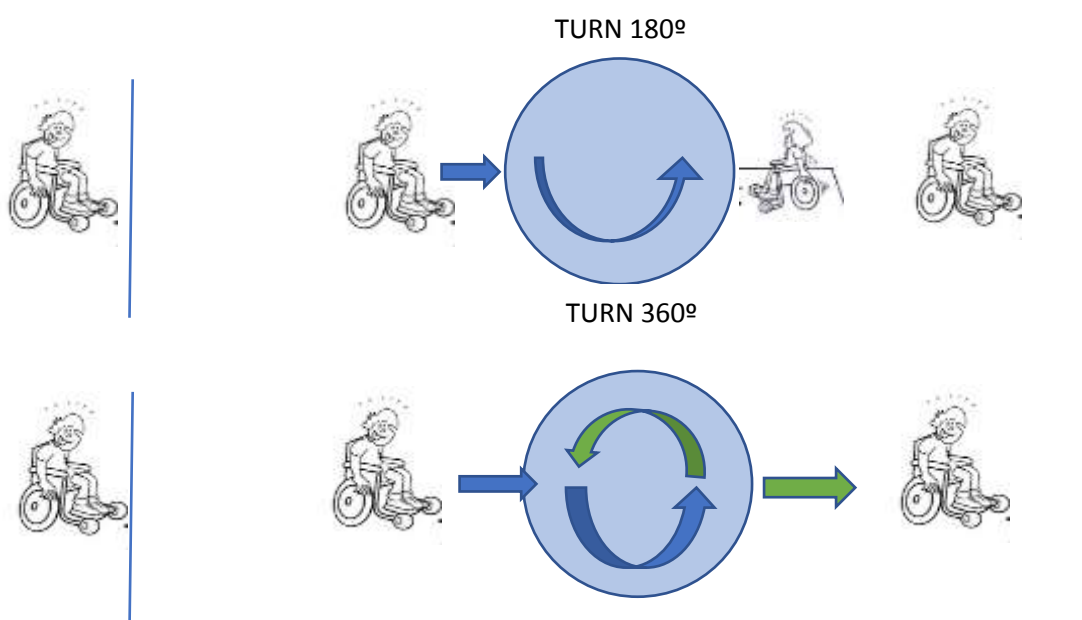


FIGURE 24 – Practical turning exercises.

**** Variant:** Different circles measures.

TURN CYLINDER

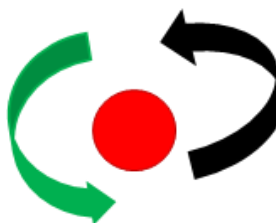
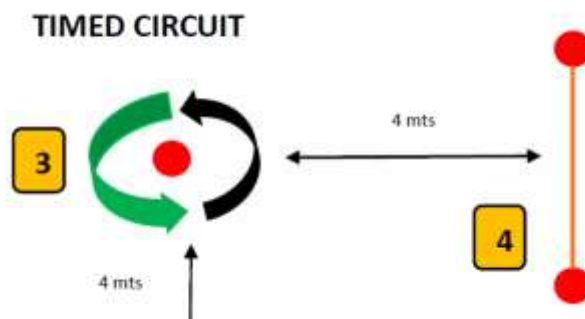


FIGURE 25 – Turn Cylinder

Different topics/suggestions that can help improve to overcome the turn cylinder

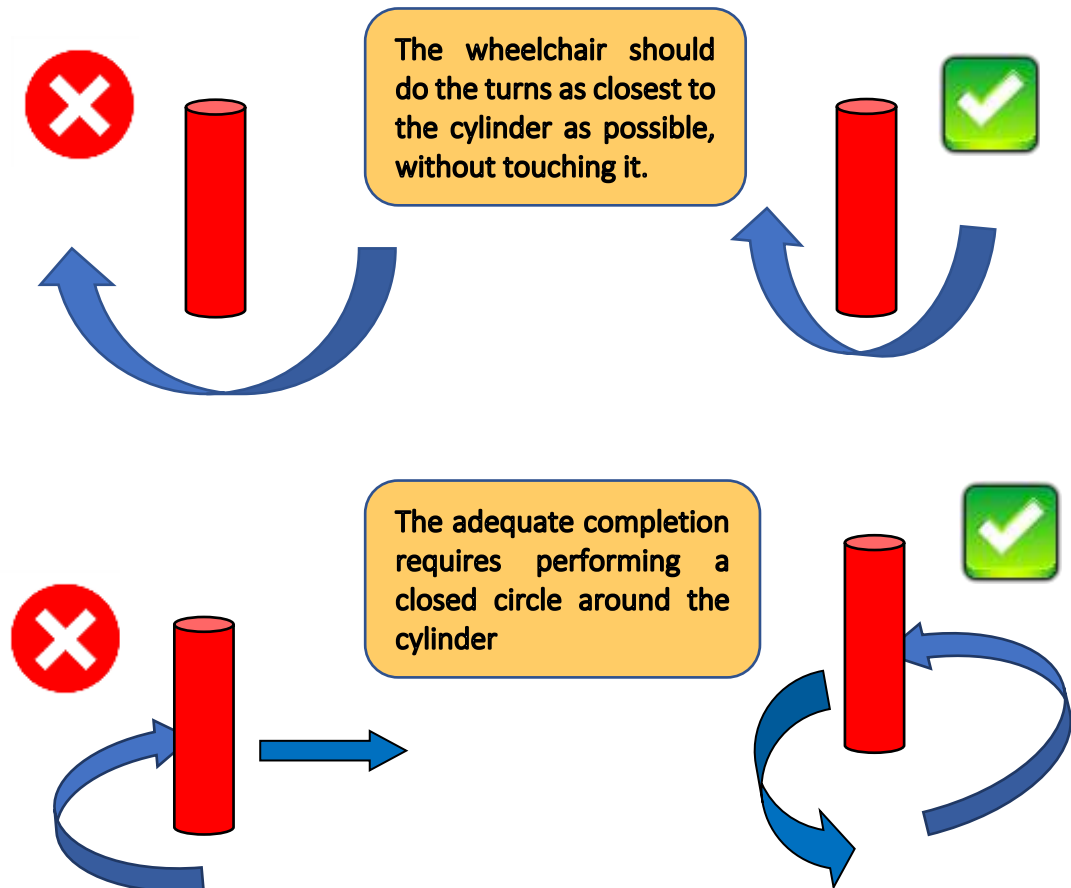
1. Knowledge and penalties identification.
2. Right way to do the obstacle:
 - a. The next obstacle should be used as reference to start with the current obstacle. The athlete will have to face the cylinder from the same side he/she will later on go over to the next obstacle, just as described in the following example.



- b. The turn wide should be taken into consideration having the cylinder as reference, and that the athlete must complete a perfect closure of the movement (consider the imaginary line that delimits the starting and end of the figure). The movement should begin and be concluded at the same point.
3. Requirements to get around the cylinder:
 - a. Spatial organization;
 - b. Coordination;
 - c. Control of the execution speed required to overcome the obstacle.

How?

- ✓ Graphic representation. Drawing in the floor the correct way.
- ✓ Repeats and diversity in the practical. Different measures and amount cylinders.
- ✓ Games with changing of directions, speed move and execution.



REVERSE GATE



FIGURE 26 – Reverse Gate

Different contents to be considered in order to improve technic and execution time for the reverse gate obstacle

1. Knowledge and identification of penalties
2. Knowledge and positioning inside the obstacle based on the athlete's own axis of rotation of rotation.
3. Exercises for the correct execution of the obstacle:

- a. Entrance: between cylinders, lateral position.
 - b. Execution: initial position, references (cylinders/lines), laterality and coordination.
 - c. Exit: between cylinders and in a correct direction.
4. Requirements to overcome the obstacle:
- a. The 3 phases should be continuous: entrance, execution and exit.
 - b. Approach to the obstacle.
 - c. Laterality: Entrance to the obstacle in relation of the predominant side.
 - d. Only one cylinder, to have a reference.
 - e. Spatial organization
 - f. Coordination
 - g. Control of the execution speed in the obstacle

How?

- ✓ Graphic representation. Drawing in the floor the correct way.
- ✓ Repeats and diversity in the practical. Different measures and amount cylinders.
- ✓ Games with change of directions, speed and execution time.
- ✓ Games of speed and change of direction.
- ✓ Work on the obstacle's approach, trying to do the turn without stopping at all.
- ✓ Games to work turns and going back with the wheelchair

RAMP



FIGURE 27 – Ramp

How?

- ✓ Work the impulse to climb the ramp, without brake.
- ✓ Control of the speed at the time of lowering the ramp.
- ✓ Trust and security work
- ✓ Physical condition: force

7.4 HOW TO MOVE THE WHEELCHAIR

Optimal movement of the wheelchair is best achieved when the user has a wide range of motion in the torso, shoulders, wrists, elbows, and fingers. With this in mind, the user should begin by extending the arm behind the torso, gripping the wheel, and pushing forward until the arm is even with the thighs. The advantage to this motion is the flexion of muscles in the arm, which allows significant force to be applied.

Ideally, the user will rotate the wheels in an alternating fashion; while one arm is even with the thighs on one wheel, completing a rotation, the other arm should be extended behind the torso, reaching for the opposite wheel. The motion of the arms should be accompanied by the respective adduction and abduction of the shoulders and rotation of the torso.

When rotating the wheel itself, the user should bend the torso; this will add more force to the movement. To complete the rotation, the user should grip the wheel at its highest point and push downward as quickly and as forcefully as possible.

With regards to the body's position in the chair, users should have maximum support points to stabilize posture and improve movement control.

It is important that the pelvis be in a neutral position, tilted in neither the anterior nor posterior directions, so as to optimize unobstructed movement at the hips and torso.

The user should also have a stable base at the feet. Armrests should be removed, if possible, to ensure maximum mobility of the upper limbs.

Note that the position of the user's hips in the chair, specifically the angle at which they open, will depend on each athlete's functional characteristics.

8. WARM DOWN

- Stretching
- Respirations
- Smooth Movements

9. EXAMPLE TRAINING SESSION

- Flexibility
- Warm up by races:
 - Different types of races
 - Games

- Physical Strength Exercises:
 - With balls
 - By body
 - By elastics rubbers
 - Dumbbells
- Technique and tactic of different obstacles
- Warm down

III. NECESSARY MATERIALS FOR W-SLALOM

This chapter is dedicated to the main equipment required to practice wheelchair-slalom and to put in motion a w-slalom competition.

For Athletes (including wheelchair regulations)

SAFETY FIRST!

Keep in mind you are expected to create a safe environment for children to participate in sporting activities.

Here is a list of safety measures that should be taken before engaging in any activity:



1. HEALTH

Be certain that your athletes are in proper medical condition to do sports. Ideally, athletes should attend regular medical check-ups and obtain a written attest from a doctor.

2. HELMET

Just like in any other racing sport, one loses sense of speed every once in a while, and accidents may happen. Therefore, it is mandatory for athletes to use a helmet.

Any regular bike helmet can be used. Make sure it is in the right size for the athlete and that it is properly fixed.



FIGURE 28 – Helmets.

3. OTHER PROTECTION DEVICES

It is also recommended to wear gloves to protect the athlete's hands and fingers from getting injured.

Knee and elbow pads have also proved to be useful.



FIGURE 29 – Gloves, knees and elbows' protections.

4. ITEMS NOT ALLOWED FOR W-SLALOM PRACTICE

Jewelry should make one look good but in sport it can sometimes be harmful if caught in the wrong place.

Athletes should take off or cover any sort of jewelry like watches, armbands, necklaces, etc.



FIGURE 30 – Jewelry should be avoided or covered to prevent injuries.

5. STRAPPING

It is very important that athletes are properly seated in the sport chairs. Just as important is to prevent them from shifting in it and, worst case scenario, even falling out of the wheelchair.

Athletes should be adequately secured and properly strapped to their wheelchair. Belts or straps will do the trick!



FIGURE 31 – Athletes should be strapped to their wheelchair.

6. MEDICAL EQUIPMENT

Medical equipment, such as oxygen tanks, are allowed but should be fixed properly to the participant's wheelchairs.

Always keep in mind to ensure your athletes' and their competitors' safety.

7. WHEELCHAIRS

Manual and electric wheelchairs with both front and back wheel motors are allowed.



FIGURE 32 – Wheelchairs

WHEELCHAIR SAFETY

There is no speed limit anti-tip device is mandatory, coaches are responsible for making sure athletes have their chairs properly and safely programmed. Check that tires do not leave marks on the floor and that there are no sharp elements on the chair.

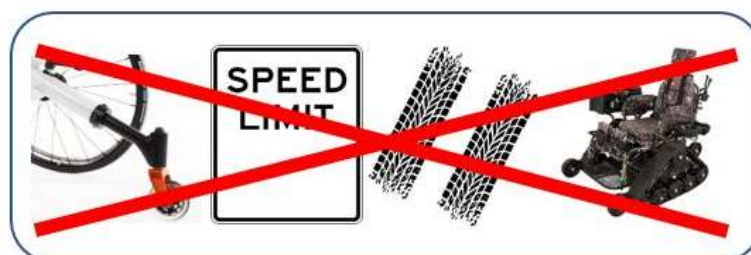


FIGURE 33 – Safety wheelchair recommendations

For Referees

Referees represent the organisation and guarantee the smooth delivery of the competition. They are essential to all sports. For W-slalom, the referee's basic kit should have:

- 2 flags: one red and one white
- 1 whistle
- 1 clock for manual time keeping
- Standard uniforms



FIGURE 34 – Basic Referee Kit

Competition Equipment

Additional materials will be required to run a wheelchair slalom event, namely:

- Marking tape to mark circuit boxes ;
- 2 sets of 12 cones of different colours;
- Wooden ramps (140cm x 200cm) and a platform (140cm x 140cm x 20cm).



FIGURE 35 – Cons and Tape

IV. THE GAME AS A CATALYST FOR LEARNING ACTIVITIES AND/OR TRAINING

Regular kinesiology activity undoubtedly contributes to a higher level of health of people of different ages. Appropriate kinesiology activity of children and youth provides short-term and long-term benefits. Regular physical activity provides the basis for proper growth and development (Ciliga et al., 2014).

However, children and young people with developmental and behavioural disabilities are less likely to decide on their kinesiological activities than their peers. As they grow older, the trend continues, and the number of adults with disabilities involved in kinesiological activities is decreasing. Experts of all profiles, doctors, kinesiologists, social pedagogues, defectologists, rehabilitators, psychologists, and others who work day-to-day with children, students and young people with developmental and behavioural disabilities, and people with disabilities or who are in contact with close family members would promote the importance of dealing with kinesiological activities in such sensitive populations (Durstine et al., 2000).

The main goal of increasing the level of physical activity of children and young people with developmental and behavioural difficulties is aimed at reducing the decrease in aerobic capacity due to their immobilisation, optimization of their physical capabilities, and improvement of overall well-being. Regular kinesiological activity is necessary for the development and maintenance of normal muscular strength, flexibility, postural control and other motor skills that can slow the deterioration of the movement's functionality in that population and increase their autonomy (Durstine et al., 2000).

The health benefits of physical exercise depend on the type, intensity and volume of the selected kinesiological activity. The long-term research on the impact of physical exercise on the overall health of people of different ages has led to a cognition of the specific action of various kinesiological activities on the basic components of health fitness. Appropriate kinesiological activity can advantageously affect the morphological, muscular, motoric, cardiovascular and metabolic components of an individual's health fitness, which will undoubtedly reflect on his overall health (Heimer and Mišigoj-Duraković, 1999).

The basic activity of each child is a game: it allows the child a better understanding and integration with the world, which enables her/hi, to experience joy, enriches the knowledge about her/himself and surroundings. The game is the activity, which improves motor and intellectual function of each child and establishes social behaviour, that is, it forms a personality (Aranitović, 2014).

Every child lives a different life, but the needs of all children are very similar, and the fundamental rights are the same. Every child has the right to their uniqueness and diversity, to the fulfilled life they enjoy, to games and socializing with their peers, so mental and physical difficulties should not prevent any child from fully participating in life.

A child with disabilities has fewer opportunities and greater need for the game. Children and young people with disabilities in the development and behaviour of these persons have greater limitations on kinesiological activities, have a lower level of health (difficulties not directly related to their disability) (Murphy and Carbone, 2008). They know the world around themselves through scant experiences. Numerous fundamental, clinical and epidemiological studies clearly support the importance of regular physical exercise in the prevention of chronic diseases and improvement of general health of children and adults (Beets et al, 2009). In children with cerebral palsy, the game must be in harmony with the motor and mental capabilities of the child, safe, interesting, useful, and stimulating.

A child with cerebral palsy may have various difficulties affecting his ability to move, hold, and balance. Motor development is characterized by delays and delays, development does not flow equally and harmoniously in all development areas. In pre-school age, the lives of children with cerebral palsy often occur outside the family - at therapies, rehabilitation and treatment, and peer groups are developed mostly among children of similar specialties.

Due to the specificity of the development path, opportunities of children with cerebral palsy are limited, a healthy development of self-consciousness is difficult and quality of life is impaired (Kraguljac et al., 2018). Children with cerebral palsy have significantly lower levels of strength than their healthy peers and with them it is necessary to carry out exercises for the development of muscular strength and strength (Rimmer, 2001). In addition, girls with cerebral palsy during adolescence have a lower level of self-esteem than their non-disabled peers in domains of physical appearance, social acceptability, sports abilities and school success (Shields et al., 2006). Furthermore, the psychosocial consequences of inactivity include a lower level of self-esteem, reduced social acceptance and ultimately greater dependence on others in everyday life (Murphy and Carbone, 2008). Above all, regular engagement with kinesiology activity of children, students and youth with developing disabilities and people with disabilities can reduce or slow down the emergence of additional health complications. Participation in kinesiological activities improves the psychological wellbeing of children with disabilities through providing opportunities for creating new friendships, expressing creativity, developing their own identity, and finding additional meaning in life (Dykens et al, 1998).

That is why it is important from the outset to follow and encourage the development of children with cerebral palsy through various props and games that will be interesting and stimulating to them. More serious international efforts to promote the social and emotional well-being of children with disabilities through participation in various kinesiological activities, from rehabilitative exercise, to sports recreation until the sporting competition, started only recently (Ciliga et al., 2014).

Wheelchair Slalom is one of the sports that can help the physical and mental development of children with disabilities.

We know that a child gets familiar with his body through movement. For a child with cerebral palsy, such experience as the game has an even greater role for psychophysical development. W-slalom challenges motor skills, and the child's sense of integration. It causes a sense of satisfaction and makes it easier for children and young people to connect, to get out of them, and to change situations, in accordance with their own feelings and needs, prompting momentary impulses.

A child interacting with her/his social and physical environment can recognize his or her abilities and limitations, build the foundation of independence or abstinence, observe his or her own borders, gain experience of their own influence on the environment and events in it, build their own identity, develop self-consciousness and self-confidence (Horvat et al., 2012).

Knowing their individual characteristics such as the possibility of movement, degree of development and other motor skills (body coordination, speed of performing motor tasks, precision of motion, endurance in performance), opened up the possibility to practice Wslalom. Wslalom provide numerous benefits for mental health. Movement stimulates cognitive development, sensory experiences relax, and experience of playing with other children the sense of society belonging.

The best quality of the game on child development with motor disabilities is visible in interaction with other children, in this case practicing W-slalom. Involvement of a child with childbearing difficulties can complement family upbringing and provide the child with contents of socialization, encouraging her/him to engage in interaction with adults and peers that will be stimulating and represent a good developmental experience. In addition, a child during time spent in W-slalom can learn various activities, games, strategies and develop productive contacts.

Many children with motor disabilities have limited experience in moving. It is important to encourage them to explore the world around them so that they will not be deprived of new experiences that will affect their overall development: developing trust in their own opportunities, gaining confidence in the social and physical environment,

gaining experience of their own impact on the environment, acquiring independence in action and building their own identity (Horvat et al., 2012).

Games that can help to develop skills needed to practice the W-slalom are simple, fun and applicable in all conditions. One of the game that can be implemented is reported to colour observation. The game is very simple and it only requires the possession of the coloured cones. The game is played in a way that the children in the wheelchair move freely on the playground where the cones in different colours are distributed. When a trainer tells the colour, the children should notice as soon as possible which of the cone is in that colour and come as soon as possible to that same cone. This game reinforces the visual perception of children and the speed of reaction to the default task. In this way, children learn to differentiate the colours which are important to W-slalom in which the two colours prevail, each of which has its own meaning.

Another game that can be implemented is the game of quick reaction: the trainer stands facing the wall and the children are aliened behind him in minimum of 20 metres. The trainer counts to three and then turns. The time that the trainer is facing the wall is the time when children needs to be moving towards him, the moment he turns they need to stop and be still. The one that he sees that is moving needs to go to the beginning. The one that first touches the trainer wins. This game encourages quick response and focus on children, as well as the ability to quickly stop in place.

The game with claps improves listening and thinking and ability of fast response to the default task. The Wslalom has 4 kinds of obstacles, the revers, zig-zag, 360° turn, and forward. The game is played in a way that every clap means one kind of obstacle. One clap means forward, two claps revers, three claps zig-zag and four claps 360° turn. Children need to move freely and, depending on the number of claps, the child must perform a certain action.

Another game that can fit into regular training is played in way that the children are moving freely. During that time the coach tells them numbers from 2 to 4 and, depending on the number mentioned, the children must be grouped in the crowd equal to that number.

There are many games that can be used as a W-slalom training preparation, which will be interesting and customizable for children in a wheelchair. All children deserve the best possible conditions for growth and development, and regardless of their needs, they should be encouraged to explore and recognize new forms of games, otherwise they will be deprived of new, important experiences that will affect their development.

Learning through playing is one of the key elements in an adequate development of a child, so the game should take place on a daily basis.

V. Improving overall fitness through the sport of w-slalom

Inclusion of children and young people with developmental and behavioural disabilities and older people with disability in general in kinesiological activities promotes their physical, emotional and social well-being. The choice of an appropriate kinesiological activity and its content is based primarily on the overall health of the practitioner, her/his individual interests for individual activities, security measures, and available resources and aids.

Personal, family, financial, and social constraints for engaging children, students with disabilities and those with disabilities in individual kinesiological activities should be timely identified and resolved at family, local or state level. The most frequently mentioned limitations for dealing with kinesiology activities among young people with disabilities are the real functional ability of the individual with disabilities, the high cost and the lack of close objects and the customized kinesiological programs (Murphy i Carbone, 2008).

Once children and young people with disabilities and development and behaviour challenges are involved in a particular kinesiological activity, it is necessary to increase their initial motivation for doing so and to ensure the continuity of their attendance. It is said to be extremely important because it will have significant effect on their psychophysical health. Only regular exercise ensures the development and maintenance of motor skills essential to improving the health of people with disabilities. Maintaining regular workouts can, therefore, help to properly plan content, tailored to the opportunities and interests of participants, setting short-term goals, and regularly tracking trainer progress.

Although there is a large number of customized kinesiological activities for children and young people with developmental and behavioural disabilities and for people with disabilities, their inclusion in standard exercise systems, together with peers without disabilities, contributes to reducing social barriers when possible greater social integration of people with disabilities. People often mistakenly assume that children and young people with disabilities are more often injured than their peers without disabilities. However, athletes with disabilities have very similar incidence of injuries to athletes without disabilities, so fear of injury should not be an additional barrier to kinesiological activities (Ciliga et al., 2014).

There is a wide variety of kinesiological activities tailored to children and young people with developmental and behavioural disabilities as well as older people with disabilities. Guidelines are also available to select appropriate activities, given the desire and opportunities of future practitioners. The aim, therefore, is to integrate children, students and young people with developing disabilities and those with disabilities into appropriate kinesiological activities, rather than demotivating them.

Adequate kinesiological facilities for children and adults with disabilities should aim at the development of aerobic abilities, flexibility, balance, postural control, agility, muscular strength, strength and endurance. It should also maximally accommodate objects in terms of increasing the availability and exercise safety levels. In general, in the work with people with disabilities, they recommend kinesiology activities of longer duration, higher frequencies and lower intensity than those planned for working with the standard population (Durstine et al., 2000). Before engaging in an activity, it is necessary to take into consideration the current health status of the future trainee, the level of competition in the selected activity, the specificity of the role in the chosen sport, the availability of protective equipment, as well as the possibility of adjusting the particular activity in the sense of more professional exercise (American Academy of Pediatrics, Sports Medicine and Fitness, 2001).

Cerebral Palsy (CP) is one of the most common disabling states in children and is the most common cause of severe non-motor disorder in children. Studies have shown that children with CP have increased energy consumption, decreased muscular strength and endurance, and reach muscle fatigue sooner than their peers. Although small and of small sample sizes, research studies of strength and resistance training effects in CP patients have shown that they can also increase muscle strength and endurance without negative effects (Cosic, 2012).

In children with cerebral palsy developing and maturing, their disability is growing and it is of great importance to anticipate the child's development needs and to respond timely to the selection of appropriate priorities, goals and contents of the rehabilitation programs that the child will be involved in. Studies have shown that people with cerebral palsy must maintain higher levels of physical readiness than the general population in order to postpone the decline of the body's functional abilities associated with the aging processes and the consequences of primary damage to the body. In the psychosocial point of view it should be emphasized that the difficulties of communication, socialization and everyday life skills are sometimes more important for the functioning of the child with cerebral palsy than the motor problems themselves and the lack of mobility (Klaić et al., 2007).

Children suffering from cerebral palsy have deficiencies in sensory, cognitive and psychosocial skills, affecting the child's opportunities when it comes to education, autonomy and socialization. Contemporary medical, kinesiological and rehabilitation

science today offers opportunities for selected concepts, programs and procedures to act in the sense of preventing, preserving or improving the health fitness of children and people with cerebral palsy (Ćosić, 2012).

In children with cerebral palsy and even with lighter forms, significant muscular weakness is present in comparison to healthy peers. Muscle weakness is considered to be a major limiting factor in achieving function in everyday life from muscle spasticity itself. Weaknesses contribute to low body activity, reduced central input to muscle due to central nervous system damage, changes in elastic muscle properties and their histological properties, change in reciprocal innervation mechanism, increased activity of stretching reflection, ie muscle spasticity. The only effective in achieving muscle strength are direct muscle load programs through specific exercises or activities. Contemporary research shows that strengthening programs enhance the ability to produce muscle strength, improve walking ability, drive wheelchairs, and other forms of motor performance. Studies even reject the biggest argument against the application of resistance programs, which is a consequence of an increase in abnormal tone of musculature (Klaić et al., 2007).

As part of the motor component of health fitness of children with cerebral palsy, the lack of or poor quality of normal automatic postural reactions, i.e. *equilibrium* response (Klaić et al., 2007), is attributed to one of the main characteristics of their posture and movement disorders. The development of motor skills is of great importance for the growth and development of the child. Motional abilities are determined in the first place by hereditary factors, but also depend largely on the environment in which the child is developing and growing.

While working with children with cerebral palsy, special attention is given to the development of fine motor skills, especially hand movement, and hand and fingers. The fine motor development standards follow the legality of the overall development of the child. Therefore, monitoring the child's developmental sequence can lead to a number of possible, sometimes even very serious injuries. For athletes in wheelchairs, the relative strength of absolute strength is more important. Due to the specificity of the game or the category of disability exercises, only the strength of the upper extremities and the strength of the body, especially the development of the muscles of the arms and shoulder belts, are used. Children practicing W-slalom in a wheelchair sit with very little body shifts, but it can still be considered exercise because during play the entire weight of the body in the wheelchair moves on the ground. Exercise also helps with coordination; the body learns how to process information faster. Welsh encourages exercise and driving skills as well as avoiding obstacles and collisions with obstacles.

Each training and competition also affects socialization, encouraging independence, self-confidence, discipline, teamwork, strategic thinking in team sports, experience of victory and defeat.

Concerning the intellectual ability to practice w-slalom, it is safe to say that it can affect the development of visual perception. Visual perception allows us to notice a wide range of visual qualities such as movement, depth, space relations, facial expression and object identity. In addition, time and space is developing. The most important intellectual component is the development of a positive attitude towards physical activity and other activities in everyday life as well as the development of pleasure in participating in activities that we can show the environment in which we live and the development of self-control.

VI. IMPROVEMENTS IN THE USE OF THE WHEELCHAIR THROUGH SLALOM AND HOW TO TRANSFER THEM TO EVERYDAY LIFE

Wheelchair Slalom, like any other sport, is a motivating activity for children and youngsters with motor functional diversity, resulting in significant benefits in three dimensions of the person (physical, psychological and social), adding to the individuals' full development.

In the next pages, we will try to highlight the main benefits of this sport, namely, emphasizing specific benefits of some of the presented obstacles.

PHYSICAL BENEFITS

The regular practice of wheelchair slalom can enhance:

- Muscular strength;
- Movements' coordination;
- Autonomy in daily life;
- Activation of muscles and joints, which allows to prevent muscular retractions and joint deformities that often causes motor impairment;
- Benefits on the circulatory and respiratory physiological functions improving health condition.



- ✓ Improvement in the acquisition of a greater ability in handling the wheelchair;
- ✓ Improvement of physical and functional capacities.

One of the main advantages of wheelchair slalom is the fact that it presents obstacles on the slalom circuit that simulate situations of everyday life, thus, preparing children and youngsters to overcome such difficulties.

Specific examples:

g. Reverse Gate

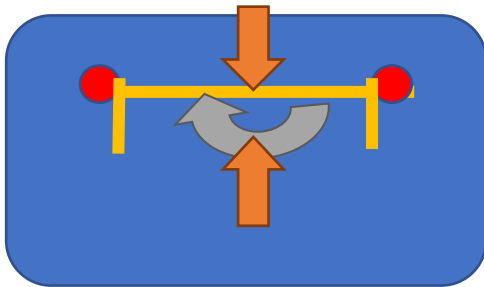


FIGURE 36 – Reverse Gate and its application in daily life

Facing a small obstacle, where it is better to deal with the rear wheels than with the small ones is the same gesture that is done to overcome the reverse gate at a w-slalom circuit. The entrance to an elevator is also simulated by the inverted door.

h. Twists

Twists are also a very positive exercise when it comes to moving around the house: Turning a square inside will cause the person in a wheelchair to learn how to size the chair, having more security at the same time accessing smaller spaces.

A good control of the turns will help circulation in the public road, where we find more elements of coexistence (people, children, animals, strollers, etc).



FIGURE 37 – Several elements of coexistence in daily life.

i. Ramp

For children manual wheelchair users, the ramp is an element that will help enhance their physical ability to perform this obstacle, which simulates a rise and a descent. Additionally, it helps electric wheelchair users in the following activities:

- Cross walking;
- Accessing the car ramp;
- Accessing buildings by ramp.



FIGURE 38 – Ramp vs. obstacles in daily life.

PSYCHOLOGICAL BENEFITS

From a psychological point of view, the following neurologic functions can experience significant improvement through W-Slalom practice, namely:

- Memory;
- Planning;
- Tasks organization;
- Spatial orientation;
- Emotional self- regulation.

Additionally, children and young people experiment positive feelings such as being able to fulfil their goals, increased self-esteem and spirit of overcoming.

SOCIAL BENEFITS

In the social domain, the w-slalom practices helps to:

- Improve social contacts established by children and youngsters;
- Acquire a sense of belonging to a group;
- To improve personal relations and interactions;
- Increase and improve the quality of communication;
- Ensure additional confidence at the moment of addressing situations.

In conclusion, it becomes clear that W-Slalom promotes all these therapeutic benefits but children and youngsters experience it from a recreational-sports aspect and, therefore, it adds a much stronger motivating factor.

It should be emphasized that motor learning takes place if the context is significant and is linked to positive emotions; this is where the importance of W-Slalom practice in children with functional diversity lies.

VII. SLALOM PRACTICE AS A BASIC ELEMENT FOR RAISING AND FACILITATING SOCIAL AND EDUCATIONAL INCLUSION, IN THE CASE OF SCHOOL-AGE ACTIVITY

The Convention on the Rights of Persons with Disabilities (United Nations, 2006), defined as principles:

“-Respect for inherent dignity, individual autonomy including the freedom to make one’s own choices, and independence of persons;

-Non-discrimination;

-Full and effective participation and inclusion in society;

-Respect for difference and acceptance of persons with disabilities as part of human diversity and humanity;

-Equality of opportunity;

-Accessibility;

-Equality between men and women;

-Respect for the evolving capacities of children with disabilities and respect for the right of children with disabilities to preserve their identities. [sic].

It is in children and young people of school age that the passage of inclusive principles and values must begin, and the school constitutes one of the primordial contexts in the supreme mission of promoting school and social inclusion of children and

young people with special educational needs, ensuring equal opportunities for participation and access to a wide range of activities, including sports.

Effectively, in its recreational, therapeutic and competitive aspects, sport emerges as a means to enhance social interaction and to improve the overall physical, social and psychological functioning of the individual (Wegener, 1996; *cit.* in Yazicioglu, Yavuz, Goktepe & Tan, 2012).

In fact, it is a fact that people with disabilities who develop physical activity have a better quality of life and a greater personal satisfaction than individuals with disabilities who are not involved in any sports activity (Wegener, 1996; *cit.* in Yazicioglu, Yavuz, Goktepe & Tan, 2012). It is verified that disabled individuals who practice sport have more confidence in their abilities, maintain closer relations of friendship and present lower levels of solitude (Shapiro & Martin, 2014).

Thus, sports practice can be a facilitating tool for social and school inclusion, as it is a pleasurable, liberating and active practice for children and young people (Rodrigues, 2003); In the case of the population with motor disability, W-Slalom proves to be another sports offer of excellence, practiced in autonomy and promoter of skills that favour the inclusive process. That is mainly due to the fact that functional improvements in the disabled population allow individuals a greater predisposition for social interaction and for effective participation in society (Souza, 1994; Costa & Duarte, 2006; *cit.* in Martin, Alves & Duarte, 2012).

Therefore, in children / youngsters of school age, W-slalom, by presenting significant benefits in the promotion of functionality, provides them with significant psychosocial improvements, which are reflected in a more active social participation in activities and joint activities with their peers, favouring social and school inclusion.

It is important that children and young people with disabilities have access to the practice of sport regardless of their functionality, and the physical and professional restructuring of the entities to promote the inclusive process is fundamental (Martin, Alves & Duarte, 2012), that allows everyone, without exception, to have opportunities to (Moniz Pereira & Rosado, 2016):

- "-Participate regularly in physical activity / sport;*
- Ability to achieve, maintain and / or improve your physical condition;*
- Demonstrate personal and social behaviour of respect for self and others;*
- Demonstrate motor skills and mastery of movement patterns for the performance of a variety of physical / sporting activities;*
- Demonstrate understanding of movement concepts, principles, strategies and tactics applied to learning and performing physical / sport activities;*
- Valorise physical / sporting activity as a means for health, fun, challenge, personal expression and social interaction [sic]. "*

To that end, it is necessary to consider the need for individual adaptations according to the individual's physical and psychological condition, safeguarding medical issues (Pedrinelli & Verenguer, 2005; *cit.* in Martin, Alves & Duarte, 2012). Those adaptations may include adjustments to the task's level of complexity and context, with the purpose of providing the individual with optimum participation and independent performance (Rodriguez, 2006, *cit.* in Martin, Alves & Duarte, 2012).

This way, intervention models should consider the individual (e.g. age, body typology, gender, levels of motivation), task (e.g. motor skills requirement) and involvement (e.g. space variants such as lighting, temperature and floor) (Newell, 1986; *cit.* in Davis, 2011). Also, equipment, rules, organizational patterns, and variants at the instruction level are included as key elements (Kasser & Lytle, 2006; Morris & Stiehl, 1999, *cit.* in Davis, 2011).

In these adaptations, the role of the teacher / coach is very important: she/he should seek to know the individual's functionality and develop inclusive work methodologies (Carmo, 2002, *cit.* in Martin, Alves & Duarte, 2012). Some general strategies for promoting this learning may be suggested (Martin, 2006; Fulton, 2004; Bataglioni, Zuchetto & Nasser, 2014): structured activities in an inclusive environment; the active role of the child in the acquisition of skills; discuss with the individual strategies to overcome difficulties; ask individuals what they feel; promote motivation and active exploitation with a view to developing autonomy and independence; provide demonstration, variability of experiences, repeated practice to learning, more time to perform tasks and constant feedback; look for possible adaptations of movements and / or material, if necessary.

Within a personal context, it is necessary for children with disabilities to become more active: to be able to perceive the importance of the general benefits of exercise and to interpret physical activity as promoting physical and psychological well-being. In addition, it is believed that the primacy of an inverse inclusion model may add value to the inclusion process. This model aims at the participation of individuals without



disabilities in structured activities and prepared for individuals with disabilities, as is the case of wheelchair slalom sports, instead of adaptations in the activities directed to individuals without disabilities, which may increase thus recruiting for sports activities on both sides (Schoger, 2006; Schlein Green & Stone, 1999; *cit.* in Hutzler, Chacham-Guber & Reiter, 2012), which is essential in increasing sport for people with disabilities.

FIGURE 39 – W-slalom training

In the process of inclusion, be it in a direct or inverse way, it is necessary to adopt a holistic view about the child / youth, being fundamental to take into account not only the characteristics, interests and needs of the child or young person, but also the school involvement , community and family (Koldoff & Holtzclaw, 2015).

On the other hand, it is important to note that the benefits of social and school inclusion are transversal to the entire population and W-Slalom also develops its social role by allowing people without disabilities to put themselves in the other people's shoes and to develop a full social awareness of inclusion and exercise their role as citizens of a community that excels in population diversity.



The contribution to the inclusion of children and young people with disabilities from physical activity practice in general, and W-slalom in particular, whether recreational or competitive is evident. However, there is a great deal of ignorance about this sport, and this demystification is essential in clarifying the psycho-social and inclusive potential of the modality for the whole community.

FIGURE 40 – W-slalom for people without disabilities

In that sense, it is necessary to develop actions in the community, including, for example:

- Development of actions that have a strong impact on the community, with demonstrations in diverse contexts (e.g. schools, municipal events, etc.) and with experimentation on the part of all;



FIGURE 41 – W-slalom Training Session

- Development of training actions for different target groups: sports managers, coaches, teachers, coaches, assistants, volunteers, etc.;

- Consulting and initial technical-sports follow-up when implementing and developing the modality in a school, community, institutional and / or club context;



FIGURE 42 – W-slalom Demonstration

- Investment of resources in the materials and equipment needed to practice W-slalom;



FIGURE 43 – W-slalom required resources

- Development of meetings at regional and national levels, encompassing different aspects: Experimentation, Recreational, School, Competition.

It is, therefore, important to highlight the role that the community can play in increasing individuals' participation through the creation of differentiated opportunities; betting on sports involving disabled and non-disabled persons; increased awareness among trainers / teachers and the community as a whole (Verschuren, Wiart, Hermans & Ketelaar, 2012); as well as the existence of a more accessible built environment that will be beneficial to all citizens, even becoming an investment to meet the needs of a growing population (Rimmer *et al.*, 2004).

In short, there are no magic recipes for inclusion, there are challenges to the development of inclusive good practices, to the detriment of attitudes of passivity, conformism and constant demand to justify non-participation; articulation among all the actors (e.g. school, family, community), in the development of means promoting inclusion.

W-slalom emerges as a physical activity that is required to promote the functionality of people with motor disabilities, which allows the diversification of opportunities, which promotes participation and equal opportunities, which contributes to the improvement of children's quality of life and young people with disabilities, which sensitize citizens to the place of the other, and which allows, regardless of functionality, to carry out activities in an inclusive environment.

VIII. HEALTH AND SAFETY IN PHYSICAL ACTIVITY

PHYSICAL ACTIVITY, LIFE QUALITY AND HEALTH

There is a straight connection between health and physical activity, as well as between health and life quality. The WHO recommendation, namely for adults, is of a minimum of 150 minutes of moderate-intensity physical activity throughout the week. People, who are insufficiently physically active, according to these criteria, have a 20% to 30% increased risk of all-cause mortality. Therefore, it is correct to conclude for the connection between physical activity and life quality, helping individuals to maintain a healthy weight, contributing to bone and muscle health, as well as enhancing their psychological well-being and reducing the risk of certain diseases including cancers, heart disease and diabetes.

Several scientific research has shown that a significant number of diseases are connected to inappropriate habits and life style (Nunomura, Teixeira, & Caruso, 2004) and the American Cardiology Association has even considered the sedentary life style as an independent risk factor for developing coronary arterial disease.

On the other hand, studies developed by King and colleagues (1993, cit. in Nunomura, Teixeira, & Caruso, 2004) have shown positive indicators from aerobic exercise on reducing anxiety, depression and stress levels. Samulski and Lustosa (1996, cit. in idem) have reported aerobics efficiency in stress, humour and self-concept. According to recent literature on exercise and depression, focused on younger adults, the relation is uniformly positive, which makes exercise an excellent treatment recommendation for people suffering from depression (Mather, Rodriguez, Moyra, McHarg, Reid, McMurdo, 2002).

Nowadays, the benefits of physical activity have been emphasized for its contribute to the improvement of life quality and stress control. In that sense, health care professionals have proclaimed the need of a balanced diet, a happy family and social life and regular sports activity practice. "Continued patterns of regular exercise reduce the risk of developing cardiovascular disease, diabetes, colon cancer, and breast cancer in later life" (World Health Organization, 2006).

In fact, studies have been made to compare stress levels between people with and without regular sports activity practice, demonstrating that physical exercise has a direct impact on physical health and mood and a knock-on effect on social life (Nunomura, Teixeira, & Caruso, 2004). On a study developed in Brazil (Caruso, 1997), comparing sedentary and regular sport practitioners, an evaluation was made on their stress symptoms and quality of life. The data obtained clearly showed that stress symptoms, including the more severe, were significantly more frequent in sedentary individuals by comparison to regular sports practitioners. Based on this study, it was possible to infer that regular sports practice is a successful strategy to reduce stress and improve quality of life, probably due to the stress reduction.

Additionally, other studies revealed that considering psychological factors is vital to develop physical activity, regardless of its preventive or therapeutic nature. According to Samulski and Lustosa (1996), similarly to what happens with the physical aspect, psychological well-being can vary according to the type of exercise and other factor such practice involves, like its environment, instructors and the person him/herself.

According to the World Health Organization (2006), not only exercise is important to the healthy development of children and youngsters, but also regular exercise habits should be developed early in life (at least of 1 hr or more of moderate-intensity physical activity on five or more days per week). However, it is estimated that only about 1 third of adolescents develop adequate exercise habits.

There are concerns, however, that only one third of adolescents reach this target and that individuals may be at risk for adverse health outcomes later in life due to not developing adequate exercise habits in childhood and early adulthood (Currie et al., 2006, cit in Maltby, Wood, Vlaev, Taylor & Brown, 2012).

Physical activity gains even more importance as an element of healthy living for people with functional limitations, namely, older adults and disabled people. In these specific populations, physical activity helps to reduce functional declination (Goggin & Morrow, 2001, cit. in Cardenas, Henderson, Wilson, 2009). Additionally, W-slalom practice, due to its specific features, allows practitioners to develop their movement range and to improve their movement coordination and to develop muscle strength.

Physically active older adults can reduce or prevent functional declines linked to disability or aging through improved cardiovascular functioning, reduced risk of falling, and reduced loss of muscle mass and strength.

BENEFITS OF PHYSICAL ACTIVITY FOR INDIVIDUALS WITH DISABILITY

If physical activity is essential to ensure life quality and health improvement for people in general, it is even more relevant for individuals with disability, since it has additional metabolic advantages.

Physical activity, in these cases, can improve children and young practitioners' cognitive, emotional and social skills, by providing them an enhanced self-perceptions and a sense of self-worth, therefore reducing stigmatisation and negative stereotypes usually associated with disabled people. It reduces, as mentioned, greater levels of stress, pain and depression, which, in its turn, makes activities of daily life to be perceived as easier. On the other hand, at this social level, developing sports activities, such as W-slalom, provides children and youngsters with a safe environment in which they can bond, meet new friends and, in that sense, increase their social integration. It is also known that their social status improves through sports practice, since non-disabled people tend to portray individuals with disabilities more favourably than non-active people.

According to the American CDC (2018), all healthcare providers should regularly recommend physical activity options to their patients with disabilities. However, the initiation to sports practice must be properly advised by physical activity experts and take into consideration some important aspects, namely:

- The need to make sure each potential sports practitioner engage in the amount and types of physical activity suitable for them;
- To promote opportunities for them to progressively enhance regular physical activity in such ways that meet their needs and abilities;
- To promote a slow and steady start of physical activity, based on their abilities and fitness level;
- To include aerobic exercises, essential to achieve certain health benefits (e.g., reducing the risk of heart disease, stroke or diabetes) by making them breathe harder and their heart beat faster;

SAFETY IN SPORTS PRACTICE

Despite its undoubtful benefits, physical activity always involves risks that can be minimized by adopting a set of simple rules to ensure basic safety measures, that should be taken into consideration in planning and implementing sports activities.

One of the keys to a healthy and safe physical activity is to program such activities and to implement them under the supervision of a qualified coach or Physical Education Teacher.

In order to ensure such safety requirements, some basic recommendations can be followed, as following (Ophea, 2018):

- Children and young practitioners should be supervised appropriately, and their team members should communicate safety expectations and promote safe sports practices on a permanent basis;

- Safety procedures to be implemented should aim for the highest possible level of safety, while allowing, at the same time, children and youngsters to engage in a broad range of activities, progressively challenging their own limits;
- Children and young practitioners should be made aware of the safety rules and the importance of safe sports practice, identifying potential risks and procedures that can contribute to prevent injuries or accidents.
- Before starting W-slalom practice, an outline of procedures and rules for safe practice should be done, demonstrating practitioners how to minimize possible risks of the activity.
- Children should be advised to use proper clothing for sports practice, avoiding to wear jackets or hoods with loose drawstrings, scarves, or backpacks attached to their wheelchairs.
- As previously mentioned, a thorough check of equipment condition and suitability for the sports practice should be done prior to starting the activity (check if the children are well adjusted to the wheelchair, if they are secured, if they are using all necessary protection gears, if their clothing is appropriate for freedom of movement, etc.)
- Children must be instructed in the proper use of the equipment, particularly when they are trying W-slalom for the first time.
- Each venue or training site should have an emergency plan, in case of accidents, and a first-aid kit easily accessible, whenever necessary.
- W-slalom, as any sports activity, should have a positive social impact on their practitioners. Children and young people should be made to feel emotionally and psychologically comfortable at all times.
- Coaches and Competition Managers should be fully informed of medical background and physical limitations of the athletes that can affect their performance in order to meet their specific abilities.
- All participants, particularly children, should be made aware of W-slalom rules, which will be enforced, ensuring the sports practice suitability to the age and physical, emotional, social and intellectual abilities of the participants.
- Prior to experimenting W-slalom for the first time, children should be explained and demonstrated the movement skills required to perform the activity.
- The surface of the spaces where the W-slalom circuits will take place should also be inspected to make sure it provides safe traction. The used obstacles, namely the ramp, must be flat and firmly secured to the floor so as not to present a

tripping hazard. Possible unintended obstacles should also be eliminated (e.g., remove furniture and equipment not relevant to the activity).

- When marking the w-slalom circuits, exterior boundaries for the activity should be outlined at a safe distance from walls and obstacles.

CONCLUSIONS AND RECOMMENDATIONS ON SPORTS PRACTICE AND ITS BENEFITS

As underlined by the National Institute on Aging at NIH (2017), almost anyone, at any age, can exercise safely and get meaningful benefits, regardless of their physical limitations. However, it is vital to make sure practitioners stay safe while exercising, particularly when they are starting a new activity or haven't been active for a long time. Since over-exercising can not only cause injury, but may, consequently also, lead to quitting, it is recommended a steady rate of progress as the best approach to engaging in any sports, but that is particularly true for w-slalom.

In conclusion, to ensure a safe and healthy w-slalom practice, each child or youngster must be made aware of the sports rules and movement requirements and included in the correct class/group, according to their physical possibilities and limitations. Before starting any sports activity, each child or youngster must talk with their healthcare provider, particularly if they are not active and want to start a vigorous exercise program or significantly increase their physical activity. The healthcare provider should also provide the potential sports practitioner with an accurate description of his/her physical potential and limitations, that the coach will use to adjust the exercise program in w-slalom initiation stages.

Their initiation to w-slalom should be progressive: they should start slowly with an exercise program that contains low-intensity exercises, and gradually enhance physical intensity and demand, improving their endurance by boosting their activity level gradually.

It is also important to make sure all practitioners warm up before exercising, and cool down afterward, creating this habit early on.

To prevent injuries in w-slalom performances, all practitioners must, by one hand, follow all rules and apply them fairly, and, on the other hand, make sure they use protective equipment and clothing at all times, checking regularly if it is in good working condition. According to recommendations from Harvard University, some basic principles for coaches can be considered as important tips for staying safe in sport:

- To make sure each practitioner always warms up before exercising (at least 10 minutes) and cools down afterwards;

- The warm-up should include complete stretches adjusted to the practitioner's range, avoiding over-stretching;
- To adjust the training plan to the athlete's physical profile, avoiding the disadvantages of overtraining by applying the principle of tedium. Training too hard or too often can cause overuse injuries like stress fractures and inflamed tendons and ligaments, caused by the repetitive wear and tear of certain body parts.
- To recommend sufficient rest, particularly after high-level sports activity moments, as well as drinking enough water to avoid dehydration and replace fluids lost during sports practice;
- To advise and verify if practitioners always wear the appropriate clothing for w-slalom activity;
- To ensure each practitioner is properly seated and adjusted to the wheelchair, strapping parts of the body susceptible to injury, if necessary;
- To demonstrate how to employ the correct technique at all times for each required wheelchair movement.

Ultimately, it becomes clear that some physical activity is better than none, so all children and youngsters should be continually encouraged to avoid being physically inactive. W-slalom is, undoubtedly, a dynamic and attractive sports that can ensure health benefits associated with physical activity and, at the same time, promote the child's social, psychological and physical development.

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