

# ***Courage Kenny Ski and Snowboard Program Curriculum for Adaptive Alpine Instruction***

This is a living document reflecting the techniques and equipment used by Courage Kenny Ski and Snowboard Program. We have drawn on our own experience and the sources that are cited. We encourage you to give us feedback on what was useful, what is missing, and points of clarification. Use this as a training manual when teaching new instructors to make sure you cover the basic points. All the words here are no substitute for your own creativity and experience.

Adaptive skiing and snowboard uses special equipment and techniques to teach people with disabilities to ski and snowboard. The goal of any adaptive lesson should be to make the student as independent as possible. In some cases the goal will be a totally independent skier or rider. In other cases the goal will be a skier that is involved with the lesson whether it is picking the run or initiating turns. In striving for this independence, there is a structured framework for teaching that addresses safety and skiing progressions. This manual is an outline of that framework. As an instructor you should call on your creativity and experience to plan and run safe, fun, and educational lessons.

This manual is divided into five parts: Emergency Procedures, Teaching Techniques, Student Evaluations, Equipment, and Skiing Progressions. The last two sections are specific to the particular disciplines.

Sources: Core Concepts for Snowsports Instructors PSIA Foundation, 2001.  
Adaptive Snowsports Instruction, PSIA Foundation, 2003.  
“ATS Teaching Model”, PSIA-RM, 1994-1995.

## **I. Emergency Procedures**

Skiing is an inherently risky sport. Falls, crashes, and wipe-outs are part of the learning process. Unfortunately these sometimes lead to injuries. We have put emergency procedures in place to deal with accidents should they occur. In this section we also address the skier responsibility code, which outlines behaviors on the hill that contribute to safer skiing conditions for all. Finally we address two medical conditions that all instructors working with people with disabilities should be aware of.

### **A. *The skier responsibility code.***

1. Always stay in control, and be able to stop and avoid other people and objects.
2. People ahead of you have the right of way. It is your responsibility to avoid them.

3. You must not stop where you obstruct a trail or are not visible from above.
4. Whenever starting downhill or merging into a trail, look up hill and yield to others.
5. Always use devices to help prevent runaway equipment.
6. Observe all posted signs and warnings.
7. Prior to using any lift, you must have the knowledge and ability to load, ride, and unload safely.

### ***B. Accident procedures***

1. After a crash – ask the student his/her condition. “Are you OK?”
2. If there is an injury, call the ski patrol immediately. They are trained to deal with medical emergencies. We are not.
3. Keep the person comfortable. **DO NOT MOVE THEM.** Wait for the ski patrol.
4. Notify the Site Coordinator of the accident ASAP.

### ***C. Medical conditions requiring additional attention during skiing.***

1. **Seizures** can vary in severity from all-out convulsions to stares or blank looks. A student with a history of seizures will have documentation in his file. In addition to the first aid for seizures outlined in the volunteer manual, instructors should be especially aware of students on the chair lift. At a minimum the safety bar should be lowered at all times and a safety strap or harness should be worn by the participant if they've had a seizure within the last 5 years. The instructor should be prepared to steady/hold the student on the lift with the aid of the safety strap/harness in an event of full seizure.
2. **Autonomic disreflexia** is a condition that occurs in persons with spinal cord injuries above T6 (just below the chest). This is a hypertensive crisis that can lead to stroke, coma, or death if not managed. If a skier exhibits severe sweating, goose bumps, flushing, chilling without fever, severe headache, high blood pressure, or increased spasticity, follow the procedure below.
  - a. Sit the skier up right to get the head above the heart.
  - b. Check for kinks in the catheter. Pinched catheter or full leg bag can trigger this condition.
  - c. Decrease stretch of hamstring muscles by flexing knees.
  - d. Get the student inside immediately.

### ***D. Other Safety Precautions***

Always inspect the equipment prior to use. Someone else may have used it since your last lesson. If there are any problems with the equipment let the site coordinator and equipment manager know immediately. If the

evacuation straps are missing on bi or mono skis the ski must be removed from service immediately.

## II. Teaching skiing

### **A. Goal setting**

Have a discussion with the student and/or parents at the beginning of the season on what the goals of the student are. These goals should be attainable. You may want to ski with a student for one session to see at what level they are skiing.

Some examples of goals:

- independence – no tethers or help on the lift
- initiate turns with head movement
- practice on steeper terrain for a trip out west with family
- ski without ski bra
- learn to stop bi ski
- load independently in mono ski

Setting goals gives structure to the lessons throughout the seasons and reduces the tendency to “go for a ride” with your student. The challenge for you as an instructor is to keep these lessons fun AND moving toward the goal.

### **B. Lesson structure**

Structuring a lesson, both when teaching a student and running a clinic, is important to keep the lesson moving toward the goals set-up at the beginning of the year or for that lesson. In addition to the structure of the lesson, the instructor should be clear on directions. “We will meet at the top of this chair” and aware of the pace of the lesson (do not talk too much!)

1. Evaluation and equipment selection – see section IV below.
2. Goal setting – see discussion above.
3. Plan the lesson – gather needed equipment.
4. Present information – this is best done in a couple of different ways explaining, demonstrating, etc. (see learning styles below).
5. Demonstration
  - a. Use same equipment, if possible
  - b. Could use an assistant to demo if you are tethering
  - c. Focus student on appropriate area of demonstration.
6. Practice – mileage
  - a. Set task and allow time to practice
  - b. Reinforce strengths and correct problems.
7. Check for understanding.
  - a. Observe the student to see whether he is implementing your instructions.
  - b. Ask the student questions or to explain the idea.
8. Recap – bring the lesson to a definite closure

- a. Point out goals and achievements of the lesson
- b. Outline the next steps
- c. Give feedback to the student's parents if appropriate and suggestions for things to practice on his own.

### **C. Learning Styles**

There is a wealth of research on different ways people learn. Below are summarized seven categories of intelligence defined by Howard Gardner in the theory of multiple intelligences. Most people do not fall into one particular category. The effective teacher uses techniques and lessons appealing to several different styles of learning. In the discussion below we outline the same way to teach moving skis from a wedge to parallel for the seven different types of learning. Using every type of description is not necessary, but being aware that your students might be better at interpreting different types of information is important in order to efficiently communicate.

#### 1. Verbal - Linguistic

These students thrive on stories and using words either spoken, heard, or read. On the hill descriptions of the movement are effective ways to communicate with the student.

*e.g. "Make the pizza slice turn into French fries" for describing moving the skies from a wedge to parallel*

#### 2. Logical – Mathematical

A student asking "why" or "how" indicates a desire to understand the steps that can be taken to solve a problem. On the hill technical descriptions of what is happening physically may help the student understand your point.

*e.g. "As you bring your skis parallel to each other, the edges do not dig into the snow and you will go faster. Instead of controlling your speed with your edges you will control your speed by the shape of the turn."*

#### 3. Spatial-

These students respond to drawings and pictures. On the hill a student seeking spatial input may want to watch you demonstrate a skill rather than listen to a description.

*e.g. "Watch how I move my skis together at the end of the turn."*

#### 4. Bodily – Kinesthetic

This student learns best by trying activities and moves skillfully. On the hill the student will try a new skill eagerly. Kids are often kinesthetic learners.

*e.g. "Let's play follow the leader. I want you to make your skis do what mine do while we're turning."*

#### 5. Musical – Rhythmic

These students have a gift for rhythm and music. On the skill hill drills with counting appeal to a learner seeking this type of information.

*e.g. "On this short hill I want you to ski straight at me. Make a wedge with your skis on a count of 1,2, then bring them together on a count of 3,4."*

6. Interpersonal

This type of person thrives in group situations and is good at responding to others in appropriate ways.

*e.g. "Lets play follow the leader. Student, you lead and make sure we stay together. You might have to speed up and slow down so use your wedge and parallel."*

7. Intrapersonal

This type of student may be quite and like solitude. They typically think a lot. On the hill will set goals well and know his strengths and weaknesses.

*e.g. "Think about how you can control your speed other than wedging while we are skiing over to the next lift."*

### **III. Student Evaluation**

A thorough student evaluation at the beginning of the season is important to help you understand the student's strengths and weaknesses and to set realistic achievable goals. For adaptive students there is sometimes important medical information to know before selecting equipment. Also important is understanding the student's motivation for learning to ski. Assessing whether the student's motivation is the same as the parents is often very important in goal setting. This section is divided into two sections: motivation and physical abilities. How you as an instructor use the information will depend on the total picture of the student you receive from your evaluation. In the specific discipline sections we will discuss how answers to certain questions will direct you to choose certain equipment.

#### **A. Assessing motivation**

1. How does the student get to the hill? Ex. Parent, STRIDE bus, personal care attendant.
2. Who else in the student's family skis?
3. How often does the student participate in sports?
4. What, if any concerns, do they express?
5. What kind of learner are they? This might be deduced from the types of questions the student asks.
6. What is their emotional state? Excited? Nervous?

#### **B. Assessing physical abilities**

The following questions are relevant to skiers of all abilities using all types of adaptive equipment. In addition, questions specific to each discipline are addressed. The following sections on equipment for specific disciplines address

how the information gained during the student assessment guides equipment selection.

1. Does the student walk or use a cane, crutches, walker or wheelchair?
2. Does the skier have all four limbs, walk with a limp, and/or wear leg braces?
3. What is the specific disability?
4. Does the skier have any related or unrelated secondary disabilities?
5. Is the skier taking any medications that could impact their skiing? (i.e. easily fatigued, unable to regulate body temperature).
6. Check to see that the skier is equally strong on both sides of their body. Ask them to push against your hands, squeeze your hands, etc.
7. Does the skier have a limited range of motion in any part of their body?
8. Can the skier understand and answer your questions?
9. Can the skier easily process information, follow directions, and stay focused?
10. Does the skier participate in other sports?
11. Check the student's balance skills.  
Can the student stand on one foot? Check both sides.
12. Ask the student when they are sitting to pick up a piece of paper off the floor. Or give you a "high-five" and "low-five" on both sides

## **Disciplines of Adaptive Skiing** **(Stand-up, Visually Impaired, Bi-ski, Mono-Ski, Snowboard)**

### **Stand-up Skiing**

#### **Equipment selection**

The goal of selecting adaptive equipment is to help the skier stand with a balanced position over the center of the skis. In addition instructors should give students as much independence as possible. This means that equipment like tethers and bamboo poles are a means to achieving greater freedom, but not the end goal.

#### ***A. Additional assessment for stand-up skiers.***

1. Is there a wear pattern on the skier's shoes/boots?

2. Does the skier have their weight primarily on their heels or toes?
3. Can the skier move each leg and arm out to the side and bring it back to a neutral stance position?
4. Does the skier ambulate with a swing gate, scissor gait, or with a walker?
5. When the student is ambulating, does his or her movement come from the legs, hips, or the shoulders?
6. Does the skier have leg length differences? Check by having the student sit with their back and butt against the wall. Check that the knees and feet are at the same distance from the wall.
7. Does the skier have orthotics/braces?
8. Does the skier have any amputations/prostheses? Where are the amputations (above or below the knee)?
9. Does the skier have any contractures/fused joints?
10. Does the skier have any pronation (rotate inward) /supination (rotate outward) of the foot?
11. Is the skier knock-kneed or bull legged?

### ***B. Fitting the ski boots***

1. Select and fit boots. Check to see if the inside of the rental boot is dry. The boot should fit comfortably with warm socks. Generally students do not need to use Ankle/foot orthotic (AFO) in boot. AFO's are used to prevent shortening of the Achilles tendon, and the forward lean of the boot accomplishes this. If your student must use the AFO, you will most likely have to get a larger boot size. Foot orthotics (FO's) can fit inside a boot. Make sure the FO and AFO are returned to the student after the lesson.
2. Secure fit – You may need to pad the boot so that the student can put pressure on the front of the boot. This can be accomplished with extra socks or foam wrapped around the ankle.
3. In order to center the student's weight heel or toe rises used under the lining of the boot are effective.
  - a) Toe lift if the weight is forward.
  - b) Heel lift if the weight is back or if braces or prosthetics are used.
  - c) Accommodate leg length (under the entire footbed in the boot on the shorter leg).
4. Students who pronate or supinate may find it easier to make a flat ski on the snow with canting. Adapt to the skier's natural stance and fill in the gaps. The cant cannot be more than ½ inch thick inside the boot and should go under the liner. Remember to take the cant out of the rental boots.
  - a.) If the student has their weight on the inside of their foot (pronates)- fill the gap on the outside of their foot.
  - b.) If the student has their weight on the outside of their foot (supinates) – fill the gap on the inside of their foot.

### ***C. Lateral stability***

The student's lateral stability can be assessed by asking him to bring each leg to the side and back to the center and by rotating the feet into a wedge position.

There are several pieces of equipment useful for aiding the student's ability to control the distance between his skis.

1. Ski bra - Keeps tips together, prevents them from crossing, and allows skis to go from wedge position to parallel. Allow as much movement as possible when selecting which type.
  - a. Hook and eye type does not allow fore and aft mobility
  - b. Trombone type allows shuffling of feet
  - c. Edgie Wedgie is for very light tip control. It is a length of bungee cord that keeps tips together but does not prevent them from crossing.
2. Spacer bar is a PVC pipe with bungee cord running through it that attaches under the boots at the heels. This is used along with a hook and eye type ski bra. The spacer bar allows skier to maintain wedge even with weak hips. Disadvantage is that the skier loses a lot of independent leg movement.

*Note: These lateral stability aids are useful when teaching a wedge progression. Not every student needs to be taught through that progression. For example, some below the knee amputees find it difficult to rotate the feet into a wedge. In this case teaching the parallel progression is the most effective tactic.*

#### **D. Balance aids**

Clues to which type of balance aid your student may need can be gleaned from watching them walk on dry land. Students that use crutches on land may need outriggers on the snow. Students that use walkers may need more aid in the form of a snow slider.

1. **Outriggers** are Canadian style crutches with a flip ski on the end. Outriggers perform like a ski pole, but also provide additional support and aid turning ability
  - a. Should be 1 to 1½ inches off the surface of the snow when the student has their skis on.
  - b. The cuff of the outrigger should be approximately halfway between the elbow and wrist.
  - c. The handle should be at about hip level.
  - d. The opening of the cuff is always worn toward the outside of the body. This allows the outrigger to break away in the event of a fall.
  - e. The break on the outrigger should be long for a beginning skier. Please be careful when adjusting the nuts and bolts so that you do not strip the screws.
  - f. Check to see that the brakes on the outriggers are set at the same length.
  - g. The older cuffs can be bent open. The newer plastic cuffs are very difficult to get on. Please assist your student.
  - h. When using outriggers, make sure the skier holds the handle and not the string.
  - i. Each pair of outriggers is numbered. Note the number and the pin/bolt placement of the student's information sheet. This will allow you or the next instructor to work with this student to set up the skier's equipment quickly.

2. **Snow Slider** – this is an extremely adaptive piece of equipment. It functions like a walker on skies but the skies can be rotated into a wedge and angled to be on edge or flat.
  - a. The student skis on two skies. Many times the students will ski with a ski bra to aid with stability.
  - b. The arm grips can be adjusted to the students natural grip and so the student is centered over the skies.
  - c. The amount of wedge can be adjusted on the snow slider.
  - d. The snow slider can be tethered from half way up the supports.
  - e. Handles from each side of the supports can be used by an instructor on either side to guide the snow slider.
    - e. The snow slider should be appropriately sized for the skier. There are children and adult sizes.

### ***E. Turning aids and speed control***

1. **Tethers** – These 15 ft. lengths of nylon webbing attach to a ski bra and are wore around the arms and skin of the wrist of the instructor. The instructor can turn the student by pulling on the tethers and slow the student down by slowing down him/herself. Tethers in stand-up skiing CANNOT be used to stop the student because the attachment point is to the skies and not the student. IF the instructor stops suddenly, the student will fall forward.
  - a. The tethers can help a student learn how to shape his/her turns.
  - b. When held loosely, the tethers do not exert any force on the skies. This is a good way to wean students off tethers.
  - c. The ski bra should be checked at the top and bottom of every lift to make sure that it is not coming loose.
  - d. When skiing with tethers the instructor should stay behind and above the student. To do this the instructor will have smaller radius turns than the student.
2. **Poles** - Poles (either bamboo or ski poles) can be held to the side of the instructor and in front of the student.
  - a. The student should hold the pole at waist level or below in front of him, not next to the body.
  - b. The pole should be long enough that the instructor does not change the student's stance during turns.
3. **Holds and assists**- always ask before touching the student. These techniques are good ways to demonstrate what a turn should feel like.
  - a. Two point hold -.Instructor is behind the student with one of their skies between the student's skies. One hand is positioned on the hip and the other hand just below the opposite knee of the student. Instructor can guide student into a straight run or turn a student using this hold.
  - b. Knee or ski tip hold – The instructor skis backwards holding the student's knee or ski tips while guiding through a turn.

# Stand-up skiing progressions

## *A. Begin teaching on a flat terrain*

1. Assist your student into his bindings. Flip outriggers should be up so that the student can use them to help balance. The instructor guides the student's boots into the bindings.
2. Demonstrate the proper body position. It may be necessary to use the touch system in the areas of flex. Remember to ask before you touch your student.
3. Moving on flat terrain with outriggers up. Using the metal comb on the end of the flip ski, dig into the snow and push off with the arms.
4. Moving on flat terrain with outriggers down. Outriggers are shoulder width apart and the tips turned out at a 45-degree angle. Flex at the knee. Using the inside edge of the outrigger, push off with the arms.
5. Turning steps
  - a) Pivot the tail around the tips. While keeping the toes of the skis together, move the right outrigger to the right, next move the right ski, then the left ski and finally the left outrigger. Keep three points on the ground at all times for good balance. Pivot in the opposite direction.
  - b) Have the student walk in figure eights if they are not using a ski bra.
6. Side stepping – use only if student's tips are not stabilized with a ski bra.
  - a) Use a gentle slope with a flat outrun. With the student facing you explain and demonstrate how each edge is dug into the hill. Once again, keep three points on the ground at all times. Emphasize skis across the fall line and small steps for good edge control and balance.
  - b) If student is fearful, side step just below him. This will also allow you to help with positioning by pushing his hip gently into the hill to help him engage his edges.
7. Falling -Show student how to lower his body to the ground with the outriggers up and outward, making sure the chin is tucked inward in order to protect the head.
8. Getting up – 2 methods. If a student is stronger on one side of his body, the strong side should be uphill. Many students will need assistance to get up from a fall.
  - a) The student's skis should be across the fall line. With the flip ski up, the uphill outrigger is placed near the hip into the snow. Grasp the shaft of the outrigger near the bottom with the uphill hand and the other hand

about three quarters of the way up. Bend forward at the waist to get the weight over the legs. Now, push up and forward until the student has come to a stand.

- b) The student's skis should be across the fall line. Outriggers should be placed perpendicular across the student's skis in front of the student. Walk the hands in a quarter circle from uphill to just over the skis while pushing upward to a standing position with body weight forward from the waist.

### ***B. Moving to a gentle slope***

1. On gentle terrain either side step or use a rope tow or chair lift. Stabilize the student by placing one hand on the tip of the skis and the other on the downhill knee. Slowly move the student into the fall line.
2. Use a two-point hold or poles to guide through a turn in each direction.
3. The gate turn. Similar to pivoting on flats only done on the side of the hill.
4. When the student is able to do a straight run on their own, practice braking with the outriggers by dropping the elbow or by putting the skis in a wedge.
5. If, during the first few exercises, you notice that the student is bent over at the waist, then their outriggers are too short. If the student is scrunching his shoulders, the outriggers are too long.

### ***C. Beginning Turns***

1. Use the two-point hold or a pole to assist the student through his first few turns. Turn in both directions.
2. Instructor holds tips of skis together while skiing backward.
3. Instructor skis backward facing student and has the student follow him through turns.
4. From the fall line, have the student look where they want to turn and turn both outriggers in that direction. This directs the upper body down the fall line and initiates the turn.
5. Encourage the student to steer with the lowest part of his body that he is able. Steer with their knees or hips if necessary. Pretend there are flashlights on their knees and outrigger handles. Keep the beams pointed in the direction of travel.
6. Link the turns, one to the other.

### ***D. Using the chair lift***

1. Loading the Chairlift. Introduce the chairlift by watching others. The student's outrigger flip skis can be up to assist them through the lift line. However, they must be in down position prior to sitting on the chair. When you are waiting for your chair, ask the lift operator to slow down the chair lift. Move to the loading position. The student should be on the lift operator's side of the char. If they are able to, the student should look over their shoulder to watch for

the chair. Sometimes it is helpful to count backwards from 3. “3, 2, 1, sit.” Or when the chair is about to make contact, give the command to sit. The student will then lift the outriggers up and hold them perpendicular to the ground during the ride. The instructor should bring the safety bar down if one is available. When riding the chairlift with tethers, the straps should be removed from the arms of the instructor and held in the hand away from the student. With a walker or snow-slider it is often easier to have the second instructor ride the chair with the equipment and the first instructor ride with the student.

2. Unloading the Chairlift. While riding the chairlift, explain how to unload. The student should hold the outriggers in front with the flip ski in the down position. When the skis make contact with the snow, the student should rise up by bending forward at the waist and placing the outriggers on the snow. The motion of bringing the outriggers forward will assist the student in standing up and skiing off the ramp. Many times it is helpful if the instructor assists the student by placing their hands on the student’s waist and directing them off the lift.

### **E. Wedge Christie equivalents**

1. Garlands – from a traverse, have the student initiate a downward movement, steering both skis slightly into the hill to great garlands.
2. Teach the skier to do a forward sideslip, with a countered body position to enhance skidding of their skis.
3. Traverse the hill with edges barely engaged. End in a turn.
4. Have the student actively steer both skis in the direction of the turn. The outriggers (if used) should also be steered in the direction of the turn.
5. Move to progressively steeper terrain.

## **Teaching Visually Impaired (VI) Skiers**

Many, if not most, points from stand-up skiing apply to VI skiing, but there are adaptations and other considerations for VI skiing. However, once initial assessment and intro is done, the main adaptation is presenting lessons in a way that is clear and accessible -usually auditory and/or kinesthetic- to the VI skier.

Re. The Skier Responsibility Code, as a guide you are a VI skier’s eyes, so you are responsible for adherence to the code for both of you.

### **Evaluating VI Skiers:**

Use other assessments in Section III.B. and IV.A., but also assess the extent of the visual impairment:

1. Does the skier have any useable vision? Tunnel vision? Peripheral vision?
2. Can the skier recognize color or shapes in light or shadow?

3. Can the skier see with both eyes equally well?
4. What sort of depth perception does the skier have?

There are different ways to check the above points. You can ask questions - another simple way is to hold up a certain number of fingers at different distances and angles. It is a good idea to check vision both indoors and outdoors because there might be a difference. Also, check each eye separately and then both eyes together. Use this information to decide how to best teach and guide the skier. For example, if a skier has some vision in one eye, you might decide to guide from the side and use that.

Check for and be aware of other issues or disabilities. For example, if visual impairment is the result of diabetes, it would be important to be aware of possible circulatory problems and blood sugar issues.

### **Equipment:**

All equipment mentioned in the stand-up section can be used as necessary. The goal of skiing with as much independence as possible also applies. Note that ski poles can provide the VI skier with more input about surroundings and terrain, so it's helpful to use them unless there's a reason not to. The skier and guide should always wear the orange blind skier/guide bibs. Don't forget eye protection – VI skiers need sunglasses or goggles.

Take time before the first lesson to introduce the equipment indoors. It is important for the skier to become familiar with it, let the skier feel all the equipment and ask questions. Have him/her walk around in boots and get used to the feel. Guide him/her around in a circle in the boots. Explain the bindings and practice stepping into and releasing in a stationary setting. Be thorough in this introduction, otherwise your student might get an incorrect and/or intimidating impression of things.

Use this time to introduce basic ski movements: athletic stance, side step, wedge stance. You will need to use touch to show these positions – make sure you ask and explain what you are going to do.

### **Communication:**

One of the most challenging aspects of guiding VI skiers is giving them appropriate and useful verbal input, without overloading them. You will need to explain/describe surroundings, conditions and terrain. Try to avoid a lot of unnecessary chatter – it's tiring for the instructor and can be confusing/distracting for the skier. Voice inflection is important and adds information for the listener.

Before you go out on the hill, establish the commands you will use. Following are some suggestions. You and your student can use other/different ones – just be sure to establish and agree on them.

## A. Emergency commands

Establish emergency commands for safety (an out-of-control skier or boarder, your student takes a wrong turn or you fall). Make sure your student knows these.

'Sit down' = An emergency; your student should sit down (to the side) immediately.

'Stop' = A more gradual stop. Use inflection to indicate how fast/urgent the stop should be.

'Slow down'

## B. Directional commands

There are different techniques to use in moving from one place to another.

### 1) Clock system:

Many people use this system based on the face of a clock. It works best in a stationary situation. Twelve o'clock is always the direction your student is facing. Three o'clock and nine o'clock are at 90° angles to the right and left respectively. This system is helpful when going through the lift line.

### 2) Grid system:

This can be used to describe a run and where you will be skiing on it. For example, you could describe a run as '10 zones wide, with a total width of 40 yards'. You could tell the student that you'll be skiing in zones 3 to 6. This can give the student a better idea of the slope and help him/her in the size of turns to make. Don't use the clock and grid system together.

### 3) Verbal commands:

These are some commonly used verbal commands for direction. The cadence of commands can help the student establish rhythm and flow, so adjust the speed and consider pauses etc. in order to be as helpful as possible.

'Right/left, turn' = Prepare and turn. Some people use 'Ready, right' or 'Ready, left'.

Make sure you're clear on left/right, especially if you're skiing backwards in front of your student. Some people prefer to not use left/right and use 'Ready, turn' instead (student turns on opposite direction from previous turn).

1. 'Right, right, right' = Keep turning right. (Or 'More, more, more' )

2. 'Go, go, go' = Keep going in the current direction. (Or 'Hold, hold, hold'). This is helpful to give the student reassurance that he/she is doing the right thing.

### 4) Auditory cues:

The instructor can tap poles together or clap when skiing backwards in front of the student. The student follows the direction of the sound. This saves the instructor's voice and gives constant auditory connection for the student.

**Safety note:** Student and guide should always be in verbal or physical contact. Make sure your student knows to stop immediately if he/she doesn't hear you or doesn't know where you are.

## Chairlift Procedures:

It is important to explain and describe the whole process in advance (lift line, loading, unloading). Explain the type of chairlift you'll be using (double, triple etc.). You can use chairs inside the lodge to demonstrate and practice.

1. Lift line: Explain what will happen and how long it is. It can be helpful to establish commands for this, e.g. 'Tips right/left' 'Straight forward' etc. The student may want to take your arm or rely only on verbal cues. If there is a rope or bar along the line, the student may be able to touch this and use it to guide themselves. Let them know that there will be a waiting point and then they'll have to move forward more quickly. Estimating distance or the number of (shuffling) steps for this can be helpful.
2. Loading: Use and practice a countdown so the student knows when the chair is approaching, 'three, two, one, sit'. Ask the operator to slow the chair if necessary.
3. On the lift: Explain all the noises and feels of the ride as best you can. Why is the chair swinging back and forth? Why did the chairlift stop? What it will feel like when the chairlift starts again? What are all those small bumps when the chair lift goes over the wheels of a post pole? Explaining those sounds and feels to the participant may help him/her enjoy the chairlift and be more relaxed.
4. Unloading: Review the standard procedure on the way up. Be sure to describe in advance the pitch of the unloading ramp and say which way to turn at the end. Give the student advance warning when you get near the top (remember this if you're chatting – it's easy to forget that they can't see when you're nearing the top!) and remind them to raise tips. A countdown to standing is helpful: 'Three, two, one, stand'. If the skier needs extra help, you can take his/her arm and tuck it between your arm and upper body. Make sure you tell the student to stay down if he/she falls during unloading (to avoid getting hit by the chair).

## **Guiding:**

There are different options for guiding. You and your student should decide which one is best. Consider: any vision, degree of hearing (think about wind noise, number of other skiers etc.) and, above all, skier preference in deciding which option to use. Remember that the skier is putting a lot of trust in you as the guide, so make sure you feel confident and comfortable in the position you use.

See section IV D #2, 3 of stand-up for use of poles and holds/assists. Use these, if necessary, in early stages, but remember the goal of as much independence as possible. You can also use poles in a 'horse and buggy' position, i.e. you ski in back holding onto the bamboo poles and your student skis in front (and vice-versa).

1. Guiding from the front (guide skiing backwards): This is good to start with. It is reassuring for the skier and gives the guide control without physical contact. Remember to be aware of what's behind you when guiding this way. (Note that as your student progresses and goes faster, you'll probably have to choose a

- different approach because you're unlikely to be able to ski fast enough to keep up)
2. Guiding from the side: This is good if the skier has some peripheral vision. It can be difficult on a crowded slope and takes some practice to stay close enough to the student without getting in the way on turns towards you. Try to maintain a consistent distance and position – it can be disconcerting if the student suddenly hears your voice coming from a different position.
  3. Guiding from behind: This allows the student to hear your voice, lets you get a good view of the slope and allows you to observe skiing technique easily. Be sure you feel confident that the student will not get away from you.
  4. Guiding from the front (guide skiing forward): This is usually used with more advanced skiers and after skier/guide have skied together a lot. Unless you're using radios, the guide has to project his/her voice over the shoulder and back.

## **First Lessons:**

As indicated above, you'll need to spend some time indoors before the lesson to familiarize the student with equipment and lift procedures. You should also give the student a description of the environment and surroundings. It should include a description of the terrain and surroundings such as position of lodge and lifts, snow makers, snowmobiles etc. Remember that you'll have to show the student this – use your hands and any props you can think of to do it.

It's always important to set and make clear goals for a lesson, but it is especially important for VI students. Since they can't rely on visual input to anticipate what's coming in any given situation, you need to give them an overview in advance to avoid unexpected surprises.

Note that you will probably be talking more than with other students and you may need to use bare hands to demonstrate things – so it's good to do as much as is appropriate in the warmth of the lodge before the lesson!

The progression for VI skiing is the same as in regular stand-up skiing, but remember that you need get the student to understand the concept of each new point before you do it. Use your hands to demonstrate (e.g. fall line, ski positions etc.) and kinesthetic to show body position.

Here are some additional points/ideas to add to the regular stand-up progression:

### **1. The flats:**

You'll probably need to take a little more time on the flats. The student will need time to get used to balancing while sliding on skis. Some exercises:

- Walk together on the flats. The student can hold the top of your pole if necessary and/or you can guide by going in front and tapping your poles.

- Walk in a circle. Guide the student to walk around in a large circle by tapping your poles or using your voice. This is a good exercise to help the student be aware of the skis. It can be difficult for the VI skier to be aware of tips in particular at first (the student may either spread the tips or cross them), so this exercise can help.

#### 2. Side-stepping and falling & getting up:

Again, you'll probably need to take more time with this. You may need to use touch in both cases to take the student through the movements.

#### 3. Finding the fall line and straight run:

Help the student feel the fall line (it's a good idea to explain the concept in advance using hands). Have the student stand with skis across the fall line. Place ski poles just forward of ski tips and move them in a half circle from side to side to feel where the fall line is. Once the student knows where the fall line is, he/she can turn into it for a straight run. Ski backwards in front giving verbal cues. Note that it can be difficult to distinguish between moving slowly and being stationary without vision. Dragging the poles gently in the snow next to heels can give feedback on this. You could also try skiing backwards in front, with palms against the student's to help with this.

#### 4. Introducing the wedge:

Introduce this on flat terrain and use touch to make it clear. Give names, numbers or sizes to the different sizes of wedge to differentiate between a gliding and braking wedge (e.. one, two, three etc.)

#### 5. First turns:

Explain the position of skis throughout the turn (probably using your hands on theirs). You may need or want to use a tip or two-point hold to help the student feel the turn. When the student starts working on linking turns, remember that the cadence and rhythm of your commands is crucial for them to be able to link them smoothly. You may want to establish guidelines for the length and circumference of turns, e.g. for length, a short turn = 5-10 feet, medium turn = 10-20 feet, long turn = 25+ feet.

## Bi-Ski

**Skier Evaluation:** *The following questions are for evaluating **Bi-Skiers**.* \*When completing this evaluation, there is an assumption that the person has been "pre-screened" by the coordinator and is a bi-ski student, or borderline mono-skier. This evaluation is to supplement the main evaluation section, note Section III.

1. How did the student arrive (note above).
2. Determine arm/grip strength. Shake individual's hand; right, then left. Is their sufficient grip strength to use handheld outriggers?
3. Determine upper extremity function: Strength, coordination, flexibility:
  - Hold your hand out at an arm-length and parallel to their knees. Then have the student attempt to reach out and touch your hands with theirs. Also have them reach across their bodies and touch the opposite hand.

- Determine bicep/triceps strength: Hold person hand and have them do a “curl” and then have them push down. Triceps strength is imperative for the use of a handheld outrigger.
  - Check for flexibility/rigidity or spasms.
4. Determine torso function:
    - Next to the person wheelchair, place a glove on the floor and have the student pick it up. Observe how the student rebounds. Do they need to grab the opposite side of the chair to pull them back to the upright position?
    - Have the person lean forward and see if they can return to the neutral position (ensure to hold your hands in front of the person so they do not fall forward).
  5. Are there communication concerns.

## Equipment Selection Bi-Ski

CKSS has two models of bi-ski’s the Mountain Man and Unique

**Mountain Man:** This is the most versatile of the units. It may be used with either fixed or handheld outrigger. The position of the bucket, foot bucket and outriggers are all easily adjustable. It is also equipped with a removable handlebar. The bucket is equipped with a variety of straps allowing options in securing the skier to the bucket. The Mountain Man is ski-able for a majority of bi-ski students

**Unique:** The Unique is the “sports car” of bi-skis. It is designed with a low center of gravity and is best suited for use with hand-held outrigger, although it may be used with fixed riggers. The Unique is designed to hold the person knee close to the torso, so it may suit a person who may not fit into the other skis. The Unique is a nice ski for a person who is a borderline mono-skier or an aggressive bi-skier. The Unique may be self loaded by a skilled student.

## Equipment Set-up

**Transfer:** Place the wheelchair parallel to the bi-ski, when possible. Ensure the brakes are set on the wheelchair and any seatbelts are released. Ensure the ski is prepared; all straps are laid open and the ski is on a solid level surface. One instructor will be responsible for the legs and the other for the torso/shoulder. Instructor on the torso/shoulder reaches under the skier’s arms and can grab their own wrists and if the student is capable, they can also hold the instructor wrists and assist. The second instructor simply lifts under the student legs. Simultaneously lift the skier from the chair to the bucket.

Use personal care attendant (PCA) or parent to assist, if they are available.

**Set-up:** Once the person is in the ski, one instructor will balance the ski while the other instructor attaches the straps. This is an obvious, but critical step. Dumping a student by not assigning a person to balance the ski is a bad way to start any lesson.

Obtaining a proper fit to the ski is imperative to a successful day on the hill. **A poor set-up will result in numerous problems!** First, ensure the person's hips are as far back into the bucket as possible. Second, look at the knees. They should be parallel/square. Knee alignment is an indicator that the hips are not square in the bucket. Use padding as necessary to fill the voids and position the person in the bucket.

- **Waist/hip Strap (Required):** Should be snug to ensure minimal hip movement. Watch placement of clothing when attaching this. Bulky winter cloths can interfere with the ability to snugly attach this strap.
- **Leg Strap (Required):** The tension on this strap varies. If you have an aggressive, advanced skier, the strap should be snug to ensure the ski is reacting to the body movement. On beginner and less aggressive skiers, the strap should be buckled, but it can be loose. Take caution in over tightening the leg strap as it may reduce circulation to the legs and result in the person becoming cold.
- **Shoulder Straps (optional):** A variety of techniques may be put into practice with shoulder strap. Obtaining the proper configuration with the shoulder straps is critical to a successful set-up. Determine whether the straps are needed at all. If the skier has strong abdominal/torso control the use of straps would only hinder the students skiing ability.

If the student has marginal abdominal/torso control, use the straps but keep them loose. This allows the person to use their shoulder and torso in initiating turns, yet it prevents the person from “flopping” forward.

If the person body position has a natural lean to one side, the strap may be used to hold the person in a neutral (erect) position. Take the strap on the “high” side and attach is to the opposite buckle, gently straighten the person, and then attach the buckle. Discuss this technique with the student prior to ensure their body can actually be moved into the desired position.

If the student has little or not abdominal/torso control, the straps should be used and tensioned to the point to keep the person erect.

- **Kidney Belt (Optional):** Should be used with students who need assistance in returning to a neutral position after leaning forward to initiate a turn.
- **Foot Bucket Strap (Required):** This strap should only be tight enough to hold the person's feet in place. Do not over tighten, as it will reduce circulation to the feet.

- **Handle Bar (Optional):** Use the handlebar only when necessary. It should be used in two situations. On a student who does not have control over their arm(s) and they need to be secured to the ski to prevent injury. In this case the arm(s) should be secured to the bar with Velcro or duct tape. The second situation is for an apprehensive student. Holding on to the bar may help the person feel more secure and at ease. When a student is holding a handlebar it inhibits their ability to rotate, which may lead to the inability to initiate a turn.

- **Handheld Outriggers (optional):** Adjust outrigger so the student's arms are near straight, with the shoulder relaxed and the outrigger tip parallel to the hip.

Disconnect the flip-cord if the person does not have the dexterity to manipulate. Also, adjust the break to its "full" position for novices and lessen as the person's skills advance.

**Leg Bag:** Determine whether your student has a leg bag. If so, you must ensure that it does not become pinched-off or obstructed in any other way.

**Dowel Test:** Note mono-ski set-up section.

**Equipment Inspection:** Inspect the ski prior to starting each lesson. Check the evacuation straps for the condition of the strap and anchor point. Inspect the condition and anchor point of the tether straps. If either the evacuation or tether straps are damaged, this ski **must be taken out of service** until repairs are made. Notify the site coordinator and equipment manager. Check all straps and buckles. Inspect the ski, binding, suspension and linkage. Ensure all pins are in place and carry an extra one. Spare parts are available. If there is damage, inform the site coordinator and equipment manager so that repairs can be made.

## Cold Weather

Students in bi-skis are very susceptible to the cold and particularly if they are using fixed outriggers. Ensure the student is well dressed prior to taking to the slopes. This is of particular concern with new skiers who may not have the necessary clothing for a day of skiing. If you are willing, it is a good idea to bring extra clothing for your student to use in the event they are not prepared or have forgot something at home.

Routinely ask your student if they are getting cold and watch for signs of frostbite. As the instructor, you are in control if the student appears to be cold, yet they do not want to go in, you have the authority to make the call. Remember as in instructor, you are moving, skiing, pushing, lifting and tethering. While you may be working up a sweat, your student may be freezing. If you are cold, your student is too cold. Go inside immediately.

## Loading and Unloading the Chair Lift:

Review with the student what to expect. A student may be apprehensive if this is their first chairlift ride. When skiing with a new student or ski buddy always practice a load/lift prior to entering the lift line.

When riding a chairlift the following procedures are to be followed.

## **Loading**

- Prior to entering the lift line prepare the ski. Stow the tether straps and ensure the retention strap is accessible.
- Release the linkage:
  - Mountain Man: remove the loading pin
  - Unique: pump up the cylinder
  - Any fixed outriggers need to be removed

**Ensuring the ski is ready to be loaded should involve both instructors and the student, but is ultimately the responsibility of the lead instructor.**

- Push the ski through the line. At the “stop line” ensure the lift attendant notice that you are approaching with an piece of adaptive equipment
- Request a slow at this time if desired.  
If the lift operator is not paying attention or is not standing at their designed work station i.e. the attendant is not near the lift controls, **do not enter the loading area.**

- One person pushes the skier to the load line.
- Securely grab the loading straps

The person on the outside of the chair will count down the lift. If there is a problem at this point do not attempt to load the ski, simply let the chair hit you in the back of the legs and push everyone forward. Obviously, request an emergency stop.

- As the chair approaches, lift the ski and set it on the chair and ensure it is pushed back against the back support of the chair.
- If there is a miss-load, yell for an emergency stop and attempt to protect the student’s head from the chair.
  - If there is a miss-load it is imperative to shout for an emergency stop. Once the chair is 5 to 6 feet off the snow there is little the lift operator can do to help you.
- Once in the air, lower the safety bar and have one instructor hold the ski while the other attached the retention strap to a structural member of the chair.

## **Unloading**

- As the unloading station approaches, typically at the last tower prior to the station, hold the ski and release the retention strap.
- Ensure nothing has become entangled with the chair during the ride.
- Raise the safety bar.
- Get the attention of the lift operator and request a slow (thumbs down sign) if desired.
- If there is a problem request a stop (cutting motion across the throat).
  - If the lift operator does not acknowledge the request simply stay on the chair. There is a dead-man switch on a bar that your legs will trip once you have passed the unload area.
- Each instructor should hold the ski in the same position as the load.
- When **over the sloped portion of the ramp**, push the back of the ski and steady it with the front hand and allow the ski to drop onto the ramp.
- The most common cause of a mis-unload is unloading too early while on the flat portion of the ramp. This often causes the ski dig into the ramp and flip.
- Guide the ski to a stop and move to an area that will not obstruct the flow of skier off the ramp.

## Chairlift Evacuation:

In the event of a chairlift failure, an emergency chair lift evacuation would be completed by the ski patrol. All instructors must be familiar with the procedure. Upon lift failure, the ski patrol would notify you of the problem and what their evacuation plan is. They will also ask whether you need a priority evacuation. If you are doing fine, simply wait your turn. If the student is experiencing any medical problems, or is extremely cold, request a priority evacuation.

The evacuation procedure is as follows:

- The patrol will ask whether you are willing to be evacuated and will proceed upon your approval. They will talk you through the procedure.
- Locate and free the three evacuation straps.
- They will throw a line over the lift cable that is equipped with two carabineers.
- Using the carabineers, attach the evacuation line to the ski evaluation straps, forming a pyramid shape. Ensure the carabineer gates are facing opposite directions and are locked.
- The patrol will then ask if you are ready.
- As they tension the line, raise the safety bar.
- Once they have the ski suspended, unhook the safety retention strap.
- Then slowly push the ski away from the chair. Ensure to protect the student's head from swinging back into the chair. The bi-ski has a propensity to spin as they are clearing the chair.
- Ensure **your skis** are free of the bi-ski as it is lowered.

- After the student is evacuated, the ski patrol will evacuate the instructors using a sitting-T.

## **Bi-Ski Progression**

**Beginner/Novice:** Prior to determining if a student is appropriate for a bi-ski make a proper assessment of their long term ski goal. Do they want to be an independent skier...can they be? Perhaps they could be a mono skier instead? Next before setting off for the slope, review the emergency procedures, skiers' responsibility code (note section 1), the bi-ski, lift loading/unloading procedures and goals for the lesson.

- **Review the bi-ski**
  - bucket and straps
  - articulating undercarriage
  - hand-held outriggers
  - fixed outriggers
  - tether lines
  - loading mechanism
  - 3 pnt evacuation system

### **Flat Terrain Drills:**

#### **Handheld Outrigger Progression:**

- Set the person up in an athletic stance, well balanced and sitting tall.
- Locate outriggers to offer good lateral support and lift outrigger off snow to test balance. Have student balance using one outrigger at a time.
- Have person lean left or right then return to the neutral position. Do same on opposite side.
- Teach person how to push with outriggers. Remember, backwards is typically easier than forward.
- Flatten the ski and pivot left and right
- Practice falling and getting up, both assisted and unassisted.

\*Do not spend too much time on the flats. It can be very exhausting to the student.

#### **Fixed Outriggers Progression:**

- Have the student try to balance over the ski. Have them move their arms, head, body, etc to demonstrate the results of movements.
- Have person move left, then neutral, then right. Stress importance of smooth movements.

### **Straight Run:**

#### **Handheld Outrigger Progression:**

- Push the student up a slight hill

- Have them assume the athletic (bull fighters) position: pressure on the outriggers, standing tall and facing down the fall line. Have the person hold them self in place by having the outrigger perpendicular to the fall line. Turn the outrigger parallel to the bi-ski and start down the hill.
- Tether should assist as necessary with balance and speed control.
- Show student how to control speed with outrigger break.
- Practice an emergency stop to demonstrate the tethers ability to stop the ski.

#### **Fixed Outriggers Progression:**

- Push the student up a slight hill
- Have person assume athletic position, standing tall with hand out in front of body.
- Tether should initiate the run by releasing the ski.
- Tether should assist as necessary with balance and speed control.
- Practice an emergency stop to demonstrate the tethers ability to stop the ski.

#### **First Turns:**

##### **Handheld Outrigger Progression:**

- Start on a gentle slope in an athletic position
- Have them tip to one side supporting their weight on the downhill outrigger. Turn to a stop.
- Repeat on opposite direction
- Experiment with varied outrigger positions, both fore-aft and laterally.
- Experiment with varied amount of lean/edging.
- Demonstrate the use of the downhill outrigger to prevent too much lean into the hill.
- Demonstrate hip angulation.
- Perform garland exercise

##### **Fixed Outriggers Progression:**

- Start on a gentle slope in an athletic position. Ensure the ski is pointed down the fall line. Starting perpendicular to it may result in student starting in an awkward, unbalanced position.
- Have instructor release the ski down the fall line
- Have student shift center of mass through:
  - Moving head/looking into the turn
  - Rotating shoulders
  - Reaching arm(s)
- Hold turn through fall line to a stop

- Tether needs to take action to ensure the ski does not tip over
- Repeat with opposite side
- If handlebars are used, have the student push or pull to lever the ski in the desired direction.
- Tether to assist with the turn as needed.
- Perform garland exercise

## **Linked Turns:**

### **Handheld Outrigger Progression:**

- Start on a gentle slope in an athletic position
- Start with quick little turns down the fall line, with shoulders square, using angulations to turn.
- Teach the parts of the turn: preparation, initiation, control and finish.
- Teach the person to push-off on the uphill outrigger to achieve crossover to a new edge.
- Encourage use of turn shape to control speed.
- Practice garlands and traversing.
- Teach turning to a stop.
- Stress the push-off, block and hip-drop sequence to create the angulation required for edging
- Experiment with different outrigger lengths. Ensure the outriggers stay positioned near the hips.
- As the person improves, the outriggers should be shortened.
- If the person has problem with a dragging outrigger i.e. the outrigger keeps getting pushed behind the ski, a bungee cord may be attached to the outrigger shaft and front of the ski to assist in maintain it in the proper position.

### **Fixed Outriggers Progression:**

- Have the student initiate a turn
- Teach them to return to the neutral position
- Take a deep breath between turns to return to center of mass
- Initiate the turn in the opposite direction.
- Teach the parts of the turn: preparation, initiation, control and finish.
- Tether assist as necessary to help initiate or control the turn
- Cue the student to maintain momentum. When the ski slows, or is held too long through the fall line, it tends to bite into the snow and tip.
- Teach multiple fall lines and propensity of the ski to follow the fall line.
- If there is a problem with oscillation, the following remedies should be considered.
  - Have the skier hold in the neutral position
  - Adjust the dampening devise
  - Adjust the outriggers so the contact the snow earlier.

- If a student is making good turn to one direction, and having difficulties with the opposite direction it is often time due to poor body position. Stop and ensure the person is positioned squarely in the bucket.

### **Mileage:**

Once the student has demonstrated the ability to link turns it is time make runs! Ski varied terrain explore the hill. Practice varied turn radiuses and encourage an early edge change. Play follow the leader, set up a little slalom course with piles of snow...have fun!

### **Intermediate:**

#### **Handheld Outrigger Progression:**

- Practice controlled skidding through increasing speed, steeped terrain and tighter turn radius.
- Teach turning the outrigger in the direction of the new turn, without moving it from the power position (next to the hip).
- Ensure to lengthen the outrigger as the person progresses to steeper terrain.
- Demonstrate intentional overturning to reinforce safe correction of an overturn. The bi-ski will naturally carve a turn backward, returning the skier to the proper orientation on the fall line.
- Encourage looking into the turn by moving the head, shoulders and outrigger.
- Re-doweling the ski may become necessary as the student improves.

#### **Fixed Outrigger Progression:**

- As the student confidence and ability increases move to steeper terrain.
- As you move to stepper terrain, the outriggers need to be adjusted so that the contact the snow later in the turn, resulting in the ability to make tighter turns.
- The bi-ski with fixed outriggers is not designed to be skied beyond intermediate trails.

#### **Righting the Ski:**

The following procedures are to be followed to right a bi-ski after a crash.

- Ensure the student is not injured (note section 1 B).
- Have the tether stand directly uphill of the bi-ski.
- The second instructor should spin the ski so it is **perpendicular to the fall line**.

- Ensure the students shoulder and arm(s) are free prior to spinning the unit.
- Position yourself parallel to the ski. If the student is able to assist, have them grab your hand with their uphill hand and pull them to the upright position.
- If they are unable to assist, grab the bucket and pull to the upright position. You may step on the units ski with yours to prevent it for sliding down the hill and to act as a lever.
- Spin the ski to face down the fall line as the tether holds the ski.

To close, remember our goal is to have a safe and fun skiing experience. Do not get so caught up in the lesson that you forget to have fun!

## **Mono-ski**

### **Student Evaluation (Assess physical abilities)**

- The type of wheelchair and add-on accessories can tell you about a student's balance and coordination as well as provide insight to which muscle groups have paresis. A rule of thumb is that individuals who are unable to push themselves in a wheelchair are not good mono-ski candidates and are better suited to bi-ski.
- Is the injury complete or incomplete? Incomplete nerve severance in the spinal cord may allow the student to have some feeling or muscle use below the level of the injury. Generally, students with spinal chord injuries below the fifth thoracic (chest level) vertebra (T5) are good candidates for mono-ski.
- What level of feeling does the student have? (pressure, heat, cold, pain, etc)
- Does the student have any sore spots on any part of their body? Make sure there is adequate padding and check regularly.
- Assess balance and strength
  - Lateral stability - left and right lean with the arms extended
  - Forward stability - hands on abdomen while leaning forward
  - Flexibility and range of motion – lean right and left with arms and pick up an object from the ground
  - Grip strength - shake hands with the student and ask them to squeeze to assess grip strength
  - Shoulder and arm strength and stability – ask student to extend arms and push upward, downward and forward to assess resistance
  - Other factors (medication, body temperature regulation, unrelated disabilities).

### **Equipment selection and fitting and overview**

- At the start of the lesson, take time to introduce the equipment to the student. Explain and demonstrate the following:
  - Functional aspects of the mono-ski and its safety features
  - How the seat and straps provide a snug, supportive and comfortable fit

- Purpose and function of suspension
- Lift-loading mechanism
- Purpose of retention strap
- Use of the lift evacuation system
- Use of outriggers (Show how to change them from the crutch position to the ski position and back. Explain the brake.)
- How to transfer to the mono-ski
- Ski/Bucket selection
  - Bucket assist (Moving from a chair to the ski and back) – Ask the student if they would like assistance in moving from their chair to the ski. If they request assistance, let the student tell you how they would like to be helped. Always ask the student if you can touch them anywhere. Then tell them what you exactly are doing when assisting.
  - Bucket - the student should fit as snugly as possible in the bucket without sacrificing comfort. Use foam pads to create a snug, but comfortable fit. This means selecting or adjusting the seat (with pads) to correspond to hip width. Padding especially important around the hips and thighs to keep the student from shifting in the seat.
  - Straps – Avoid placing straps over a collection bag.
  - Foot Tray – The foot tray should be adjusted to allow for good contact between the thighs and seat bottom. Ideally, the foot tray produces a 90 degree bend in the skier’s knees.
  - Outriggers – Beginning mono-skiers should size outriggers to the shafts form a 35-40 degree angle to the snow (usually midway between their knee and ankle). Set the student in the athletic position before sizing outriggers:
    - Head up and looking forward
    - Shoulders, hips and knees level
    - A slight forward curvature of the spine
    - Arms hanging vertically (down) in a comfortable position.
    - Adjust brakes so outriggers lie flat on the snow and don’t drag.
    - Check brake releases to make sure the student can release the easily.
    - Show students how to use the brake and how to balance using outriggers
  - Balancing (dowel test) – It is important that the student be balanced (front/back) on the ski before moving to instruction.
    - Identify the center of the ski (most skis have a center mark)
    - Transfer the student to into the ski
    - Place a dowel under the bottom of the center of the ski (perpendicular)
    - Have the student assume the athletic position with outriggers in place
    - Assist the student in sliding forward or backward until centrally balanced over it. (weight is equally balanced between the tip and the tail of the ski). The student should be able to put pressure on the tip of the ski with a slight head dip forward and the same to the tail of the ski with a slight head bend backward.

- Mark this centered position on the equipment frame.
- Make adjustments to the binding and ski to align the centered position of the frame with the center mark on the ski.
- Tethers – For most Courage mono-skiers on Minnesota hills, tethers are not necessary. Holding on to the foot tray or skiing behind the student while holding the bucket is sufficient (see holds and assists).

## **Holds and assists**

- How and when to hold
  - Always hold the bucket or foot tray when the student is moving from a chair to the ski. Continue to hold the ski (don't hold the student) until the student is fitted in the ski, has outriggers on and is able to balance themselves independently
- How and when to assist
  - Assist the student when:
    - Moving to the teaching area
    - Sliding up hill for beginner base learning
    - Moving to the lift loading area
    - Moving away from the lift unloading area
    - Falling and getting up right

## **Progressions**

- Flat land drills - After the student has become familiar with the equipment, go to a flat, uncrowded area with good snow. Help the student practice the following:
  - Push backward by engaging the outrigger claws. Use this as an opportunity to adjust the outriggers if necessary.
  - Push forward with outriggers in crutch position
  - Show practical methods for balancing and moving around flat snow
  - Push the student forward and backward with outriggers in crutch and ski position
  - Lean forward and aft with outriggers in crutch and ski position
  - Balance with outriggers off the snow
  - Perform a star turn and turn the whole mono-ski with outriggers in the crutch position
  - Put the ski into the chairlift position and maneuver the ski
  - Practice getting upright after falling
- Straight run, gliding, sliding – When the student starts to feel comfortable on the ski, it is time to begin sliding. Try the following:
  - Push student up the hill
  - Help the student do a star turn across the fall line and show them how to hold the position facing down hill
  - Demonstrate the athletic position, dynamic balance, proper position of outriggers and importance of keeping their head up (have them look at you).
  - Let student experience the feeling of sliding on the gentle slope of snow. Hold the student by the bucket or foot tray for stability initially. Work towards letting the student do a straight run on their own without assistance
- Turns – Introduce turning by:

- Skiing in front of the student in a reverse wedge and have them follow you in gradual turns.
- Help the student to understand the meaning of a flat ski.
- Demonstrate speed control by turning across the fall line.
- Linking turns When the student can comfortably follow you, and change directions, introduce linking turns:
  - Start by rotary movements of the head, shoulders and outriggers.
  - Emphasize the small movements required to turn the ski.
  - Have the student look in the direction they want to turn.

## Chair lift procedures

Here are some general procedures:

- Put the mono-ski in the load position
- Practice loading outside the chair lift area. Each person should be told exactly what to do, including:
  - Who will communicate with the lift operator
  - Who will push the skier into the loading area
  - Where each person will grip the mono-ski
  - What the load count down will be and who will count
  - What to do with the outriggers
  - How much each person will lift the mono-ski
  - Who will put the safety bar down
  - Who will attach the retention strap
  - Who will make sure the lift operator is next to the safety switch
  
  - Communicate with the lift operator using hand signals in addition to verbal commands
  - Use the safety bar if the chairlift is equipped with one and it is compatible with the mono-ski
- Review unloading procedures with the student once on the chairlift, including:
  - Who will unhook the retention strap
  - Who will lift the safety bar and when
  - How will each person hold and lift the mono-ski
  - What the count down will be and who will
  - What the student should do with the outriggers
  - Who will push the student away from the unloading area
  - Have the student start the count down

- Introduce independent unloading by having the student lean forward and throwing the torso and outriggers forward at the unloading ramp

## **Rest breaks**

Take rest breaks. You will need them and so will the student. Be careful to not let the student get over tired. You want to create a fun atmosphere and not let the student's enthusiasm mask fatigue and the possibility of an injury. Additionally, as an instructor, make sure you don't get fatigued to the point that you are not able to provide adequate assistance to the student for safe instruction.