

PSIA-Rocky Mountain-AASI

Adaptive Snowboard Resource Guide 2008





The purpose of this guide is to share knowledge about Adaptive Snowboarding (ASB). ASB clinics, exam criteria, and this guide are subject to constant monitoring to reflect the progressive nature of ASB. Adaptive Snowboarding exam information can be found at psia-rm.org.

The ASB (Adaptive Snowboard) Committee PSIA/AASI RM extends an invitation to instructors to contribute educational material for future revisions. Contact ASB members:

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This Adaptive Snowboard Resource Guide was written by volunteers. It is dedicated to the students and instructors, nationally and internationally, who participate in adaptive snowboarding. They have found a way to make the dream of snowboarding come true for people who have disabilities. Through our work and dedication, we can continue to make dreams come true.

This guide should be read in conjunction with the Adaptive Snowsports Manual and the AASI Snowboard Manual.

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PREFACE

Since the early 1990's, Adaptive Snowboarding (ASB) has grown by leaps and bounds. Snowboardings popularity has continued to increase as more people have become interested in learning to ride. Creative teaching methods and innovative equipment make snowboarding a fantastic mountain activity. People of all ability levels have fun experiences as they learn to snowboard.

The desire to snowboard has come from students of all levels of abilities, who have physical and/or *cognitive* challenges. The desire to teach comes from able-bodied and physically challenged snow-sliding instructors. These instructors and volunteers have joined together idealistically, intellectually and in spirit to welcome students into the realm of adaptive snowboarding.

Collaboration from all disciplines worldwide has contributed to the development of the beginning phases of ASB. Drawing upon successful, proven, and well-documented crossover techniques, the contributions from cross-teaching have been valuable in the success of our students. There has been involvement from snowboard instructors who teach both adaptive and able-bodied students as well as adaptive alpine and Nordic instructors. Mono and bi-skiers who teach with or without a snowboard under their sit-down rigs have also enriched the material. All of these instructors embrace and support their students' dreams of snowboarding.

The diverse, creative and unique collections of crossover teaching techniques exhibited by these instructors have greatly increased and advanced the possibilities and options for students to ride successfully.

INTRODUCTION

The ASB Resource Guide was written to help instructors with innovative ideas for teaching adaptive snowboard techniques. It is not intended to be an all-inclusive bible of adaptive snowboarding, but a living document.

The **Guidelines Section** of this manual emphasizes openness for creativity and innovation, safety, fun and learning and a recommended teaching approach. These important elements set the stage for this publication.

The **Rider Profiles and Evaluations Section** provides an overview of six general *profiles* for adaptive riders and specific information that is important to evaluate individual student needs. A description of each profile follows. Each account contains general information, appropriate adaptive equipment, and specific evaluation concerns. Some profiles include communication recommendations and safety issues.

The segment on **Body Position** addresses balance, stance, and movement. It leads into equipment and teaching.

The **Equipment Section** includes general information regarding boots, bindings, set-up (positioning for stance), and snowboards. Adaptive Equipment covers teaching aids and equipment and how each piece may be beneficial to a specific need. Each piece is categorized as *instructor assisted* or *student independent* equipment.

Guidelines are given for developing skills in the **Progression Section**, along with the applications of the *leapfrogging* and *detailling* approaches to teaching. The question of whether an instructor should teach from a snowboard or skis are addressed. A basic snowboard progression is outlined as a general lesson plan that can be adapted to meet individual student needs.

The **Student Scenarios Section** gives examples of the different student profiles and how snowboard progressions can be tailored for students.

The **Glossary** provides a quick reference for understanding common terms. Glossary words appear in italics the first time used in the text.

The **Summary** reiterates an overview of the entire guide, giving support to move into the adaptive realm of teaching.

The **Further Reading** pages provide additional resources concerning disabilities, snowboarding, and adaptive snowboarding.

Adaptive Equipment Suppliers are listed at the end of this publication.

GUIDELINES

Millions of people who love the natural "high" created by playing with gravity in a natural outdoor setting share the experience of snowboarding. Adaptive snowboarding can inspire an intrinsic motivation to experience life to its fullest extent. It is important to uphold the following essential guidelines to achieve this success, always remembering that it's "Safety, fun and learning".

SAFETY COMES FIRST.

The basic premise of ASB is "anything goes" as long as safety comes first. All aspects of safety are looked at and are thoroughly considered:

- * Every movement of the body.
- * Every skill attempted or performed.
- * Every aspect of the turn-initiation, shaping, and finish.
- * Every incremental change of speed.
- * Every aspect of terrain used.
- * Every skill taught or learned.
- * Every aspect of the safety code.

Instructors should emphasize safety and ease of learning, by appropriate encouragement and use of adaptive equipment for as long as the student is enjoying the experience. Instructors have a greater chance of success when they know and are willing to experiment with adaptive tools and equipment available to them. ***Mind Set:*** Keep it Open.

ALL BEHAVIOR IS A FORM OF COMMUNICATION!

Think Options, options, options.....

In snowboarding, there are many options and possibilities. Adaptive aids and equipment may greatly enhance success, although they may not help everyone.

ASB instructors need to be positive, empathetic, open-minded, and have an inquisitive outlook to explore, learn, and practice all the concepts involved in ASB teaching. Always remember that where there is a will, there is most certainly a way for learning. There are ***NO LIMITS!***

**LET'S NOT LIMIT OUR STUDENTS OR
OUR INSTRUCTORS BY, OR BECAUSE OF,
OUR OWN LIMITATIONS.**

SLAM-FREE LESSONS

The goal of a slam-free lesson is to teach students how to ride with the use of adaptive equipment and/or hands-on assistance to prevent hard falls. Students learn to ride and acquire greater balance and skill development at an accelerated pace when they are not falling or rushing. In an appropriate adaptive situation, many students with disabilities learn to ride harder green and easy blue terrain consistently in as little as 1-4 hours. Often the enabling situation involves using additional equipment, beyond a snowboard and bindings. A good adaptive instructor will take as much time as necessary to go at a student's pace, being thorough, being safe, and using appropriate equipment to enable a student to learn to ride without slamming or falling.

MAINTAIN CREATIVITY

Experiment to find the teaching method that works best for the student. Some techniques may address the way a student learns more effectively than other techniques. If a method does not work, the attempt may bring an instructor and student team closer to a creative solution that will work. Be unique. Stance set-up can be a trial-and-error process for what will work; there is not a right or wrong way to stand on a snowboard. Flexibility, creativity, and persistence will help overcome obstacles to learning.

**SUCCESS COMES TO THOSE WHO
CHALLENGE THEMSELVES.**

TEACH TO HOW A STUDENT LEARNS

Most of us tend to teach in the style that we prefer. The creative process behind ASB teaching is to teach in the way that your student learns best. The PSIA Core Concepts Manual talks about different learning styles for "thinkers, feelers, doers, and watchers". Another thing to consider is people who learn by looking at the whole, or "big picture" VS people who consider the parts, or small details. In addition, we should consider people who tend to lump ideas together that have common characteristics in contrast to people who split ideas based on their differences.

MATCHERS and MISMATCHERS

Matchers teach and learn by finding minute similarities. Matchers take the same information; knowing and understanding the minute differences, yet show the commonalities within the differences. This population usually is the feelers and watchers.

Mismatchers teach and learn by processing the same information analytically by finding minute differences and flaws. Mismatchers then create exclusively different categories. This population usually is the thinkers.

An example, consider how Matchers and Mismatchers would look at a snowboard under a mono-rig:

Matchers consider that a snowboard under a mono-rig is snowboarding.

Matchers understand the restrictions of a student who is unable to use their legs, and the limitations of adding a seat and outriggers to a snowboard. Matchers will tend to see and share the common similarities. For example, riding switch on a mono-rig/snowboard might be compared to riding switch on an alpine/race-board; it can be done, but it isn't really practical.

Mismatchers consider that a snowboard under a mono-rig is not snowboarding.

Mismatchers dissect nuances in showing the differences between two styles of riding a snowboard. For example, edge-to-edge movements in a mono-rig are controlled by the student moving side to side rather than toe to heel. Edge-balance is affected by fore-aft movements versus left-side to right-side of the body. Mismatchers see that the 'rider' is not facing same direction as most snowboarders.

**Matchers identify similarities;
Mismatchers identify differences.**

However we learn, think, or process information, we need to consider our students and how this affects them. The bottom line is that no two snowboarders face or move in identical ways to make a snowboard turn. Snowboarding is an infinite combination of applied movement's to affect an infinite number of outcomes, from extreme race carving to extreme free styling to sit-boarding and everything in between.

TEACHING FROM A SNOWBOARD OR SKIS

All of the teaching concepts, aids and equipment can be taught from either a snowboard or pair of skis. ASB lessons can be taught with instructors utilizing snowboard, alpine, or Nordic gear, and/ or an instructor utilizing adaptive equipment.

When teaching a snowboard lesson from skis, or an alpine lesson from a board, instructors must have both a strong knowledge base of the discipline being taught and excellent communications skills. In some situations it may be safer or more advantageous to teach from a pair of skis rather than from a snowboard.

RIDER PROFILES AND EVALUATIONS

PROFILE

Each student comes to their lesson with unique characteristics, needs, abilities and motivations. Instructors should take care to make a thorough assessment that will help determine the best communication style and teaching approach.

In this guide, disabilities are categorized into six general profiles.

A description of the impairments is provided along with information about how to evaluate a student before choosing equipment or heading to the slopes.



The different profiles are:

1. **Visual Impairment** - students with impairments ranging from diminished vision to blindness.
2. **Auditory Impairment** -(Hard of Hearing, "HOH") - students with impairment ranging from decreased hearing to deafness.
3. **Cognitive Impairment** - students with disabilities that affects intellectual processing of perception, memory, judgment, &/or reasoning.
4. **Neurological Impairment** - students with disabilities that affects the nervous system (Due to its manifestation, this impairment may also be Cognitive, Structural or Anatomical.)
5. **Structural and Anatomical Impairments** - students with disabilities that affects the muscular and/or skeletal systems.
6. **Combination of Impairments** - students with two or more disabilities which fall with in the above profiles.

EVALUATION

Once a specific student profile is identified, the instructor needs to assess the student's strengths and weaknesses, including cognitive, physical, and visual abilities. During the evaluation, the instructor should acquire the following information:

1. Description of the disability including the hindering or restrictive aspects that will effect snowboarding.
2. Identify medications and any side effects attributed to the medications.
3. The student's strengths, weaknesses, and motivations.
4. The student's goals. (Help the student develop realistic goals, and share the lesson plan with the student.)
5. Select appropriate equipment.
6. Determine teaching techniques for a successful experience.
7. Evaluate safety issues.

It is important for the instructor to become as familiar as possible with the student's disability. In addition to talking to the student, talk to family members or the caregiver when appropriate. No two students are exactly alike, even if they have the same disability. There may however, be many similarities.

Student evaluations should consider the student's physical and cognitive needs. Snowboarding set-ups should also be determined before going out to ride. The evaluation is an on-going process throughout the lesson. The student's strength and endurance, including muscular, cognitive or visual abilities, may change with physical or cognitive exertion. Changes in weather and snow conditions can also affect performance considerably. Instructor notes written at the end of the lesson helps inform future instructors what the rider has accomplished, if any equipment was used, the set-ups, behavioral needs, and starting point for the next lesson.

VISUAL IMPAIRMENT

DESCRIPTION

Visually impaired (VI) students have different degrees of limited vision or are totally blind. The range of vision can be but not limited to these: partially sighted, peripheral vision, tunnel vision, poor depth perception, or only seeing shadows. The damage to the eye or optic nerve may have been present at the time of birth or may have occurred from an injury or an underlying disease.

Use the student's sense of feeling when teaching a skill or task.



Visually impaired students often use their other senses to perceive the world around them. Typically, their sense of feeling and hearing can be stronger compared to sighted students. The instructors' evaluation should determine if one sense is stronger than the other.

Visually impaired students may or may not need more time working on their balance depending on their previous athletic experiences. Work on static and dynamic balance, on and off the snow, to improve balance skills. Visually impaired students may also have a loss of hearing as well as visual limitations, which may affect their balance.

EVALUATION

The following assessments, specific for the VI student, should be added to the routine evaluation:

- * Assess the amount of vision, lack of vision or any sensitivity to the eye, of any VI students.
- * Assess both indoors and outside. This will help to identify any differences in vision that occur with dull, low light, and bright light.
- * Do not forget to assess the student's senses of feeling and hearing.

COMMUNICATION

Give simple, detailed descriptions to VI students so they can understand their equipment and surroundings. This includes: the general area, the trails that they will be riding on, the sounds that they may hear around them, and how busy the lodge or slope is with other people.

Use clear, concise words when guiding VI students. In most cases, teaching occurs when the team is stopped. Guiding occurs when the team is riding and moving forward. Deliver guiding commands with simple, continuous, and alternating sequences. If available, a radio system can be effective.

Before heading out to the snow, instructor/guide and the student should choose a command for an emergency stop. An emergency stop command is spoken when instructor wants their student to stop right then, without starting, continuing, or finishing a turn. Students may have to do a sharp, quick edge set if possible, or sit or fall down to stop suddenly. For safety, students must be able to demonstrate they understand this command early

in the lesson. Emergency stop words can be "stop," "sit," "crash," "dump," or any word that works for the team. Practice the emergency stop at the beginning of the lesson. This will reveal students' reaction times and confirm their understanding of the command. A general rule is that students should not ride if they can not perform this maneuver.

The terms "heel side," "neutral," "and," and "toe side" may replace "right turn" and "left turn." "Heel side" is equivalent to a heel side turn or heel side edge engagement. "Neutral" or "flat board" refers to releasing the edge and moving to a flat board. "And" tells the student to prepare for the upcoming turn or the next command. "Toe side" is equivalent to a toe-side turn or toe-side edge engagement. For beginner and lower-end intermediate riders, there is always a "neutral" or "flat board" command in-between each edge-to-edge command. Toe, neutral, and heel commands imply weight transfer.

Here is an example of guiding commands spoken for a beginner or intermediate rider:

Spoken:	Implied:
Neutral AND	Flat board, centered position, prepare for turn.
Heel turn AND	Heel-side turn, prepare for new turn.
Neutral AND	Return to flat board, prepare for new turn.
Toe turn AND	Toe-side turn, prepare for new turn
Neutral AND	
Heel turn AND	
Neutral AND	
Stop	Turn to a stop
<i>(AND = Preparation for a new turn is the release of the old turn)</i>	

When the instructor or guide wants a student to maintain their position or direction, the terms "hold," "holding," or "keep holding" can be used. To come to a simple stop, instructors and guides need to anticipate the stop and state, "toe-side turn and stop." For advanced riders who do not need the neutral/flat board command between turns, holding a turn and coming to a stop may sound like this:

"Flat" can be spoken in place of "neutral" and "heel-side turn" or "toe-side turn" can be spoken instead of "heel turn" or "toe turn." To keep it simple the calls can be toe, and, heel.

Spoken:

Toe turn AND

Heel turn

Hold, Hold AND

Toe turn..... AND

Stop

Implied:

Toe-side turn, prepare for new turn.

Heel-side turn, stay on heel-side edge (traverse).

Toe-side turn, prepare for new turn.

Heel-side turn and stop.

Once VI students can link turns, the instructor can state that the team will begin with either a heel-side or toe-side turn. Then, the instructor calls out, "turn, and turn, and turn." It is imperative for instructors and guides to look up the hill to check on traffic before moving out. It should be instilled upon students to ask their instructors, "Is it safe uphill before we start riding." Also, before starting down a slope, instructors should inform their students about the snow conditions, terrain, and the other people or activities on the hill.

ADAPTIVE EQUIPMENT

Visually impaired students can become familiar with their equipment by 'up close' visual inspection and or feeling the board, boots, and bindings. Students can create images of how the body moves onto the toe or heel edge from the instructors' descriptions. The instructors' description can help create an image on what is being explained or the student can see or feel the example by demonstration or molding (ask for permission before touching).

The movement of sliding laterally may upset or distort the riders feeling of equilibrium. Props such as the hula-hoop, sno-wing, horse-n-buggy, tethering, bamboo pole, ski poles, ski pal, outriggers or the tandem board can give students a sense of a stable connection to the ground or 'grounding'. This may help offset any distortion they may have in their equilibrium.

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SAFETY

Specific safety needs for visually impaired students include:

- * Have a term that works for the student and instructor that means to come to an immediate stop (emergency stop). The student may need to fall or sit down as needed.
- * All teaching (speaking that is not commands) is usually done while stopped. The instructor solely guides the student with verbal commands when moving. There may be situations where teaching does occur while riding, depends on the situations.
- * Both the instructor and student should wear a bright orange vest that reads, "Low Vision", "Blind Skier/Rider" or a visually impaired vest for the student, and "Instructor of the Blind" or "Guide" for the instructor. Wear the vests to inform other individuals on the slope to provide more space for this special team.

AUDITORY IMPAIRMENT

DESCRIPTION

Hearing-impaired (Hard of Hearing, "HOH") students have different degrees of hearing in one or both ears or are totally hard of hearing. Damage to the middle or inner ear or nerve pathway may have been present at the time of birth, may have occurred from an injury and/or an underlying disease. Students who are HOH may use a hearing device. They may be able to read lips or use sign language to communicate. Be aware that not all students who are HOH can read lips or use sign language.

With loss of hearing, it may be more difficult to balance on a snowboard. Spending time on balance drills may help improve this skill. A hands-on technique with or without adaptive equipment can be helpful.

EVALUATION

The following assessments, specific for the student who is HOH, should be added to the routine evaluation:

- * Determine how well the student can hear.
- * Assess the best way to communicate with the student.
- * Assess the student's balance, strength, and level of endurance.

COMMUNICATION

It is important to have the student's attention and to face the student who is hard of hearing before talking to them. The instructor may need to talk in a louder voice than usual. Pay attention to the conversation while students talk and watch their facial expressions and body language. Anticipate the context of the conversation to better understand what is being said. If necessary, write a note and/or have students write their needs or thoughts down.

Keep communication simple while teaching. Demonstrations, shaping or molding students' body into the position (with their permission before touching), can show students proper body position. Allow time for student to try the position and feel the moves. Other than these modifications, lessons should be conducted in the same way as they are done for students without hearing impairments.

ADAPTIVE EQUIPMENT

Props such as the hula-hoop, board buddy, horse-n-buggy, bamboo pole, ski poles, tethers or the tandem board can be beneficial.

SAFETY

Specific safety needs for HOH students include:

- * Both the instructor and student should wear bright orange vests that read, "Hard of Hearing" or "Hearing Impaired" for the student, and "Instructor of the HOH" or "Guide" for the instructor. This will alert other individuals on the slope to allow more space and not to "buzz" students.
- * Remind the student who is HOH, of the snowboarder's blind spot. With decreased or no hearing, they need to be very aware of their surroundings and other snow-sport participants. Reinforce the Responsibility Code and "Ride the Code."

COGNITIVE IMPAIRMENT

DESCRIPTION

The intellectual capability for processing information is diminished for students who have Cognitive Impairments. Disabilities that fit in this category

ry include Alzheimer's disease, diagnoses that fit under the umbrella of Autism, Brain Injuries, Cerebral Palsy (CP), Downs Syndrome, Learning Disabilities, and Mental Retardation. Students can range from a very young child with a mild learning disability to an adult with Alzheimer's disease.

Some students may be in good physical shape; other students may not be able to tolerate long periods of activity. The pace of lessons for students who have muscle weakness or activity intolerance needs to be adjusted to avoid fatigue. Some students may become easily frustrated with challenges such as a wrinkle in a sock, being cold, or being afraid. They may have a difficult time or not be able to explain a problem. Remember that all behavior is a form of communication. Take the time to figure out the problem. Many students will respond best to firm and consistent guidelines while keeping the snowboarding experience fun. Make sure to tailor the lesson to the appropriate age level and intellectual ability of the student. Having fun maintaining interest will count more than a strict lesson plan.

Teaching this student population can be very rewarding. Meet the challenge, go out, be safe and have fun.

Similar to the adjustments for students who are Visually Impaired and Hard of Hearing, modifications to the snowboard lesson progression will contain mostly minor changes for students with Cognitive Impairments. Positive reinforcement, encouragement and consistency are extremely important for a successful experience.

EVALUATION

The following assessments, specific for students with Cognitive Impairments, should be added to the routine evaluation:

- * Assess the student's ability to understand direction and to *sequence directions*.
- * Assess physical strength, balance, and inquire about tolerance for activity.
- * Determine emotional maturity, developmental age, and chronological age.
- * Speak to family members and/or caregivers to acquire insight about the student's abilities and behavioral patterns including likes and dislikes, and if they do best with following a *schedule* or using a *contract*.

COMMUNICATION

Students may have special communication needs. They may have different ways to communicate, such as using a picture book, sign language, or answering only *closed-ended sentences*. Also, they may need more time to express their needs or comprehend information. Allow for more time when needed. If the student follows a schedule or uses a contract at home or at school, they will do best following a schedule or contract when riding.

ADAPTIVE EQUIPMENT

The hands-on technique can be helpful to practice or learn skills, although this population of students may do better with hands-off teaching. Adaptive equipment that can provide support without direct physical contact includes: tethers, hula-hoop, horse-n-buggy, and sno-wing, ski pal, and poles. Some students will not need physical assistance.

SAFETY

Not all students will be aware of or understand safety needs and the Responsibility Code. Ride 'the code'! Establish the rules that need to be followed before the lesson begins. Review and follow the rules strictly throughout the day.

NEUROLOGICAL IMPAIRMENTS

DESCRIPTION

Students with Neurological Impairments have disabilities that affect the nervous system. Disabilities that fit in this category include: Brain Traumas, Cerebral Palsy (CP), Epilepsy, Muscular Dystrophy (MD), Multiple Sclerosis (MS), Spina Bifida, Spinal Cord Injuries (SCI), and Strokes. The disability can be caused by interference, blockage, infection, trauma, congenital defect, or an unknown cause that disrupts the pathways of the nerve impulses throughout the nervous system. As in any student scenario, there will be differences of student's strengths and weaknesses within the same disability.

Each specific disability will have its own characteristics. As a group, this profile does have some similar needs to be aware of:

- * Students with the same disability may have different strengths and weaknesses.
- * Students may fatigue easily due to decreased muscular strength and limited endurance. Pay attention to a loss of focus, decreased coordination, or increased frustration, as they can be signs of fatigue and pace the lesson with rest periods. It is helpful to have a chair or bench near the practice area.
- * Depending on the disability, there may be some cognitive impairment in conjunction with a physical disability. Cognitive issues can range from processing information slowly to a type of *aphasia*. Give the student time to think and respond to what they have been asked or told. Tailor the lesson to the appropriate age and intellectual level.
- * There can be a lack of feeling or movement in a part or parts of the body. The student may have poor muscular control, muscular weakness, poor coordination, or paralysis in some extremities. A lack of feeling in the legs or feet may decrease the student's ability to feel the board, decreasing control of the board. Balance is more challenging when one or more extremity is involved.

If a student has a history of seizures, find out if he or she acts differently or senses an *aura* before a seizure. Also determine when the last seizure occurred, and if anything is known to trigger a seizure. Be aware of the medication(s) the student is taking and the last time the medication was taken. Any student who has a history of recent seizures must wear a proper restraint belt while riding a chairlift. Instructors should know the policies of their program. The general guide is that a belt is not needed if the participant has been seizure-free for two years.

EVALUATION

The following assessments, specific for students with Neurological Impairments, should be added to the routine evaluation:

- * Observe how the student arrives at the program. Is he or she walking independently, with a limp, or a notably weaker side? Check forward, backward and lateral balance.

- * Check balance while standing and determine how long the person can stand. Can he or she transfer weight equally from foot to foot, or does one foot/leg support more weight and pressure? Does he or she participate in any other activities while standing?
- * Assess the student's physical abilities and identify the point of control that is closest to the feet, thus closer to the snowboard.
- * Assess foot strength while sitting.
- * The instructor supports the student's heel, while placing the other hand on top of the student's toes then below toes. The student gently presses his or her toes upward and then downward upon request of the instructor. The instructor can feel if the pull is weak, mild, or strong, and can compare if the strength is the same for both feet. This test may indicate the students' ability to move onto the heel and toe edge.
- * When a student arrives in a wheelchair, do not assume that he or she cannot stand. Find out the ability to stand, if the person can stand independently, and for how long they can stand.
- * If the student is unable to stand, offer a mono-ski rig, shredder plate, or another set-up that is attached to the snowboard.
- * Evaluate the student's strength and endurance level. If the rider will be sitting, arm strength and torso ability must also be considered.

ADAPTIVE EQUIPMENT

Adaptive equipment makes riding possible for students who have neurological impairments. Use props such as outrigger(s), horse-n-buggy, hula-hoop, tethers, bamboo pole, ski poles, sno-wing, ski pal or the rider bar. These pieces of equipment provide minor physical support.

Outriggers can help to improve balance while walking and sliding. Depending on the disability, an individual may use one or two outriggers. Outriggers and tethers can be used together. Tethering a student creates a feeling of independence, yet still provides assistance with turns and speed control. A student who is unable to stand for long periods or has increased weakness with standing may benefit from using a rider bar and/or CADS.

A student who is unable to stand at all may benefit from using a bi-ski, mono-ski seat, or mono-ski rig (includes the seat, suspension, and loading system) mounted to a snowboard. With this set-up, students can use outriggers, *picks*, or their hands for balance and to initiate turns.

Rider Bar Offers Support!



SAFETY

Special safety needs for students with Neurological Impairments include the following:

- * A helmet is necessary for students who have had head injuries and/or seizures, or for a student who has a shunt. The helmet should not restrict the shunt.
- * Watch students who have a spinal cord injury, thoracic vertebrae, level 6 (T6) and above, for signs of *autonomic dysreflexia*.
- * Individuals who have seizures under control with medications, and have not had a seizure in the past 2 years, may be exempt from wearing a safety restraint while riding the lifts. Check the policy for your program/ski school.

STRUCTURAL & ANATOMICAL IMPAIRMENTS

DESCRIPTION

Students with Structural and Anatomical Impairments have disabilities that affect the muscles and/or the bones of the body. Disabilities that fit in this category include: Amputation of one or more extremities, Arthritis, Cancer, Cerebral Palsy, Diabetes, Polio and Post Polio Syndrome, Multiple Sclerosis (MS), Muscular Dystrophy (MD), Spina Bifida (SB), and Hemiplegia. Students may also have neurological impairments. Therefore, each disability requires additional, specific evaluation.

Lower Extremity Prosthesis

Students may have been born without a limb or with an extremity that does not function well. An amputation may have occurred as a result of cancer, trauma, or other health complications.

In theory there are no set rules to decide stance for students who wear a *prosthesis* (see Stance and Rider Scenario # 4 for different set-ups). Consider dominant steering factors such as, fore/aft movements and weight-bearing issues. As in any snowboard lesson, if the set-up does not work, try the other foot in the lead position. Go with what works for the student. Check with students to learn how their prosthesis works, as there are many different types of prostheses.

Check for flexion and extension at the ankle, knee, and hip of the leg with the prosthesis. The placement of a heel lift in the boot with the prosthesis moves the rider into a flexed stance. This position will allow the rider to move more easily onto the toe- or heel-side position. Also consider how much weight bearing the leg, with the prosthesis, can withstand; this may help determine which foot will be the lead foot. Each student will move differently with his or her prosthesis. Evaluate flexion and extension with movement and stance while indoors, as well as outside on the snow with the snowboard.

A change in a student's weight, either weight loss or gain, can affect how the prosthesis fits. Be aware that loss of feeling, or slipping between the limb and the prosthesis, is possible. Ask how the prosthesis is fitting and remind the student that swelling may occur with increased activity and altitude. This can cause decreased or loss of control of the board. Friction may occur between the limb and the prosthesis. Remind the student to make frequent skin checks of his or her *residual limb*.

While riding a chairlift, added leg support may be needed to avoid excessive pulling on the prosthesis when the prosthetic leg is supporting or carrying a snowboard. A device known as a *knee strap* (a 2" wide strap that is adjustable for length) can be connected to both bindings, suspended over the knee, and when connected by a shorter strap or buckle to a waist belt. Connection of the knee strap to the waist belt prevents the strap from falling when the student stands up for unloading and riding. Once the student sits on the chair, the knee strap is pulled over the knee of the lead foot. This evenly distributes the weight of the snowboard over the knee. Alternatively, the student can ride up the chairlift, while riding *switch* with the snowboard hanging from their good leg.

Hint #1: By placing the prosthetic foot into a plastic bag, the foot will slip into and out of the snowboard boot easier.

Hint #2: It may be easier for some individuals to put the prosthetic foot/leg into the boot first, then attaching the prosthesis to the residual limb.

Hint # 3: With a lower-leg prosthesis, the space created between the cuff of the snowboard boot and prosthesis needs to be filled. Use foam, a towel or other material to fill this space; use duct tape to help hold the filler material in place. Filling the space helps transmit the movement from the leg to the boot, then to the snowboard. Check periodically to see if the filler is still filling the space, as it can slide out easily.



Riding Rails with a Prosthesis!

Upper Extremity Prosthesis

Students who have upper extremity amputations may or may not wear a prosthesis. These students tend to have good balance. Once they start sliding, the tendency may be to keep the amputated arm back, throwing the shoulders back, resulting in a weak stance. Remind the student to keep the shoulder and residual limb forward, in the direction the rider is moving.

Arthritis

Arthritis can affect people of all ages. It is an inflammation of the joints that can occur in various forms. Special needs are determined by how the disease affects the individual. Using *slam-free* teaching tactics are critical for these students. Setting up the student in a comfortable and functional stance will help improve balance. Outrigger(s), bamboo pole, ski poles, and holding hands or 'the dance' are useful balance supports.

Cerebral Palsy

Students who have Cerebral Palsy (CP) can snowboard. No two CP students are the same. Students can be affected physically and/or cognitively, with symptoms ranging from almost unnoticeable to severe. Many CP students are cognitively unimpaired, yet their speech may be difficult to understand and/or they may need extra time to process questions that are asked. They may walk in without a noticeable wobble, use one or two crutches, or use a manual or powered wheelchair.

Fatigue and over-worked muscles can increase or induce muscular weakness. Cerebral Palsy is classified into three categories:

1. **Ataxic**- Jerky, uncontrolled movements that cause the person to appear clumsy or uncoordinated. Muscle tone is normal, yet balance is severely affected.
2. **Athetoid**- Involuntary, jelly-like, purposeless movements of the extremities or trunk. Movements are described as extraneous or uncontrolled, with an inability to direct precise motor function. Muscle tone may vary irregular.
3. **Spastic**-Increased muscle tone, which may affect a single limb, one side of the body (spastic *hemiplegia*), both legs (spastic diplegia), or both arms and legs (spastic quadriplegia). Muscles are usually tense and flexed. This is the most common type of Cerebral Palsy.

The CP student may have an unusual stance. The instructor should keep in mind the stance that is most comfortable for the student and the stance that makes the best use of available movement. The degree of fine motor control should also play a role in the selection of the boot/binding system. Some systems are much easier to use independently for students who have difficulty with fine motor control.

Some students may wear a leg brace(s) or an *ankle-foot orthotic(s)* (AFO). Usually, these devices need to be worn while riding. The student, family member, or caregiver can help to describe their usage. A brace or AFO can fit into a snowboard boot, yet the boot may need to be a size larger.

Post-Polio

Post-Polio students may have a weaker and/or shorter extremity/ies. The affected extremity /extremities may have a loss of muscle tone and strength. It is common for a student to wear a brace. The brace should also be worn while riding.

If a leg is shorter, the length difference can be evened out with a shim or lift that is placed in the boot or between the boot and binding. An alternative is to place a shim under the binding. One or two outriggers can help with balance when there is weakness in one or both legs. The lesson needs to be paced to avoid muscle fatigue. Overworking the affected muscle(s) can increase weakness and muscle pain.

EVALUATION

The following assessments are helpful for choosing equipment and set-up. Additional information regarding stance and set-up can be found in this publication, and in the AASI Snowboard Manual.

- * Evaluate balance, range of motion, leg strength, endurance, and physical ability.
- * Assess normal stance to see what would work well on a snowboard. The stance needs to be comfortable and functional for the student.
- * Identify the person's closest point of control for the snowboard.
- * How much can the student flex or extend their ankle? Knee? Hip?
- * Consider hard boots for additional support for ankle / lower leg.
- * Check the student's ability to rotate the spine, hips, and femurs.
- * Assess the student's ability for both toe-side and heel-side movements. Are both legs equal, or is one leg stronger than the other?
- * Assess the student's upper body for range of motion: ability to move shoulder and head to face the direction of descent.

ADAPTIVE EQUIPMENT

The tools that can be helpful here depends if the student's disability affects the upper or lower extremities or both. For balance and turn initiation the bamboo pole, ski pole, or outriggers can be helpful. To aid in minimal support, the dance, snow-wing, ski pal, horse n buggy, hula-hoop or outriggers can be used. When the student's legs are involved, outriggers, rider bar, and/or Constant Force Articulated Dynamic Struts can be helpful (see adaptive equipment section). These tools can assist the student in standing, standing longer or giving support to the leg muscles. When both upper and lower extremities are involved and depending on the degree of involvement, the above tools may be out of the question, the mono or bi-rig set up can be the answer.



**A bi-skier tethered & taught by a snowboarder,
with assistance from a "blocker" (shown right).**

SAFETY

Special safety needs for students with Structural and anatomical impairments include the following:

- * Have an awareness of areas of the skin that may have friction conducted to them - the feet and ankle areas, the end of residual limbs, along any brace that may need to be worn on the leg, feet or arms.
- * Increased muscle weakness, can be a result of increased physical activity, snow conditions, and excitement. Pace the lesson to the students needs.
- * Most of these students may become easily fatigued, so an instructor should watch them carefully. They may be so excited to be riding they will deny that they are slowing down or unable to do what they did an hour ago.

COMBINATIONS OF DISABILITIES

DESCRIPTION

Students who have a combination of disabilities fit into two or more of the previous profiles. They may have multiple disabilities from birth, a result of trauma, and/or health complications. They may have Cancer, Cerebral Palsy, *CHARGE* Syndrome, Diabetes, Stroke, or injuries that result from multiple traumas.

Many students who have multiple disability issues can snowboard. The instructor needs to be aware of each disability and how it affects the student. Assess all impairments fully, including how each of the impairments hinder or restrict the student's strengths. It is important to learn which, if any, activities the student participates in, how he or she tolerates activity and for how long.

Examples of Combinations of Disabilities:

One example may be a student who has diabetes, has had a foot amputated, and is losing his/her eyesight. The underlying disease of diabetes caused both issues. The instructor will need to assess the student's *visual field* as well as his or her strength and ability with a foot prosthesis.

Students with *CHARGE* Syndrome may have peripheral vision in only one eye, no hearing, and poor muscle tone. The instructor will need to assess the student's visual field, muscular strength and stamina, and method of communication, and create a system that works for guiding on the snow.

Another example is a student who has sustained a head injury in an accident and has hemiplegia, or paralysis of an arm and leg on one side of the body. He may also have difficulty articulating his thoughts.

The instructor will need to assess the physical strength of all limbs, static and dynamic balance, and gait if the student is walking. Does the student use a cane, crutch, or wheelchair? Also evaluate the cognitive abilities of the student. Can he put sequential steps together, follow instructions, and understand the instructor? Also determine how best to word sentences in order for the student to understand and respond, and how long it takes the student to respond.

EVALUATION

Students will have more than one issue that needs to be addressed. Determine a lesson plan once impairments have been fully evaluated. Refer to the previous profiles and use the Adaptive Snowsports Instruction Manual or Bold Tracks: Teaching Adaptive Skiing for additional medical and assessment information.

ADAPTIVE EQUIPMENT

The tools and equipment that can be helpful here depends on the student's disabilities. The instructor's evaluation of the student should show the student's strengths and weaknesses. Stance and balance need to be considered first. Often the second step is watching for other concerns on the snow. The degree of involvement and the student's strengths and weaknesses will help the instructor choose equipment or a tool that can be helpful.

SAFETY

Special safety needs for students with a combination of impairments include the following:

- * Know the different impairments that the student has and know the safety issues for each (see individual profiles above with specific impairments).
- * This student population may fatigue easily, depending on their physical fitness, how long they have had their disabilities as well as the usual fatiguing factors, snow conditions, weather, etc.
- * Pace the lesson to the student's needs. Take breaks to balance out the lesson. Remember, students may not admit that they are tired, for this means less snowboarding for them.

BODY POSITION

STANCE

Stance refers to the position of the feet on the snowboard. The stance includes the angle of the feet to the edge of the board, the distance between the feet, and the decision regarding which foot will lead. The goal is to find a stance that allows the rider to have a comfortable position with equal balance over both feet. The AASI Snowboard Manual contains additional information regarding snowboard stance and set-up.

During student evaluations, determine which leg or side of the body is stronger. Observe how they walk and stand to help determine their stance on a snowboard. A comfortable stance to the student will be more functional than a stance that is uncomfortable.

Keep in mind:

- * The direction the toes point when walking and standing. Are the toes pointing straight ahead, in a lateral (outward), or medial (inward) direction?
- * Is the student's weight distributed equally on both legs?
- * Is the student more balanced when picking up one leg than the other?

An aligned stance will be effective to help maintain stability while riding. The aligned rider will have their hips and shoulders approximately 90 degrees to the front foot. With lower stance angles the rider will have the appearance of hips and shoulders lined up with the board. With a large "split" between front and back angle the aligned stance may be perpendicular to a median angle. Another benefit for the aligned rider is being able to use skeletal strength instead of relaying solely on muscular strength. This will help reduce fatigue.



**Alignment
in the
Half Pipe!**

Open Stance

In this stance, each foot points toward the toe edge of the snowboard, yet slightly forward. Each foot will be set at a different angle, depending on the student's comfort and riding ability. This stance provides a good set-up for beginner to intermediate riders.

Directional or Race Stance

Compared to the open stance both feet point more toward the tip of the board. This may work well for students who use outriggers, as it minimizes twisting of the torso. Riding switch may be restricted with this stance.

Duck Stance

In this stance, the lead foot points toward the nose of the board (to some degree) while the rear foot points toward the tail of the board. This stance can be used for students who walk or stand this way, or for students who want to ride switch. For some students, this stance will keep their muscles more relaxed versus positioning their legs and feet in a position that is unnatural or uncomfortable for them.

BALANCE

Balance and stability are essential to good riding. A balanced platform is created by a person's stance (feet placement). It determines how much a person can move before falling down. In a narrow stance, it is easy for a person's hips and upper body to move outside of the platform, challenging balance. A broader base of support allows for a greater range of motion while maintaining balance. This creates a larger *swing weight*, which may hinder rotational aspects.

Coaching students to build a solid stance encourages a balanced riding position. Staying in balance is achieved by continuously making adjustments through flexion, extension, lateral, fore/aft, and rotary movements. Managing these movements as close to the snowboard as possible for greater control.

Students who have tight ankles (only minimal or no movement) must use their knees and/or waist to flex, extend, absorb, and adjust balance (a heel lift for these students may help). Incorporate the "four-step plan to success" to sequence movements that are necessary for success: static movements, simple movements, complex movements, and free riding.

MOVEMENT CONCEPTS

At its simplest, the body can move in two different ways, either through Flexion/Extension or Rotation. The time it takes for a snowboard to turn depends on several factors including a rider's actions, height, weight and strength of the individual, board length and width, degree of edging, and momentum of the rider sliding on the snow. The most efficient movements are those that are initiated closest to the board. This creates an immediate effect on the board and therefore requires less effort. This allows the rider to reserve bigger body movements, usually from the upper body, for recovery moves. The higher up the body the movement originates, the slower the board will respond.

BASIC SNOWBOARD EQUIPMENT

EQUIPMENT AND SET-UP

Snowboard equipment, stance, and adaptive equipment should meet the student's and instructor's goals and keep safety as the first consideration. This section covers the basic equipment that is available for students with disabilities. It explains equipment differences and how they benefit students. Refer to the AASI Snowboard Manual for more specific information on snowboard equipment and stance.

Instructors should be familiar with the different snowboarding equipment available in their program as well as the equipment that is available at local rental shops. This way the instructor will know the options that can be offered to their students. The initial evaluation of the student will help the instructor to choose appropriate equipment.

SNOWBOARD BOOTS

The primary purpose of snowboard boots is to support the feet and to keep the heels down. Boots should be snug, but not overly tight. With a good fit, the movements of the feet, legs, and body will be transferred to the board. Boots should be chosen for comfort and function. It may be difficult to communicate how the boots should fit, but it is essential for comfort and success. It may be necessary to make adaptations within the boot to promote good body-to-board movements.

When the student has motor-control and/or leg-strength issues, it is important to have equipment that allows control of the board at the feet.

Friction to any part of the ankle or foot needs to be prevented. Assess the boot fit by checking for pressure areas in the toes, foot, ankle, and lower leg. This can be done by asking questions and looking at the student's feet. The boots may need to be a different size to fit each foot, especially if an ankle-foot orthotic (AFO) is needed. Fit each boot for comfort and avoid pressure areas.

In general, there are two types of snowboard boots: soft boots and hard boots.

Soft Boots

A huge selection of soft boots is available in a range from very soft to very supportive. The softer the boot, the more ankle flexibility and freedom of movement can occur at the ankle and foot. Increased stiffness provides greater ankle and foot support. These boots can be adjusted for comfort and fit with either a lace or buckle system.

The more traditional soft boots use a binding system that has straps to hold the foot in place. Soft "step-in" boots use a fastening system located in the soles of the boots that allows the student to step into the bindings. These boots may be advantageous to many students. Currently these boots are harder to acquire due to limited availability.

Advantages: Soft boots are easy to walk in, more comfortable, and easier to learn in than hard boots. The step-in boot system allows for a hands-free entry into the binding, although it may require fine motor control.

Disadvantages: Soft boots may need to be re-laced at intervals throughout the day. Both lace- and buckle-style soft boots may not have adequate ankle support for riders who have compromised leg strength.

Hard Boots

This snowboard boot has a hard shell, which is similar to an alpine ski boot. It works best with the alpine board, yet can be worn with any snowboard that has the correct binding set-up. It has a longer sole length, so a more directional stance may be necessary to prevent toe or heel drag over the edge of the board.

Advantages: Hard boots give the greatest support to the ankle and foot.

Disadvantages: They can be difficult to fit and not as available as the soft boot styles. In variable terrain and snow conditions, these boots may be less versatile due to restricted ankle movement.

SNOWBOARD BINDINGS

Snowboard bindings attach boots to the snowboard. Some bindings are specific to certain boots. Most snowboard bindings are easily adjusted to accommodate the stance needed by the student. It is important for the boot to fit snugly into the binding since responsiveness of the board is directly related to how little play there is between the boot and the binding.

All snowboard bindings are non-releasable. With both feet attached to the same board, a triangle of strength is created between the legs and the snowboard, making the attachment safe.

Strap Binding

Strap bindings are the original type of snowboard binding and they are still the most widely used. Designed to work with the soft boot, they provide two or three straps to hold the foot in place. The ankle strap can be adjusted to give more or less support to the ankle as it holds the ankle and heel in the binding. The toe strap keeps the foot in place. This binding style has a high back. The height and angle of the high back affects the amount of support the rider has on the heel side. Usually, the high back can be adjusted to give more or less forward lean, depending on the need of the student.

Advantages: Improved ankle and foot support with the adjustable straps. Forward lean can be adjusted.

Disadvantages: It may be difficult for the student to buckle his boots independently.

Step-in Binding

The step-in binding works only with a matching step-in snowboard boot. This binding has a fastening system in the sole of the boot, allowing the student to step into the binding. To release from the step-in binding, a clip has to be pushed or pulled, as the foot is pulled out of the binding. This binding works for both soft and hard boots that have the special coupling at the bottom of the boot.

Advantages: The step-in binding may be easier to use for getting into and out of the binding independently.

Disadvantages: The release latch may get frozen or packed with snow, making it tough to get out of the binding. Also, the bottom of the boot may get packed with snow, making it difficult to click in. This problem is less prevalent with newer bindings. The step-ins may be harder to find.

Plate Binding

The plate binding is for hard snowboard boots (or alpine boots may work well). These bindings are seldom available in rental shops. They have a wire guard where the heel and toe of the boot fits with a latch that secures the boot in place. Ankle support comes from the boot only. The binding provides a solid connection to the snowboard.

Advantages: Easy to step in; provides a solid connection to the hard boot.

Disadvantages: This binding requires hard boots only.

SNOWBOARDS

There are a variety of snowboards available. Each board is designed for a specific style of riding. Most boards have general similarities. The different types of boards are freestyle, freeriding, and alpine/race boards.

The length and width of the board is chosen based on the height, weight, and ability level of the student. For an experienced rider, the style of riding is also considered. In general, the height of an upright snowboard should fall between the student's collarbone and chin for beginners and between the chin and nose for experienced riders. The student's strengths, weaknesses, and capabilities should be considered when choosing the type and length of board. Study the AASI Snowboard Manual to learn more about the different boards and sizing boards for students.

Freestyle Board (also known as a Twin Tip)

The freestyle board works well for beginners, individuals who are unsure of which foot should be forward, and for riders who spend time riding in both directions. It has a symmetrical side cut, the tip and tail are turned up equally, and it has a soft flex. These characteristics offer great versatility.

Advantages: Easily ridden in either direction. This type of board is the most available in rental shops.

Disadvantages: May be too soft flexing for the student.

Free-Riding Board (also known as a Directional Board)

The free-riding board rides differently forward and backwards. The tail has a different flex pattern and it is typically shorter than the nose. Also, the freeriding board has a stiffer torsional flex than the freestyle board. These characteristics enable the rider to hold an edge better at the finish of a turn. The side cut is designed to contribute to stability when riding forward. This board can be ridden switch, as well.

Advantages: Performs well for most riders with varied riding styles, terrain choice, or stance.

Disadvantages: Turns may happen quicker while riding switch. Some adjustments to riding may need to be made. Binding set-up may need to be adjusted if frequent switch riding is intended.

Alpine/Race Board

The alpine board is commonly used for carving on groomed terrain and for racing in courses. It reacts quickly from edge-to-edge as it is narrower in width. The nose of the alpine board is turned up more than the tail of the board. It is much stiffer than the other boards and less forgiving for beginner riders.

Advantages: Very responsive. Stable on hard snow and at higher speeds.

Disadvantages: Less versatile in different terrain and snow conditions. This board may not allow a beginner to easily experience switch riding and may be more difficult for beginners to ride.

ADAPTIVE EQUIPMENT

Adaptive equipment consists of different aids or equipment that can enhance a student's snowboarding experience. Adaptive equipment helps assist students to generate performance from their snowboard and keeping safety at the forefront.

Three objectives to consider when choosing adaptive equipment are:

1. Support the student in the cognitive and psychological aspects by encouraging confidence through the use of adaptive equipment.
2. Use of adaptive equipment to work on a specific development of skills such as Pressuring, Twisting, Pivoting & Tilting the board.
3. Use of adaptive equipment to assist the student with directional changes and/or with speed control.

Review the student evaluation to learn about the student's strengths and weaknesses. Use this information to determine the basic snowboard equipment and the possible need for adaptive equipment for the lesson.

Once a student starts to slide, a teaching aid may be useful in assisting the student towards their goals. Continually assess the student's needs to determine appropriate equipment or equipment changes.

Weaning off of a piece of adaptive equipment should be gradual. This process depends on how much the student depends on the equipment. It could take a few hours, days, or seasons. Base the process on the student's goals, needs and skill level. Not all students will 'wean off' the use of adaptive equipment as they gain experience. Some students will become independent with their equipment; then may choose to purchase their own adaptive equipment.

Instructors may find that teaching on snow blades (90-100 cm long skis) or slightly longer skis may make maneuvering easier, depending on the student's balance, strength, endurance, size, and/or adaptive equipment being used.

Always start on very gentle terrain when new equipment is introduced. Terrain that has a natural run-out is optimal for first experiences.

A list of different teaching aids and adaptive equipment follows. These lists are not complete. There are many instructors in programs throughout the world who work creatively with the needs of their students. Solutions are being developed and adapted constantly to meet the special challenges that adaptive students present. These lists are intended to provide examples and ideas to teachers. The key for working with adaptive aids is to be creative.

Teaching Aids

- * Toys and Props, such as balls, strings or ribbons, finger puppets, small stuffed animals, cones, flags, and food coloring.
- * Writing, signs, sign language, picture book, schedules, and contracts.
- * Demonstrations and drawings.
- * Noisemakers, horn or bell for noise, radios.

It is also helpful to have patience, empathy, understanding, and to use humor.

These teaching aids can enhance students' strengths and support their weaknesses. The aids can increase cognitive awareness, be confidence builders, and provide motivation while encouraging independence. They are helpful for communication with students who have visual, hearing and/or communication impairments.

Adaptive Equipment

The student either uses equipment after receiving instruction (student independent), or with assistance from the instructor (instructor assisted).

Instructors must have sufficient riding and/or skiing skills to use the equipment before handling it with a student. Know the equipment and practice using the equipment before going out with a student. Test your competence with another instructor instead of a student.

Adaptive Tools & Equipment: How They Affect Board Performance

Adaptive tools and toys are used to assist a student's ability to generate performance out of his or her snowboard. We know from the Snowboard Manual that the board performances a rider can create are tilt, twist, pivot, distribution and pressure.

The primary and secondary performance concepts vary from tool to tool. Certain tools achieve the same outcomes often with minor differences in execution, thus can be grouped together. Others are unique in their uses and outcomes. The ultimate goal, of course, is to increase ease and enjoyment for the student. A positive outcome is more likely to happen when a student understands what these tools can do and how they do it. Pressure distribution is certainly a board performance that is evident with the use of any and all of these tools; though, it's more of a tertiary performance.

Ski Poles (student independent)

Ski poles are used for balance while stationary, climbing, and propulsion across flat terrain. They are also used to assist with the stability, timing, and initiation of turns. Be aware of stance and upper-body position when using poles. Actually, some able-bodied riders use ski poles for confidence, propulsion and slam-free riding.

Telescoping poles can be shortened and carried tucked along the forearm, in a boot shim attachment, or in a backpack when they are not needed.

Ski Poles (instructor assisted)

Instructor can guide or cue students by clicking their poles together to develop the timing for when to turn.



Rider Using Bamboo Pole to Initiate Turn.

Bamboo Pole / Delaney Pole (student independent)

The bamboo pole is similar to the long pole used by Nordic skiers long ago. The Delaney Pole is an extendable pole with discs at either end. With the disc, it can be used as a sliding base of support or to give additional feedback about terrain to the rider. With the disc removed, the usage is identical to using a bamboo pole. (The Delaney Pole is currently no longer being manufactured.)

The student touches the pole on the snow to assist with initiating turns and, therefore, control speed. The pole is touched on the snow to the inside of the new turn to begin the turn. The contact point is a point around which the board can pivot. While riding, the bamboo pole should be held at hip

level to maintain the alignment of the upper body. Using the pole can be compared to using a kayak paddle.

The bamboo pole can develop more confidence for heel-side and fakie turns. At an advanced level, the pole can be touched to the outside of the turn to create improved angles and reduce banking.

Board Performance: Ski pole(s), bamboo pole, the Delaney pole and outrigger(s) are similar in creating at least one more point of contact with the snow. The contact point often becomes a point around which the board can pivot. Giving the rider another 'point of contact' to the snow while utilizing these tools, gives the rider improved stability to tilt the board on its edge safely and with a little more ease.

Horse-n-Buggy, Hula-Hoop, Ski-Pal, & Sno-Wing (instructor assisted)
These four different pieces of equipment assist the student in similar ways. They help with turn initiation, turn completion, and speed control. They also allow the instructor to help the student develop balance. They are all valuable tools for hands-off teaching assistance for students who cannot tolerate, or get distracted by, a hands-on approach. This equipment also prevents a "runaway" student.

The **Horse-n-Buggy** consists of either two PVC pipes, bamboo poles, or ski poles. Select two poles with an optimum length of six to seven feet. Attach either a bicycle or wheelchair inner tube to the poles at each end of the tube to form a "U" shape. Wrap the inner tube one and a half times around the student's waist (start at belly button, with one and a half wraps, to the small of the back). The instructor stands behind the student and holds the ends of the pipes or poles. This apparatus allows the instructor to rotate the student's hips into a turn and can also be used by the instructor to aid in speed control.

The **Hula-Hoop and Ski-Pal** offers a little more independence for the student. The instructor holds the hoop and rotates it through the hands while the student holds on, helping with turn initiation (this is while the student is in the middle). The student can be inside or outside the hoop while using the hula-hoop. While using over-the-head rotation of the hula-hoop, 180's and 360's can be taught. The Ski-Pal offers the same support but with a different rectangular configuration rather than the round hula-hoop.



Horse & Buggy Used to Help Student Initiate Turn

The **Sno-Wing** is operated much like the two previous devices, but it is attached to the student, not continuously held by the instructor. It looks similar to a wind-surfer boom with a waist belt in the middle that straps around the student. The Sno-Wing helps with the student's hand positioning and gives the instructor a means to assist the student in turns and speed control.



The Sno-Wing

Board Performance: Stability is delivered from the instructor by either the *dance position* or the use of instructor tools. The dance or other tools utilizes leverage allowing the instructor to assist the student to gain more or less tilt of the board. In addition, these tools may provide support around the waistline and hips. Sometimes, by rotating his hands along the equipment, the instructor can help a student rotate around the midpoint of the board's axis (pivot).

CADS (Constant Force Articulated Dynamic Struts) (student independent)
CADS are pre-tensioned rod and spring-loaded (bungee-type) devices that create an upward-lifting effect on the upper leg area. They are designed to relieve pressure on the knees and quadriceps muscles by providing anti-gravitational assistance (lifting). CADS benefit injured students, or students who have weak leg strength.

CADS are worn on both legs. The fiberglass rods and cords run between a pelvic harness and thick elastic bands. These are anchored to the snowboard boots. This suspension system transfers weight from the legs to the rods. CADS pre-load the snowboard with pressure derived from stretched, specially engineered rubber bands. The bands have a much faster response time than human muscles. CADS can provide support for a student to ride standing upright, or provide the support to ride for a longer duration.

Board Performance: While using CADS may affect the edge angle with more or less tilting while flexing ankles, hips and knees.

Outriggers (student independent)

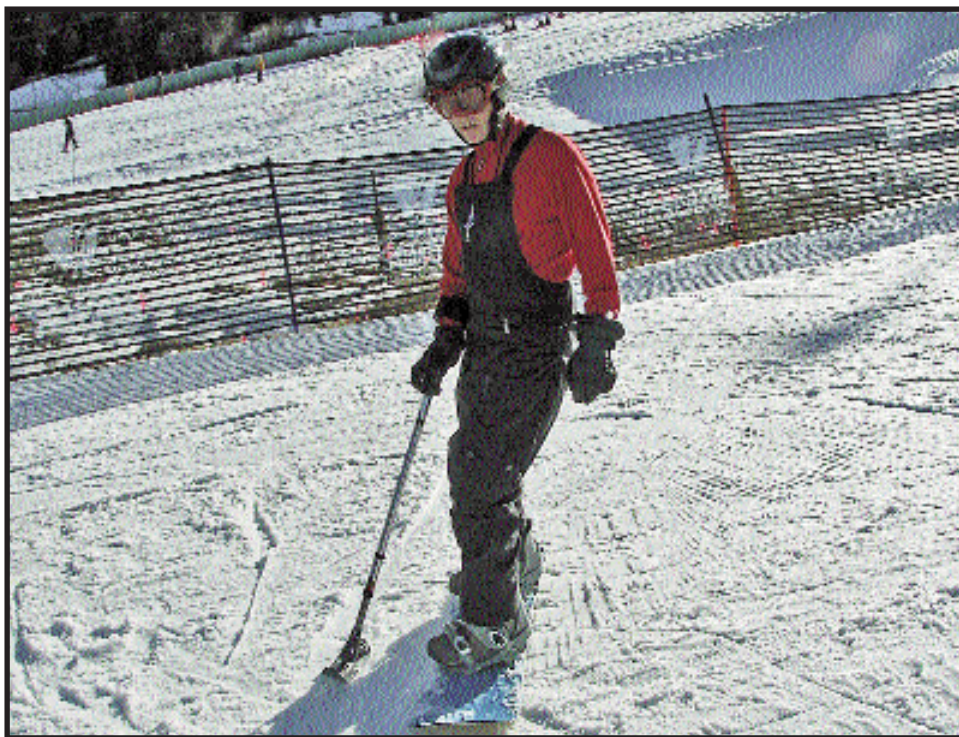
Outriggers are Canadian-style crutches that have ski tips mounted on the ends. They give the student a sliding platform when the skis are in the down position. The skis can be flipped up for walking. Some outriggers are made of lightweight but stiff materials, which cause less fatigue. Outriggers that have a shock-absorbing mechanism are more forgiving for the upper body.

It is very important for instructors to use outriggers competently in order to fully understand how they operate before they teach students. Talk to instructors who have used outriggers for snowboarding rather than for skiing. Increase your knowledge through reading and attending educational clinics.

Outriggers can improve balance while walking on icy surfaces, moving onto the snow, and while snowboarding. Depending on a student's balance

and coordination, either one outrigger or two can be used. Outriggers can facilitate skill development and lend support to prevent falls. There is not a set rule that specifies the proper stance angles when using outriggers. Utilizing outriggers should promote good body alignment, including standing tall with flexed stance. Comfort and function determine stance.

Outriggers are used in two ways: the single rigger technique or the double rigger technique.



Riding with a Single Outrigger

For the **single rigger technique**, the lead arm uses the outrigger. From heel side to toe side, the outrigger crosses over the nose of the board for each turn providing support to the inside of the turn. (see Rider Scenarios #4 and #5).

The **double rigger technique** involves a front and rear outrigger. The student stands in a comfortably tall, yet slightly flexed, riding stance. Position the front (lead) outrigger on the snow approximately halfway between the nose of the board and the front foot, on the heel side and approximately 6-12 inches away from the board. This location is known as the magic circle.



Riding with 2 Outriggers

Position the rear outrigger approximately 12 inches behind the lead foot, on the toe side or in between the two feet. The lateral placement of the rear outrigger should be 4-12 inches from the board.

Outriggers for beginner and intermediate students need to be the same length. For more advanced riding or increased board tilt, the student may benefit with the rear outrigger being shorter by about 1- 2 inches.

Adjust the outrigger's claw/brake at the beginning of the lesson and readjust it when necessary. The claw should engage sufficiently to create resistance against the snow, yet not dig in. There is too much brake (the brake bolt is set too high) when the student's elbow gets pushed back or jerked constantly and the riggers do not glide smoothly. As skill and speed develop, adjust the claw/brake to provide more rigger gliding and less brake.

To determine the amount of brake to use for a beginner, have the student stand on a flat surface and place his/her outriggers in the snow close to his/her sides (in the above arrangement). When the student flexes downward engaging the claws of the outriggers enough to push himself/herself backward, the brake setting is sufficient.

Board Performance: The rider is using the single outrigger technique has a third point-of-contact to allow the board to tilt onto an edge; however, because the rider also crosses the rigger over the nose of the board, the rigger creates a pivot move around that axis point. The double rigger technique, on the other hand, relies primarily on tilting the rider's weight off of the uphill edge and rigger to the opposing edge and outrigger.

Rider Bar (instructor assisted)

The rider bar is a horseshoe-shaped device that is mounted to the outside and underneath both bindings of the student's snowboard. The upside-down "U" shape provides a horizontal bar that crosses in front of the student. A basic starting set-up for your student would be a tall, yet slightly flexed alignment gripping the bar. The elbows should be slightly in front of hips, forearm 90 degree to upper arm. The student and instructor can hold the bar for balance and control. It helps to stabilize the upper body and provide support for fore, aft, and lateral movements. The rider bar is adapted from the slider version that adaptive skiers use. This device helps a student who has a diminished control or weaker lower body or severe balance issues. Using CADS along side the rider bar can maximize the rider's ability.



The rider bar was designed for students to use upper body movements to control the edge angle of the board. Moving hands in opposite directions (push away with one hand and pull towards the body with the other) twists the snowboard. The twist movement is much more subtle and forgiving than a push or pull of the entire bar.

Pushing the bar away from the body engages the toe edge, bringing the bar back to center creates a flat board, and pulling the bar toward the body engages the heel edge. Both methods are effective in changing from toe edge to heel edge.



It is often safer, more stable, and sometimes easier on the instructor's back to wear skis when a student uses a rider bar.

An alternative use might involve *ghost riding*. Ghost riding is when the student is riding on his or her own equipment, using an 'empty' rider bar set-up, as an external sliding base of support and balance aid.

This is similar to the dance or outriggers.



Student Using Ghost Riding

The instructor assisting a student with a rider bar wearing skis can also straddle the tail of the board, similar to *seat assisting* a bi-ski/mono ski.

Board Performance: The Rider bar may utilize torsional twist by using a simultaneous push-pull movement (pushing one corner of the bar, while holding or pulling the other corner). To gain tilt to the board while using the entire bar, push (a move to toe edge) or pull (a move to the heel edge).

Tethers (instructor assisted)

Tethers are used to help students start and follow through with their turns. Also, they are used to help control the student's speed. Tethering allows the instructor to be close to the student in a hands-off manner. In this way, the instructor can avoid a runaway student.

The actual act of tethering is an art form. The instructor needs to be thoroughly familiar with the do's and don'ts of tethering. Developing a high level of competence before going out with a student is critical for safety. In many situations it may be easier and advisable to practice with fellow instructors or volunteers before going out with a student. In some situations it may be easier and safer for some instructors to tether from a pair of skis.

Guidelines for using tethers follow:

1. **A sign of good tethering**, is when the student cannot tell if he/she is being tethered. This is an important goal to strive for as an instructor.
2. **Tactical sensitivity** is needed when the instructor is perfecting the coil-spring process (arm flexion and extension movement) with their lower arms, wrists, hands, and fingertips. Having this sensitivity will help obtain the goal in #1.
3. **Handling:** The tether should never touch or drag on the snow or have too much slack. Practice to develop a good coil-spring or wrap system to deal with extra slack.
4. Use a **safety line** while tethering. It can prevent a "runaway student" who cannot control his/her own speed and turns. As a general rule, safety lines are used in all tethering, with few exceptions as dictated by safety. As an example, an instructor may be new to tethering in a clinic setting.
5. **Riding and Alpine Skills:** The instructor must be able to change directions instantaneously while accelerating and

decelerating, while maintaining the student's position.

- * Riding skills required to tether a student are balance, precise speed control, riding switch, directional changes, performing heel-side slides and falling leafs equally well in both directions, and riding synchronized to the student's turns.
- * Skiing skills to tether a student are wedge change-ups, stem-steps, converging and diverging turns, hop turns, short radius turns, skating, and hockey slides.



This is a good example of the tether being attached to the nose of the snowboard VS the front foot because of the large student/small instructor weight ratio.

6. **Positioning**, timing and handling: There are two types of positions: synchronized (uphill) or tracking (following). The need for either type of tethering is relative to speed, slope, terrain, ability and the student's and/or instructor's desired intention or outcome. The instructor should never be below the student.

- * **Synchronized** is most effective for beginning to intermediate students and occurs when the instructor is directly uphill in the fall line or gravity zone from the student. It is more efficient for lower speeds and is more commonly used. The instructor makes the same turns simultaneously with the student.
- * **Tracking tethering:** The instructor is following in the student's tracks. This is appropriate for students who have advanced skills and are capable of higher speeds and longer radius turns. It is used when the student's primary need is assistance with speed control.

7. A **blocker** provides extra support to the instructor/student team. The blocker can run interference as needed. This position may be a revolving position around the team determined by terrain, traffic, and other obstacles. The blocker watches traffic, guiding other skiers/riders around the team. This is particularly important when a team rides close to intersections or the edge of a trail.

- * A Blocker, blocks traffic from uphill approximately 15 feet from the team. Slightly in lead of the team, approximately 5 feet (relative to speed).
- * Running interference is the act of clearing a path in front or below the team as necessary.
- * In a stopped position, the blocker may stand below the student to prevent a 'run-away'.



Stopped Position on Steeper Terrain, Blocker Below Student

The attachment location of the tethers affects the swing weight and how hard or easy the board turns. The instructor generally tethers from the nose of the board, the lead foot, or a point somewhere in between. Tethering from the nose of the board creates a greater leverage factor providing greater turning ability than attachments that are placed farther back or at the lead foot. This works well when the student is larger than the instructor. With a lighter student-to-instructor weight ratio such as a child or small adult one may want to attach the tethers to the lead foot rather than the nose. This creates less leverage and prevents over powering or turning of the student.

- * A teaching board can be set up for tethering in the following ways: Attach a snowboard tethering clamp, to the nose of the board, as it is easily attached and removed without damaging the board (or using a C-clamp). If this is not available, the tether can be connected to the student's lead boot. It is not recommended to connect the tether to the student's upper body: this can interfere with the student's balance.
- * Attach eyebolts to the board with flush-mounted T-nuts on the bottom, or:
- * Drill a hole at the tip of the board and use a carabiner to attach the tether.



This photo shows a tether attached to the nose of the snowboard for easy control. Sometimes it is easier for the instructor to be on skis instead of a snowboard.

Board Performance: Tethering can create variable pivot points along the length of the board. While using tethers, an instructor can assist the student with gaining some tilt on the board. An instructor generally tethers a student from the nose of the board, the lead foot, or any spot in between.

Tethering Specifics for Sit-Down Equipment

The following are basic descriptions of techniques that have been progressively developed since the mid 90's, by snowboard instructors and volunteers who teach and tether sit-down skiers/riders. Enterprising instructors have developed tried and true methods that demonstrate tethering from one board vs. skis. The adaptive world is just that, adaptive. Safety is always the first concern and appropriate skill level of the rider is a must to keep the team safe.

A good hand position for a tetherer can lead to more control.



The instructors' stance on the snowboard should permit them to ride with either end of the board forward, thus good switch riding is important. It is necessary that the tetherer be able to move to the left and to the right with equal facility, safety, and control. The neutral 'duck foot' stance, such as +10 and -10, may be helpful. This promotes equal use of the riders' strongest leg muscles. If the instructors' feet are large, this may require a relatively wide board or larger stance angles, or the heels and toes may drag in the snow.

A symmetrical board is best, but a freeride board will do especially if the bindings are mounted midway. Alpine carving boards and race boards will present problems.

Tethering a mono or bi-ski from a snowboard is best done using the heel-side falling leaf technique. The tethers are held in both hands, with hands positioned forward and elbows slightly in front of the hips for maximum strength and control. This range of movement of the hands while tethering, from the shoulders to the hips is known as the power box. The position of the instructor is uphill and inside the students turn. The tetherer should anticipate the next turn and move in that direction slightly before the student turns. Watching the student for clues such as head, shoulder, torso, and arm or outrigger movements can help anticipate turning. When low tether tension is required, as for flat terrain, a lightweight student or near-independent student, the snowboard instructor might link turns with the aim of reducing the tetherer's speed, and maintaining proper positioning.



Seat-Assisting Bi-Ski.

Stopping while tethering can be simply a matter of applying additional heel-side pressure and increased edge angle to come to a stop or turn to a stop. If the tetherer is in direct alignment behind the student, the student is least likely to tip over. Alternately you can stop or slow students by riding along side of them and seat-assist them to a slow or stop. The tetherer can restart by seat-assisting until the team reaches a comfortable speed then cast the student forward and resume tethering. This may be a preferred method especially if there are no blockers available. Alternately if you have a blocker, ask the blocker who has positioned himself in front of the bi-skier to clear out of the way and with tension on the tethers resume tethering. If the student is using outriggers, they should be encouraged to use them appropriately as much as possible.

When seat assisting the sit-rig or any sit-down equipment, the instructor needs to ride close enough so they can grasp it with their hands. Using one or a combination of techniques, the instructor tilts or twists the rig so that it turns. This is done while maintaining control, without interference of both the student and instructor.

There are three precautions that apply to seat assisting that need to be maintained;

- * It is a good idea to remind the student that when they are turning they should tip the upper body with the rig rather than try to remain vertical, just as you would advise a novice passenger on a motorcycle. If they remain vertical they may wind up inadvertently fighting the instructor on the turns. The student may be fine with this idea while on tethers but he may feel the urge to remain upright when he sees you close alongside.
- * It is helpful to wrap the tethers around the instructor's wrists/hands, one or two wraps, or develop a good coil system so that the tethers do not drag on the snow and get in the way.
- * Seat tethering assisting should never be done without a safety strap. There is nothing about seat assisting that renders falling impossible. Should the instructor fall without tethers attached, the student can accelerate down the hill unimpeded and uncontrolled.

There are at least four methods by which a snowboarder can seat tether/assist with sit-down equipment. Seat tethering is made easier by installing a horizontal handle with a 4" to 10" extension, much like a towel

rack. The extension handle may be connected to the back of the seat. The instructor controls speed with the shape of their turn. Learning to skid the equipment through turns will also help keep the speed down.

While seat tethering on the heel side edge, instructors can control the student's speed by weighting and varying the edge angle of their snowboard. The instructor controls speed from the toe edge by weighting and varying their toe-edge angle. The instructor, while on toe side, can also create a wedge between their snowboard and the sit-down equipment by extending the back arm and leg and contracting the front arm and leg.

Strength ability and desired outcome may help decide which of the following methods is most advantageous or easiest to use for the technique.

The four seat-assist techniques are:

Downhill End-Around Technique- The instructor on their toe edge is in a parallel position to the student on the outside/downhill side of the turn. The instructor needs to switch his/her position from one side of the seat to the other side while moving. This is accomplished by initiating the next turn to a momentary heel side/inside edge turn. As the sit-down equipment goes through the fall line, the instructor walks their hands, (thus their body) around the back of seat of the rig finishing the turn with a quick toe-side turn, back to a parallel position on the opposite downhill side with the other foot forward. Some mono-skis & dual-skis stick out much further from the back of the seat than the bi-ski, making this maneuver very difficult for most, perhaps requiring a small (advanced) hop turn. If the hop turn cannot be done appropriately (not disrupting rhythm & flow), do not do it.

Advantage: The advantages of this technique are two-fold. One-the instructor may be able to view uphill traffic easier; Two; with the instructor being on the lower downhill and the student being on the higher uphill allows for a stronger taller stance and less fatigue on the back, especially if the rig does not have a handlebar (this is the strongest position).

Disadvantage: The main disadvantage is the skill required to make the edge changes.

Uphill End-Around Technique- The instructor is on their heel-side edge and rides parallel to the sit-down equipment on the uphill side. The instructor grasps the handle or back of the seat with one hand, while the other hand holds somewhere between the hip strap or knee area. The equipment is tipped to make the turn, with a similar walk-the-hands-around technique.

The instructor moves around the back of the sit equipment to the same parallel position on the other uphill side, the whole time remaining on the heel edge.

Advantage: There is no edge change.

Disadvantage: In this technique the instructor is uphill and the student is downhill. This can be strenuous on the back and requires constant squatting, which is more fatiguing and a weaker position. It is often more difficult to control the front of the sit-down equipment and may be less stable.

Falling Leaf Technique- This technique is a variation of the uphill end around. The instructor holds onto the handle or the back of the seat with both hands, remaining on the heel edge, and slides in the 'falling leaf' position much like using hand-held tethers. The instructor's arms are outstretched, and their body position is bent at the waist as much as necessary to keep the snowboard clear of the sit-down equipment's tail.

Advantage: This technique allows the student to use hand-held outriggers more easily and with less interference while being tethered.

Disadvantage: Caution, unless there is a very long extension handle on the back of this rig, this position may cause back fatigue. Use of short tethers may replace holding onto the rig itself and allow the instructor to stand up straighter. With short tethers, the position of the tetherer is directly uphill of the student.

Synchro or Dance Technique- In this technique, the instructor grasps the front of seat with one hand and the back of the seat with the other hand. While making linked turns, the instructor rides along the same side of the sit down equipment the whole time. The instructor does the steering, by tipping the equipment to one side or the other and making the same simultaneous edge changes as the student.

Advantage: This technique gives the student a feeling of 'support', emotionally and physically. Allows the instructor to give immediate feedback on what the student is doing

Disadvantage: Instructor needs to have strong riding skills. This technique can be more challenging for the instructor when the instructor is smaller in portion to the student.

Tandem Board (instructor assisted)

A tandem board is a snowboard with two sets of bindings to accommodate

an instructor and student. The instructor can use outriggers for added support. This style of riding and teaching was developed in Europe, and is currently seen more on the European slopes than in the United States. Use of the tandem board is primarily for beginning students. They can experience more dynamic riding without the worry of control. They can feel the transition from toe-side turn, to neutral, to heel side turn. After the students experience linked turns, they are ready to begin skill development at the entry-level on their own snowboards. The size and weight of the student must be considered relative to the instructor/ student skill level for this equipment to be safe and effective.

Board Performance: The tandem board relies on weight transfer from heel side to toe side (tilt). The instructor can also twist the snowboard, yet



with two sets of bindings (and two people) on the board, the effect is diminished.

Tandum Board with Instructor Using Outriggers

Sit-Down Equipment (student independent)

Sit-down snowboarding is broken into three distinct categories: Sit boarding, bi-skis and mono-boarding-skiing with a snowboard.

- * **Sit boarding:** This is a seating interface without loading or shock mechanisms, mounted directly to the snowboard. The seat may face forward or laterally. The rider sits low to snow, and may use hands on snow, hand picks, short poles, highly modified outriggers as balance, propulsion, and or turning aids.

- * **Bi-ski:** The bi-ski originated from a split snowboard. It is a forward loading and sometimes having a shock system. This is attached to an articulating parallelogram interface, mounted on two very shaped skis with a 7-12 meter radius side cut. Currently there are many variations and modifications. See the [Alpine Adaptive Snowsports Manual](#) for more information.
- * **Mono-boarding:** (not to be confused with the standup mono-board or mono-ski). This is a forward facing seated position, which allows a mono-rig, including shock assembly to be mounted via an interface (currently there are two: Shredder Plate and Trench Digger) to various types of snowboards. The Shredder Plate is a system that is highly adjustable, allowing for fore/aft adjustment along the length of the board. This is for centering purposes, while dowel testing. It also allows for lateral *float-across* adjustments across the board from edge to edge. The Trench Digger is currently not readily available. The most popular snowboards used are carving or alpine/race boards as they are narrower, creating a quicker change edge to edge. The rider may use hands on snow, picks, short poles, or outriggers as balance, propulsion and turning aids.



Mono-rig Attached to an Alpine Board with Shredder Plate

The shredder plate/trench digger and mono-rig (sit-rig) were developed to give students who are unable to stand the opportunity to ride. This piece of equipment was adapted from mono-skiing. The mono-rig, (sit-rig), includes a seat, loading and shock system, which are mounted to the snowboard with the shredder plate or trench digger interface system. Adjustments can be made to have the student centered on the board. The student tips his or her upper body weight from side to side to engage the edge of the board. Riders can use turning and balancing tools in their hands, depending on the set-up and their preference. If the rider sits low to the ground, hand picks or hands can be used. If the sitting position is higher off the snow, outriggers are used to support balance and turning.

Board Performance: Using any of the sit-down riding equipment relies heavily on the student tipping his or her upper-body weight to tilt and engage the edge of the snowboard. The student also has to pivot the board to create quicker turns.

Mono and Bi-skiers (Student independent)

The teaching techniques for these two pieces of equipment are explained in the Alpine Adaptive Snowsports Manual.

Note: The following is not currently explained in the Alpine Adaptive Snowsports Manual. A shorter outrigger technique also known as 'The Drop and Block' has been applied to both mono- and bi-ski lessons. The main emphasis is utilizing a shorter outrigger. The outrigger ski position, on the snow, for the drop and block is between the hips and the knees

Students in beginning mono/bi-ski lessons with balance and strength issues, often learn to ski much more easily while using the shorter outrigger technique versus a longer outrigger. This shorter outrigger, allows for improved stacking concepts thru the wrist, arm, shoulder and torso, giving more skeletal support than muscular support, a biomechanical advantage. Creating balance with less energy enables students to achieve success more easily in the earlier stages of learning. As students advance with improved balance and strength, the outriggers can be lengthened to encourage a lever arm or fulcrum turn.

Swivler (student independent)

A Swivler is a rotational device that is mounted under the binding of the lead foot. It provides a quick-release change of position that allows the lead foot to rotate toward the nose of the board. This decreases the inward or outward twist of the lead foot and leg needed for maneuvering with one

foot out. Thus a more comfortable position is possible for walking, skating standing in lift lines, as well as loading and unloading lifts. This is particularly useful for those students who choose to ride with their prosthesis as their leading leg. Also, it allows for a quick stance change when riding.

PROGRESSIONS

A progression is a sequence of tasks and exercises that develop a specific skill(s). This teaching approach works well for most students and makes class handling easier for instructors. Instructor must keep the student's strengths and weaknesses in mind in order to determine the steps of the progression. Some students may need to repeat certain tasks or spend more time on specific skills. This is referred to as detailing a progression, by slowing it down and breaking it into smaller chunks of information. Other students may achieve the same outcome by following a leapfrog format. The leapfrog approach skips over certain steps of a progression as needed to promote successful student outcome. This may help to maintain student interest by avoiding skill progressions that may be too hard and not very relevant at the moment. Refer to the [AASI Snowboard Manual](#) and [PSIA/AASI Children's Instruction Handbook](#) for specific steps to teach snowboarding.

Each progression should include the following four steps; static, simple, complex, and free riding. By working together through a progression, a strong teaching and learning relationship can evolve between the instructor and student. Teach with a set goal in mind and use different strategies to achieve a safe, fun, and successful snowboard lesson.

Teaching from Skis or Snowboard

Instructors of adaptive snowboarders can be on snowboards or skis (alpine or Nordic) while they teach, depending on appropriate skill level of the instructor or student team. In teaching an alpine-based lesson from a board or a snowboard lesson from skis, each situation must provide instruction that is based on thorough knowledge of the discipline being taught and strong communication. In some situations it is easier and/or safer to teach from a pair of skis rather than from a snowboard and vice versa.

Basic Snowboard Progression

The progression starts with the student evaluation and equipment set-up. Afterward, the instructor can modify the progression and tailor each lesson to the student. All lesson plans should take into consideration the student's goals, abilities, and needs to achieve success. Allow students to gain ownership of their progress. Take care to set an appropriate pace and try not to push your students too hard.

Many ASB lessons will not require additional adaptive equipment. Instead, the instructor can modify the lesson presentation and progression. At the same time, many students will require or benefit from the use of adaptive equipment for accelerating progress and providing a slam-free lesson.

A sample snowboard progression for a beginning lesson follows:

Student Introduction and Evaluation

- * Review all written notes from previous riding experiences and medical issues
- * Introduction to student and communication with family or caregivers
- * Physical and Cognitive assessments
- * Set goals with student

Introduction to Equipment

- * Explain equipment, allow student to touch it and ask questions
- * Show student how equipment works
- * Set up stance, consider the student's desires and needs

Introduction to Environment

- * Discuss the Responsibility Code and Safety
- * Choose appropriate terrain for the ability level of the student
- * Explain and show the student the terrain

Introduce Body Position and Balance

- * Work on balance and body position first without equipment and then with equipment

Walking and Skating

- * Walk in boots on a dry surface, then on a snowy surface
- * Walk with lead foot attached to board
- * Show ankle flex

- * Skate with rear foot on toe side alternating with heel side
- * Pivot the board in both directions
- * Boot games with rotary movement
- * Board games with rotary movement, lead foot in binding

Climbing

- * Side step uphill and downhill
- * Toe-side climb, uphill and downhill
- * Heel side climb, uphill and downhill

Basic Glide to a Natural Stop

- * Work on athletic stance
- * Work on balance (head and eyes up, looking ahead)
- * Glide to natural stop (on appropriate terrain)
- * Start with lead foot in binding, then both feet in bindings (place the second foot in the binding when sliding faster than walking speed)

Directional Changes

- * Develop and encourage switch/fakie riding
- * Flat (neutral) board to slight directional change
- * Toe and heel drag
- * Either end of the board leads
- * J-turns
- * Garlands
- * Falling leaf
- * Spins (180's or 360's are okay, be it accidental or intentional - encourage them)

Chairlift Ride

- * Give detailed verbal and visual explanations before loading
- * Communicate with lift operator for slow speed loading and unloading, or stopping if necessary

Turns Across the Fall Line

- * Toe-side turn
- * Heel side turn
- * Falling leaf to practice on new terrain
- * Garlands

Linked Turns (start with the turn that is easier for student)

- * Edge, flat board, opposite edge

- * Develop turn shape
- * Work on speed control
- * Work on rhythm and flow

Introduction to Carving Turns

- * Stationary edge changes
- * Increased tilt on green/blue terrain
- * Develop awareness between skidded and carved turns

Carving Turns

- * Skid/Carve Traverse on green/blue terrain
- * Use sounds and feelings as cues w/skidded versus carved turns
- * Retraction turns
- * Flexion/Extension thru out the turn versus 'park and ride'

Introduction to Easy Bumps

- * Linked short radius turns in the fall line on green/blue terrain
- * Skidded turns with a flat board
- * Sequential flexing/extending movements of front/rear leg
- * Sideslip/falling leaf through the troughs/sides of bumps

Introduction to Park-n-Pipe

- * Inspect features/learn park protocols
- * Improve Switch riding
- * Slope side freestyle tricks, natural
- * Basic air off small features

STUDENT SCENARIOS

The following scenarios are from instructors who taught these actual situations. The scenarios highlight the disabilities presented by the students, the goal-setting process, and the equipment used. Many of the goals had to be broken down into smaller steps, to reach a mini-goal, while still progressing towards the initial goal that might take years, rather than a day or a week, to attain. Ideas and understanding can be gained from reading through each scenario. Realize that all students will not present the exact challenges seen here. All students will hold a dream to ride, with the opportunity to turn it into a reality. The dream to ride is where it all begins.

Rider Scenario #1 (Visual Impairment)

This student scenario is an example of a progression that follows the leapfrog approach. In this approach, certain aspects of the progression are skipped over to fit the needs and goals of the student. Students who are suited to this approach are usually highly active and engage in other activities that have similar movement patterns. This approach does not work for all students.

Antonia, age 17, is a level 7-8 alpine snow skier who also water skis in the summer. She is from Italy, speaks no English, and is totally blind. Antonia's senses of hearing and feeling are very strong. A few words were shared and learned in both languages to provide communication for a safe lesson. The shared words referred to body position and terrain as they relate to snowboarding. Some of the words were stop, toe, neutral, heel, hold, and turn. The team relied on other senses to move beyond this barrier. They used intuitive perception and physical kinesthetic senses or the combination of these while learning.

Antonia first felt the stance, toe-side move, and heel-side move indoors. Then she repeated them on the snow and was ready to start sliding. The instructor was on skis. They used the holding hands dance technique for sliding. Antonia had great balance and easily learned the toe-side, neutral, and heel-side moves. She quickly advanced to basic turns.

Initially, the pair stayed in contact as Antonia held onto the instructor. She started to let go as she acquired a feel for the board. A trusting relationship developed and Antonia let go long enough to link a few turns independently with the instructor close by.

On the chairlift ride, an interpreter rode with the pair so they could talk. Teaching was done on the lift or along the side of the slope when stopped. Antonia started to feel each turn and no longer held onto the instructor. She took a few falls, but she learned to get up and start to ride again. People steered clear as they heard the instructor call out, "heel -turn, neutral, toe -turn, neutral, heel -turn, hold, hold, neutral, toe-turn..." By the third run, Antonia could link six to twelve turns. Her energy level, understanding, and feeling the board made it possible for her to ride easy greens within two hours.

Rider Scenario #2 (Cognitive Impairment)

On a cool snowy day, a group of never-ever snowboarders started to get to know each other. The class of older teens and freshmen college students included Henry. Henry was a bit older at age 28, yet fit with this class better than with "older" adults. Henry's two younger siblings had snowboarded for the past three seasons and Henry wanted to give it a try too. Skiing was a family affair before his siblings started snowboarding. Henry has Down's syndrome, lives at home with his parents and siblings, and has a day job at the local resource center "earning a paycheck."

Henry's parents and siblings dropped him off for class. It was the first day for the season and everyone in the family was taking a lesson. Henry's parents said that he was not taking any medications, and he could follow simple steps, one at a time. They reported that an x-ray taken years ago showed no problems with the atlantoaxial instability in his neck. Henry wore glasses.

As Henry walked around and waited for class to begin, his toes pointed slightly outward, away from his body in a duck position. With this knowledge, we adjusted his binding stance to -6 and +6, with Henry's right foot in the lead. This "goofy foot" position was discovered when Henry talked about playing soccer and showed how he could kick the ball. There were some other soccer players in the group, too, and this led to some great stories that helped bring the group together. Cheryl, a participant in the group, shared with us that her brother also has Down's syndrome. Henry and Cheryl became a pair as they helped each other. It was great to see their friendship build.

Henry had difficulty walking and skating with the front foot in the binding and the rear foot pushing. As the group practiced this, Henry practiced walking in the snow along with the group while holding his board, "looking like a cool dude". For climbing, Henry showed how he would climb a gentle hill if he were skiing. Then he showed how he would edge his board in the snow in the future when he was ready to climb on a snowboard.

Moving onto a very gentle straight run with a natural stop at the end, the group started a quarter of the way up a knoll. At first, they had one foot out of the binding. Almost everyone wanted or needed the instructor to be next to them for their first slide. Everyone's focus was working on stance and looking down the hill. Henry had the group laughing with the jokes he told and the group cheered as everyone accomplished a little more of the

knoll. By lunchtime, everyone was either "King" or "Queen" of the knoll, determined by riding down the knoll without assistance, having both feet in the bindings, and achieving some directional changes, whether on purpose or not.

Then the group played "What are we doing?" The question was asked of the person heading down the knoll and they had to respond by saying one of the responsibility code rules. If the same code was said twice in a row, the student had to say two of the codes next time.

After lunch the group returned to the knoll by group decision and continued to gain "ownership" of the task at hand, making directional changes. Once everyone accomplished this, they rode the chairlift for a run on the beginner slope. Everyone had the choice to walk on and off the chair carrying their board, or ride with their snowboard on. The instructor went to the top to assist by calling out reminders and making sure the lift was slowed down. Cheryl and Henry rode up together holding their boards for the first time.

The big step to the beginner hill provided more terrain to work on heel and toe exercises. When the terrain is too flat, it is harder to gain the feeling of the edge and easier to catch an edge and fall. The group worked on garlands and falling leafs. On part of the hill, they worked as a group and then practiced independently. Everyone watched everyone else and cheered if they did well or even when they fell.

Towards the bottom of the run, it flattened out and was a perfect place to practice 180's or 360's. By doing this, they worked on feeling a flat board and avoiding the edges, pressuring the board in different areas, and pivoting the board. It was a great way to have fun and learn at the same time.

On the last run of the day, Henry started walking and skating with his board, while in line. Henry still chose to carry his board while riding the lift, as did a few others. On this last run, we returned to garlands and falling leafs to improve these skills. The students were paired up with one person following his or her partner. When some individuals "follow the leader", they do not think as much and the moves become easier. At the bottom, they made the choice to work on 'spins', 360's or 180's.

Since this was the first day of a three-day lesson, the group was told that they would work on full turns in the morning on the same trail and try some ollies or nollies.

Rider Scenario #3 (Neurological Impairment)

Brian came to the lesson with an incomplete Spinal Chord Injury at level C1/C2, meaning that his spinal chord was damaged but not completely severed in his accident. He had sustained his injury when he slipped off a rail, riding in a rail-yard at nineteen. Less than a year later he wanted to know if he would ever be able to snowboard again.

Physically Brian is progressively regaining small increments of overall body function. Brian uses a wheelchair and he virtually has no fine motor control. His right hand does not listen to him very well. He regularly attends therapy sessions and works on strengthening his body. His doctors told him that if he keeps working, there is a good chance that he will regain more movement, coordination and strength over time.

When Brian first rolled in he wanted to know what his options were for snowboarding. After the introduction, we entered into evaluation and assessment. We tested balance, range of motion, endurance, etc. After a thorough evaluation and assessment it was determined that Brian was still very weak yet currently could stand for approximately 10 to 15 minutes. In that time span he could take approximately 20 steps using a swing-through gait with a walker. His right side, especially his right hand, wrist, and forearm, were slightly weaker than his left side. His attitude was inquisitive, robust, and determined. The assessment revealed two strong options; Rider Bar- (short term stand-up) or Bi-ski- (long term sit down).

When asked which option he would prefer, he chose both. This brought us into beginning goals and plans. The basic starting plan was to experiment and play with the Rider Bar in order to discover and exploit options in the morning, and then in the afternoon session we would do the same with the bi-ski. Goal setting for the morning Rider Bar session involved a review of strength and balance issues, and the variables of different playground and snow sliding environments. It was determined and agreed upon that if Brian could stand and play on the Rider Bar on snow for 10 minutes, the experience would be considered successful. We chose the Rider Bar option 1st in order to optimize early morning strength and endurance.

Brian was then fitted with snowboard boots. The right boot was one size larger to accommodate his ankle foot orthotic (AFO). The Rider Bar was set up as close as possible beforehand in order to optimize actual time standing up in the Rider Bar. From the notes taken in the assessment we learned that Brian had been an accomplished snowboarder who rode regu-

lar. His most comfortable stance ended up being +8 and -8, this position also promoted switch riding per Brian's goals. The U-bar on the Rider Bar was raised and angled to allow the forearm to be perpendicular to the upper arm and the elbows slightly in front of the hips. The horizontal adjustment of the U-bar was loosened ever so slightly to allow for independent twisting of the board, resulting in easier engagement and disengagement of the leading edge, (turn initiation). During setup Brian sat and asked questions about the sizing adjustments.

We were now just about ready to rock and roll. Before going out onto the snow we reviewed what Brian remembered about basic riding and board performance. We combined that information with a brief discussion of Rider Bar function and application of balancing movements. We then worked on how to affect steering by gently pulling or pressing (pushing) the lead end of the U-bar. Taking a deep breath, we wheeled out onto the snow, ready to go.

THE FOLLOWING IS AS APPROXIMATE TIMED SEQUENCING OF HOW THINGS WENT:

- 60 seconds;** Brian stood up, stepped in, strapped in (with assistance), height was ok, quick adjustment of angle for comfort all with team like precision.
- 30 seconds;** We lightly wrapped a 2" by 16" Velcro elastic strap around his right hand to the bar to aid his weaker hand in gripping the bar.
- 60 seconds;** We pushed and or pulled while lightly supporting Brian (no value in falling now) across the flats approximately 30 feet each way. Brian remembered sliding. The instructor checked out the snow conditions, (snow resistance/ wax) while observing Brian's balance. Checking in, we got the anticipated look. Everything was ok. With minor corrections we moved on.
- 45 seconds;** Where is the gravity? Fortunately, our program had two Rider Bars so the assistant was able to give two quick demos. The instructor observing the starting point of the demo, noticed that the travel might have been too far, too fast and made a slight adjustment in Brian's starting point.

Brief explanation of desired outcome: Stand up, look in direction of travel, balance, don't do anything else just ride. Slide

- approximately 10' - 12' to a natural stop in a run out zone.
- 45 seconds;** We pushed Brian up the slight incline turned the nose of the board downhill paused for moment, quick review: Stay in a tall yet slightly flexed stance, turn head to look in direction of travel, deep breath, relax and go. Instructor's focus was to not let him fall. Brian rode about 13 feet to a natural stop, with one minor save and with a combined look of horror, anticipation, and relief. Brian's position was toward the tail of his board. His instructor suggested to increase flexion in his lead leg to help move his weight forward.
- 30 seconds;** Repeat straight run, better balance all ok. Go again? Yes! Big smile this time.
- 30 seconds;** Break, discussion: Fun? Yes. Scared? Yes. Beautiful day? Yes. Breath, ok lets go.
- 30 seconds;** Repeat of previous steps except starting point 2' higher up than original start. This time, a slight bobble, but Brian rode approximately 15' to 16' with a grin from ear to ear.
- 30 seconds;** Repeat from high start. Total success. Hey you want to try switch? Sure. Back to the original lower start. A few seconds longer to set up with weak side forward and processing of a new direction. No fall, but right shoulder dipped, causing twisting and imbalance.
- 45seconds;** Repeat with better results but a lot more effort. Let's go back to regular. Do you want to try something new? Sure.
- 5 minutes;** Take a break, pulled up his wheel chair and let him sit down and rest while still rigged up.
- 60 seconds;** Brief explanation, same as before (regular), but this time look over left shoulder approximately 25 feet to 30 feet and gently pull front of horizontal bar with left hand as you start moving. Brian had a good soft touch and performed quite well. At the bottom of the hill we showed Brian how the board had deflected about 3 feet to 4 feet in about 12 feet of travel. Nice heel side turn dude!
- 30 seconds;** Repeat as before with about '2 more ounces' of pressure applied to the pull and focus on balancing a little more over the heel side edge. Brian had an excellent run with 4

to 5 feet of deflection in 11 feet. Do you want to try a couple of toe-side turns? Yes.

60 seconds; Brief explanation. This time when you start moving gently press or push the bar away from you while balancing more over your toe-side edge. 2 feet of deflection in 12 feet of travel. Good.

30 seconds; One more toe-side turn. This time was much smoother 3' of deflection in 12 feet of travel. Only problem now is Brian's face is cramping from smiling too much. Brian's legs were getting tired but had enough for one or two more runs.

60 seconds; Linked turns. Brief explanation, start with heel side turn and as soon as you begin moving, go to neutral, then to toe side. At bottom we quickly got Brian's chair as his legs were giving out. Once in the chair we looked at Brian's last run: 1' of deflection on heel side and 2' of deflection on toe side. In summary, Brian made 2 flat runs, 4 straight runs, 2 switch runs, 2 heel side turns, 2 toe-side turns, and 1 linked turn.

This was Brian's beginning morning session. Exhausted he went to lunch beaming with success.

After lunch, we brought out a BI-Unique Bi-ski and showed him the similarities between carving a snowboard and carving the two short, shaped skis under this sit-down apparatus. Because of Brian's overall weakness and exhaustion from the morning session, he was not yet able to fully balance with hand-held outriggers. The initial introductory set-up was a tethered, fixed outrigger setup, with a single hand-held outrigger in his left hand. Fixed riggers gave him lateral stability while he became familiar with the hand held rigger. Brian was excited and liked this option because he didn't have to work as hard. It allowed him to cruise more of the mountain at a higher rate of speed. We had Brian sit in the bi-ski and fit him with a hand-held outrigger for his left hand. The outrigger would allow him to take a more active role in balancing and turning. We also attached the fixed outriggers, since his right hand was not strong or coordinated enough to hold an outrigger. Brian's stamina would not yet allow him to be outside more than 1 to 1.5 hours, so we worked inside on balance drills and the movements needed while sitting in the equipment. Once we moved

outside, we skipped the flat land drills and went up the chairlift (full instructor assist for the load and unload) to a wide-open green trail.

Brian was a pretty accomplished rider before his accident, and it took him only one run with a full seat assist to figure out basic balance and weight shift for turning. His center of mass in the Bi-Unique was low to the snow that he was able to balance by using his body and occasionally his left outrigger. He was able to engage the outrigger brakes, but preferred to carve it up, using turns to control his speed. As a safety measure, we kept the tethers with a safety strap on his bi-ski during all his runs, since the fixed outriggers prevented him from falling over and stopping, even if he wanted to.

In summary (stand-up/ sit-down) in his first attempt, he didn't go very far but he accomplished a lot. He rode standing up, when he first wasn't sure he would ever snowboard again. He left hopeful, encouraged and determined. He ended up coming back several times that year, following the established pattern, with progressive results. By springtime he was able to do two full laps while using the rider bar (assisted), on the beginner run with a break

The following year Brian came back stronger than ever and he could now stand approximately forty-five minutes to an hour without a break. He was always assisted while using the rider bar; he began to ask if he could ever be independent. We explained the single outrigger technique with the rigger in the lead hand (while riding in a regular stance, with his left hand). Using an outrigger in the lead hand while his right hand is on the rider bar, could lead to Brian's riding independently. To promote an easier and more natural hand position, a hole was drilled in the lower outrigger at a 45-degree angle to the existing holes. This turned the outrigger ski 45 degrees from the outrigger handle. Brian loved this, making it easier to use the outrigger while snowboarding.

We introduced the outrigger progression by showing him how to gently let go of the rider bar with his left hand and use it to point in the direction of the turn. After a lot of mileage and being comfortable with that, we gave him an outrigger to play with using a crossover (outrigger in front) method. The long-term goal of this progression might be to ride independently with use of the Rider Bar and single outrigger. An extended progression from this point might include a transition to a double outrigger technique without the Rider Bar. This would require increased functional core and shoul-

der strength thus permitting outrigger stability.

On his return visits he was also able to use a hand-held outrigger on his right hand, as long as it was secured with Velcro to his wrist and forearm. We introduced Brian to a specific technique referred to as 'drop and block'. The primary difference or variance from the standard outrigger set-up is the "shorter outrigger." Shorter outriggers are used as a technique for mono and bi-ski participants who may have either diminished upper body strength or severe balance issues. Outriggers may increase in length as needed with skill development, if desired.

Soon after Brian was comfortable using hand-held outriggers in both hands, we got rid of the fixed outriggers. When Brian's turns had speed control he graduated to riding off tether. We showed his family how they could assist him with chairlift loads, when his arms got tired, and seat assists across flat terrain, in order for him to become more independent riding in the bi-ski. For Brian, that was a great way to get back on the mountain, even though his body never fully recovered from his spinal cord injury.

Rider Scenario #4 (Structural and Anatomical Impairment)

Carin is a nineteen year-old with an AK amputation. She skis on one ski and two outriggers (three tracking) and has been racing successfully for two years. Carin came in during an ASB clinic and was wondering what was happening. "I wish I could snowboard!" She was asked, "Why don't you?" Carin replied, "Because I'm an AK, and I didn't think AK's could ride." She was told that she could. She then examined the padded and angled rebar setup that would brace and stabilize her flexed prosthesis.

Carin was a racer with a high level of athletic ability, full knowledge of skiing and edge control, and the ability to utilize outriggers. Because of this, the introduction of riggers and usage was leapfrogged. We substituted Cairn's race outriggers with outriggers that had brakes for stabilizing purposes, so she had a platform to catch herself for balance or to push off of for realignment.

The rebar setup was ace bandaged onto the prosthetic leg. While flexing this leg, the rebar slipped forward so it was realigned and duct tape was used to hold it into place.

Once outside, we started in an area with a small incline and run-out zone. Starting with stance and body alignment while looking ahead, Carin glid-

ed for twenty feet and came to a natural stop. Everyone was cheering. On the same run out, we added looking over the shoulder with balance over the heel-side edge resulting in a slight heel-side turn. Then we added balance over the toe-side edge producing a great toe-side turn. Her knowledge of skiing was transferred to the snowboard.

SSince the next step up in lift-served terrain was a long run that started with a blue pitch, leapfrogging through the basic snowboard progression was necessary. At the top of the lift, we set the brakes up for stability and explained the next step. For the blue slope (about 100 yards), we did four heel-side falling leaf traverses with the outriggers in the crutch position. Next she spun around to the toe side with a brief explanation, description and demo. She did four toe-side falling leaf traverses. She had no falls as of this point.

By then we were down to steeper green terrain. After a brief explanation and demo, Carin did a heel-side turn to a stop followed by a series of garlands. We turned the opposite direction. After another explanation and demo, she made a toe-side turn to a stop followed by another four garlands. As the terrain had eased to an easy green, Carin was able to accomplish a heel - neutral - toe linked turn after an explanation and demo.

Exhilarated, full of excitement, and breathless, Carin took a breather before heading to the bottom of the hill, approximately, 200 yards. She took off and linked about 20 turns in the last 100 yards. The instructor only needed to make an occasional fine-tuning comment, as Carin explored and experimented with outriggers and board usage. At one point, Carin got her weight too far over the nose of the board, over-rotated, and did a slow spin-out to an easy fall (first fall). She was laughing while getting up. We had a small refinement discussion about having quiet upper body and riding centered and balanced between her feet. She was off again, making gleeful linked turns all the way down to the lift, including down the last steep pitch. The elapsed time for the mile-long run was 50 minutes.

In jubilation (and every other elated descriptor you can imagine), the first words out of her mouth were "Can we go again?"

Carin made two more runs, 35 minutes each. She used her outriggers and rode independent of an instructor. Her total time out riding was 2 hours. Carin wanted more time, but the lifts were closed for the day. Her day ended on a high note - at the bottom, she proudly picked up her board,

walked over to her cheering friends, and said "I'm a snowboarder".

The following set-ups focus on students who have had amputations to one or both legs. In the past, stance was controversial for students with these disabilities. The conflicts led to many stance variations in which the prosthesis is either in the rear or lead position. The stance is individualized for students with disabilities just as it is individualized for able-bodied students. Consider comfort level and goals when setting up the stance. Valuable information can be drawn from these examples to use in corresponding situations.

Prosthesis on the Rear Leg

This stance allows a student to develop a technique for turning by weighting the front foot confidently. This set-up gives a student more flexion and extension abilities in the lead leg while allowing the student to steer the tip of the board actively through turns. Sometimes this stance hinders the student's ability to perform more advanced and complex moves if the ability for the prosthetic leg to flex is limited. Some students are able to use the prosthetic leg for skating. Many students with a single leg amputation prefer this stance.

Prosthesis on the Lead Leg

This stance positions the stronger leg in the back. It increases the student's ability to hop, push, or steer the rear of the board through turns. This stance may increase pressure on the forward residual limb. Once getting into turns, the participant can try to push the toes on the lead foot first and once in the turn push the toes of the rear foot. This creates a twist to the board, easing into the turns. This set-up may allow a student to skate more easily on flats.

Above-the-Knee Amputation

A student with an above-the-knee amputation (AK) may have more support when the prosthetic knee is braced in a slightly flexed position. Use heavy cardboard and duct tape, an Ace wrap, or Velcro to help hold the prosthesis in a flexed position. This will eliminate a full range of flexion, which can cause loss of control. Avoid locking a prosthetic knee into a straight position, which can be awkward, uncomfortable and limit function. With ace wrap, velcro or duct tape next to the prosthesis. Secure the brace set-up over the student's prosthesis to create a flexed position.

If the student's prosthetic knee cannot be locked into a flexed position, try one of the following: A leg brace, which has a built-in angle at the knee, can also be used to acquire a flexed position. Or, use a piece of steel rod (1/2 or 5/8 inch rebar, depending on student's size and weight) bent to the desired angle, approximately 10-15 degrees. Encase the steel rod in PVC tubing, heavily padded, and secured

A person who has an above-the-knee amputation is a good candidate to try the CADS system (see Adaptive Equipment). The CADS system may work without a brace yet provide the same results.

Bilateral Below-the-Knee Amputation

A student with bilateral (both legs) below-the-knee amputations (BK) found that riding without prostheses was easier than with them. This was



accomplished by putting the residual limbs into the snowboard boots (in place of feet). Ensure adequate padding is provided to fit and protect the limb. This set-up gave the student a better feel for the movement of the snowboard and improved balance. Hands can be used as a means of resistance to pivot the board.

Rider Scenario #5 (Combination of Impairments)

John, age 30, sustained a Traumatic Brain Injury in a car accident. He was left with right-side hemiplegia and difficulty articulating thoughts. John had not experienced snow sport activities before his accident. After the accident, he tried skiing for six years with little success. Before the injury, John had skate boarded and liked speed. John's dream was to snowboard.

Physically, John's left side was strong and he did weightlifting and body-building. His right leg was hypertonic, but could bear weight. Flexion, extension, and fine motor movements were diminished and movements were jerky. John relied on his left side to help maintain his balance.

John was not aware of the sequential steps that are necessary to accomplish snowboarding. He was determined, positive, aggressive, and independent in pursuing his dream. He is fearless and often unaware of the dangers of speed and impact. Through extensive groundwork helped John comprehend the process necessary to achieve his desired outcome. It has proven to be rewarding, although it has not been easy.

It took many tries to find a set-up that was comfortable and effective for John. The soft freestyle boots fit well and are not too difficult to walk in. The stance took even more experimentation. John's final stance position is at Plus 14 for his lead foot and Minus 4 for his rear foot, a 20-degree split.

Minimal time was spent on pushing, skating, and toe/heel side drills due to the weakness of John's right side. The first straight run was accomplished using a modified *dance position*. The instructor, on skis, rode parallel to John, and provided a stable support. Unfortunately, the initial terrain did not have a natural stopping point. After a few trials, the team received help to locate better terrain. A 'bowl shaped' terrain in the beginner area provided an excellent location for John to slide forward, then look in the reverse direction, and ride switch back to the original side with the assistance of the instructor. It allowed John to work on feeling balance and improving his toe and heel side moves. This is a good example of leapfrogging part of the progression while detailing other parts.

An outrigger was introduced on the second day since John was so eager to be independent. He refused to use the outrigger initially, but after his struggle and frequent falls, John decided to give the outrigger a try. John was instructed how to use the single outrigger with his left arm. John's turns were slow and had little shape. He could not control his speed. For safety, a tether was attached with a snowboard clamp, to assist John in initiating turns and maintain speed control.

John was ready to ride the chairlift after he gained basic balance, some directional change and speed control with the instructor's assistance. The lift was stopped on the first few chair lift rides to allow the student and instructor to develop a loading and unloading procedure. The chairlift brought the pair to a beginner slope that offered gentle terrain for turning and longer practice runs.

Tethering allowed turns to happen in slow motion as the instructor talked John through the turns. The instructor verbalized the heel release, going to a flat board (neutral), and moving to the toe edge. The timing created with each turn allowed the turns to be linked at a comfortable speed. Repetition enhanced learning without adding any new information that could cause confusion.

John's snowboarding is limited to a few days per year. Each meeting starts with a review of experiences from previous years. By the fifth year, John could ride independently on green terrain, with the use of one outrigger. He was making eight to twelve linked turns before he fell or needed to reassess his position. Tethering is still used in narrow, crowded, or steep situations. There have been only a few setbacks along the way and a better unloading technique is still needed. The Swivler offered great hope because it allows John to face forward on his board for walking in the lift line, loading the lift, and unloading.

In eight years John was at last able to load and unload the chair lift independently. In his ninth year, he was able to ride independently on all green and most blue terrain. John's newest goal is to get into race gates and decrease the amount of his outrigger use. He can currently lifting his outrigger off the snow for 8-10 linked turns. John's love of snowboarding has grown with his accomplishments. Tears of joy and a feeling that just cannot be expressed well up inside of us every time we see John riding independently out on the hill.

SUMMARY

People who have disabilities and have the dream to snowboard should be given the opportunity to turn their desire into reality. Instructors can assist their quests by being open minded, creative, and innovative. Many adaptive students have had instructors who went beyond what was available at the time and found unique solutions to their challenges.

Take on the challenge, share the love of snowboarding with all individuals, including those who have a disability and who have the dream to ride. Teach students as individuals, find their strengths, set goals together, and watch them grow, both on and off the snow. Once our students start sliding or return to the slopes, the courage to go beyond, to reach for other goals becomes even more alive.

Consider the information you have read here to be a step towards a search for knowledge. Read, but also put time and energy into teaching, becoming adept with adaptive equipment and riding. Experience speaks louder than words. Continue to train, ride with friends, learn from each other and attend educational clinics.



Let the riding begin and the dreams come true!

This is a sample of a student evaluation form. Some schools/programs obtain this information over the phone while taking a reservation for the student. Adapt accordingly!

Student Evaluation Form

Student Name: _____

Type of Disability: _____

Date of Injury: _____

Unique Needs: _____

Medications Taken: _____

Do you have any of the following, if so give date: _____

Shunt Yes No Harrington Rod Yes No Fused Joints Yes No

Sores or blisters Yes No

If yes, give location: _____

History of Seizures: Yes No

Date of last Seizure: _____

Describe Type of Seizure: Absence _____ Tonic/Colonic _____

Details (Aura etc.): _____

Method of Mobility: Walks Unaided: _____ Gait: _____

Walks with Aid(s): _____ Type of Aid(s): _____

Uses Wheelchair (type): _____ Always / Sometimes: _____

Independent in using wheelchair or has someone pushing it (circle one)

Snowboarding / Other Sport Experiences:

How many times have you snowboarded or skied? _____

Before: _____ After disability: _____

How would you rate your snowboarding now? Beg Inter Adv

What goals or expectations do you have? _____

What other sports have you participated in? _____

Since your injury? _____

General Conditioning and Strength:

How long can you remain active, length of endurance? _____

Do you need frequent rest breaks? Yes No If yes, how frequent? _____

How would you describe your strength? Strong Average Weak

Is one side of your body stronger than the other? Yes No If yes, explain: _____

When you are active do you have any pressure sores/blisters? _____ If yes, where? _____

Communication and Behavioral Needs

Do you have difficulty speaking or communicating? Yes No

Do others have difficulty understanding you? Yes No

Do you have difficulty in remembering new things? Yes No

Do you have difficulty in learning new things? Yes No

Are you hard of hearing? Yes No

Do you wear a hearing aid? Yes No

Do you use any of the following? lip read finger spell sign language

Any Behavioral Needs? Yes No

If yes, explain: _____

Instructor Note

Keeping Instructor notes helps you or another instructor either remember or discover, whether it's in the same year or a year or two later, what the plan was, what was worked on and what to start with the next time. Each program should have some form of documentation for the lesson. Some programs may have one page or it may be a few pages. Depending on the program, the notes can be written daily or a summary for multiple days that are consistent.

Instructor Notes

Student Name: _____

Instructor: _____

Date(s): _____

Student's Disability: _____

Student's Goals: _____ Parents Goals: _____

Medications Taken: _____

Behavioral Needs: _____

Snowboard settings: Regular or Goofie Stance angels/ width: _____

Adaptive Equipment Used? Yes No

If yes, please describe: _____

Was a Helmet worn? Yes No

Length of snowboarding time? 1-2 hours Half Day Full Day (circle one)

How was the activity tolerated? Excellent Good Fair Poor

Were breaks needed? Yes No

If yes, describe: _____

Attitude Adjustments needed? Yes No

If yes, describe: _____

Level of Rider: _____

Location on Mountain Snowboarded: _____

Lesson Progression: _____

GLOSSARY

Ankle-Foot Orthotic (AFO) - A device that supports the foot and ankle.

Aphasia - An inability to understand or use words and their meanings.

- * Receptive aphasia refers to the inability to understand words.

- * Expressive aphasia is the inability to formulate words into thoughts.

Atlantoaxial Instability - Instability of the top two vertebrae (C1-2) of the neck, this condition can be seen in conjunction with Down's syndrome. Ligaments tend to be lax and muscle tone often low, giving one vertebra the potential to move to a greater extent on its neighbor. Individuals with this syndrome are more prone to injury if they participate in activities, which over-extend or flex the neck.

Aura - A premonition of an approaching seizure. The awareness can be psychic in nature or sensory with olfactory, visual, auditory, or taste indicators. An epileptic aura may precede the seizure by several hours or only by a few seconds.

Autonomic Dysreflexia - Potentially life-threatening hypertensive (an increase in blood pressure) occurrence produced by the body's inability to sense and react to specific stimuli. It can occur in people with spinal cord injuries above thoracic level 6 (T6). Symptoms include a feeling of impending doom, flushing of the skin, sweating, blurred vision, severe headache, and/or a sudden change in the ability to comprehend or communicate. This is a life-threatening occurrence and should be treated as an emergency.

Bi-Ski - A piece of adaptive, sit-down equipment, on two short skis, which are shaped similar to a snowboard that was cut in half. It has an articulating device connecting the skis to the seat, and which assists with turning. A Bi-ski can be used with hand-held or fixed outriggers, or a handle-bar as needed.

Body Alignment - Includes a tall slightly flexed stance, with flexed ankles, knees and hips, weight centered over the turning edge and shoulders parallel with the board/terrain.

CHARGE Syndrome - The acronym, CHARGE, is derived from the first letter of the names of common symptoms that are related to a specific set of birth defects. "C"=Coloboma, abnormalities with the retina or optic nerve. "C"=Cranial nerve abnormalities. "H"=Heart malformations. "A" is for atresia of the choanae (blockage of the passage from the back of the nose to the throat). "R"=Retardation of growth and/or development. "G"=Genital and/or urinary abnormalities. "E"=Ear abnormalities and hearing loss. To be diagnosed with CHARGE syndrome, one must have 5 of 7 disabilities listed. www.chargesyndrome.org

Closed-Ended Sentence - A question that can be answered with a yes or no response.

Cognitive Ability - Capacity to gain knowledge through awareness, perception, intuition, judgement, and reasoning.

Contract - An agreement between the student and instructor for doing or not doing something specified. May include, but not limited to these; schedule for riding and/or for the day, rewards and how these are earned, time outs and what behavior trigger the need, breaks and lunch times, behavior to be avoided.

Detailing - Providing additional information to develop a specific part of a progression further. Some students may also need to repeat certain tasks or spend more time on specific skills.

Dance Position - A teaching technique where an instructor and student face each other and hold hands to provide support for the student. The instructor can be uphill or downhill of the student, and they can go into the turn together.

Evaluation Form - A form which is initiated with contact, either over the phone or in person, and completed once the instructor assesses the student. Some of the information may need to be obtained from the parent or caregiver.

Fakie - Riding with what is normally the back foot as the lead foot. Also known as Switch.

Flaccid - Relaxed, flabby, have poor or a lack of muscle tone (see Hypotonic).

Float-Across Center - Allows the center of mass to move across the center of the board before edge engages. The edge engagement is delayed with this application.

Ghost Riding - When a student or instructors is riding, with the rider bar set-up, without a person in the set-up. This can help the student's independence, while working on specific skills or turns. An instructor could be using this set-up for the same reason or is increasing his confidence/experience in working with rider bar.

Grounding - A feeling of stable connection to the snow/ground.

Hand Picks/Paddle - A hand-held object, which is used for another point of contact in the snow, creating resistance, while sit-down riding. Prevents direct friction on the gloves/hands of the rider

Hemiplegia - Paralysis of one side of the body.

Hypertonic - Muscles remain stiff and tight and are not relaxed.

Hypotonic - Low to lacking of any muscle tone. (see Flaccid)

Instructor Assisted - The use of any piece of adaptive equipment that requires the assistance of the instructor. The student would not use this equipment alone.

Instructor Lesson Form - A form on which the instructor writes down notes about how the lesson progressed. It is a good place to record special equipment needs, behavioral needs, and the progression used.

Leapfrogging - Omitting or skipping over steps of a progression.

Knee Strap - A device that distributes the weight of the snowboard and pull of gravity onto the knee while riding a chair lift. Attaches to each binding, up and over the knee, preventing undue pressure on a weak, injured leg and prevents the prosthesis from being pulled off.

Mono-ski - One ski or board under the rider.

- * **Alpine-Mono-board** - A wide platform with two bindings set up facing the tip of the ski. The rider stands while riding, utilizing two ski poles

- * **Adaptive** - One ski under a sit-ski rig where the skier sits down to ski, utilizing two outriggers for snow contact, which aid in a pivot point and balancing.

Nollie - A maneuver (trick) used to get the snowboard off the ground by springing off the tip of the board.

Ollie - A maneuver (trick) used to get the snowboard off the ground by springing off the tail of the snowboard

Open-Ended Sentence - Asking a question in which the response is unlimited.

Pressure Point - Where pressure and/or friction create a reddened area of skin. It may occur on the ankle, foot, or any part of the body where equipment or clothing rubs.

Profile - A group of disabilities that are categorized together because each disability requires similar teaching methods. There are six different profiles in this guide: Visual Impairment, Auditory Impairment, Cognitive Impairment, Neurological Impairment, Structural and Anatomical Impairments, and a Combination of Impairments.

Prosthesis - An artificial device that replaces a missing limb or part of a limb.

Residual Limb - The part of an extremity that remains intact.

Safety Line - A loop made in the tether line that goes around the instructor's wrist, or a separate loop that ties into the tether and then around the instructor's wrist. This is a safety measure to prevent a "runaway student."

Schedule - A direction of activities for the day, either in picture form or written out. Example: 1) getting gear 2) putting gear on 3) going outside 4) taking 3 runs or chair lift rides 5) going in for a break 6) going back outside 7) making 3 more runs 8) going to lunch 9) taking a bathroom break 10) going outside, etc.

Sequence Directions - Ability to follow directions in a 1-2-3-step fashion.

Seat Assist - An adaptive tethering technique that is used while teaching any sit down equipment. The instructor holds onto the seat of the equipment to assist with turns, speed control, and stopping.

Shredder Plate - A float-across center mono-ski-snowboard interface system.

Slam-Free Teaching - Teaching in a manner to prevent hard falls, primary by the use of adaptive equipment or assists. Instructors must be aware of safety concerns including the disability, fatigue levels, terrain, snow conditions, and skill progressions so that their students are less likely to take hard falls.

Slider - An 'A' frame piece of alpine adaptive equipment similar to the rider bar. It gives the skier continuous moving support while skiing standing up. Utilized for those with weak muscle tone, severe balance problems and inability to stand up for long periods or by themselves.

Stance Angle - The measurement, in degrees, of the placement of each binding on the snowboard; a stance angle of 0 degrees describes facing the board edge, while a stance angle of 90 degrees describes facing the tip (+90 degrees) or tail (-90 degrees). A typical stand angle might be +8 front foot and -6 rear foot.

Student Independent - Refers to any adaptive equipment that the student uses without assistance after receiving instruction.

Swing Weight - The location of the primary weight either close to or farther from the center of rotation, affects the timing. Example: An ice skater, spins faster while their

arm's are pulled in tight to their body or they will spin slower while their arm's are stretched outward.

Switch - Riding with what is normally the back foot as the lead foot or non preferred direction. Also know as Fakie.

Tethering - A looped connection between the instructor who is holding the tether line and the student. Ideally, the line is connected to the snowboard. The tether usually consists of a one-inch wide webbing. The length is approximately 20-28 feet long.

- * **Synchronized (Uphill)** - The instructor remains uphill of the student and turns at the same time.

- * **Tracking** - The instructor, follows the student's path.

Tethering Clamp - A 'C' shaped device, which has loops to connect a tether to. The clamp is attached to the tip of the snowboard with out damaging the board.

Visual Acuity - Clarity, sharpness of vision.

Visual Field - The total area in which objects can be seen while looking forward.

FURTHER READING

AASI Snowboard Manual

Describes effective methods to learn, teach, and coach snowboarding. 1998. 6 x 9 inch. 136 pages. American Association of Snowboard Instructors www.psia.org

Adaptive Educational Materials, PSIA Rocky Mountain

The Adaptive Educational Materials are in PDF format and can be downloaded from the PSIA-RM web site and/or sent to an instructor who has registered for an adaptive exam prep clinic or an adaptive exam. www.psia-rm.org, click on Ed Materials, Adaptive

Adaptive Educational Workbook and Exam Guide

Professional Ski Instructors of America East/Educational Foundation
Online, Revised 2005 www.psia-e.org, (518) 452-6095

Adaptive Snowsports Instruction Manual

A comprehensive resource for alpine, snowboard, and nordic adaptive instruction. A reference for physical, cognitive, and developmental disabilities. 2003. 108 pages. Professional Ski Instructors of America www.psia.org, (303) 987-9390

Bold Tracks: Teaching Adaptive Skiing (3rd Ed.)

Author, Hal O'Leary with the National Sports Center for the Disabled
Skiing for the visually and hearing impaired and the physically and developmentally disabled. 1994. 156 pages. www.johnsonbooks.com

Children's Instruction Handbook: Alpine Skiing and Snowboarding

A portable handbook and on-hill tool for providing creative, fun, and effective lessons. 2000. 4 x 6 inch, 84 pages. Professional Ski Instructors of America/American Association of Snowboard Instructors www.psia.org, (303) 987-9390

Children's Ski and Snowboard Movement Guide

This small waterproof booklet is chock full of simple descriptions and images to demystify children's movement patterns. 2005. 3 1/2 x 4 1/2 inches. 28 pages. American Association of Snowboard Instructors www.psia.org, (303) 987-9390

Core Concepts for Snowsports Instructors

Professional Ski Instructors of America/American Association of Snowboard Instructors
www.psia.org, (303) 987-9390

Disability Etiquette

Protocol and manners to follow when working with individuals with disabilities.
Eastern Paralyzed Veterans Association
Email: publications@epva.org 800-444-0120

Fitness Programming and Physical Disability

Provides information to develop and conduct exercise programs for groups that include people with physical disabilities. Human Kinetics 1995, A publication for Disabled Sports USA www.ihrsa.humankinetics.com, click on Special Populations
www.ihrsa.humankinetics.com

Guest Centered Teaching Workbook

www.psia-rm.org, (970)879-8335

Internet Web Sites

Search specific disabilities. Use reliable sources.

Local Pharmacy

Obtain a "patient education sheet" for specific medications for basic information.

Nobody Nowhere

Author, Donna Williams Written by a person who has autism.
www.nobodynowhere.com

Nursing Drug Handbook

Query the web for the current Nursing Drug Handbook to find basic information on medication use and side effects.

Pain Free

Author, Pete Egoscue www.egoscue.com, click Education, Click Pain Free Books

Park and Pipe Instructor's Guide

Terrain, etiquette, class management, skills and tricks, designed for all snowsports, extensive glossary. 2005. 6"x 9", 158 pg Professional Ski Instructors of America / American Association of Snowboard Instructors www.psia.org, (303) 987-9390

Snowboard Movement Analysis

Pocket book size, recognizes, understand and apply the elements of MA related to snowboarding. 2003. 3" x 6", 146 pg. American Association of Snowboard Instructors
www.psia.org, (303) 987-9390

Taber's Cyclopedic Medical Dictionary

Venes, Donald et al Medical dictionary, information on medical terminology and disability information. 2001 Query the web to purchase

The Curious Incident of the Dog in the Night-time

Author Mark Haddon Christopher's quest to investigate the suspicious death of a neighborhood dog. Christopher knows all the countries of the world and their capitals, every prime number up to 7,057 ...a must read, one chapter at a time, has you seeing it from a different outlook. First vintage 2002

The Pro Rider

Professional Snowboarding Magazine, Specific articles: Winter 2001 Delvin-Young, Christopher, pg 38-40, Mono-ski Adapted for those with Desire to Shred

Winter 2002 Fox, Beth, pg 40-44, 58, Ripping it Up Adaptive Style

Winter 2003 Peters, Tony, pg 41-44, New Adventure awaits blind Snow Sports enthusiasts

Winter 2006 Kuemmerle, Brent, pg42-44, Turn loss into Victory: get amputees in on the action

American Association of Snowboard Instructors www.psia.org, (303) 987-9390

Vail-Beaver Creek Children's Snowboard Teaching Handbook

Pocket handbook that provides snowboard progressions, games, common difficulties/solutions and skill blending for students age 7-15 years. 4 3/4 x 6 1/4 inches. 246 pages. 2006 AASI www.psia.org, (303) 987-9390

Vail-Beaver Creek Snowboard Teaching Handbook, 2nd edition

Resource handbook to expand teaching options. Travels easily on the hill. Includes progressions, common difficulties with possible solutions, skill blending. 4 3/4 x 6 1/4 inches. 207 pages. 2006 AASI www.psia.org, (303) 987-9390

ADAPTIVE EQUIPMENT SUPPLIERS & EVENTS

Adaptive Action Sports

Lucas Grossi www.originalgimp.org

This is an organization that creates/promotes opportunities for individuals with permanent physical disabilities. They offer riding freestyle and race camps.

CADS

Walter Dandy (970) 949-4533, (970) 845-8673 Fax Vail, CO

National Disabled American Veterans (DAV) Winter Sports Festival

Grand Junction VA Medical Center, 212 North Ave, Grand Junction, CO 81501

They prefer at least a level 1 certification in adaptive to work in the program.

Rider Bar, SB Tether Clamp, knee strap & Shredder plate

Andy & Lynn Tirums www.freedomfactory.org (931) 520-4898, (931) 520-4864 Fax

Ski-Pal

Stephen Falter info@ski-pal.com www.ski-pal.com (585) 281-2223

Sno-Wing

Jonny Boy Ent. Inc. www.sno-wing.com, (909) 989-7199

Swivler

Rick White www.swivler.com, 866-Swivler (794-8537), (360) 225-7482 Fax Woodland, WA

Tandem Board, Outriggers, and more

Paul Speight, Sports 'n Spokes www.spokesnmotion.com, (303) 922-0605, (303) 265-9685 Fax Denver, CO

The Hartford Ski Spectacular by DSUSA

451 Hungerford Drive Suite 100, Rockville, MD 20850 (301) 217-0960



PHOTO CREDITS

Adaptive Action Sports www.adacs.org 702-683-6218

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