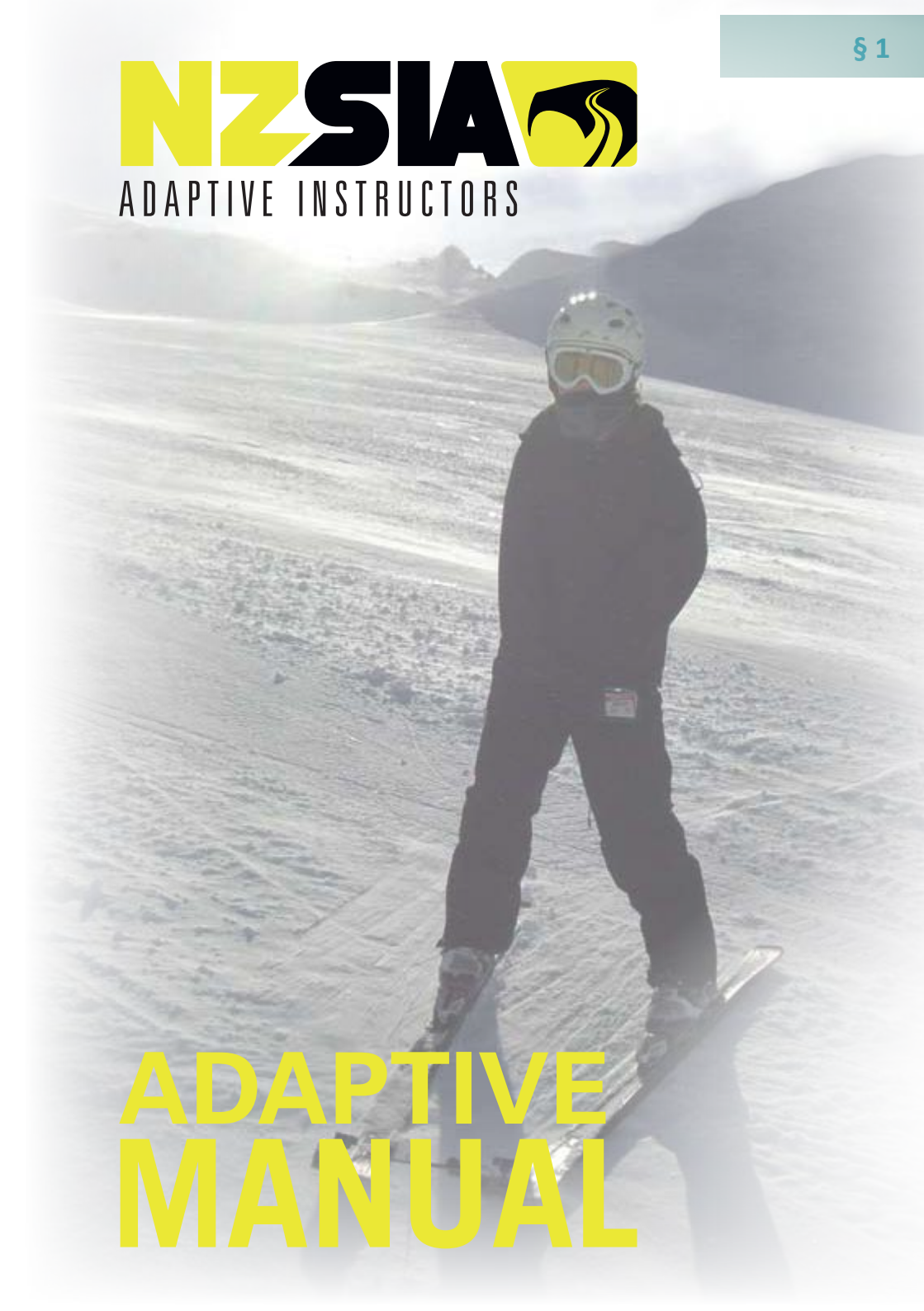
NZSIA

ADAPTIVE INSTRUCTORS



ADAPTIVE MANUAL

FOREWORD

Adaptive snowsports is about adapting teaching and equipment, and providing support for people with a wide range of disabilities to enjoy the freedom of snow sports.

This manual will give you a brief introduction to assessment, adapting teaching, and adaptive equipment as well as information on disabilities. It is not exhaustive, but is designed as a starting point to give you the best opportunity to use the skill sets you already have as an instructor to the many varied and unique teaching situations you will come across in the adaptive arena.

This manual is designed to be used alongside the other NZSIA manuals as the core skills used in adaptive instruction are the same as used in all snowsports instruction.

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INTRODUCTION

Adaptive snowsports in New Zealand has grown from small grassroots organisations, through to ski field based programs, providing recreational opportunities alongside a long history of success at an elite level. We have always had to adapt to the resources available at the time and the need to be generalist in our approach.

Our teaching is based on the following principles

- We teach adaptive disciplines using the same techniques that we teach all snow sports
- The same forces need to be applied to the equipment that slides on snow in order to turn
- Assessment of the student forms the basis for success
- Only use the equipment and support that is necessary for the student to achieve their goals
- Aim towards independence for the student
- The student and/or caregiver knows their disability best, we relate that knowledge to snow sport and the mountain environment

SECTION ONE: TEACHING THEORY

NZSIA TEACHING MODEL

The teaching model is the foundation of snowsports instruction in New Zealand, providing the framework for an effective lesson.

There are 7 points are:

1. **Introduction**
2. **Skier/Rider Analysis**
3. **Determining Goals**
4. **Presenting Information**
5. **Guided Practice**
6. **Checking for Understanding**
7. **Summary**

In the following parts we will highlight differences and adaptations to this framework to deliver a quality lesson for clients with a range of disabilities.

INTRODUCTION

This is a very important aspect of an adaptive lesson and often happens before the student arrives at the ski area when the student books a lesson. Such information such as impairment, cause, if accidents when it happened, red flags etc need to be ascertained in a courteous and sensitive manner, don't just talk about the disability otherwise people will think you see them as a disability rather than a person.

Remember the individual is the expert on themselves they know what they can do and their limitations.

Talk to a new student and ask about what else they do in daily life. What other sports do they play? What work do they do? While you are getting to know them you are starting to assess them.

The manner in which the student is met and approached is equally important. This must be respectful and appropriate. Talk to the student first not to the care giver if they have one, It is their lesson after all.

Image how you would feel if you had a car accident and needed to use a wheel chair to get around, you turn up to a lesson and your instructor ignores you and talks to the friend who came up with you and then spoke to you like you were stupid.

Ask before you help

Just because someone has a disability, don't assume they need help. Many people with disabilities live fully independent lives. This independence has often been a long hard road to achieve and they may resent you trying to do something for them that they are perfectly capable of doing themselves. Offer assistance only if the person appears to need it. And if they do want help, ask how before you act. On snow this independence will often need to be regained in this new situation and you may need to assist them more as a beginner until they learn the sport and gain the ability to do everything for themselves. People with a high degree of independence may take some time to get used to needing help as a beginner, so patience is needed.

When talking to wheel chair users get down to their level and talk don't make them sit there craning their necks back trying to join in a conversation being conducted above their heads.

Be sensitive about physical contact

Some people depend on their arms for balance, grabbing them even if your intention is to assist could knock them off balance. Avoid patting a person on the head or touching or pushing the wheelchair, scooter or cane. People consider their equipment part of their personal space.

Don’t make assumptions

As in all lessons the person themselves will have desires about what they want to achieve from the lesson.

Make sure you ask them the motivations behind taking a lesson and what they hope to achieve. Sometimes as in every lesson people may have unrealistic expectations. They may remember being an expert before the accident and not remember they have problems getting down that beginner slope now.

Motivation may also play a part in deciding which equipment to use.Do they want to stand/sit? Are they interested in doing the sport on a regular basis and becoming competent and independent or do they only intend to do it once and are looking for a bit of fun and not really interested in putting in the hard yards to develop a new sport?

ASSESSMENT

Assessing the student involves

OBSERVATION, COMMUNICATION, TESTING, AND RE-ASSESSING.

As with all lessons we need to ascertain the student's on snow ability level, their goals, the equipment they will use, and the best teaching approach to take.

General questions about the student's daily life, sports, work and interests allows you to get to know the person. Using the CAP model will also give you valuable insight into who the student is. Information on general assessment and the CAP model can be found in both the NZSIA, SBINZ manuals.

With adaptive instruction we may also need to specifically assess:

- Cognitive ability
- Physical ability
- Sensory ability
- Medical and environmental risks and medications

The student, and their whanau is the expert in their disability. The instructor is the expert in teaching snow sports. Combining the student's knowledge with your knowledge gives you both the best chance of success.

Physically the instructor needs to know how a student moves, their strength, balance and stamina to apply the movements used on snow. This will also form the basis for choosing which equipment will achieve success for the student.

Cognitively the instructor needs to know the students behaviours, how best to communicate, any triggers, and motivators.

Sensory assessment allows the instructor to best adapt the way information is presented and if necessary how best to guide a student.

The instructor also needs to learn from the student any specific information relating to safety of the student including **medical risks and medications**. Will the student be affected by the mountain environment, the physical exertion, do they take any medications that might affect them or need to be administered by them during the lesson

The assessment gives the instructor a **baseline** reference from which to observe changes that occur on snow that might need an intervention. When observing, asking questions, and testing always have the why in mind.

Firstly **observe** the student when you meet and greet them. Watch how they move and communicate, and how they relate to friends and whanau if there are any.

Then **ask** the student questions, or if unable a support person, about themselves in a way that relates to why you need the information. This focuses your questions and lets the student understand why you are asking.

Then fine tune the information you have through more **specific questions or testing**. This may involve physical tests, with and without resistance, and sensory tests. Again involve the student in the why. Reassess throughout the lesson.

COGNITIVE ASSESSMENT:

The term cognitive is used loosely to cover disabilities that relate to how the brain functions and may involve intellectual ability, information processing, co-ordination, or behaviour. Where possible aim to get the information you need from the student but use support people and whanau as well especially where the student is unable to answer your questions. It may also be useful to arrange for a carer to meet you after you have spent some time with the student to gather more information after you know the student better. The basic information the instructor needs for a successful lesson can be broken down as follows:

COMMUNICATION

Assess how the student communicates. Observe interaction with others. Verbal, non-verbal, Simple, complex. Single or multiple instructions

Find out how the student will communicate if there is an issue that needs addressing during the lesson, i.e. stress, hunger, pain, toilet, cold, tired

Sample question: So we can get the best out of the lesson what is the best way for me to give instructions? If something goes wrong while we are on the hill how will I know?

BEHAVIOUR

Assess and find out the students normal behavioural traits.

Find out if there are any challenging behaviours and what approaches to take to manage these. Using the same tactics the student is aware of will bring consistency and a greater chance of success.

A sample question: To give him the best experience possible can you let me know if Sam has any behaviours that I need to be aware of? what would the best way to manage these on the hill?

MOTIVATIONS

Find out what interests the student has. Depending on the disability these may just make a lesson more enjoyable, may be a focus for most of what you do, and may be good as a distraction

TRIGGERS

Is there anything that might happen on the slopes that might upset the student and what are some strategies to use if this happens. Triggers may be environmental, physical, cognitive, or social.

PHYSICAL ASSESSMENT.

OBSERVE, ASK, TEST, REASSESS

Aim to assess the student's range of movement, which muscles groups they use, their strength and co-ordination, how they balance, and their stamina.

Observe generally what equipment the student uses off snow, if any, and how they move. If using a wheelchair, what type and how do they propel themselves, if walking what gait do they have, do they have independent leg movement. Does the student use any aids for balance or support. What is their natural stance?

Together with the student goals use this information to assess what equipment to use, and as the beginnings of assessing how the student will apply movements used for their skiing /riding.

The next stage is to **ask** the student to move in a way that relates to the movements of skiing and riding. Find out more about which muscle groups they use and how much strength they have in these muscle groups to refine equipment choices and to gain an understanding of how they can make the movements needed to improve their skiing or riding.

A sample question: In order to balance better there are some movements we need to make when riding. Can you show me how you move forwards and backwards, can you do that from... [a joint that uses a muscle group as close as possible for the student as you would normally teach].

Ask the same for lateral and rotational movements as needed.

To refine your understanding **test** by asking the student to make a movement, firstly to observe the range of movement, then while applying resistance and feeling the strength of the movement. When doing this let the student know why and how they will use that movement on snow.

Reassess throughout the students learning and ask the student for feedback on how they are making the movements and how it feels for them to incorporate that feedback in your teaching

SENSORY ASSESSMENT

VISION IMPAIRMENT

Aim to assess the student's visual acuity, and field of vision, and their response to light and colour. Use this information to know how best to present information and the best approach for the sighted guide.

Firstly **ask** the student what they can see. How much, at what distance, and what their peripheral vision is like. Ask how light or shade affects their vision, what colours they can see best and if their sight is different in either eye.

If applicable use this information to choose a colour to wear that the student can see best when on snow and then while on snow **test** how far away they can see you, in what detail, and how far to each side they can see.

HEARING IMPAIRMENT

Assess how much the student can hear, is one side better than the other, what sign language they use.

SECTION TWO: ADAPTING PROGRESSIONS

ANALYSIS

Once you have established the student's goals, assess their strength and mobility so you understand which parts of their body they use to move.

Then observe the student on snow to establish their ability level from 1-6 and their application of stance/balance, rotation, edging, and pressure skills.

Establishing the ability level will give you a starting point from which to build a progression. In general you are assessing the terrain that the student can ride in control, the turn shape they are making, whether it is even on both turns, and the amount of skid in the turn.

Look at the track the student leaves in the snow. At level 2b the turn will be skidded throughout, at level 3 the turn will be skidded above the fall line with some skidding after the fall line especially on intermediate terrain, at level 4 there will only be slight skidding through the turn with some carving occurring through the second half of the turn on easier intermediate and beginner terrain.

Then observe the student's movements in terms of the skills. Initially this may be one skill at a time but as you get more practised you can observe all the skills at once. As a reference have in your mind what a demonstration turn would look like at that level.

BALANCE/STANCE

The student wants to maintain a balanced stance through the turn and if they lose balance, be able to recover. If there is limited flexion in lower joints use heel lifts and have the student maintain a centred stance. Aim to have even flexion in the ankle, knee, and hip as much as possible.

ROTATIONAL

Movements want to be transferred to the ski/board as directly and smoothly as possible. If the predominant force is applied through the hip, complement this with rotation below this point as much as possible. If in a mono ski rotation occurs above the hip, ensure there is sufficient strapping to transfer it through the ski. Aim to have some counter rotation above the part of the body that is creating the rotation.

EDGING

Edging movements should be small at the lower skill levels and should be progressive at all levels. Balance any edging movements with angulation and at higher speeds use the forces of the turn. Where active edging movements are difficult in the lower body, aim to have the lower body “fall” inside the turn under a stable upper body.

PRESSURE MOVEMENTS

Have the students move forward slightly at turn initiation, and to re-centre through the turn to use the whole ski. Where possible flexion and extension movements should be used to evenly control pressure

TIMING AND STRENGTH

Check the timing of the movement. Is it efficient i.e. is the rotation being applied to a flat ski, is the rotation being held for the correct length of time? Is the edge being engaged at the appropriate phase of the turn for the ability level of the student?

RHYTHM AND FLOW

Use rhythm and flow to smooth out and blend movements. It is a powerful tool

THE WEDGELESS PROGRESSION

This is basically a blend of the NZSIA ski and SBINZ snowboard progressions. It is used where a student is facing their direction of travel but unable to form a wedge (physically or because they are only on one ski). Common situations are monoski, 3 track, and 4 track.

LEARNING TO TURN

Introduction to equipment

Ensure the equipment is set up and adjusted so that the student can maintain a centred stance.

Movement on the flat

As this may be tiring it is good to integrate this in with other parts of the lesson. Outriggers are usually used in the flip up/crutch position when the student is pushing themselves on the flat.

Side stepping

This is tiring and may not be achievable. Alternatives are the magic carpet and using outriggers to propel oneself backwards up a slope.

Straight runs

It may be necessary to assist the skier to position themselves facing downhill.

Straight run exercises and outrigger stopping

Allow the skier to explore a full range of movement including outrigger position but be careful to not lift the outriggers too far from the snow. Be in close proximity even with light contact to prevent a fall. Using the outriggers to stop, keep elbows close to the body and push the claws of the outriggers forward and down. The aim is to learn how to slide on a flat ski.

Falling

Where outriggers are used, safe falling techniques should be practised. This involves lifting the outriggers forward and away from the slope to prevent falling on them and to protect the shoulder joint.

Direction changes

Trying a mixture of open turns and a shallow fan progression will determine the best approach to take. Focus needs to be on keeping the skis flat and applying turning force from the lowest functional part of the body. Rotational force at this stage needs to be applied around a vertical axis. Both outriggers

need to point in the direction of the turn.

Developing Turning

Use a mixture of a fan progression, J turns and C turns as appropriate to the student and the terrain.

Skidded Traverse

The skiers CoM should remain close to the centreline of the skis with the slope determining the edge angle. Where holding an edge is difficult, for example 4 track, allow for a lot of skid in the traverse.

Garlands

Introduce the concept of flattening the skis at turn initiation with the garland

Linking Skidded Turns

Chairlift use

Safety is paramount. Once you start skiing chairlift accessible terrain, it may be necessary to assist the skier hands on during the first few runs due to steeper beginner terrain or busy slopes.

STRENGTHENING THE TURN

Determine the skier's level based on the terrain they are skiing and timing of their edge engagement. Analyse the skier's movements carefully and then apply the principle of using the lowest functional part of the body to make a movement. Aim to develop movements that are as close as possible to what you would see in a demonstration turn for that level. Teach the exercises you always use when teaching turning, from the fan progression through to garlands. This will help the student to develop their skills at all levels.

Active edge engagement and release

As the skier does not have a wedge to create an edge angle they will need to actively edge the ski at the end of the turn and actively flatten the ski at turn initiation. As with snowboarding the initial movements will be small and will occur only at the completion of the turn and to initiate the new turn. The ski will be flat through most of the turn with only enough edge to allow the ski(s) to grip through the completion phase.

Progressively earlier edge engagement

Over time teach the skier to engage the edge earlier and earlier in the turn. This will require them to move more actively across the ski(s) with the lower body to flatten the ski, and to continue that movement to engage the new edge. Angulation with the upper body will assist the skier to remain balanced while doing this. It cannot be stressed enough that the development of this movement happens over time and is progressively applied. Only move across the ski as much as is possible without losing balance to the inside of the turn. Edge engagement will gradually move from the completion of the turn to slightly earlier and slightly earlier as the skier's skills increase. At level 3a we see the edge engage late in the control phase on easy terrain. For a given skill level edge engagement will happen later in the turn on steeper terrain than it does on flatter terrain. At level 4 we see edge engagement early in the control phase on easy terrain but late in the control phase on steep terrain.

As with any skiing and riding ALL of the student's skills will need to be strengthened to allow for successful earlier edge engagement. Increased rotational forces need to be developed with the lowest functional part of the body turning underneath the upper body to create a more counter rotated position. Pressure needs to be controlled with a progressive directed extension and controlled flexion. The movements will need to be blended and have more precise timing and rhythm.

Exploring turn shape, size, and speed

This will strengthen the student's ability by applying their skills in different ways, at different speeds, and at varying strengths.

Varying Terrain and Snow Conditions

When exploring steeper and varying terrain, and different snow conditions, ALL of the skier's skills; balance, rotation, edging and pressure control will need to be developed in the same way as in your regular progressions. On steeper terrain it will be important to apply pressure to the front of the ski and to rotate it through its flat phase to initiate turns, and to then re-centre through the turn. More active edge release will need to be encouraged. Stronger rotational movements will prevent the skier picking up too much speed through the turn.

MONO SKIING

What

Monoskiing is skiing the mountain using a monoski (see equipment section). It can be done anywhere on the mountain from the beginner slope through to the most advanced runs.

Who

Typically the user of a monoski will not have the ability to ski standing up. This may be due to low leg strength and/or coordination, or it may be due to low endurance levels. A monoskier will generally have to be able to control their movements above their sternum (T5 level). No control above this level generally indicates use of the bi ski. Grip on the outriggers is not a necessity, as hands can be strapped to the handles, but having he strength to apply pressure down through the handles is essential.

Assesment

In assessing whether someone will use a monoski and how to set up the monoski start with the following tests. Try these tests freely at first and then with some resistance.

To assess whether the student will need a high back seat or may be more suited for a bi ski

Assess the student's balance in various planes. Ask the skier to lean forward and then straighten up. Ask them to lean from side to side and straighten up. Watch for how high in the trunk the movement is coming from and whether they use their arms to assist at all. Note any differences from side to side.

Ask the student to rotate the lowest part of their body they can. Ask permission to place your hands on their trunk as they do this to feel the force they generate.

Kneel down beside the skier with your arm straight and palm upturned. Ask the skier to push down your hand as you resist.

When skiing, the trunk of the skier will need to be supported up to the point at which they move when achieving these tests. This will also give you an

idea of the lowest part of the body that they can use when skiing. If the skier cannot achieve these tests without pivoting from a point at or below sternum area consider a biski.

To assess whether a skier should monoski, or standup ski or snowboard

Is the skier able to walk with or without the use of crutches? If with, ask them for how long they are able to be active while standing with the support of their crutches. Use your judgement as to whether this would enable the student to have an enjoyable and productive time on snow. Check to ascertain whether their natural stance suits the use of skis and boots or a snowboard.

If the answer to these questions supports standup skiing or riding then talk to the person about options. Include information about the availability and cost of monoskis for rental and purchase vs regular gear and possibly outriggers. Discuss the challenges, rewards and independence involved in learning each of the options to assist them in coming to a decision. Any decision can always be revisited at a later time, always taking into account the student's goals.

Progression

The wedegeless progression is used.

Safety

- Helmets are essential
- Ensure there are no pressure points from insufficient padding, objects in the seat or in pockets, twisted straps and buckles, or over tightening of the straps
- Monitor temperature for overheating, hypothermia and for frost bite.
- Ensure there is no pinching of any catheter tubes, or pressure on a colostomy bag if either of these are present.
- Follow safe chairlift loading/unloading practice.
- Bucket the monoski in crowded areas if the user has insufficient skill to manoeuvre safely.
- Teach the mono skier to fall with their outrigger forward and across the body to protect the shoulder joint.

Technical

All movements are transferred through the seat to the ski so the seat can be considered in the same way as a boot. Equipment set up is critical and many issues a student might have often come back to incorrect set up. Dowel test students on their equipment. Canting can be used in the seat to fill the voids in order to have a flat ski when the student is in their centred stance. Take your time and recheck from time to time especially if there is a change in performance.

STANCE/BALANCE

In a centred stance the pelvis is tilted forward and square to the ski, the knee joint is flexed, and there is room for the chest to move towards the knees. The outrigger shaft passes the leg about mid thigh with the elbows out from the body. In this position the outrigger ski tips should be lightly touching the snow. The ski is flat on the snow.

If the skier has limited control of their trunk it can be supported with a higher backed seat and/or additional strapping .

During the early stages of learning it may be useful to lightly bucket the skier to prevent falling or collision. Ensure your assistance does not affect the student's movements and ability to find balance.

After a fall check the skier's stance and adjust if required

Strengthening the turn

As the skier moves fore/aft and laterally, it is important for the skier to maintain a position in which they can keep their balance without support from the outriggers (occasional correction with the outriggers is fine). Knowing where their centred/neutral position is and being able to return to this between turns will help. Outrigger position should complement the skier's movements in the same way stand up skiers position their arms.

ROTATIONAL

Learning to turn

Initial turning is best achieved without technical discussion. Have the student look in the direction they want to turn and point *both* outriggers in that direction. A follow me approach with the instructor facing the student helps. As much as possible the whole body should move as a block with the eyes looking in the direction of the turn. To keep the ski flat, rotational movement at this stage must happen around the vertical axis.

After the skier has begun making turns, work with them to become aware of the part of their body that is twisting. Rotational movements should come from the lowest functional part of the body, so work towards this goal. Where someone can aid a twist of their trunk with movement in their legs this should be encouraged.

When turning is difficult, the claw of the inside outrigger can also be used to create a point of friction around which the skier can rotate. Be aware that this may encourage poor movement patterns so teach this move with discretion and aim to reduce it as much as possible.

Strengthening the Turn

In between turns, the rotational movement should be relaxed as the skier returns to a neutral position before rotating in the direction of the new turn. As the skier becomes confident linking turns a slight counter rotation of the head and shoulders is encouraged to aid in anticipating the next turn and to assist edging movements. Development of rotational movement from here focuses on varying the application of rotational movements both in strength, duration, and speed to vary turn shape. The lowest part of the body will steer underneath a stable upper body resulting in increased counter rotation. Rotational movement becomes more blended with the other movements.

A leading inside outrigger can assist in stabilising the upper body which allows the lower body to turn underneath. The outside outrigger should also actively move with the turn.

EDGING

Learning to turn

The focus in learning to turn is to keep the ski flat at the initiation and control phase of the turn. At turn completion when the ski is across the hill, the skier sits in the centred stance with the angle of the slope creating sufficient edge angle. A traverse is a good way to teach this.

Strengthening the turn

Edging movements are achieved by the skier moving the seat across the longitudinal line of the ski while maintaining a level upper body. Even at lower skill levels this will need to happen at turn initiation to flatten the ski. The outriggers need to be just far enough away from the seat to allow room for the seat to move laterally.

As speed and terrain increase, the ski needs more edge angle to maintain good control. Initially the edge will engage at turn completion and from there will progressively engage earlier as the skier increases their skill level and performance. Any time the skier moves, or allows, the lower part of their body to move inside the ski the upper part of the body must counter this by remaining level or in line with the slope (angulation) . This will be more pronounced at lower speed and in shorter turns.

In shorter turns and on steeper slopes the skier will move more aggressively across the ski than in longer turns and on flatter terrain. Outrigger movement occurs in a similar way to poles. The outriggers move both forward and towards the direction of the new turn. In shorter turns they are directed more down the hill than in longer turns. Ensure that both outriggers move together to work in conjunction with the other movements

PRESSURE

Learning to turn

The skier should be encouraged to move forward with the ski to maintain a centred stance. If this stance results in limited pressure on the tip of the ski at run initiation, check the set up with a dowel test, and consider moving the seat/frame forward on the ski.

Strengthening the turn

Pressure control happens in two directions, longitudinally and vertically. In sit-skiing the vertical movement is mainly controlled through the shock absorber. This should be set up so the skier has maximum travel without bottoming out over rough terrain. The rebound settings on the shock should be set up so that the ski is quick to move out of a turn without too much “bounce” when rapid pressure is applied.

As the steepness of the terrain increases, the skier should be encouraged to move forward and across the ski at turn initiation to apply pressure to the tip of the ski and to release the old edge. The skier will then need to return to centred stance through the turn to pressure the whole ski.

OUTCOMES AND APPROACH

Use this section in conjunction with the steps in the wedgeless progression

Learning to turn

OUTCOME	HELPFUL EXERCISES
Student learns to maintain a flat ski in a straight run	Check position of pelvis in the seat to ensure that it is level and square to the ski. Cant if necessary. In a stationary position have the skier slightly lift the outriggers and tell you whether the ski is flat. If it is, get them to move to and from this position to recognise what it feels like. If it isn't, get them to move to the position where the ski IS flat then move to and from that position. Repeat this in a straight run.
Student practices safe falling	Outriggers forward and across the body away from the slope.
Student initiates and completes shallow turns by rotating a flat ski	Check stance and ensure there is pressure on the ski tip. Pick a direction then look and point both outriggers in that direction. Try a shallow fan progression or a 'follow' me approach while making shallow turns. Create awareness of rotational movement in the lowest functional part of the body and apply subtly in a shallow turn. Minimise tension in the student's body with breathing or through distraction.
Student initiates and completes round turns	At turn completion, ask the skier to return to a centred stance, to stop rotating, and to look across or slightly down the hill. Check that the edge is engaged at the end of the turn. Try some traversing with the monoski frame vertical and the skier in a neutral stance Both outriggers are tracking on the snow.
Student links controlled round turns	Encourage the student to move the seat across the ski at the beginning of the turn until the ski is flat. Maintain rotational movement throughout the turn. Check that they are balanced on their edge at the end of the turn. If not, use traversing exercises to find balance. Encourage the student to return to a neutral position between turns.

Strengthening the turn

As the student progresses reduce the brake on the outriggers and adjust their length according to terrain and speed.

Student applies their skills using varying turn shapes and on steeper beginner terrain.	Ask the student to vary the intensity and duration of their rotational movements. Ensure the ski remains flat through the initiation and control phase of the turn. Encourage a slightly counter-rotated position at the completion of the turn. Adjust the student's angulation at turn completion so they remain balanced over the edge of the ski. As terrain becomes steeper, these movements needs to be more pronounced and precise. Ensure that the edge is not engaged too early for the skill level of the skier or the steepness of the hill.
Student skis intermediate terrain at greater speed	Analyse the student's movement patterns. The skills should be applied in a blended and more dynamic way. Encourage a more directed extension with strong rotation through the initiation phase and a strong counter rotated and angulated position through the completion phase. Both outriggers should be stable and move in conjunction with the student's other movements

Bucketing a monoski

In certain situations it may be necessary to bucket the monoski to safely negotiate a busy area, a steep section of slope or due to equipment malfunction. This is done with the instructor straddling the ski from behind and gripping the back sides of the seat with both hands. The instructor then pushes down on the back of the seat to flatten the ski and twists the seat to pivot the ski. The ski should remain flat until the very end of the turn. On a snowboard the rider can bucket from beside the monoski, holding the seat back and side.

On cat tracks a single tether can be used for speed control. This will reduce the ability of the skier to turn the ski so only use when there is not enough width to control speed with turn shape.

BI-SKIING

What

Skiing in a bi ski with hand held outriggers, fixed outriggers, a hand bar or a combination of any of the above. Bi skiing is generally done on beginner and intermediate terrain only. In all circumstances a trained helper must tether the bi-ski if it is rented from a New Zealand adaptive programme.

Who

Students will generally have a high level of impairment with some or all of the following; poor balance, limited trunk control, upper body weakness, brittle bones, and low endurance. Some students with lower levels of impairment who only ski for short periods of time each year may also prefer to use a bi-ski.

Assesment

When assessing someone the questions to answer are whether the student has enough control of their trunk and/or enough balance to ski in a monoski. 4 tracking may also be an option for students who can stand. Endurance, and weak bones and joints are another consideration in choosing a bi ski.

Use the same assessment tests that you would use for a monoskier.

To fine tune, check arm and hand strength and control to ascertain whether the student can push themselves up to a centred position with hand held outriggers or if they need to use fixed outriggers. Hands can be taped to the outrigger handle if grip is an issue. If the student does not have the strength or control to use outriggers, use a hand bar set up on the bi-ski. Hand held, fixed outriggers, and/or the hand bar can be used on one side only if needed.

Assess for multiple disabilities.

Progression

Use the wedgeless progression with an edging focus. (See Bi-Ski technical section).

Safety

- Helmets are essential.
- Ensure there are no pressure points from insufficient padding, objects in the seat or in pockets, twisted straps and buckles, or over tightening of the straps.
- Monitor temperature for overheating, hypothermia and for frost bite.
- Use a blanket in cold conditions to keep the skier warm.
- Ensure there is no pinching of any catheter tubes if they are present.
- Follow safe chairlift loading/unloading practice.
- Bucket the bi-ski in crowded areas and use a volunteer for blocking.
- Teach the bi-skier to fall with their outrigger forward and across the body to protect the shoulder joint.

Establish an emergency stop call (this may be non-verbal) and practice this to give confidence to the skier that you will be able to stop them if they feel uncomfortable.

Although the movement used in bi-skiing is relatively simple, push/block/drop, it may take the student time to master so adjust your goals accordingly. Moving around on the flat is difficult so intersperse the student's effort with bucketing.

With soft snow conditions the bi-ski may not carry enough speed through a turn so encourage a more open turn.

LEARNING TO TURN

Basic stance is similar to the monoski with the pelvis tilted forward and square to the ski, knees slightly flexed with room to move the chest forward, the outrigger shafts passing approx mid thigh and set up at a length that allows the student enough flex in the elbow to be able to push off them. A high brake provides more support.

When this stance is not possible, position the student in the seat as close as possible to centre. If a student has uncontrolled movement in their arms or upper body, strap to allow for this movement to happen, but to prevent injury. In this case extra padding should be considered on the frame to prevent injury.

Practice turning movements in a stationary position first, then while being pushed on the flats, and then on a slope.

To go from a left turn to a right turn ....

PUSH – off the left outrigger to a centred position, from a position that is tipped to the left

BLOCK- any further upper body movement to the right by resisting with the right outrigger

DROP- the hip to the right while continuing to use the right outrigger to support the upper body

Repeat in reverse to go from a right to a left turn. The more the tip the tighter the turn.

If the student is having difficulty break down the move and teach **PUSH – BLOCK** first, then add the **DROP.**

If the student is not able to use hand held outriggers have them lean their upper body from one side to the other. They can use the handle bar to

help with this. If they can use an outrigger on one side then combine the movements into **LEAN/BLOCK/DROP...PUSH/ DROP**. In this scenario set up the fixed outrigger(s) to stop the bi-ski falling over.

STRENGTHENING THE TURN

Stance/Balance

Try and make the movements controlled and smooth. Return to a laterally centred position between turns. Reduce the brake on the hand held outriggers as the student's skill and speed increase. If the student is using fixed outriggers adjust the position of the fixed outriggers relative to the terrain to allow the ski to tip enough to control speed through turn shape. Good outrigger position should be maintained at all times.

Edging

Encourage angulation to aid the student's lateral balance. Encourage a progressive edging through the turn. As the student's skill level increases the edge can be engaged more aggressively but ensure the student maintains lateral balance. If the student can move their legs use this to aid the push/ block/drop. If possible encourage the student to push their inside hip down into the seat.

Rotational

Rotational movement is not necessary but can be used to assist the edging movement in advanced turns.

Pressure

Encourage the student to move forward with each turn initiation if possible and then to re-centre through the turn.

OUTCOMES AND APPROACH

Student has a centred stance in straight run	Dowel Test. Set up the bi ski so that the skis are flat when the student is in a natural stance. Cant as necessary. Teach good outrigger position with the elbow(s) out and riggers slightly forward while stationary and then moving. Explore the planes of movement in a stationary and then moving position with emphasis being placed on returning to a centred stance.
Student practices safe falling	Inside outrigger forward and away from slope
Student makes smooth controlled direction changes	Teach PUSH BLOCK DROP or a variation depending on the equipment set up. Encourage slow progressive movement wherever possible especially when the student drops the hip into the turn.
Student varies speed using turn shape	Explore quickness and duration of the movement with the student. Encourage turn completion with a turn shape appropriate to the terrain. Encourage even turn shape on both sides.
Student skis lift accessible terrain	Encourage the student to hold the tipped position until the ski starts to slow down at turn completion. If the student has control of their lower body ask them to push their inside hip down through the turn and to point their knees to the inside of the turn. Ensure the student maintains a strong outrigger position throughout the turns. Reduce outrigger brake as speed increases

TETHERING AND BUCKETING

This is generally best done on skiis for safety reasons although it can be done on a snowboard if the rider has a high skill level.

Bucketing involves holding the handle of the bi ski and taking close control. For teaching allow the student to move out of balance but correct the movement if they are going to fall. If you are bucketing while moving around on the flats, through crowded spaces, or on steeper slopes have the student hold their outriggers over their legs.

On skis straddle the bi-ski and hold the handle close to your body. On a snowboard position yourself to the side of the bi-ski and either stay on the same side or perform an “end around” move between turns.

The quicker that you tip the bi-ski into the turn the shorter the turn will be and the slower you will go. On very steep slopes rotate the ski as much as possible through the flat ski phase to shorten the turn.

Always keep the tether lines attached to your wrist and the bi ski when you are bucketing.

TETHERING

Tethering involves assisting control of the bi-ski through the use of two tether lines attached onto the outside rear of the bi-ski seat and to your wrists. For developing skiers the tethers assist the turning movements. For advanced skiers the role is one of safety where you ensure the student skis at a safe speed and act as an emergency brake if needed. Always tether at a speed at which you can safely stop at any time. Maintain a power wedge or keep your board on edge, and keep your elbows close to your body when tethering.

Communication is also essential when tethering, to co-ordinate movements. This can be done with either the instructor or the student calling the turns. In addition an emergency stop call should be established and practised. This can be non-verbal if necessary.

Learning to turn

The predominant risk is that the skier will fall inside the turn. Position yourself marginally to the outside of the turn, hold tension on the inside tether with your hand close to your hip to prevent the ski from tipping over too far. Cross the outside tether over the inside tether to assist in tipping the ski into the turn if needed. At the completion of the turn centre yourself behind the ski, bring the new inside tether to your hip and cross over the new outside tether to assist with the new turn.

Strengthening the turn

As a skier picks up speed the forces of the turn will help to keep them upright. Skiers may have difficulty holding enough edge angle to complete the turn and may tip too fast into the beginning of the turn. To assist this, the tetherer needs to adjust their line to be inside the line of the bi ski through the second half of the turn. During this phase you will maintain light tension on both tether lines with the outside tether holding the edge angle on the skiis as much as needed to complete the turn. Through the initiation phase ease off on the tension of the outside/new inside tether to allow the ski to tip into the new turn. At this stage you will be slightly on the outside of the turn. Once in the fall line you should be directly above the ski crossing towards the inside of the turn. For a competent rider the goal is to maintain only enough tension on the tether lines to allow you to perform a corrective move or an emergency stop.

VISION IMPAIRED

What

Skiing and riding with a vision impairment. Students will almost always need a sighted guide. Speed and terrain will depend on the student. At an advanced level racers' with a vision impairment compete in downhill events at Paralympic level

Who

Vision impairments can vary from absolute blindness through to a wide range of vision impairments affecting visual depth and field, and visual acuity. Sometimes there are multiple disabilities so always check on the cause of the vision impairment and for any relevant medical information.

Assesment

When assessing the vision impairment you are endeavouring to ascertain what will be the best approach to guiding and teaching. This will include knowing where to position yourself relative to your student in terms of direction and distance as well as the type of clothing to wear.

If the student is not totally blind you can assess their depth of vision, visual field, and acuity. Assess both eyes and then one eye at a time. Always check these assessments outside in the conditions you will be skiing in as well as inside.

Walk backwards away from your student until they can't see you. This is the maximum distance you should be away from your student. It may vary in different positions and light conditions.

Come back to the point at which they can see you. Then with the student looking forward step sideways in both directions until they can't see you in their peripheral vision. When communicating and guiding the skier you should position yourself inside this zone.

Try these assessments using bright clothing and high contrast clothing, such as black with a white stripe, to see what aids the student's vision the most.

For some the extra brightness on the slopes may reduce their vision and very dark lenses will help, for others vision may be enhanced with a light coloured UV lens.

To fine tune you can repeat the exercises holding your hands or fingers up to work out the level of detail the student can see.

Progression

Use the SBINZ snowboard or NZSIA ski progression

Safety

- Helmets are strongly recommended
- Wear Vision Impaired Skier/Rider and Sighted Guide vests
- Students must always wear UV safe eye protection
- Always establish and practice an instinctive emergency Stop command.
- Use countdowns for loading and unloading lifts
- If uncrowded slopes are not an option consider using an extra volunteer as a blocker.
- Ensure that there is good communication between you and the student and all times.

Teaching - Technical

Skill development is no different to what you would teach in a regular lesson.

LEARNING TO TURN

Time spent showing the student their equipment and explaining how it works is important so the student understands the effect of their movements. Be careful around sharp edges.

Stance/balance

If students are taking a defensive stance, a hands-on approach will help to encourage a more natural centred position. If separation from the student is needed consider using poles, a ski pal, or a sno wing. Once the student gains confidence, aim to have them ride/ski independently. A double or single pole drag while moving will help the student to gauge their speed and adjust their stance accordingly.

Rotational

These movements tend to be abrupt creating L or Z shaped turns. Encourage even continuous steering movements. Continuous sound through pole tapping, clapping, or talking will help to guide a student through a turn.

Edging

Without a visual reference to the angle of the slope edging movements are challenging to learn. Keep the movements small and use poles or a Delaney pole to assist the student to feel their position relative to the slope. Outriggers can sometimes assist as a teaching tool for a snowboarder to maintain balance until they develop a feeling for the edge change

Pressure

Spend time working with the student to develop their awareness of the different positions, feelings, and movements they make to control pressure. Do this statically, then whilst moving , then apply it in the exercise you are teaching.

STRENGTHENING THE TURN

Rhythm and flow are crucial for blending the movements while free riding. Encourage this with your guiding and teaching as much as possible.

Stance/Balance

Have the student lower their stance and strengthen their core to maintain stability when riding on variable terrain and at speed. Use guiding calls to signal terrain changes

Rotational/Edging/Pressure

Teach as per usual incorporating your teaching cues with your guiding calls.

GUIDING

As an instructor it is best to teach with someone else acting a sighted guide. However you may also be teaching while guiding, and you may teach others to guide. The essence of sighted guiding is developing a mutually agreed set of calls and techniques that you use. It is a team effort so good communication and mutually agreed safe decisions are important. Establish effective two way communication both on and off snow and do not deviate from established simple calls.

Off snow a person with a vision impairment will generally have a preferred

way of being guided. Ask first, but a common method is having the person hold your elbow. Keep up normal conversation only mentioning obstacles if the person you are guiding needs to take some action to avoid them. In many cases simply moving your elbow in or out will guide the person effectively.

Common phrases to use are steps up/down, last step, step up and over, ramp up/down, handrail on your left/right, door on your left/right, seat etc.

When reaching a seat, place your hand on the back of the seat so that the person you are guiding can reach down your arm and locate the seat for themselves.

B2 Ski Racer with Sighted Guide - note microphone guide wearing

On snow with equipment on. If a person has ridden or skied before they may have a preferred way of guiding. If you are not comfortable with the techniques they use then negotiate with the person to find alternatives that work for both of you. Calls must be instinctive and cannot be confusing for either the guide or the rider. Keep them simple.

When entering terrain for the first time, orientate the student. Use fixed sources of noise such as lifts and cafeteria decks as reference points. Describe the slope steepness and width, the snow condition, and the number of people around. Keep any unnecessary descriptions to a minimum.

On the flats you can guide with the use of a pole or your elbow. Common

calls that are used for moving around are step left/right/forward/back, tip (of board/ski) left/right, slow down, stop.

The clock system is also commonly used on the flats whereby a change of direction is indicated by the time on a clock. 12 o'clock is directly in front, so for example, "turn to 9 o'clock" would indicate a 90degree turn to the left.

Once a person is sliding, an emergency stop call has to be established. This needs to be loud, different from your regular slow to a stop call, and must be instinctive for both of you. Some examples are STOP NOW, DOWN, and HALT. Practice a safe way for the student to stop abrubtly after this call to minimise the risk of injury. Remind each other of this call from time to time.

TURNING

Guide from the front if someone has partial vision so they can use you as a reference. Guiding from in front, beside, or behind are all OK if someone has no vision. Take breaks if you are getting tired or struggling to concentrate.

Turning calls involve a preparation call, so the student can anticipate the change, and an execution call. Different execution calls can be used to indicate the length of the turn combined with a change in the cadence of your voice. Repetition of the execution call can be continued until the turn is complete.

Examples of common turning calls are AND short AND short AND short (3 short turns), AND turn turn turn (1 medium turn), AAAAND looooooong (one long turn).

Teaching cues and terrain changes can also be incorporated into the calling such as AND rise rise sink sink, AND twist twist, STEEP turn turn.

Other calls used on the slopes are straight, hold, slow, traverse. These can all be repeated to continue the task.

Continuous pole tapping , clapping, or whistling helps the student to locate your voice or position.

Students with better vision may only need guiding calls in challenging situations preferring just to follow the guide. In all circumstances when you are guiding from in front your goal is to maintain a constant position and distance, relative to the student, that is within their field of vision.

The tone and cadence of your voice will carry a huge message so if you want your student to remain calm keep your voice calm and steady even if you are freaking out.

Wind and hard snow can make it difficult to hear so be LOUD.

4 TRACK

What

4 track traditionally refers to skiing on two skiis using two outriggers for support. In reality someone 4 tracking may be on two skiis with one outrigger, might ski with a frame or may be better suited to snowboarding using a sno wing or rider bar. Tethers attached to the ski tips or nose of the board can be used to assist with turning and speed control. The techniques and progressions used in 4 tracking can be a mix of everything you know in adaptive snowsports.

Who

Anyone using supportive equipment to ski or snowboard standing up. This includes a wide range of physical disabilities and combinations of disability.

Progression

NZSIA Ski where the student wants to ski and can form a wedge

SBINZ Snowboard where the student wants to snowboard especially when their natural stance suits snowboarding and when independent leg movement is difficult

The wedgeless progression is used where the student wants to ski but can't form a wedge. This progression may only need to be used on one turn.

Assesment

The student's choices may include sit skiing, snowboarding or standup skiing with a range of additional equipment for extra support. Considerations to discuss with them are their preferences and goals, their stamina, their natural stance, their strength and flexibility, and the cost and accessibility of equipment.

When choosing equipment with your student always work towards using the minimum equipment needed to realise your student's goals. Aim to have the student standing centred on a flat board or ski(s) when they are in their natural stance.

If they have no preference towards skiing or snowboarding then guide them to the choice that will bring most success. As a general rule snowboarding offers a platform that stabilises independent leg movement and allows the feet to be placed in a wide range of natural positions. Snowboarding presents challenges where a student has difficulty with edging movements. 4 track skiing offers the ability to support movement of the CoM with the assistance of outriggers or a ski frame. 4 track skiing can present challenges where a student has weakness on one side. These are just general guides. Trial and change through the learning process will lead you and your student to the best solutions.

Observe the student. Do they use a wheel chair or crutches? Is walking difficult? Do they have a swing through or scissor gait? Do they have good core and upper body strength. Are both sides of the body the same?

The use of a wheelchair does not necessarily preclude standup riding/skiing. If the student can stand the defining factor is the student's stamina and any risks associated with the stress of stand up riding such as weak bones or pressure sores. Standing up will allow the student to access most equipment at regular rental shops without major extra expenditure for equipment that isn't available to rent.

Knowing how much strength a student has will guide your teaching of the movement patterns. Assess the student by assessing the specific balancing/rotational/edging/pressure control movements they need to make to ride.

Test the strength and movement in the part of the body that is closest to the part that you would normally use using the examples below as a guide. *Perform each exercise freely first and then with resistance.* Test each side independently and together. Allow your student to use any support they might need such as from their crutches but encourage them to do it with as little support as necessary.

Balance	Ask the student to balance on one leg then the other Have the student move in and out of balance in different directions	Use this as a guide to know how much initial supportive equipment they might need. If they have a dominant leg this should be the front foot on a snowboard
Rotational	Have the student turn their feet in both directions Ask the student to turn their knee in and out Ask the student to turn their hips	If skiing check whether the student can turn out their heel to make a wedge. If a student uses the hip to turn on one side or both a ski link must be used.
Edging	Ask the student to press down and then lift the balls of their feet and then their heels Have the student push their knees forward and pull them back Have the student move their hips forward and back and side to side	If they have limited ankle strength this may be indicated by an Ankle Foot Orthotic (AFO). The AFO can worn inside a snowboard boot for extra support. A ski boot will generally offer enough support, if the AFO doesn't fit in the boot.
Pressure	Have the student flex down and up on one leg and both	Observe where the student flexes and extends from. Have the student maintain a centered position throughout.

Safety

- Check on specific disability safety awareness
- Be aware of indicators of fatigue
- Check for pressure sores if feet are not in natural stance
- Teach safe falling and minimise the risk
- If the student has poor circulation and/or feeling in their extremities regularly check for frostbite.
- If a student is using a ski link never allow them to slide backwards

Technical

Getting the right equipment set up is critical. Your goal is to have your student standing in their natural stance with the equipment flat on the snow. Support equipment such as outriggers should be set up so that they provide support when the student is in their natural stance as close as possible to a centered postion. If the skiis or board are not flat when the student is in their natural stance, pack out the gaps under their feet/ bindings with cants to allow the board/ski(s) to be flat when the bindings are closed. Where the difference is minimal this can be done inside the boot with such things as sections of shoe insole. When the difference is great then wedges and packers may need to be placed under the ski bindings/ snowboard boot or slant boards might need to be used.

LEARNING TO TURN

To minimise fatigue incorporate moving on the flat with sliding exercises in the progression. Some exercises such as sidestepping or one foot riding may be extremely difficult or impossible to perform. Use a hands on approach with two point holds and a board buddy with the aim of reducing this level of support when possible. Aim to progress to tethers and other more independent equipment and ultimately on to independent riding and skiing .

Use your assessment to guide you in how to teach the student's movements. Relate movements to the outcome you want to achieve i.e. turning the hips gently will eventually result in turning of the boots.

Stance/balance

The position needs to be as close as possible to a centred stance longitudinally and laterally. Have the student move forward with their equipment when starting to slide, as it will be difficult for them to correct an out of balance position. Outriggers should be positioned to support a centred stance. For skiing this is with the elbows touching the body for support and the outrigger claws just in front of the toe binding. If using outriggers with a snowboard the front outrigger will be placed just behind the tip of the board and the back outrigger will be placed in front of the back foot. Set up the length so they support the rider/skier in a natural stance and screw out the brake so that it provides friction for support. A snowboarder using outriggers will generally need to be set up in a more alpine stance.

Rotational

The hip will be the highest point at from where efficient rotational movements can be made standing up. Ensure the movement is applied around a vertical axis to prevent the edges engaging. Where possible use any movement the rider/skier is able to make below the hip as much as possible. Use the most efficient part of the body for each turn if the strength on each side is different. Outriggers can focus a skier in the turn direction when the tips are pointed in that direction.

Edging

Keep lateral movements as minimal as possible. Traversing is a difficult but still useful skill. Set an easier goal with a greater degree of side slip expected in the traverse.

Pressure

At this level the main emphasis will be to move forward with the equipment to stay centred.

STRENGTHENING THE TURN

A 4 tracker may have less ability to recover from extreme positions. Teach new skills gradually and in small increments. Where a movement is made, follow it up with a counter movement to balance it.

Stance/Balance

Reduce the amount of support as much as possible to strengthen the student's ability to stay in balance independently. Shorten the brake screw

on the outriggers as speed increases and shorten the outriggers as the terrain steepens. Become more hands on as necessary when trying new terrain and then encourage independence. As the rider becomes more proficient teach them how to work with the forces of the turn to support their balance.

Rotational

The higher the part of the body to initiate a rotational movement the stronger yet less controlled that movement will be. Explore the timing and force of the movement. Slow the movement earlier in the turn and use counter rotational movement with the upper body to prepare for the new turn. Skiers can lead with the inside outrigger to help prevent over-rotation.

Edging

Where edging movements come from moving the CoM inside the turn, aim to make these movements gradual and only as much as needed. As speed and terrain increase use angulation to stay balanced over the edge. Outriggers help angulation by keeping the shoulders parallel to slope.

Pressure

Students may find it difficult to build pressure on the board/ski. Where speed allows encourage stacking of the joints. Ensure vertical movements are centred and use them to blend the other movements. Aim to keep pressure as even as possible through the turn and where it builds to support against it using both legs. Where vertical movements are difficult encourage fore/aft movements.

OUTCOMES AND APPROACH

SNOWBOARDING

Learning to turn

Rider completes a balanced controlled J turn	Use the straight run to establish the level of support a rider needs to maintain a balanced stance, and then to develop that balance. Introduce J turns. Check the rider's ankles have enough support to be stable. Use a sno wing or be hands on. The rider may need to be two footed at this stage.
Rider maintains balance over the edge while side-slipping and starts to blend skills in garland and the skidded traverse.	Encourage the rider to make *small controlled* movements. When movements come from above the ankle, ensure that movements are being transferred to the board. Aim to ensure that the rider maintains a balanced stance while making movement.
Rider makes controlled C turns and linked skidded turns	Encourage the rider to make movements as a block to aid with stability. Movements from higher in the body tend to generate large forces. Ensure that that are applied only for as long as necessary and with as small amount of force as necessary. Tethers can be used to assist in the learning process with the goal of the student becoming independent.

Strengthening the Turn

Rider varies turn shape and speed	Encourage the student to anticipate the movements they will need to make well in advance – pressuring the front of the board, flattening the board and rotating. (twist if possible). Encourage flexion and extension to help blend the movements. Check the equipment set up. As the rider increases speed the forces generated in the turn can be used to assist with balance. Use garlands and a fan progression as a tactical approach to develop turning on steeper terrain

SKIING - WEDGELESS PROGRESSION

Learning to turn

Student achieves a centred stance while sliding	Re-assess the amount of support the student requires to maintain a balanced position. Encourage the student to support as much of their weight as possible through their legs with an even distribution of weight through both their outriggers. Encourage student to move forward with the skis as they slide to maintain a centred stance. Have the student explore their centred stance with small movement out of centre and recovery to centre in various planes

Student initiates and completes shallow turns	To prevent edge engagement ensure rotational movements are applied around a vertical axis.
Student initiates and completes round turns	Ensure rotational from the hip movement is slowed once the turn has started. Practice a short skidded traverse between turns to develop edge control.
Student links round turns	Encourage the student to return to a neutral position between turns. Add flexion and extension to aid other fore/aft and rotational movements.

Strengthening the Turn

Student links turns on lift accessible terrain and at greater speed	Encourage more counter rotation at the end of the turn. Encourage a lateral extension to aid edge release but don't let the hip move further inside the turn than is necessary. Reduce dependence on the outriggers for support and ensure outrigger position that complements the skier's movements.
Student varies turn shape and skis intermediate terrain.	Develop angulation to stay balanced over the edges and teach the student to use the forces of the turn to balance against. Adjust the timing, power and duration of movements.

4 TRACK SKIING WITH A WEDGE

Student achieves a centred stance while sliding	Re-assess the amount of support the student requires to maintain a balanced position. Have the student explore their centred stance with small movement out of centre and recovery to centre in various planes
Student initiates and completes shallow turns	Encourage the student to support their weight as evenly as possible between their legs. If the student uses an outrigger(s) ensure it is kept in a position that doesn't unnecessarily affect their stance. If after canting the student has different edge angles in their wedge have the student move their hips across their skis to a position that balances the edge angles. If needed use rotation on the flatter ski and edge/pressure on the edged ski to turn
Student initiates and completes round turns	Balance rotational force on both sides by adding movement from the hip on the weaker turn side if necessary.
Student links round turns	Encourage the student to return to a neutral balanced position between turns. Encourage evenly balanced movement on both sides and an even turn shape if possible.

3 TRACK

What

Skiing on one ski using outriggers to aid balance.

Who

Anyone who wants to ski, and can only stand on and control one ski. This may be an above knee amputee or someone with one paralysed leg.

Assesment

3 Tracking can be physically demanding even for an above knee amputee. Check whether the student wants to ski and whether or not they have the strength and stamina to 3 track. It is also important to ascertain the cause of the amputation or weakness in the leg. This will guide you in considering snowboarding, with the prosthetic leg at the back. If there is potential to damage the dominant leg considering sit skiing.

If you decide on 3 tracking find out if there are any factors such as medication ,muscle and joint weaknesses or brittle bones that might guide you to take a cautious approach.

Progression

The wedgeless progression

Safety

- Ski without the prosthesis, and keep it in a warm dry place
- Teach the student to fall in way that protects their stump
- Strap the weak leg to the strong leg if they have no control over it.
- Avoid exercises that stress the knee joint
- Determine the cause of impairment and check safety red flags

LEARNING TO TURN

Take frequent rest breaks.

Balance/Stance

The student stands centred over their ski in the basic stance. The joints are slightly flexed and the outriggers are just brushing the snow with the tails in front of the toe binding. If the ski is not flat check the alignment of the boot cuff and consider minimal canting on the outside of the foot.

Rotational

Focus on turning a flat ski. Have the student use the inside heel and little toe/outside heel and big toe when turning to ensure the ski pivots around the centre of the foot.

Edging

Keep the ski flat and keep edging movements to a minimum. Edging at the completion of the turn and in a traverse is achieved by the skier standing vertically relative to the angle of the slope. The skier will need to actively flatten the ski at the beginning of the turn.

Pressure control movements

Dynamic movement can be less tiring than static positions so encourage the student to use flexion and extension where appropriate.

STRENGTHENING THE TURN

Balance/Stance

As the student progresses reduce the brake on the outrigger and shorten the outriggers to match the steepness of the terrain and encourage minimal use of the outriggers. Encourage an evenly flexed, centred stance. Watch for overflexing at the waist

Rotational

Ensure that steering is led from the foot and that the hip and upper body follow. Progressively introduce a counter rotated position. Make sure that the ski is being flattened when rotational force is initially applied.

Edging

Focus on the foot and knee at first then the hip as speed increases. Use the outriggers as a guide to keep the shoulders parallel to the slope. Check the ski is not being flattened after the student has begun rotating.

Pressure

Move forward into the turn then re-centre through the turn. Ensure flexion and extension happens through the ankle knee and hip.

OUTCOMES AND APPROACH

Student develops a centred stance in a straight run	The student should be supporting all their weight through their leg with even flexion in every joint and in a relatively tall stance. Outriggers are only used to correct imbalance and should be positioned just in front of the boot to maintain a centred stance. Focus on finding a flat ski
Student makes single turns by rotating a flat ski	Focus on the student steering a flat ski with their whole foot. Rotation needs to be led from the foot and happen around a vertical axis. Try a mix of fan progression and open turns gradually making the turns rounder. Use flexion and extension to aid the turning movement.
Student links round turns	Use garlands and traversing to teach the student edge release and engagement. Ensure edging movements are small, happen from the foot and only occur at turn completion and initiation. The ski should be steered flat through the majority of the turn.

Strengthening the turn

Student skis lift accessible terrain using a mix of turn shapes	Use a follow me approach. Flexion and extension will help blend the movements as the student varies the timing force and duration of their movements. Check that all movement is being led from the foot and that the student is maintaining a good stance. Encourage a slightly counter rotated stance and begin developing angulation as the student skis steeper terrain
Student skis intermediate terrain at greater speed	Gradually encourage a more directed extension with increased angulation as the edge angle increases. Encourage the student to pressure the tip of the ski at the beginning of the turn and to re-centre through the turn.

AMPUTATIONS

What

Riding , skiing, and sit skiing with the loss of any limb or part thereof

Who

People lose limbs through accident and disease

Progression

NZSIA SKI, SBINZ Snowboard, Wedgeless

Assesment

Assess which limbs are affected and at what level, the strength and mobility the student has with their unaffected limbs, and the cause of the loss of limb.

From there you can pick any necessary equipment, cant as necessary, and determine any associated risk factors.

There is currently large development being made in the area of specific skiing and riding prosthetics. Discuss these options as this may enable a student to ski/ride standing up on two legs.

Safety

- Check medical history.
- Protect stump from impact and cold and keep prosthesis in a warm dry place if it is not being used.
- When a prosthetic is being worn ensure that the fit is strong enough to cope with the extra forces applied on snow.
- Check for rubbing and sores on the stump and ensure that it is kept clean and dry.

Technical

Below the knee

If the ankle joint has no flexion place a heel lift inside the boot to achieve a good stance.

Use sensations the student has in their lower leg and knee to describe the movements they would make with their foot.

Ensure that the prosthetic is firmly packed in the boot to prevent movement.

If the student has no dominant stance for snowboarding, place the prosthetic on the back

Above the knee

When snowboarding place the prosthetic leg in the back. Ensure the prosthetic knee joint is locked in an appropriate stance and use movement of the leg above the knee to achieve the desired response from the board. Aim to ensure the board is flat when setting up the rider. Avoid impact through the hip from the prosthetic leg. Outriggers and/or a hands on approach can assist in the early stages of learning to aid balance and give confidence in order to prevent injury.

For skiing see 3 track

Upper Limb

Watch for excess upper body rotation.

A student may need initial assistance getting up

COGNTIVE AND DEVELOPMENTAL

What

This mainly involves adapting your teaching style to suit the needs of the student.

Wh0

Anyone who learns, thinks, behaves, and communicates in a way that is different from what is considered normal for their age. This may be congenital, developmental or through an accident.

Progressions

Progressions are the same as you teach in a regular lesson unless the student also has a physical disability.

Assesment

Find out what the disability is. If you have any concerns with regard to your student being able to realistically communicate their needs then always involve their family and/or carers in the discussion.

You want to know what risks there are, the most effective approach to take to teach the student, how to most effectively communicate with the student, and any behavioural tips that will help in the lesson.

Safety

Communication

Find out what the student's most successful communication style is. Abstract and complex concepts can be difficult. Some people respond to visual cues such as pictures on a notebook or drawings in the snow. ALWAYS check for understanding in a variety of ways in addition to verbal. Establish vital communication methods for such things as toileting, cold, discomfort.

Distraction

This may happen due to a short attention span or fascination with other

people or objects. Be aware of signs that student is not focused on the lesson.

Inappropriate Behaviour

Do not accept inappropriate behaviour and treat it in the same way as you would for anyone of the same age.

Distorted perception of risk both high and low.

This includes environmental risks such as terrain and temperature and personal risks such as speed and control. A student may not feel cold or pain or may not want to upset you or their experience by expressing that need. A student may not understand the need to ride in control or may present an excessive fear of speed.

Distorted perception of ability

Always check the ability level of a student before moving to terrain where there are required skills.

TEACHING TIPS

Eye contact and touch

Eye contact and appropriate touch can be used to focus a student's attention. Be aware that eye contact and touch can cause distress in some autistic students.

Imitation

Model the movements you want to make. You might also observe your own habits reflected in the habits of the person you are teaching.

Repetition

This may be finding creative ways to practice the same movement or where short term memory is affected may be continuously repeating the same instruction.

Concrete instruction

Use descriptions that directly relate to what you are teaching.

Reflect areas of interest

Using the student's area of interest as a basis for your lesson can help build rapport and focus.

Age Appropriate

Always treat people in an age appropriate way. For example, if someone is 28yrs old treat them as a 28 yr old regardless of their intellectual age.

ADHD	Keep the lesson calm. Involve the student in finding solutions and always give them choices. Plan ahead so that you have plenty of different ways to teach the same thing. Build self esteem. Give responsibility to the student.
Autism	Check to ascertain whether the student is sensitive to eye contact and/or touch. Visual learning is often dominant. Find out areas of interest/fascination to build your lesson from. Use the behavioural cue words the person knows. Language is commonly interpreted literally. Students may have difficulty relating in group situations.
Intellectual Impairment	Use repetition and follow routines. Use eye contact to maintain focus. Be specific and use concrete instruction. Keep it simple.

NZSIA ADAPTIVE SNOWSPORTS INSTRUCTORS MANUAL

SECTION THREE:

ADAPTIVE EQUIPMENT

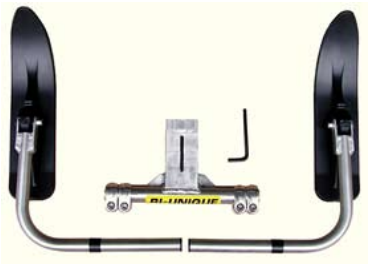
EQUIPMENT

There is an array of adaptive equipment available both commercially and through kiwi ingenuity and adaption.

Standard equipment is adapted to suit each individual, with the use of duck tapeand padding some of the most commonly “extras”

Use adaptive equipment with the aim to **use the least amount necessary to achieve the student’s goals**. Equipment used should be assessed throughout the learning process with changes and adjustments being made as necessary.

OUTRIGGERS



Range of hand held outriggers - stand up and sit ski; fixed outriggers

Help to stabilise a student and are either hand held or fixed.

A hand held outrigger is an elbow crutch with the tip of a ski pivoted on the bottom of the crutch. Most outriggers have an adjustable brake screw at the back of the shaft. Most outriggers have a flip-ski function which allows them to be used more easily for propulsion and as a walking crutch. Some outriggers have a claw on the tail of the ski to add friction.

A fixed outrigger is used on a bi-ski when hand held outriggers are unable to be used. They are fixed at a height that creates a turn shape appropriate to the terrain being skied on. Closer to the snow for open turns on learner terrain, further away from the snow for tight turns on steeper terrain.

Set up

Learning to Turn

The outrigger length can be adjusted in two ways. Adjust the cuff height so that it allows free movement of the elbow. The length of the outriggers should be adjusted when the student is on their equipment and in a centred stance. If the outriggers are needed for support the student should be able to weight bear on them while in their centred stance. Padding can be placed on the handles to support the palm. If they are used to assist with balance the ski tips should just brush the snow when they are being swung. Ensure that the outrigger height is set correctly on both sides especially where someone has different strengths and/or arm lengths on each side.

Strengthening the turn

As the student's speed increases the brake screw should be reduced to prevent the outrigger from dragging behind the student. As the terrain gets steeper outrigger length should be shortened to prevent the uphill outrigger from affecting the student's body position.

SKI LINKS

The ski link is a device that is attached to the front of the skiis. It prevents the skis from crossing or spreading apart when the student cannot control their skiis independently. Independent leg movement is minimised with a link so moving around on the flat is limited to shuffling. Remove the link on lifts and never allow a student to slide backwards when the link is attached. For children and light students an edgy wedgie gives a greater freedom of movement.

If tip separation is the only issue a rope or bungee is effective.

HEEL SPACER BAR

A tube with a bungee through it, and washers at either end. It is positioned between the student's boots, preferably under the heel. The spacer bar is used when the student cannot form a wedge and needs the platform provided by a wedge for balance. Wedge size is determined by the length of the tube. Never allow the student to slide backwards when a spacer bar is attached.

MONOSKI

Freedon Factory Revolution : Tessier Dual and mono skis

A seat mounted on a ski or skis through a shock absorbing frame. Outriggers are used for balance. Mono-skis come in a wide range of designs and performance levels suiting different skiers. Most have a lift loading mechanism and should all have a lift evacuation system and lift safety line fitted. If a higher level of support is needed a high back seat with additional strapping should be used.

SET UP

The dowel test is used to find a centred position for the skier and frame on the ski. With the student strapped in the ski place a dowel or a tennis ball under the **boot sole centre** of the ski. The mono-ski should be roughly

balanced over the dowel/ball when the skier is in their centred stance. If not adjust the placement of the frame on the ski and retest. If a skier has difficulty moving forward the position of the dowel can be moved slightly forward of the boot sole centre for the test.

On snow, if the skier is over-rotating their turns the seat may be set up too far forward. If they are having difficulty pressuring the front of the ski then the seat may be too far back on the ski. Also check the track the ski leaves on flat snow while straight running to ascertain whether the skier is laterally centred in the seat.

Shock Absorbers can be adjusted for preload and rebound. The preload determines the stiffness and amount of travel in the shock and is usually adjusted by screwing a ring up or down at the top of the spring. Do this when there is no load on the spring. The correct setting will allow the shock to have the maximum amount of travel without bottoming out over rough terrain. Rebound determines the amount of "bounce" the shock has. If this is too slow it will be more difficult to transition from one turn to the next, it is too high the ski will bounce too much when rapid pressure is applied.

Bi-Ski

Bi Unique : Mountain Man Bi Skis

A bi-ski is a seat mounted on a pair of articulated skis. It can be used with outriggers, hand held or fixed, or in combination, and/or a handle bar. New Zealnad programme bi-skis must be tethered at all times. The two main types used here are the Mountain Man and the Bi-unique. Generally the Mountain Man is used when a higher level of support is needed due to the Mountain Man having a more stable fixed outrigger set up.

Determine the amount of support the student will require (see bi-skiing section). The student should only be strapped to the level of support they require. Shoulder straps should be crossed over the student's body so they don't fall off the shoulders. If using fixed outriggers set the height to the appropriate turn shape for the terrain being skied.

If a student has uncontrolled movement in their arms or upper body, strap to allow for this movement to happen, but to prevent injury. In this case extra padding should be considered on the frame to prevent injury.

BIBS

Used by skiers with a visual impairment and at any other time that it would be helpful for other mountain users to have an awareness of the student's needs for safety reasons. Bibs need to be bright. For vision impaired student's both the guide and the student should wear a bib.

CANTS AND TOE AND HEEL LIFTS

Cants and lifts are used to allow a student to stand or sit in their natural stance and at the same time to have the ski or board remain flat on the snow. This can be fore/aft as well laterally. Lifts can also be used to position a fused or prosthetic ankle in a flexed position by raising the heel. They can be made of any suitable material. For small adjustments the cant should go inside the boot. Sections of insole work well for this purpose. For large adjustments cant outside of the boot. If permanent large canting is required placing plastic wedges between the binding and the board/ski works well.

When canting use the cant to fill in the void. For example if a monoskier is sitting in their seat with the ski flat and one buttock higher than the other you place some foam in the space under the high side.

SLIDER FRAMES

Various versions exist for both skiing and snowboarding. The frame has skiis attached to the bottom and gives the student a greater level of stability than using outriggers. They are generally used on beginner terrain only. Tethers can be attached to the student's board/skiis until the student is able to achieve speed control through turn shape. Some frames have a handle the instructor can use to assist control of the frame. If the student has difficulty controlling their ski a ski can be attached to the frame.

WIRELESS COMMUNICATION AND LOUDSPEAKERS

A loudspeaker amplifies the voice of a sighted guide and is especially useful at speed and in noisy conditions. Wireless communication achieves the same result. The advantage of the loudspeaker is that the student can locate the position of the guide from the direction of their voice.

SLANT BOARDS

Slant Boards allow the binding to be positioned above a ski at any angle. They are used in the same way as cants and lifts but allow greater flexibility of position. Slant Boards are not in common usage.

TETHERS

Tethers can be used to assist the student to make turns and for slowing and emergency stopping. They are attached to the front of skis combined with links, to the tip of a snowboard or the front foot of the rider, and on the frame at the back of a bi-ski. Tethers must also be securely attached to the tetherer.

When using tethers use turn shape to control speed and always ride at a speed at which you can confidently stop .

A single tether can be used occasionally with a mono ski to assist with speed control on steep cat-tracks. Do not tether a monoski in other situations as the tether will restrict the ability of the monoski to turn. If the terrain is too steep, bucket the monoski to flatter terrain where the student is able to control speed with turn shape.

SKI PAL

An adjustable rectangular tube used by the instructor as a teaching aid to assist with balance, turning, and in some cases speed control.

RODS AND POLES

Can be used in various ways to assist the student, such as horse and buggy

and side by side. Aim to minimise the amount of dependence the student develops on the rod

RIDER BAR

Useful as a teaching aid to develop movements for snowboarders who have low leg strength and control. Set up with the rider in a centred stance with the hands on the bar. Extra support can be given with webbing around the hips of the rider if needed. The bar can be used to create twist in the board but beware of the rider using the bar to pull against or push away from in a way that changes their stance. The handle allows you to assist with control of the board, either walking or skiing alongside.

BOARD BUDDY

A hula hoop attached to a harness that allows the instructor to stabilise the movement of the rider's CoM. The ski pal can be adapted to make this.

CADS AND SKI MOJO

These help reduce fatigue for standup skiers. They consist of a rod that is attached to the boot and a hip harness either inside or outside of the ski pants.

SKI AND SNOWBOARD PROSTHETICS

Advancements in prosthetic technology are being made all the time. Current models allow for double and single above knee amputees to ski and ride standing up providing hip protection with shock absorbers. Various below knee prosthetics assist with ankle flexion. Ensure prosthetics are well fitted in the student's boots. Where there is not adequate ankle flexion in the prosthetic for a centred stance use a heel lift to create the correct angle.

SKI BIKE

The ski bike provides an alternative way to play and slide. A variety of options include snowboard bikes and ski trikes. Some allow the rider to be seated when riding.

NZSIA ADAPTIVE SNOWSPORTS INSTRUCTORS MANUAL

SECTION FOUR: DISABILITIES

SECTION FOUR: DISABILITIES

Each person is unique, and each disability affects each person differently.

The information in this section is a very simple overview of some common disabilities. It is aimed to provide a starting point for more research.

Use the assessment tools to learn as much as you can about the individual. The person with the disability and/or their caregiver will understand their abilities better than anyone else.

The considerations for teaching section give more information on how the disability might affect the client learning to ski / ride and on the safety issues in an alpine environment.

Disabilities are functional impairment, categorised as physical, sensory or cognitive.

People with a disability may have a single disability or can have a combination of physical, sensory or cognitive disabilities. For example, diabetes can cause amputation and visual impairment. A head injury may cause cognitive and balance issues.

A good assessment is important to fully understand the strengths and needs of each person you are teaching. Even a basic knowledge of a person's disability will build confidence and trust and allow you work with the person to fully understand the effects of their disability on them and how best to teach them to ski or ride.

COMMON PHYSICAL DISABILITIES

AMPUTATION:

Partial or complete removal of a limb. The causes are varied including but not limited to: accident, congenital disorder, peripheral vascular disease, cancer, and diabetes.

AK -Above knee

BK - Below knee

AE - Above elbow

BE - Below elbow

Hip Disarticulation - Amputation at the hip joint, this preserves the pelvis and the soft tissue to the buttocks.

HP Hemipelvectomy - This amputation includes half of the pelvis and the limb leaving, only the soft tissue of the buttocks.

Shoulder Disarticulation Amputation - at the shoulder joint.

Unilateral Amputations - on the same side.

Bilateral Amputations - on both sides. This can include: 1) amputation of both legs, 2) amputation of both arms, 3) amputation of an arm on one side and leg on the other

For above knee amputations people will generally ski without their prosthesis. This is changing as new prosthesis technology allows more freedom to ski with a prosthesis. Most snowboarders – above and below knee will use a sport prosthesis with shock technology to snowboard with.

Of importance is how new is the amputation, how good is circulation, how will the limb handle the cold, and protection from impact.

ARTHRITIS:

Refers to more than 140 conditions that affect the joints, most commonly the knee hip and spine, with pain and stiffness being the common symptoms.

Arthritis can affect people of all ages including children but generally affects people as they age. The most common forms of arthritis are osteoarthritis, gout arthritis and rheumatoid arthritis.

Managing pain by not overusing or stressing the affected areas is important.

BRAIN INJURY:

Brain injuries can be caused by stroke, disease, lack of oxygen, toxins, or trauma to the brain.

A Traumatic Brain Injury (TBI) is caused by an external force and can be either open (involving an open wound) or closed (blunt trauma with no wound). A brain injury caused by internal factors would be considered an Acquired Brain Injury (ABI).

Each brain injury is unique - there is no reliable way to predict how an individual's brain will be affected by a injury. Once a person's brain has been injured, health care providers perform several different psychological and neurological tests in order to determine the areas of the brain that have been damaged. With some brain injuries the damages done and the result in behaviours are barely noticeable. In other brain injuries the damages and effects are more extensive.

Moderate to severe Brain Injury may result in:

- Fatigue
- Physical Disability- affecting Mobility, Pain, Speech, Senses
- Cognitive Disability - affecting attention, memory, processing, language, intellectual flexibility
- Emotional and Behavioural Disability - including anxiety and depression, excess or absence of behaviours, agitation, impulsiveness, aggression, lack of drive

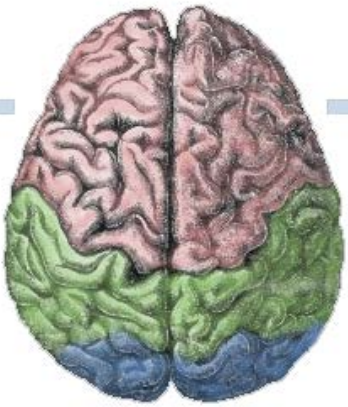
Hemiplegia or Hemiparesis is common with brain injury and refers to a paralysing or weakening that affects one side (hemisphere) of a person. A brain injury predominantly of the left brain affects the right side of the body and vice versa.

Below are the typical effects for right and left side brain damage, these are not exhaustive, and the effects may be mixed due to both sides of the brain having been affected or through compensation of the healthy parts of the brain.

Left brain damage affects the right side of body. It is often characterized by poor short-term memory, distractibility, lability (difficulty controlling appropriate emotions), difficulty with time and place, possible perserverification (repeating)

Right brain damage affects the left side of body. It is often characterized by dysarthria (inability of muscles that control speech), aphasia (receptive or expressive – difficulty understanding or utilizing speech to convey appropriate meaning)

- Analytical thought
- Detail Oriented Perception
- Ordered Sequencing
- Rational Thought
- Verbal
- Cautious
- Planning
- Math/Science
- Logic
- Right Field Vision
- Right Side Motor Skills



- Intuitive Thought,
- Holistic perception
- Random Sequencing
- Emotional Thought
- Non-verbal
- Adventurous
- Impulse
- Creative Writing/Art
- Imagination
- Left Field Vision
- Left Side Motor Skills

CANCER:

Invasion of healthy tissue by rapidly reproducing mutated cells. It often presents itself as a collection of cells known as a tumour. It can affect nearly any part/system of the body. Treatment often includes chemotherapy, radiation, and/or surgical removal. Sometimes the removal of affected cells results in an amputation. Remission may be partial, or complete and more than 5 years of complete remission may be referred to as a cure.

Someone who is receiving treatment or in remission can be affected by fatigue, pain or nausea and other longer term affects dependent on the type and cancer and treatment plan. Some treatments increase susceptibility to sunburn.

CEREBRAL PALSY (CP):

A group of disorders that affect the ability of the brain to control muscle movement. The damage to the brain occurs during pregnancy or during or just after birth. Depending on which part of the brain is affected CP may affect muscle tone, co-ordination, control, reflex, balance, and posture. The effects may or may not improve or worsen over time.

Individuals with cerebral palsy may or may not have an associated epilepsy, cognitive impairment, and/or sensory impairment.

There are different terms used relating to classification of CP that may refer to severity, the area of the body affected or motor function.

Severity - Mild does not need assistance, Moderate - Needs assistance and some aids, Severe - faces significant challenges and usually uses a wheelchair.

Area of body affected - Hemiplegia -one side, Paraplegia- legs, Diplegia - legs more than arms, Tetra/Quadra plegia - all four limbs affected

Muscle tone:

Hypertonic, spastic refers to high muscle tone or stiff, tight muscles,

Hypotonic, flaccid refers to low muscle tone or loose floppy muscles (less common)

Motor function

Spastic, the most common type of CP around 70-80%. Normally when one muscle groups tightens another corresponding muscle group will relax. With spasticity both muscle groups will tighten. Depending on the stiffness of the muscle's movement may also be stiff or jerky. If the muscles are permanently shortened movement may be fixed or difficult.

Dyskinetic affects 10-20%. The muscle tone can quickly change from stiff to relaxed causing uncontrolled involuntary movements, or spasms, often described as slow writhing movement. Can affect the muscles movements used for speech which is known as dysarthria. The effects may be more pronounced in stressful situations. It is sometimes referred to as Athetoid when it affects the limbs with a resultant writhing movement, and Dystonic when it refers to the trunk often resulting in a twisted posture.

Ataxic affects around 10%. Ataxia relates to coordination of movement and is often accompanied by low muscle tone. Individuals may have poor coordination with an unsteady gait and characteristic shakiness. Balance and depth perception may also be affected.

Mixed affects around 10%. As several or all movement centers of the brain are affected the resultant effects are a mix of the above.

Click on or copy this link for a short video describing and showing the types of cerebral palsy

https://www.youtube.com/watch?v=cOfUGUNxEqU

DIABETES:

A condition that occurs when the pancreas does not make enough insulin to keep blood glucose (sugar) levels in the normal range, or when the insulin it produces is not effective. Insulin allows glucose in the blood to be transferred into the cells to be used for energy.

Type 1 (also known as juvenile or juvenile-onset) is where the body does not make enough or any insulin.

Type 2 is characterized more by the body's resistance to the insulin produced, insufficient insulin or insulin that doesn't work properly. Risk factors for Type 2 are age, obesity, physical inactivity, some medicines, pregnancy (gestational diabetes) or any illness that damages the pancreas.

High blood sugar levels usually develop over a longer period of time due to low insulin levels in the body. If someone with diabetes thinks their blood sugar is high, they should seek medical advice.

Low blood sugar levels can cause a low blood sugar reaction known as hypoglycemia, and is caused by taking too much insulin, missing a meal, exercising too much, or drinking too much alcohol. Low blood sugar can cause shakiness, confusion, fatigue, hunger and may result in sweating or a headache. If it drops too low, it may result in unconsciousness or seizure. Treat low blood sugar quickly by giving sugar in the form of high sugar drinks, milk, orange juice or hard sweets, followed by a small snack.

MENINGICOCCAL DISEASE:

Can cause meningitis or septicemia as a result of bacterial infection. This may in turn result in brain damage, paralysis, gangrene, and amputation.

MULTIPLE SCLEROSIS:

An autoimmune disease that affects the central nervous system (CNS). The CNS controls movement and response to the senses of touch, vision, and hearing. Although the cause is not known for certain, the effects are a result of an inflammation affecting the myelin sheath (which encases nerves), and the nerve cells. In addition to nerve damage, inflammation may leave multiple areas of scar tissue (sclerosis) on the coverings of the nerve cells resulting in residual effects.

Symptoms can vary from person to person and episode to episode. The impact can be mild to severe, the disease can progress slowly over a period of months or years or may worsen in a stepwise fashion with each relapse. It is possible for the disease to go into complete remission, or for symptoms to ease for periods of time.

Symptoms may include:

- Loss of control of bladder and bowel function
- Fatigue
- Pain
- Spasticity - ranging from muscle tightness to muscle spasm
- Speech and swallowing issues
- Thinking and memory issues
- Vision loss including blurring, loss of contrast, double vision, eye pain

MUSCULAR DYSTROPHY:

A group of disorders involving deterioration/loss of muscle cells and tissue resulting in progressive muscle weakness. The four most common types are:

Myotonic: Genetic. Most common form. Begins in adulthood. Most predominant in the lower legs, hands, neck and face. Characterized by prolonged muscle tensing (myotonia) and an inability to relax certain muscles after use. Can also cause cataracts and heart problems.

Duchenne's: Rapidly-worsening. Not known to be genetic. Most severe in the legs and pelvic region. Duchenne's generally presents by the age of 6. Frequent breathing disorders and damage to the heart.

Becker's: Similar in presentation to Duchenne's but progresses at a much slower rate and is certainly an inherited disorder. Most people can walk until around 25-30 years. Women rarely develop symptoms.

Limb-Girdle: Can present anytime from child to adulthood. Affects the muscles surrounding the shoulders and hips. Slow progression. Heart problems can occur in later stages.

POST-POLIO

Post-polio is a condition that can affect polio survivors' years after the virus' initial onset – not only weakening previously affected muscles but also those that were presumed unaffected. Progressive muscle weakness and atrophy, joint degeneration, and scoliosis are all characteristics. People with post-polio may have general fatigue, muscle weakness and pain, cramps and spasms, joint pain and respiratory difficulty.

SPINA BIFIDA

A defect that occurs to an embryo during early pregnancy. The two sides of the embryo's spine do not join together leaving an open area. The spinal cord can then push through the opening into the embryo's back creating a lesion. If the nerves are damaged control of the muscles, typically leg, bowel and bladder and sensation in these areas may be affected in a similar way as for spinal cord injury.

There are two types:

Occulta: Means 'hidden' and is the mildest form. The spinal cord is often unaffected.

Manifesta: Two types – meningocele and myelomeningocele. Myelomeningocele is the most severe form where the spinal cord pushes through. Babies born with this type often also have a buildup of fluid in the brain cavities known as hydrocephalus – requiring a shunt to drain the fluid.

SPINAL CORD INJURY (SCI):

An injury to an area of the spinal cord which results in an impairment or loss of function and or feeling. The damage can be complete, resulting in a complete loss of movement and sensation or incomplete resulting in partial loss of movement and /or sensation. Someone with an incomplete spinal cord injury can often walk and stand up ski or snowboard.

Paraplegia (legs)

Quad/Tetraplegia (majority of the body including arms and legs)

The spinal column is comprised of 26 individual bones called vertebrae which are divided into 5 different areas.

The cervical vertebrae are C1 - C7

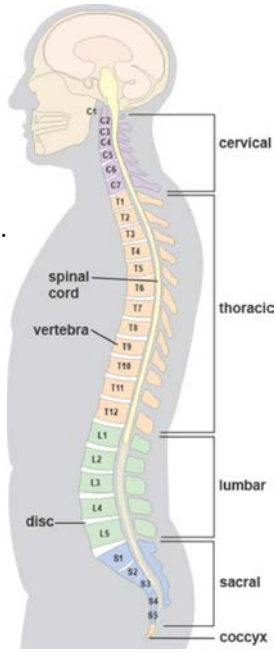
The thoracic vertebrae are T1 –T12

The lumbar are L1 – L5

The sacral are S1 - S5

Coccygeal is Co

Nerves exit at each of these vertebrae so damage at the vertebrae affects the nerves at or below this point.



Cervical Nerves "C": (nerves in the neck) supply movement and feeling to the arms, neck and upper trunk.

C3,4 and 5 supply the diaphragm (the large muscle between the chest and the belly that we use to breath).

C5 also supplies the shoulder muscles and the muscle that we use to bend our elbow.

C6 is for bending the wrist back.

C7 is for straightening the elbow.

C8 bends the fingers.

Thoracic Nerves "T": (nerves in the upper back) supply the trunk and abdomen.

T1 spreads the fingers.

T1 –T12 supplies the chest wall & abdominal muscles.

Lumbar Nerves "L" and Sacral Nerves "S": (nerves in the lower back) supply the legs, the bladder, bowel and sexual organs.

L2 bends the hip.

L3 straightens the knee.

L4 pulls the foot up.

L5 wiggles the toes.

S1 pulls the foot down.

S3,4 and 5 supply the bladder. bowel and sex organs and the anal and other pelvic muscles.

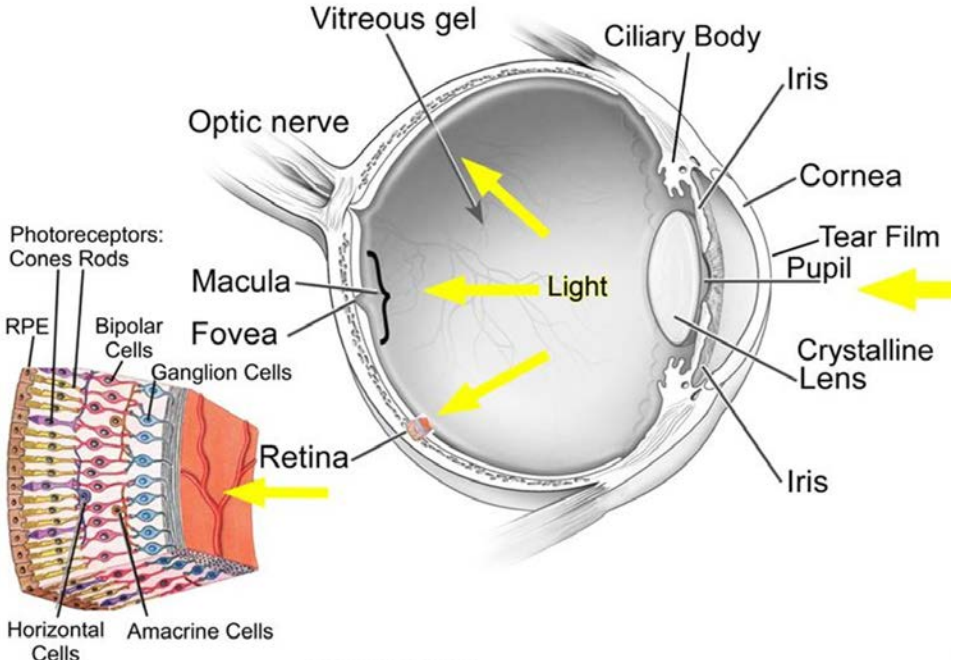
Autonomic Dysreflexia Syndrome (ADS) or hyperreflexia can occur where there is an injury at level T6 or higher. It is caused by an irritation, such as pressure, temperature, or full bladder occurring below the injury level. When there is no response to the nerve impulses caused by the irritation (due to the injury) an abrupt onset of dangerously high blood pressure occurs. This is considered to be a medical emergency.

Signs: Pounding headache, goose bumps, sweating above the Injury and cold and clammy skin below the injury, blotching of the skin

Actions: relieve any potential pressure points, catheter blockage, or any other potential irritant stimulus and seek urgent medical attention. Individuals at risk of ADS are made aware of the symptoms and what to do during rehabilitation and so may be aware of the onset.

VISUAL IMPAIRMENTS

Many people have some type of visual problem at some point in their lives. Many of these types of conditions are often easily treated with eyeglasses or contact lenses. A vision impairment occurs when a corrective aid is unable to correct the vision to within a normal range. Most commonly vision impairment affects visual acuity (the sharpness or clarity) of vision and/or the visual field or range of vision. Around 15% of people with vision loss cannot see anything.



COMMON VISUAL IMPAIRMENTS

Cataracts: A clouding of the lens of the eye – like looking through a foggy window. They make it more difficult to see things in general but also can affect distance vision and cause glare problems. Generally painless. Develop slowly, progress with age. Can be hereditary, congenital or be caused by chemical burns. Surgery, while common and reasonably safe, can cause a detached retina

Diabetic Retinopathy: An eye disease caused by changes in the blood vessels of the retina. It generally occurs in both eyes. For some people, the blood vessels may swell and leak. Others may have abnormal new blood vessels grow on the surface of the retina, which cause inflammation and scarring. The scarred tissue eventually pulls the retina away from the back of the eye.

There are 4 stages to the disease, but vision problems may not present themselves until long after onset. Proliferative retinopathy, the most advanced stage of the disease, occurs when fragile, abnormal blood vessels develop and leak blood into the centre of the eye, blurring vision and often causing blindness. See also: detached retina.

Glaucoma: This is a condition in which the optic nerve is damaged at the point where it leaves the eye. This nerve carries information from the retina to the brain. It affects the peripheral vision first and may spread so far inward and outward that it resembles tunnel vision, eventually causing complete blindness.

Macular Degeneration: A progressive disease marked by the deterioration of the macula (centre of the retina – responsible for central vision). It doesn't cause blindness but leaves a blur, or blind spot, in the centre of vision. This generally affects people later in life but can occur anytime.

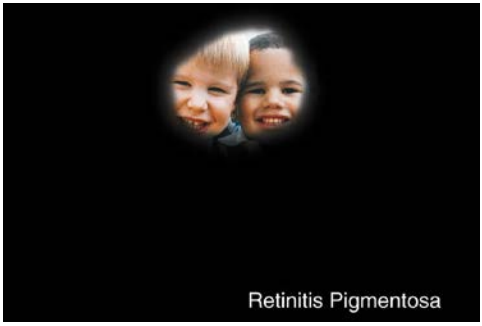
There are two types – wet and dry (most common). The wet variety often develops from the dry and is accompanied by bleeding.

Myopia: Short- sightedness (inability to see things far away). Occurs if the eyeball is too long or the cornea has too much curvature. As a result, the light entering the eye isn't focused correctly and distant objects look blurred.

Nystagmus: An uncontrolled movement of the eyes – usually from side to side but sometimes can swing up and down or in a circular motion. Related conditions include cataracts, glaucoma and albinism.

Optic Nerve Disease: Wide range of diseases all causing some form of damage to the optic nerve

Retinitis Pigmentosa: A genetic eye disease causing damage to the retina. The rods, which control night vision, are most affected. As the disease worsens, the peripheral vision is also lost (tunnel vision) followed by central vision as well. It occasionally, but not often, leads to complete blindness.



Tunnel Vision: A loss of peripheral vision which can be caused by many factors including, but not limited to … blood loss to the brain, tumours pressing against the optic nerve, retinitis pigmentosa and other eye diseases.

OTHER CONDITIONS

Albinism: A heredity gene mutation resulting in the body's inability to produce melanin (pigment) or sustain adequate production over time. Lack of melanin causes abnormal eye development. Without enough melanin, the area of the retina necessary for sharp vision doesn't develop properly.

Amblyopia: Commonly known as 'lazy eye'. Vision is reduced because the brain does not properly acknowledge the images seen by the eye. In most cases, only one eye is affected.

Colour Blindness: Generally, only affects men. Is a result of an absence or malfunction of colour-sensitive cells (cones) in the retina. The eye has three types of cone cells – each sensitive to either red, green or blue light.

Detached Retina: A condition caused when the vitreous humour does not properly detach from the retina as we age. If it remains attached, it can tear the retina when it finally pulls away. Not necessarily harmful, these tears may allow fluid to collect underneath the retina. If the fluid spreads, the retina may peel away and detach from the back of the eye – causing a detached retina. Symptoms can be gradual or sudden and often appear in one eye at a time. Distinguished by a shower of thousands of black dots across your field of vision or seeing floaters of quick white flashes. Once the detachment is complete, the entire visual field may seem darkened.

People with diabetes are at risk for a different type of this condition. It presents itself through the creation of scar tissue on a weakened blood vessel lining.

COGNITIVE DISABILITIES

The definition and range of cognitive disability is broad. Persons with cognitive disabilities may have difficulty with various types of mental tasks either from disorders, birth, disease or injury.

Cognition refers to a range of high-level brain functions including the ability to learn and remember information; organise, plan and problem solve; focus, maintain and shift attention as necessary; understand and use language; accurately perceive the environment (physical or social); and perform calculations.

Many cognitive disabilities have a base in physiological or biological processes within the individual, such as a genetic disorder or a traumatic brain injury. Other cognitive disabilities may be based in the chemistry or structure of the person's brain.

Persons with more profound cognitive disabilities need assistance with aspects of daily living. Persons with minor learning disabilities might be able to function adequately with their disability, maybe to the point where their disability is never diagnosed or noticed. Knowing the different ways and the extent to which a person is affected by a disability assists an instructor to develop behavioural and learning strategies that enhance the abilities of the students while minimising the effects of their disability.

Use the cognitive assessment tool to understand your student's abilities and needs better. This tool can be found in the assessment section of the manual.

ATTENTION DEFICIT HYPERACTIVITY DISORDER (ADHD)

ADHD is a recognised neurological condition affecting a person's attention, activity and impulsiveness. There are 3 main subgroups so the behaviours represented will differ. ADHD does not affect intellect although acquiring skills can take longer as it can affect maturity.

Predominantly inattentive: difficulty paying attention and focusing, easily distracted with a short attention span, forgets instructions, may not listen, may daydream a lot. Can sometimes also be slightly hyperactive and impulsive

Predominantly hyperactive/impulsive: always moving, restless and fidgety, trouble switching off, trouble waiting, often acts without thinking, interrupts or blurts out answers/secrets, loses control of emotions, may have little or no sense of danger. May also be inattentive but to a lesser degree.

Combined: where all 3 behaviours are presented equally

People with ADHD are also often energetic, enthusiastic, creative, intuitive, and sensitive. All attributes that can be harnessed positively.

Children with ADHD can be said to do all the things that children generally do, just louder for longer and with greater impact. ADHD often remains into adulthood and adults may also need support networks and strategies to enhance their lives.

Treatment of ADHD involves behavioural strategies Including creating structure and planning, boosting self-esteem and building social skills. Medical treatment involves stimulants that assist with concentration, reduce impulsiveness, increase calmness, and help learning.

AUTISTIC SPECTRUM DISORDER (ASD)

Autism is a lifelong developmental condition that affects around 1 in 70 people. People on the autistic spectrum typically have challenges with social communication and interaction, repetitive behaviour and routines, high or low sensory sensitivity, and highly focused interests. These challenges are often exacerbated by the social and physical environment and therefore being aware of and adapting the environment in small ways can have a huge impact on difficulties a person may face. It is a spectrum disorder meaning that there is a huge variety of ways in which these characteristics are present and every individual on the spectrum is unique. Some people on the spectrum may have an associated intellectual impairment and alternatively around 10% have an extremely high intelligence.

Social communication and interaction: People with ASD may or may not use language to communicate. Where language is not used by the person, they may still understand the verbal communication or alternatively might effectively communicate using visual aids or sign language. Generally functional exchanges of information are understood whereas informal small talk, facial expressions and social gestures can be challenging. Communicating and participating in large groups may be more challenging due to all the informal social cues and interactions that exist.

Repetitive Behaviour and Routines: Autistic people generally have a need to follow routines and patterns of behaviour, including such things as greetings, clothing or food, and may have difficulty altering these. This may be a way of providing some certainty and structure to life. Individuals may also have repetitive physical behaviours such as hand flapping, rocking, or bouncing, sometimes referred to as “stimming”, which may help alleviate anxiety or assist with processing information.

Sensory Sensitivity: Sensitivity to the senses may be heightened, commonly hearing, but also including vision and touch. This may result in discomfort or even pain resulting from loud noises or certain tones, or from bright light, or the feeling of a pair of goggles. The senses of proprioception, (awareness of where one is in space), thermoception (temperature), and nociception (pain) can also be affected resulting in apparent clumsiness, insensitivity to cold, not noticing hunger or being indifferent to pain from injury.

Highly focused interests: People with ASD may have an intense interest in or knowledge of a particular subject. For some this leads to expertise in their area of interest.

The term Asperger's was used to describe a form of autism where language delay was not observed. Rett's syndrome is another neurodevelopmental disorder that falls under the Autism Spectrum and is characterised by normal early development followed by loss of hand control, speech, decrease in muscle tone intellectual impairment and seizures.

DEVELOPMENTAL DELAY, GLOBAL DEVELOPMENTAL DELAY

A general term that is used to describe when a child's development is slower than that of other children of the same age, particularly when the cause is not clear. If can affect any area of development including gross and fine motor skills, speech, language, cognition, social and emotional skills.

DOWN'S SYNDROME

A congenital disorder caused by an extra copy of the 21st chromosome existing in every cell. Although there are common characteristics any individual will have a unique mix of these and will therefore have a unique abilities, appearance and personalities.

Down's syndrome is a lifelong condition that causes delays in learning and acquiring skills, and delays in development. It may also affect behaviours making it more difficult to control impulses and manage emotions to varying degrees.

People with Down's Syndrome may, along with family features, also exhibit certain physical characteristics such as a flat face, particularly the nose, small mouth with the tongue sticking out, flat back of the head, small fingers and toes. They may also have low muscle tone and loose joints. Vision and hearing can also be affected.

About 1 in 10 people with Down's Syndrome have another cognitive disability such as ADHD or Autistic Spectrum disorder.

DYSPRAXIA OR DEVELOPMENTAL COORDINATION DISORDER (DCD)

A neurological impairment that affects coordination of gross and fine motor skills. DCD can also affect processing of information and the senses. As a result, people with DCD can be slower to learn new skills and may have difficulty expressing what they are learning. People with DCD have normal intelligence.

FRAGILE X SYNDROME

The most common form of inherited intellectual impairment. It occurs when the Fragile X Mental Retardation 1 (FMR1) gene mutates. Effects can range from learning disabilities to more severe cognitive/intellectual disabilities. Can exhibit autistic spectrum like behaviours, speech, language, and processing delays.

CONSIDERATIONS FOR TEACHING

The information in this section aims to give some ideas on making your lesson more effective and keeping your student safe.

Personalise these tips by combining them with the specific information you gain on the person's abilities from your assessment. As well as keeping your student safe, you can affect the impact of a person's disability on their skiing or riding by adapting the physical and social environment they are in, and through your communication. Often a disability only exists in relation to the circumstance the person is in. By removing barriers and handicaps physical and cognitive challenges may have no longer have an impact. For example, if you know that a person is anxious in groups have them go through the lift line on the outside, or if someone is affected by bright light suggest extra dark goggles.

GENERAL CONSIDERATIONS

Remember the baseline traits (movement, balance, strength, behaviours, communication) established in your assessment so that you notice any changes as they happen to make it easier to establish the cause and act. Common causes of changes are:

Temperature - Both hot and cold temperature, in the core, and /or the extremities. People may be more impacted by temperature or may not be aware of or be able to feel temperature changes. check in with your student, notice how you are feeling and if in doubt check the student's temperature, or change where you are by going inside or moving to a slope with a different aspect.

Fatigue - This may be general or specific to a movement or position. Take a rest or change the activity. Sometimes people may take a longer time to recover or may need to avoid getting fatigued at all.

Dehydration and hunger whether it be the excitement of learning something new, unfamiliarity with the mountain environment or a lack of awareness sometimes we need to suggest time for food and water.

CONSIDERATIONS MORE COMMONLY ASSOCIATED WITH COGNITIVE DISABILITY

The following is a starting point and individual strategies may vary.

Communication - Keep it simple, keep instructions single step, (2 steps may cause confusion), use concrete language, include lots of visual content.

Routines - establish and adhere to routines. Changing routines may cause anxiety and confusion.

Interests - use the student's interests as a basis for your teaching.

Behaviour - expect and demonstrate age appropriate social behaviour.

SPECIFIC CONSIDERATIONS FOR PHYSICAL DISABILITIES

Cerebral Palsy: Do not force or stress limbs to be in a certain position and loosely support or strap limbs If necessary, to avoid Injury. Monitor effect of fatigue, temperature and anxiety on a person's movement.

Diabetes: Take sugar sweets with you and in cold weather check in with the student to avoid excess cold in the extremities due to poor circulation. Always seek assistance in an emergency if student requires insulin.

Multiple Sclerosis: where possible teach in a colder part of the day or season and avoid overstressing the student both mentally and physically. Check for any associated sensory impairment particularly vision. Be aware that performance may vary from day to day and over time.

Muscular Dystrophy: avoid fatiguing the student and take frequent breaks. Take care when lifting and avoid falls due to possibility of loose joints due to loss of muscle tone. Change position frequently to reduce stiffness associated with being in the same position for long periods.

Spinal Cord Injury: check seat straps, boots and clothing for anything that may cause a pressure sore. Be aware of cold in legs/feet where there may be a loss of sensation. Check that any straps are not putting pressure on a catheter or colostomy bag and above T6 be aware of ADS.

Spina Bifida: as for spinal cord injury and after big falls, check for headaches or double vision due to hydrocephalus and if there seek medical attention. May have a latex allergy (latex is sometimes used in sticking plaster and medical gloves). If Harrington Rods are present, reduce likelihood of high impact landings.

Stroke / Traumatic Brain Injury (TBI): Always wear a helmet. If the student is unknown to you, check ability on the learner slope as student may have a historical perception of their ability. Check for seizures and if they are not controlled use a harness on the chairlift. Take your time to learn how the TBI affects the person so you can adapt communication, equipment and expectations accordingly. Be empathetic to inappropriate behaviour but set appropriate boundaries and use repetition if necessary, due to memory loss.

CONSIDERATIONS FOR VISION IMPAIRMENT

Use the person's vision as much as possible and supplement where necessary with verbal instruction, touch and body molding.

Colour and Contrast: Be aware of how the student responds to colour and contrast so you can wear the most effective clothing when guiding.

Light and colour: Understand how the person responds to light to choose the right eyewear from clear and coloured lenses through to super dark lenses. If the person is affected by bright light choose aspects and positions that have them facing and riding away from or out of the sun where possible.

Visual field, depth, and acuity: Know the person's visual depth and field, and acuity so you can position yourself well when instructing and guiding and can use any vision they do have when teaching.

SPECIFIC CONSIDERATIONS FOR COGNITIVE DISABILITIES

ADHD:

- set up and regularly revisit a structure for the lesson.
- keep calm almost boring.
- give praise and responsibility.
- change tasks regularly.

AUTISM SPECTRUM DISORDER:

- Set up or learn their routine and follow it.
- Use visual tools in your teaching
- Use student's interest (if they have something particular) as a basis for your lesson
- Understand that language is almost always understood in a literal sense
- Be aware of where your student is at all times when riding, in case they get distracted by something and ride off
- Observe signs of anxiety and reduce this where possible (increased stimming can signal anxiety).

DEVELOPMENTAL DELAY AND INTELLECTUAL IMPAIRMENT:

- Check for understanding by asking open questions
- Keep it simple, with single step instructions and allow time for understanding and processing of information,
- Don't expect coordination or understanding to match the physical age of the student, set up simple routines.

DOWN SYNDROME:

- Avoid lifting using arms or putting pressure on joints as these may be loose,
- May have a latex allergy (latex is sometimes used in sticking plaster and medical gloves)
- Only accept age appropriate behaviour if emotional extremes such as anger or passion are shown
- Set up simple routines and keep communication simple.

FRAGILE X SYNDROME:

- May exhibit a combination of developmental delay and ASD traits so adapt accordingly.

DYSPRAXIA:

- Break tasks down to simplify
- Give single instructions, don't necessarily assume instructions are understood
- Allow more time to achieve tasks
- Acknowledge effort.

NZSIA ADAPTIVE SNOWSPORTS INSTRUCTORS MANUAL

SECTION FOUR: LIFTS AND LOADING

TRANSFER

To transfer a skier from a sitting position into their equipment, ask them first what works best. Discuss what you are going to do before you do it, and arrange any assistance you might need, including having someone to stabilise the equipment the student is transferring into. Allow the student to do as much as possible.

If you need to assist, avoid any action that pulls on a student's limb. Avoid straddling the student's legs in case of spasm. Always lift with a straight back with your core muscles engaged and keep the student as close to you as possible.

When ready to lift use a count, 1-2-3-lift, or ready-steady- go, so that everyone moves at the same time.

LIFT LOADING AND UNLOADING

For all lifts the following guidelines apply.

- Practice loading before you get on the lift so everyone knows their role
- Designate one person to be in charge
- Involve the student as much as possible
- Use counting to co-ordinate everyone's movement both on and off the lift

- Ensure the lift operators understand what assistance you need and advise them whether you need a slow or a stop at the bottom and top of the lift
- If unsure ask the lift operator to stand-by the stop button

MAGIC CARPET

Skiers can straddle the student from behind to give them support, snowboarders can remove their equipment to support their student.

When loading stand-up riders and skiers, make sure that you are in a position that will prevent them from falling backwards. Be careful that outriggers are positioned on the moving carpet.

PLATTER LIFT

Straddle the student from behind with the platter either between the student's legs or your own. Advise the operator where to place the platter. As the student's skills increase reduce the amount of support you give them and encourage them to take the platter with the aim of them becoming independent.

For sit skis straddle the ski supporting it between your legs. The platter is held in the hands of both the student and the instructor with the student taking as much weight they are able.

T-BAR

For sit skis attach a short tether to the front of the sit ski seat and loop it over the t-barr. Have the student use a quick release mechanism to release the tether.

Stay as close to the student as possible. Reach around them to support them and hold the rope with both hands. Have the student hold the rope to assist where possible.

With sit skis use the knees to support the student and counter the turning movement created by the pull of the rope by steering the sit ski slightly towards the rope.

skiers - one with spina bifida, one arm amputee on T-Bar.

CHAIRLIFT

Be well organised in advance, know what assistance is required and practice in advance including countdowns. Advise the lift operator of the speed you need the lift to run at both at the bottom and top of the lift. Ensure that you get a definite acknowledgement from the lift operator. If in doubt do not proceed with either the load or unload.

4 Trackers should have their outriggers in the ski position at loading to prevent them getting pulled under the chair. Sit skiers use their outriggers in the flip up position if they have the arm strength to push effectively. Otherwise the outriggers need to be placed across the student's legs out of the way. Sit skis need to be put in the loading position before entering the loading area. In some cases this may mean that the student needs extra support to balance when they enter the loading area.

If there is a misload, yell STOP and push the skier/rider into the pit. Do NOT wait and try to 'fix' the misload when off the ground.

Anyone who is at risk of having a seizure must wear a harness on the chairlift.

On a sit ski, the safety strap should be used.

If for some reason the chair lift was to stop working the ski patrol will have to lower the sitski to the ground, using the evacuation strap. An evacuation strap with a locking Caribbean will attach to their life line.

MOUNTAIN POLICY ON QUEUE MANAGEMENT

Each mountain should have its preferred policy is for managing special needs in a lift queue. Generally it is appropriate to ask a person with a disability to wait in line with everyone else.

Exceptions include:

- Very long waits – lower limb amputees and those with weak leg muscles find it very tiring to stand on one leg for long durations. People with autism or similar conditions may panic or feel excessively claustrophobic if surrounded by people for a long duration.
- Waiting on a slope – people in sit skis, amputees and those with weak muscles may find it difficult to manoeuvre in a lift queue with a slope as they may lack some control.

We encourage you as Adaptive Instructors to work with lift operators on the mountain to practice techniques so that handling clients with special needs does not need to slow the lifts down during busy times.

ADAPTIVE FUNDAMENTALS

The NZSIA FUNdamentals is a national framework and educational resource for children's skiing and snowboarding in New Zealand. It is based on developing fundamental skills in the sport of skiing and snowboarding that are fun and build on a solid base – the FUNdamentals.

The Fundamentals are a useful resource for adults as well and are a good starting point for developing an adaptive lesson plan.

ADAPTIVE LEVEL I CORE SKILLS	INSTRUCTOR INFORMATION	SKILL ACQUISITION FOCUS
I know my equipment and how to be set up correctly to use it	Demonstrate set up and use of equipment	Balance
I can stand in a functional centred stance and move away from and back to that position	Identify the most functional centred position with support and/or canting as needed. Show student different ways of moving in and out of a centred position identifying when they are centred	Balance, Lateral, Vertical
I can move around either independently or with support on the flats	Assist as much as required and dictated by stamina so that student understands how to move	Balance, edge, pressure, rotation
I can slide maintaining a centred stance and can move away from and back to that centred stance while sliding	If possible, teach student how to climb the hill and turn to slide down and then how to maintain the centred stance moving away from and back to that stance with different exercises	Balance, Edge, Pressure

I can perform some form of basic speed control either using outriggers or with board/skis and know how to fall safely	Demonstrate safe falling, particularly with outriggers, then use either a wedge, outriggers, sideslip or tethers to slow speed	Balance, Edge, Pressure
I can ride conveyor lifts safely	Introduce good technique for riding conveyor lifts	Balance, Edge, Pressure
Adaptive Level 2 Core Skills		
I can make a direction change both ways	Introduce rotational movement to change direction both ways using either a wiggle or fan progression. Bi ski uses lateral movement	Ski: Rotation SB: Twist, Tilt
I can link turns	Link direction changes	Ski: Rotation SB: Twist, Edge, Rotation, Pressure
I can use my turn to control my speed	Speed control through turn shape	Rotation
I can change my turn shape and size	Vary turn size and shape with a rotational focus	Rotation
I can balance on the edge at the end of the turn	Develop body positions to aid balance on the edge at the end of the turn and also edge release. Garlands are a good drill	Edge
I can traverse across the hill	Continue developing balance on the edge.	Edge

ADAPTIVE LEVEL 3	INSTRUCTOR INFORMATION	SKILL ACQUISITION FOCUS
I can ride a chairlift and ride beginner terrain	Teach Chairlift Riding and develop skills introduced already to ride green terrain	
I can adapt my movements to green terrain	Work on edge release and moving forward into the turn as well strengthening rotation to encourage separation and angulation	ALL
I can adapt my movements to varying terrain features	Use mileage to introduce student to varying terrain such as rollers, small bumps, and variations in snow conditions on trail	ALL
I can ride blue terrain	Strengthen and blend skills appropriate to intermediate terrain	ALL
Using turn shape and size appropriate to terrain	Encourage student to choose appropriate turn size (small to large) and shape (open / closed) for the terrain they are riding	Rotation, Edge
I can edge and balance on the edge at or near the fall line	Focus on encouraging student to balance on the edge at or just after the fall line	Edge

ADAPTIVE LEVEL 4 CORE SKILLS	INSTRUCTOR INFORMATION	SKILL ACQUISITION FOCUS
I can carve the second half of the turn	Develop edging skills both release and engagement to enable carving through the second half of the turn on green terrain, and stronger edge release with earlier engagement on blue terrain	Edge
I understand the difference between skidded and carved turns and when to use them	Teach student the difference between skidding and carving the pros and cons and how to blend	Edge, Rotation
I can make medium/ short turns	Shorten turn shape through stronger rotation and separation, encourage outrigger or pole use as appropriate	Rotation
I can ride all blue terrain	Introduce steeper intermediate terrain with appropriate blended movements	ALL
I can ride easy off trail terrain	Introduce off trail riding	
I can ride easy natural terrain features	Introduction of basic Freestyle manoeuvres outside the park	All
I can ride easy features in the park	Teach student park etiquette and how to ride small feature such as a box or small jumps	All