

ADAPTIVE PARALLEL TRACK SKIING

Teaching Adaptive Alpine Skiing With Parallel Track Technique For Persons With Mild To Moderate Motor Impairments.

by

Anne-Marie Ducommun Physiotherapist
NDT Coordinator Instructor

Published by Clinician's View®

www.clinicians-view.com/cview

Copyright 1999

ADAPTIVE PARALLEL TRACK SKIING

Teaching Adaptive Alpine Skiing With Parallel Track Technique For Persons With Mild To Moderate Motor Impairments.

Table of Contents

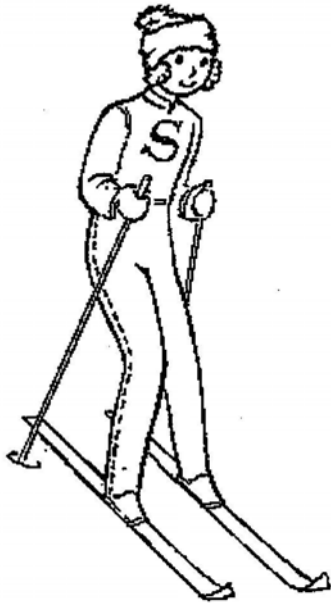
Preface	1
Introduction.....	3
Chapter 1: Teaching Skiing Methods for Students With Cerebral Palsy	4
Cerebral Palsy	4
Typical Motor Handicaps	4
Spasticity.....	4
Athetosis	4
Ataxia.....	4
Associated Disorders	4
Perceptual Disorders	5
Body Image Disorders	5
Disorders of Orientation in Space.....	5
Disorders of Lateralization.....	5
Hearing Impairments	5
Language Disorders	5
Vision Impairments.....	5
Effects of Motor Disorders on Learning How to Ski.....	9
Chapter 2.....	11
Pre-Ski Exercises	11
Principles of Teaching	11
Objective of Pre-Ski Exercises	12
Pre-Ski Exercises	12
Elementary Exercises on the Slope.....	12
Walking with Skis.....	15
Side-Stepping - Getting Up after a Fall - Turning on the Spot with Step Turn	17
Downhill Run in the Fall-Line	21
Traverse.....	23
Uphill Step Turn	25
Side-Slip and Uphill Parallel Turn.....	27
Program for the Advanced Level.....	29
Parallel Turn.....	29
Skating Step	32
Crossing Bumps and Hollows.....	34
Short Turn	35
Pre-Ski Exercises for High Mountaineering Skiing.....	38
Relaxing Movements	38
Chapter 3.....	38
Principles of teaching.....	38

Presentation of the Skiers

All through this book, we will follow the progresses of four young students with Cerebral Palsy, as they progress through each stage of ski instruction. From the beginner to the advanced level.

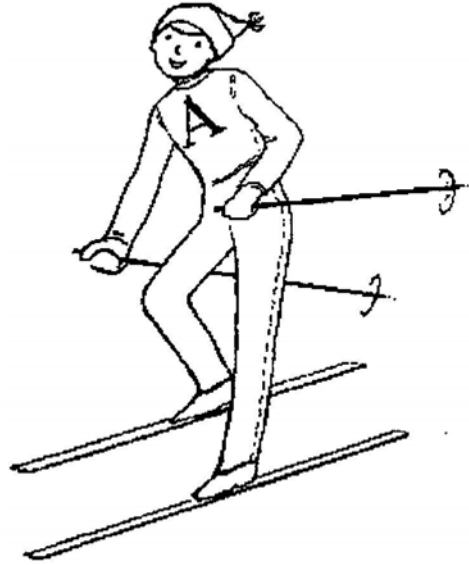
STEPHANIE

12 years old, skiing from the age of six.
Presenting a spastic diplegia.



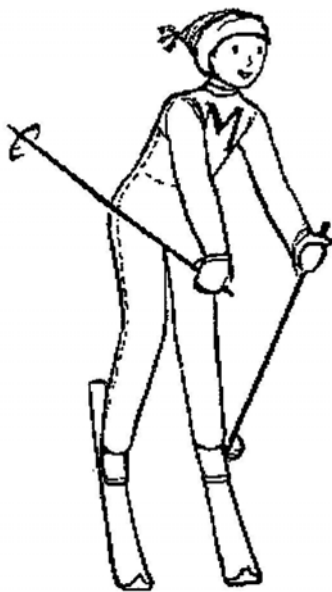
ALAIN

10 years old, skiing from the age of four.
Presenting a left spastic hemiplegia.



MICHEL

11 Years old, skiing from the age of five.
Presenting an athetosis.



CHRISTINE

17 years old, skiing from the age of twelve.
Presenting a mixed form of Cerebral Palsy with ataxia.



Basic Skills Necessary to Learn How to Ski

Motoricity

1. Walking without support, even if the appearance is abnormal.
2. Ability to stand on one leg, keeping balance, with or without holding a support.
3. Jump on the spot with, or without holding a support.
4. Ability to grip two poles, with or without help of the magic glove.
5. Hold squatting position with knees apart.
6. Roll backwards like a ball and sit up again, keeping legs together knees bent.
7. Side-sit beside the heels, on both sides.
8. Side-sit, stand up with one hand as a support, without kneeling.

Age

- From 4 years on, children with Cerebral Palsy are welcome with their parents.
- From 7 years on, children with Cerebral Palsy are attempting a course for several days without their parents. The child has to be independent enough to join a group and to cooperate.
- Teenagers and young adults participate in various courses for several days.

Equipment

Clothing

Woolen ski hat, anorak and ski trousers, or a well fitting ski overall that is warm and waterproof to protect from the cold, which increases the spasticity.

Warm gloves or mittens, waterproof and not too big, allowing the skier to hold his poles properly. The ski-boots must open sufficiently to allow the foot to slip in with ease. The ankle must be well maintained. Boots must not be too high, as this greatly limits movements. Persons who are wearing corrective devices should use them in their ski boots.

Skis

Short skis facilitate mobility and confidence for beginners. For skiers with Cerebral Palsy, the tip of the skis must not reach beyond eye level. A good ski with an excellent running surface is necessary. Ski bindings must be adjusted professionally to open during a fall, avoiding an accident. Beginners usually start with short skis promoting a vertical position. Progressively adapt the length of the skis to the improvement of the skier. Ski bindings have to be fixed 2 to 4 cm. ahead of the normal guidelines to compensate for incorrect distribution of body weight backwards.

Ski Poles

Length should be from the ground to the skier's flexed elbow.

An adjustable strap and a large hand-grip are useful to encourage wrist control and stability of the hand.

- Movements to mobilize hands and wrists.
- Endurance and agility training with gymnastic balls.

Working with music is very important in the application of pre-ski gymnastics. Students learn how to adjust to a given rhythm, to orient themselves in space, and to perform coordinated exercises in a group. These experiences can be applied when skiing on the slopes. For example, beginners with precarious balance will find side-stepping easier on the slope, if they have learned beforehand how to stand and move together side by side. Advanced students will also benefit when skiing downhill behind the ski instructor, where maintaining an equal distance between each other is required.

OBJECTIVE OF PRE-SKI EXERCISES

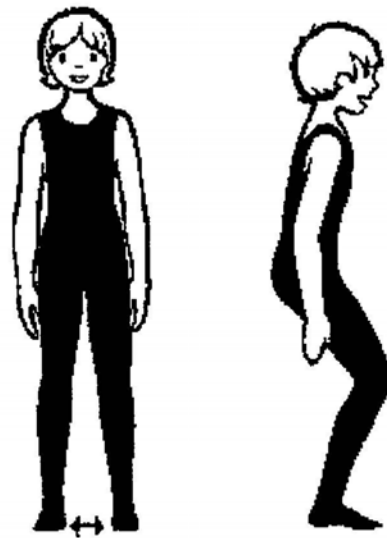
The student with Cerebral Palsy learns step by step to feel the basic movements of skiing deep in his body by using different visual, hearing, tactile and sensori-motor experiences.

Pre-Ski Exercises

These exercises are grouped specifically to prepare each technical stage of the skiing program. (refer to chapters 4 and 5 for specific stages).

Elementary Exercises on the Slope

1. Springing movement of both legs.



2. Symmetrical arm swinging with springing movements of the legs.



3. Asymmetrical arm swinging with springing movements of the legs.
4. Walking forwards, backwards, side to side, in zigzag, alone or in pairs.
5. Feet apart and parallel, with hands on the knees, jump in rhythm.
6. Running softly.
7. Twist : push hips, knees and feet to one side, arms and trunk to the other side, and vice-versa.

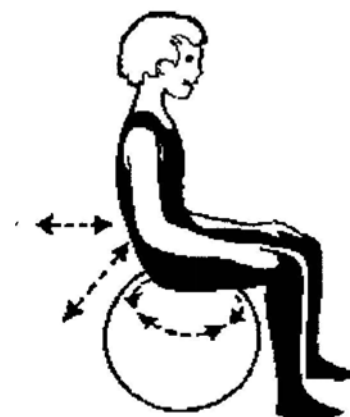
8. Standing or sitting, make a tennis ball slide forwards and backwards under the sole of the foot.



9. The Stork. Standing on one leg, lift and bend the other leg keeping in balance; stretch the back of the neck, look straight ahead, push the neck slightly up and look horizontally. Inhale and then exhale, while making a hissing sound : SSS...pulling up well the comers of the mouth. Then lift up the other leg.



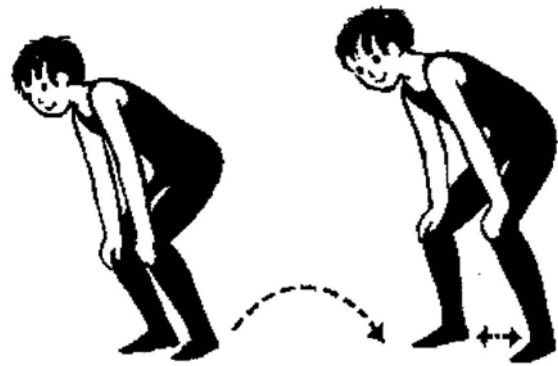
10. Sit on the ball. Straighten the back, roll the ball backwards and forwards, to the right and to the left, diagonally, then roll the pelvis round in a circular movement.



11. The Swing. Sitting on the edge of a stool, feet parallel on the ground, stretching up the trunk, holding a small ball horizontally at shoulder level, arms are half-flexed, elbows down. Tilt the pelvis backwards and forwards. Inhale and transfer the weight onto the sacrum; exhale with the sound : WAH...and transfer the weight onto the ischial-tuberosities.



13. Standing, feet parallel and almost together. Keep the hands on the knees and jump, landing with feet and knees bent and apart. Exhale with the sound OOO... and jump back to the starting position.

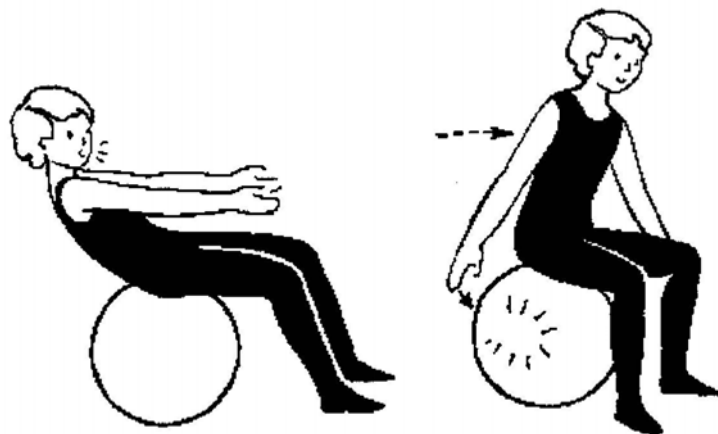


14. Walking forwards, sideways, stepping over obstacles of different heights.
15. Walking in zigzag, with or without marks on the floor. Downhill Run in the Fall-Line

Downhill Run in the Fall-Line

These exercises contain the movements to encourage balance in the downhill runs.

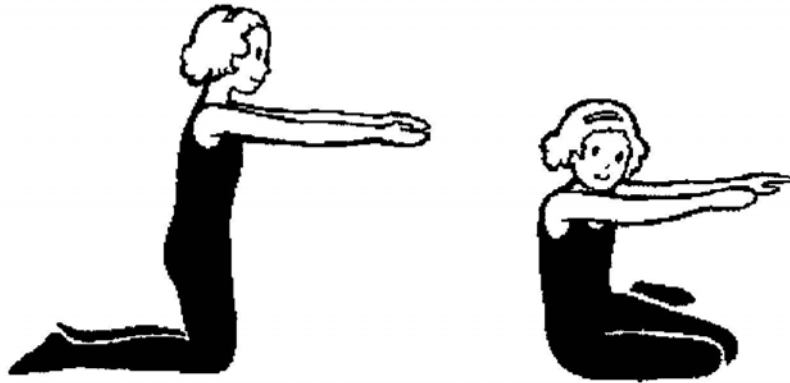
1. Sitting on the ball, lean slightly backwards, while blowing out the sound OOO... With the chin tucked, extend both arms forward with palms facing each other. Rise to the sitting position while inhaling and clapping the ball several times with open palms.



2. The Half-Moon. Sitting on the ball, hold a balloon, lower the head and the trunk, extend the arms and make a semicircular movement in front of the ball.

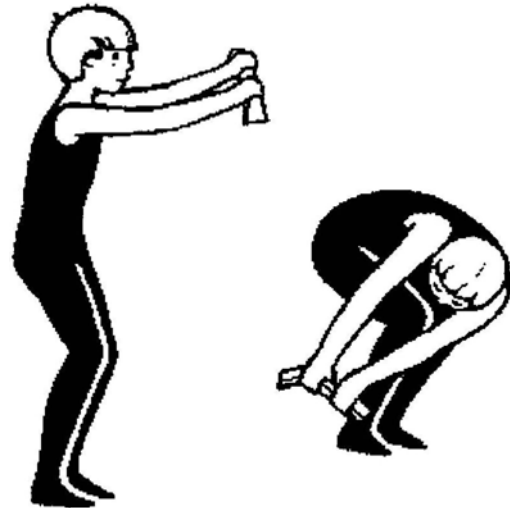


3. High kneeling, side-sit to the left and to the right of the heels with outstretched arms..

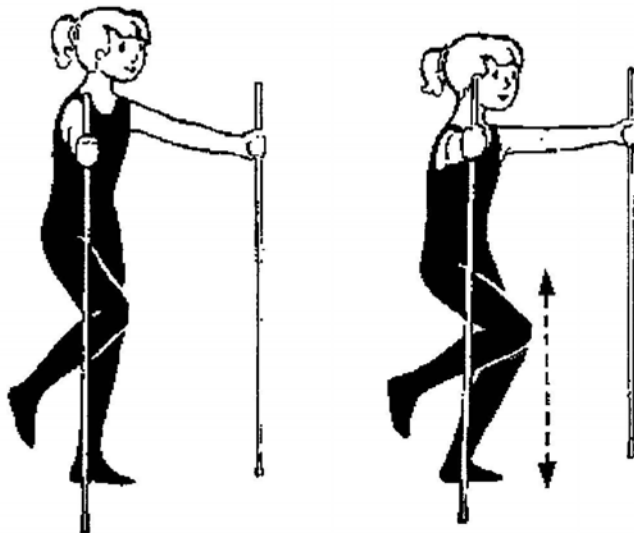


4. The Tortoise. Feet and knees flexed and apart to the width of the hips, forearms placed on the thighs. With the head down and back rounded, tilt the pelvis backwards to look at the coccyx. Then tilt the pelvis forwards lifting up the head and slowly extend the back from the skull to the coccyx.

5. Cleaning Shoes. Performing a springing movement of the legs, swing a scarf, first at knee-height, then descending to the feet. First to the left, stand up again, then to the right, while lowering and turning the mink.



6. Lift up one leg, spring on the other leg with or without using poles.



Specific motor difficulties - therapeutic aid

STEPHANIE, diplegia.

Stephanie leans backwards with the trunk, to compensate the exaggerated flexion in her legs, the knees interlock, making her slip.

Therapeutic aid :

The therapist crosses her hands and places them on Stephanie's knees, to separate them and encourage extension. With her shoulder she supports the sacrum and brings the body weight forwards. The uphill side of the body is brought forwards, turning to face down the slope. Check the position of the feet, to correct the edge grip.



ALAIN, left hemiplegia.

When traversing on the right, the hemiplegic side is downhill, so the ski lies flat on the snow, without gripping. Alain places too much weight on the uphill side, making the whole body tuna towards the slope, in order to avoid slipping downhill out of the track. Traversing to the left is easier, then the hemiplegic side is uphill, but it is retracted and the leg stiffens in extension.

Therapeutic aid :

Place one hand on the abdomen, the other on the sacrum, from this central point, distribute the weight evenly on both legs, which are held in flexion. Then, transfer slightly more weight on the downhill ski and turn the skier to face down the slope. Keep looking horizontally.

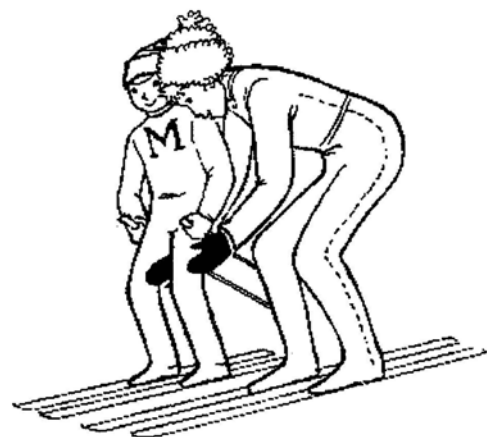


MICHEL, athetosis

In order to keep balance and to compensate for the fluctuating muscle tone, he blocks his chin in flexion, the shoulders in protraction, with the elbows extended and the forearms pronated and held closed to the body.

Therapeutic aid :

Beginning with both hands on the sternum, slide towards Michel's shoulders, widening the thorax and lifting up the head. To stabilize the shoulders, lower the



elbows and place them in semi-flexion, away from the body, and so balance is increased.

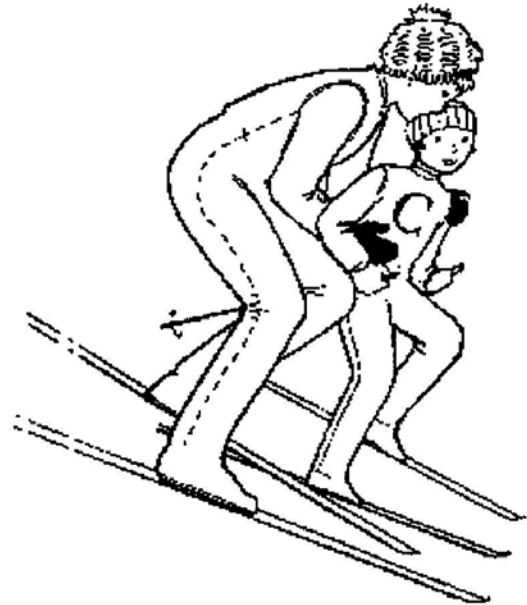
Perform rhythmical compressions on each side of the last ribs, whilst turning the trunk to face downhill.

CHRISTINE, ataxia.

She does not like the traverse, because the rotation of the trunk gives instability. In order to feel more secure, she turns the whole body uphill, and so, she is unable to look up and follow the track. When taking up speed, tension and tremor increase, as she must continually correct the direction of her movements.

Therapeutic aid :

Place the hands diagonally opposite on one hip and shoulder, to increase rotation and mobility of the trunk, then perform a few rhythmical compressions on the hips to encourage stability in the legs and to help maintain a narrow track during the traverse.



Uphill Sidestepping

TECHNICAL POINTS

When turning place the weight on the downhill ski, lift and turn the tip of the inside ski diverging uphill. Place the weight on the uphill ski, lift the downhill ski to join the other ski and continue to step and turn, gripping edges until one stops. Repeat the exercises on both sides equally.

OBJECTIVES

- Ability to stop or turn without using the snow-plough position.
- A means of controlling speed, when snow conditions are difficult.
- Improvement of the dissociating movement of the legs.

SITE

Stepping turn is accomplished on the lower part of an easy slope, after a downhill run. On a medium gradient, the stepping turn is accomplished at the end of a traverse.

WARM UP EXERCISES

Repetition of the exercises for balance.

EXERCISES HOLDING POLES

- Lift up one ski horizontally, lift and lower the tip several times.
- Lift up and hold one ski horizontally, turn the tip out, bring it back parallel to the other and replace the ski on the snow. Repeat on the other side.