The Professional Ski Instructors of America
American Association of Snowboard Instructors
Eastern Division

Adaptive
Study Guide

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PSIA/AASI EASTERN DIVISION

Adaptive Study Guide Intro

The Adaptive Study Guide is a reference aid to Snowsports Teaching Professionals and Adaptive Volunteers. The Guide provides information about the Adaptive Disciplines, Common Disabilities, Medications, Gaits, Behavior Management, Adaptive Equipment and Recommended Reading List.

It should be noted that some of the material presented in each section may be dated and refer to concepts we no longer use. However this material is still beneficial and has valuable information in preparing for a certification exam.

For information on the exam process and the National Certification Standards, please refer to the Adaptive Exam Guide. Best wishes pursuing your goals and kudos for accelerating your professional development.

PSIA-E Vision and Mission Statement:
PSIA-E Vision Statement: PSIA-E works to inspire life-long passion for snowsports.

PSIA-E Mission Statement: To provide professional development opportunities that continuously improve member fulfillment and guest satisfaction in order to strengthen the snowsports industry.

PSIA-E/AASI
ADAPTIVE STUDY GUIDE

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INTRODUCTION

It is only through determination, dedication and experience that one can gather enough knowledge of disabilities to learn what is necessary to competently teach adaptive snowsports. Specific resources concerning adaptive snowsports teaching are limited, scattered, and virtually unknown. Except for a few college texts, a basic overview of major disabilities is not available. Most of the time, it is necessary to wade through technical/medical disability texts to obtain even a general understanding. Only then can this hard-to-come-by knowledge be applied to snowsports teaching and skill development.

To independently assemble all of the written materials needed to become an adaptive snowsports teacher is not feasible. The sheer volume of materials needed and keeping that medical information updated and timely is prohibitive. This guide is meant to provide an overview of information and resources to assist our members in their pursuit of knowledge.

This Adaptive Study Guide is designed to provide the most elementary, introductory information plus specific recommendations for further research materials. This guide provides:

* Information on commonly found disabilities and their effects on skill performance
* Definitions of adaptive equipment
* Information on commonly found medications and their side effects

In addition, this guide provides information and references about the American Ski Teaching System (ATS), skill development, necessary modifications, and Adaptive Certification Exam information. We also provide information and references about the Snowboard Teaching System (STS), skill development, necessary modifications and Adaptive Certification Exam information.

We emphasize that this guide is only a framework on which to begin building knowledge of Adaptive Snowsports Teaching. The recommended reading list is the next step and then, individual exploration of specific disabilities/adaptive snowsports categories is encouraged. The last page of this manual is only the beginning!

Many have contributed greatly to this guide. The Eastern Adaptive Board of Examiners has contributed its time, energies, efforts and expertise to offer the most comprehensive Adaptive Snowsports Teaching educational programs available. Each member has, either in person or through written materials, contributed to the contents of this manual. A special acknowledgment and thank you must go to Gwen Allard for spearheading the creation of this guide and her involvement in adaptive snowsports in the east since its inception.

A special welcome as you begin your exploration of the world of Adaptive Snowsports Teaching. Each student, with his or her individual disabilities, brings a special challenge for you to design a student-specific lesson to best meet their needs. You will discover new meanings for the term “student-centered” and “outcome-based”. An exciting, challenging chapter of your ski teaching career awaits you in the pages ahead. Welcome!

Kathy Chandler
PSIA-E/AASI Adaptive Coordinator

EVALUATING YOUR KNOWLEDGE - PREPARING FOR CERTIFICATION

Acquiring skills and knowledge are often accomplished in many different ways such as: observing, experiencing, researching/investigating, and discovering. We purposely expose ourselves to many different situations and environments to become better prepared to "perform". For example, when many finish high school, they then go to college. When we obtain a bachelor's degree, we may seek a MA or Ph.D. Then we climb the corporate ladder. When, finally, retirement comes, pleasurable adventures expand our knowledge in a variety of interest areas. Both academic and physical development is a never ending process keeping us motivated, plus mentally and physically fit!

As we develop our knowledge and skill base, we typically focus our attention on either developing our minds (academic studies) OR our bodies (physical development and endurance). We are accustomed to having our progress monitored so we can ensure successful completion of our particular task. Developing ourselves in one area at a time enables us to rely upon the solid foundation already established in other areas. For example, if we know we excel in sports we are better able to accept our weak mathematical or language skills. Seldom do we simultaneously monitor or evaluate both our mental and physical abilities at the same time, except... when you take a professional ski teaching exam! Awareness of what it encompasses will greatly assist you in preparing for this educational experience.

Adaptive snowsports teaching is technical snowsports knowledge plus more! Alpine- and snowboard-based principles and information are the foundation from which you will expand your knowledge. Adaptive snowsports teaching focuses on skill development, regardless of where the movement originates. This takes creativity, skill and experience. The required technical information, professional knowledge, PSIA/AASI National Standards for certification, and exam processes all parallel the Alpine and Snowboard sectors. /ASSI National Certification Standards are available online (refer to the *Adaptive Exam Guide* for information about the National Standards.

In addition to all the knowledge, professional components and physical requirements of the Alpine and Snowboard certification exams, the Adaptive exams include knowledge relative to common disabilities, their causes and effects upon the cognitive processing and voluntary motor movement, medications and their side effects, plus adaptive equipment.

Unlike the Alpine and Snowboard educational systems, the Adaptive sector is still developing its reference manual and materials. You will need to research, and then assimilate your findings to develop a comprehensive understanding of adaptive snowsports teaching. This guide can only assist you in this search; it will not provide all of the answers. Disabilities-related information may be found in college texts, medical journals, publications, pamphlets, association materials, legal documents (i.e. The Americans with Disabilities Act), or via online researh. One example of required knowledge is the five titles of the ADA, which are: Title I - Equal Employment Opportunities, Title II - Public Services (state and local government including public school districts and public transportation), Title III - Public Accommodations and Services operated by private entities, Title IV - Access to Telecommunications, and Title V - Miscellaneous Provisions (this title addresses such issues as the ADA's relationship to other laws).

Participation at an Adaptive educational event will assist in your adaptive educational development. The adaptive examiners and clinicians are a ready resource for you; as are other professionals within the disabled sports field. Involvement with adaptive sports groups such as Disabled Sports USA, Special Olympics or community-based groups can provide a "hands-on" experience. As you pursue the development of adaptive snowsports teaching skills, remember to

encompass both the academic and physical components. Monitor your development, reinforce areas of weakness, and when ready, participate in an adaptive snowsports teaching exam.

PSIA/AASI TEACHING MODEL

The Teaching Model is a pillar of PSIA/AASI's educational systems which encourages instructors to create a learning partnership with their students. The **Learning Partnership** is the combination of *Student Profile* (discovering the student's characteristics, background, learning styles, motivations, beliefs, attitudes, values and physical capabilities) plus *Instructor Behavior* (using the Teaching Cycle).

There are some minor terminology differences between the Alpine and Snowboard teaching cycles but the instructor's actions are similar. AASI breaks the teaching cycle into three (3) parts of the lesson - Introduction, Body and Conclusion. The steps within the three parts are very similar. To further complicate matters due to our clientele, the Adaptive Teaching Cycle has a few modifications. The adaptive changes reflect the need to conduct a thorough evaluation or assessment of the student's disability and abilities.

This Teaching Cycle is an amalgamation of the cycles from each of the disciplines. The Teaching Cycle documents the various aspects of the instructor's behavior before, during and after the lesson. *The instructor should…*

LESSON INTRODUCTION

"The goal of the introduction is to develop a learning pathway for each student." (AASI *Snowboard Manual*, 1998)

- *Develop trust and rapport.* Create a supportive environment with the adaptive student.
- *Student Assessment.* Assess or evaluate the student's motivation, athleticism, physical conditioning and their movements (movement analysis). The purpose of the assessment is to see and understand the student's skills and capabilities. For the adaptive student, do a thorough evaluation of the adaptive student's disability (including strength, coordination, cognitive ability, adaptive equipment, medications, potential medical problems, and other sports or physical activities).
- *Goals.* Help determine goals based on the student's potential, disabilities and expectations. Effective goals should be specific, measurable and achievable.
- *Action Plan.* Plan the student's experiences and how the student can achieve his or her goals. For an adaptive student,
    - Select and fit appropriate adaptive equipment.
    - Select appropriate terrain and consider the current snow conditions.
    - Present a logical progression of the adaptive technique specific to the student's needs.
    - Determine the pacing of information and practice based upon the student assessment.

LESSON BODY

"The goal of the body of the lesson is to ride (and ski)." This is the time to implement the action plan. The Pattern of Teaching is teaching others to ride or ski through a combination of explanation, demonstration, practice, and feedback.

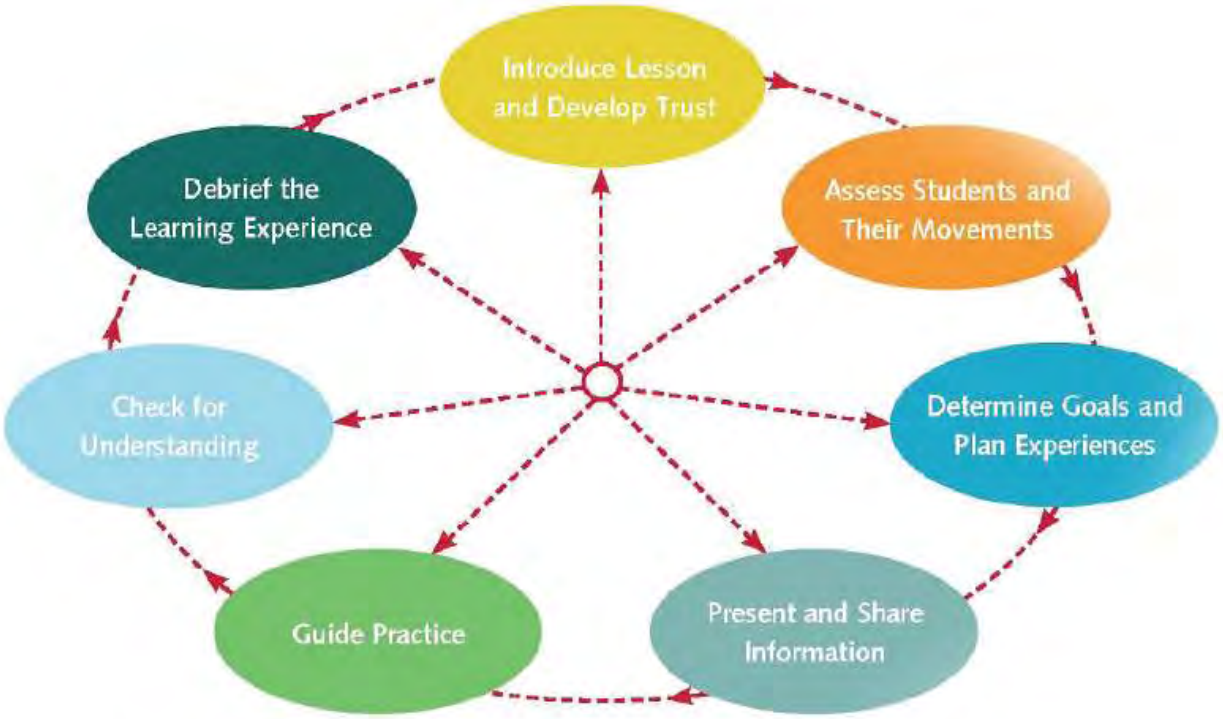
- *Explanation.* Present the information clearly and simply of the type of movement you want the student to make. Recognize the student's learning styles and preferences so you can teach in the appropriate teaching style for that student and disability.

- *Demonstrations.* Use a demonstration of the type of movement wanted (visual explanation). Demonstrate from a variety of angles (front, side, or back) and focus the student's attention on specific elements, area, and/or movements.
- *Guide Practice.* The student needs the opportunity to apply and reapply the information and movement he or she has acquired. Use the various teaching styles to facilitate practice. Use the appropriate guiding, tethering, and hands-on assistance, feedback, as necessary for adaptive technique.
- *Check for Understanding and Provide Feedback.* Make sure the student understands the task or movement you are seeking. Check for understanding based upon how the student is performing (visual) and/or ask the student to restate the task and desired movement. *Feedback* is vital and enhances practice time and speeds learning. There are various types of feedback but it should always be objective and constructive.

LESSON CONCLUSION

The conclusion is very important as an opportunity to review the day, lessons, experiences and successes and to encourage the student to return for another lesson.

- *Debrief the Learning Experience.*
  - Review what was covered in the lesson.
  - Relate the lesson content to the original goals and action plan.
  - Establish independent practice guidelines (or focus) for each student.
  - Discuss the next step in development. Encourage to return for another lesson



The Teaching Cycle courtesy of ASEA and taken from the Alpine Technical Manual, 2nd Edition

ADAPTIVE STUDENT EVALUATION

The Adaptive Student Evaluation is an extension of the Student Profile portion of the Learning Partnership. During the student assessment, discover your student's:

- Characteristics and background;
- Learning styles and preferences;
- Motivations, understandings, and desires;
- Emotional state;
- Beliefs, attitudes, and values; and
- Physical conditioning and health

For the adaptive student extend the assessment process to include the student's disabilities and capabilities.

I. MEDICAL INFORMATION
   * General physical condition
   * Fitness level
   * Medications
   * Extent and effect(s) of disability
   * Mental/Emotional/Learning preference

II. BODY FUNCTION
   * Balance: fore and aft, vertically and laterally
   * Mobility: arms, legs, trunk and hips.
   * Upper body strength: laterally, fore, aft and arms.
   * Lower body strength: laterally, fore, aft and legs.

III. EQUIPMENT NEEDS
   * Mono-Ski, Bi-Ski, two skis, one ski
   * Snowboard, mono-board
   * Outriggers
   * Rider bar
   * Snow Slider or Snow Legs
   * Sno Wing®
   * Ski-Pal®
   * HulaHoop™
   * Tip connector devices - Ski-Bra, trombone, Edgie Wedgie, Wedgease, etc. (lateral stability devices)
   * Board clips
   * Bamboo pole(s)
   * Reins/tethers
   * Personal 2-way radios
   * "Horse & Buggy"
   * Poles
   * Ski or snowboard boot(s)
   * Adaptation needed for orthotic or prosthetic devices.

IV. EQUIPMENT FAMILIARIZATION
   * Description of parts and inspection
   * Safety features
   * Use of adaptive equipment and stationary (indoor as appropriate) balance practice.

* Proper clothing
* Special considerations for disability while in snowsports environment.

V. IMPORTANT TO EMPHASIZE AT ALL LEVELS
* Safety, "*Your Responsibility Code"* and Smart Style
* Fun
* Success
* Mileage (practice)

ADAPTIVE ALPINE OVERVIEW

TEACHING PROGRESSIONS FOR ADAPTIVE ALPINE

The PSIA *Alpine Technical Manual*, 2nd Edition (2007) uses the term "Skier Zone" to define skill levels and terrain difficulty. Previously PSIA used a "level" system to define skier abilities. The following teaching progressions merge the use of the Skier Zones with the Skier Levels.

The *Adaptive Alpine Standards Exam Supplement* (June 2014) provides the Adaptive Demonstration Equivalencies for mono-ski, bi-ski, three-track, and four-track skiers.

Beginner/Novice Zone – The student is unfamiliar with skiing; only comfortable on green terrain; and is mastering green terrain and venturing onto easy blue runs. Levels 1 - 3.

Intermediate Zone – The skier is skiing parallel on most runs; able to link turns on green or blue terrain; and mastering blue terrain and venturing onto easy moguls and easy black runs. Levels 4 – 6.

Advanced Zone – The skier is linking turns on steeper terrain; able to handle all blue and black terrain; venturing into big moguls and double black diamond terrain; and competent in most snow conditions. Levels 7 – 9.

Beginner / Novice Zone Objectives
Certified Adaptive Alpine Level I Instructor

Level 1: Welcome to Skiing / Build the Foundation

Develop familiarity with equipment, which helps promote identity as skier
Develop a balanced, athletic stance to build a foundation of balance through mobility
Learn how to get up after a fall, which helps create independence
Learn to slide at slow speed, becoming familiar with the concept of a fall line and the effect of changes in terrain
Glide and slide across the slope to experience the exhilaration of skiing
Change direction out of the fall line to develop speed control

Level 2: Introduction to Turning

Enhance mobility and confidence through skating
Use linked turns to develop the ability to change direction and establish speed control
Vary the shape and size of turns as a tactic to manage speed and direction relative to terrain
Learn to perform a braking wedge as a way to stop in lift lines and other narrow areas on the mountain
Learn how to ride a chairlift, which expands terrain options
Develop sideslip skills in the beginner area to build confidence to navigate and ski more of the mountain

Level 3: Introduction to Green Terrain

Actively skid the skis for turn shape and speed control

Apply proactive edging movements that release the skis and initiate a turn by moving the center of mass into the fall line.

Explore terrain to hone skills and build confidence – go for lots of quality mileage

Intermediate Zone Objectives
Certified Adaptive Alpine Level II Instructor

Level 4: Mastering Green Terrain

Develop and refine the ability to control the skis by turning the feet and legs

Develop edge control through edge engagement and release in a traverse

Experiment with turn shape by turning the legs at different rates

Adjust turn shape and size as terrain and situations change

Using a falling leaf exercise, develop an understanding of how changes in stance affect the skis.

Learn a stem turn that includes a release move at the initiation phase for tactical effect and versatility.

Learn how to use a hockey stop as a quick and efficient way to stop.

Level 5: Developing Skills to Enhance Parallel Skiing

Use skating to improve dynamic balance, increase range of motion, and feel the edges.

Gain an understanding of upper and lower body independence, turning the feet and legs simultaneously by using hockey stops and hockey slips.

Develop simultaneous edge release for parallel turns on blue terrain.

Develop tipping and turning skills to control speed, using turn shape and tactics on green and groomed blue terrain.

Learn how to use a pole swing, touch, and/or plant to help with torso stabilization.

Learn to ski a "green line" in the bumps.

Level 6: Anchoring Parallel Skiing and Learning Tactics for Bumps and Variable Conditions on Blue Terrain

Link open, or basic, parallel turns with emphasis on simultaneous movements to release and engage edges and develop rotary skills.

Learn how to do carved uphill arcs.

Refine tipping movements to become more dynamic.

Perform short-radius turns while developing upper and lower body independence.

Explore using skidded and carved short turns as tactics for speed control on steeper terrain.

Explore powder, crud and cut-up snow conditions.

Learn to ski a "blue line" in the bumps on blue terrain to build confidence in changing conditions and provide access to more terrain.

Advanced Zone Objectives
Certified Adaptive Alpine Level III Instructor

Level 7: Linking Parallel Turns on All Blue and Some Black Terrain, and Increasing Confidence in Variable Terrain and Conditions

Perform carved railroad track turns.

Explore a variety of turn shapes on groomed and variable terrain to promote versatility and freedom of movement.

Explore tactics for skiing different environments, developing the skills needed to ski new environments with confidence and success.

Level 8: Mastering the Mountain and Exploring the Latest Ski Designs

Use pivot slip exercises to enhance the ability to turn the feet and legs independently of the upper body.

Carve medium-to-long-radius, using ski design effectively.

Refine edge engagement and release movements, changing line, turn shape, and speed to adapt to challenging terrain and snow conditions.

Refine flexion and extension movements to maintain balance, manage uneven terrain, and allow the efficient blending of all other movements.

Perform short-radius turns using upper and lower body independence in variable conditions to develop more speed control and manage terrain more efficiently.

Ski the "black line" in the bumps on a black run. Become comfortable skiing all of the mountain's most difficult terrain.

Level 9: Skiing Any Turn, Anytime, Anywhere, in Any Snow Condition

Increase confidence I n ski design and speed in a safe environment (especially useful for the skier interested in racing).

Refine flexion and extension movements to enhance turn mechanics.

Use timing and tempo to enhance the release of the old edges, tipping both skis simultaneously from turn to turn while reducing anxiety and fatigue to allow for more enjoyable skiing on challenging terrain.

Refine movements and options in short-radius turns, adjusting tactics at will.

Explore alternative movement blends and tactics for variable conditions, skiing the entire mountain efficiently.

Beyond Black Specialist

Bumps, racing, off-piste, terrain parks and pipe

VISUAL IMPAIRMENT/COGNITIVE DISABILITIES TEACHING OVERVIEW

Summary

Students with visual impairment have decreased visual acuity. The student's visual acuity can range from a person who has limited depth perception, peripheral or tunnel vision, to someone who is legally blind or has a total loss of vision.

Cognitive-related disabilities broadly apply to a person's ability or method for processing information, applying knowledge and changing preferences. The Intellectual/Cognitive Disability classification includes intellectual disabilities (previously referred to as development disabilities or mental retardation), learning disabilities, and brain injuries (acquired, genetic or congenital, and neurodegenerative diseases).

Students in these classifications can usually ski or ride independently. The student has the ability to stand and maintain balance while in motion. However the student may need adaptive equipment such as tip connecting devices (ski bras), tethers or reins, climbing harness, horse and buggy or other equipment to help them maintain balance while moving and learning how to turn.

Many disabilities, various degrees of disability, and/or combinations of disabilities are included in the Visual Impairment (VI)/Cognitive Disabilities (Cog) classifications. Some disabilities included in this classification are: developmental, cognitive, various levels of visual impairment, deaf and hearing impaired, and acquired or traumatic brain injury. A student with a cognitive disability can also have other disabilities which may affect their mobility.

Student Assessment

A complete and detailed student evaluation is needed to determine if the student fits into this category. A review of physical strengths (range of motion, strength of limbs, ability to balance, move right and left, etc.) as well as a determination of cognitive strengths/weaknesses (do they comprehend left/right; can they follow commands; is there a delay in processing information?) assist in making this assessment. The student assessment also provides insight into the student's learning preferences and abilities which affect your selection of teaching style(s).

This evaluation will determine the equipment needed to create a successful learning environment; as well as discussion about current medications and/or other disability involvements and how they may affect the student and the lesson.

After becoming aware of your student's abilities, you will be able to construct a lesson plan to best meet their goals and needs. The lesson plan should be based on the PSIA/AASI Teaching Model and Teaching Cycle. Your plan seeks to facilitate learning while achieving the student's goals.

Be aware of and teach to the student's sensory preferences (VAK). These include (a) auditory (concise verbal instructions), (b) kinesthetic (body awareness and how the body feels when it moves) or (c) visual (learn best by seeing or watching; store information as a picture or image).

VISUAL IMPAIRMENT

A student who is visually impaired can usually ski or ride unassisted. Use a kinesthetic and concise, focused, verbal approach to the skill progression. Do not confuse this approach with learning style preferences of students. Due to the visual difficulties, the student with visual impairment must use his or her other senses (hearing, taste, smell and touch) to process information. However some people with visual impairment can "see" with their 'mind's eye." For example, when teaching a skiing student the "gliding wedge" the instructor may need to draw a wedge or V with his/her fingers on the student's palm or back. Another skiing example is for the instructor to physically place the student's skis side by side when instructing a student with visual impairment how to "match their skis".

For a student with visual impairment learning how to ride, the instructor can use the student's hands as a snowboard to teach the difference between a flat board and an edged board. The instructor can simulate an edged board by tilting and flattening the student's hands.

Causes of Visual Impairment

According to the National Eye Institute of the National Institutes of Health (http://www.nei.nih.gov/health/fact_sheet.asp), the leading causes of blindness in the United State are:

- *Age-related macular degeneration (AMD)* – is the leading cause of vision loss in Americans aged 60 and older (estimated 10 million people).
- *Cataracts* – commonly decreased vision in older adults. By age 80, more than half of all Americans have had a cataract or cataract surgery, amounting to 1.35 million cataract operations annually.
- *Diabetic retinopathy* – is the leading cause of blindness in American adults and the most common diabetic eye disease, affecting an estimated 4.1 million adults over the age of 40.
- *Glaucoma* – is a group of eye diseases that affect an estimated 2.2 million Americans.

The following are some other causes of blindness or visual impairment.

Cataracts	Retinitis Pigmentosa	Detached Retina
Myopia	Friedreich's Ataxia	Central Nervous System
Multiple Sclerosis	Macular Degeneration	Vascular Diseases
Surgery	Corneal Diseases	Nystagmus
Tumors	Light Damage (welding)	Traumatic Brain Injury
Chemical Burns		

Student Evaluation

The first part of the student assessment focuses on the student's:

1. Cause of visual impairment
2. Visual abilities (acuity, depth perception, range of vision)
3. Medication and any medical precautions
4. Hearing and other sensory abilities.

Next discuss the student's preferred guiding technique for use indoor, outdoor and on-snow. Some factors to consider are:

1. Level of sight
2. Range of vision
3. Ability to hear
4. Skiing/riding skill level
5. Terrain and conditions

Guiding Overview

Guiding When Not Skiing or Riding

Most people with a visual impairment are independent and often need little assistance from a sighted person. However, when a person with a visual impairment needs assistance there are guidelines for a sighted person to follow. Many organizations focused on working with people who are blind or visually impaired offer advice on how to be a sighted guide. Guide Dogs for the Blind Association UK, *Sighted Guiding - How to help blind and partially sighted people*, Part 1 and Part 2.

Refer to the various resources listed when learning how to guide a person with a visual impairment. Remember it is a partnership so ask the person how they like to be guided and let them be independent when it is safe. Here are some basic guidelines.

- Introduce or identify yourself whenever you enter the room or approach a person with visual impairment.
- Ask the person if he or she would like assistance. If they say no, respect their wishes.
- If the person wants assistance, ask what he/she needs and how they prefer to be guided.
- A common guiding technique is to offer the back of your hand to the person and tap his/her hand with yours. The person will slide his/her hand up your arm and grab your arm just above your elbow. If the person is a child, the child may grab your wrist instead of your elbow due to the height difference. Some people may prefer to place their hand on your shoulder. Always be on the person's side opposite their cane or guide dog.
- Give specific and clear directions. Use words such as "go straight; straight ahead; turn left; on your right; the desk is five feet to your right; etc." You do not need to describe the surroundings to them unless they ask, or if you are orienting them to the room. Do tell them about any obstacles or dangers.
- The person will walk about a half pace behind you so that they can "feel" your movements. Stop when you need to change direction, at the top or bottom of stairs or to cross the street.
- If you travel into a narrow space, tell the person and move your guiding arm to the middle of your back, this brings the person right behind you. As the space opens up, move your guiding arm back to the appropriate position.
- At stairs, stop and tell them if the steps are going up or down. Place the person's hand on handrail while maintaining contact with your guiding arm. Let the person step on the first step before going up or down the stairs. At the end of the stairs, stop so the person has both feet on the level ground.
- To guide the person to a seat, describe the chair (high or low back, side arms, approximate height, if on wheels). Place your guiding hand on the back of the chair and let the person slide his/her hand down your arm to grasp the back of the chair. Assist them as needed to sit on the chair. If the chair does not have a back, place you guiding hand on the seat.
- Never leave the person in "free space." If leaving them in a room or office, leave them near a wall and describe where the nearest exit or door is located. The person needs to be able to leave the room independently.

Clock System - The clock system compliments the simple-directional command system. This is a system used commonly within the visually impaired/blind community. This command system is mostly utilized inside especially in crowded areas such as the lodge; at the bottom of the trail flats; in lift lines (corrals) and on the slope for orienting the student. The *student* is always facing 12 o'clock. If you want the student to turn 90 degrees to the right, your instruction is to turn to 3 o'clock. Once completed, the student is again at the 12 o'clock position and is ready to receive new instructions such as turn to 9 o'clock (a 90 degree turn to the left.) It is never used while riding or skiing.

When Guiding on the Slopes

The focus in guiding someone who is blind or has a visual impairment is to provide clear, concise instructions that will enable the student to ski or ride safely. The instructor essentially "*becomes their eyes*." Verbal, as well as kinesthetic instructions are utilized to establish a solid communication base between student and instructor. The pair becomes comfortable with each other to develop a strong bond of trust, ensuring the student's safety. A beginner snowboard VI lesson can be taught effectively by an instructor on skis or a snowboard; but as the student progresses, the instructor will be more effective if riding a snowboard.

Auditory communication is kept to a minimum of pre-determined verbal commands while the student and instructor/guide are moving. Teaching comments and instruction takes place while stopped. New tasks and skill development instructions are explained clearly before skiing or riding, and then practiced while the guide simultaneously calls verbal commands for turning. Your voice tone and inflection will dictate the rhythm and flow of their turns.

For the student who is completely blind, or has visually acuity that is severe enough to need all directional movements to be verbally given, the guide must learn the following:

Simple-directional verbal commands - This method of instruction can be done by using a set of voice-activated head-sets, or loud verbal call-out method with pre-determined commands using universal words. These commands are universally understood, and given clearly and concisely. Simple, basic commands can serve as the basis for communicating on and off the slope with students, regardless of their skill level.

Some of the universal commands whether a snowboarder or skier are: *hold* (for a traverse); *and* (preparatory word); *slower* or *faster*; *go*; *stop*, etc. The words used to cue the student to make a turn vary between snowboarders and skiers. For a **snowboarding student** the commands are: *Heel-turn* or *toe-turn.* For **skiers** the guide says *right turn* or *left turn.* If the student does not know which way is right or left you need to come up with other words to get the student to turn in the desired direction. Instructors have used colors (blue, red) animals, or any other system the student may use normally.

Grid System - The grid system is used primarily on open, uncrowded trails and enables *intermediate/advanced* students with visual impairment to be aware of their location within the confines of the present trail terrain. When using the grid system, image the trail being divided based on a number system; usually "0 to 5" to "0 to 10." Picture the trail width where one side of the trail is "0", the other side is "10", the center of the slope is "5", etc. Make sure you agree whether "0" is the right or left side

of the trail. Generally "0" is skier/rider's left and "10" is the right side of the trail. The guide repeatedly calls out the appropriate numbers based on the student's position on the trail and grid. The grid system allows the student to make turns independently while adjusting position based on knowing where they are on the trail. The guide may also use the Simple-Directional Command System (or a modification thereof) to tell the student of any terrain changes, obstacles or directional changes in the trail. The goal is to keep the student well informed of their position on the trail, while experiencing some independence. The grid system works best with students who have some vision; or when riding or skiing on wide, uncrowded trail.

As the student progresses in skill, the need for an agreed upon abbreviated/concise command system greatly increases, because timing is of the essence in upper level, blind teaching/guiding. Having the same person guide the rider or skier is ideal as they develop their own rhythm and flow. But an experienced guide can adapt to the skills of their student.

Emergency Word

The guide needs to be able to convey any imminent danger (such as a collision with another person or an object) to the student. Therefore, the student and instructor should agree on an emergency or "bail out" word such as *sit, down, fall, or crash*. An experienced student may have an emergency word they use when skiing or riding. The word needs to be established before each lesson or whenever the person is being guided on the slopes.

The emergency word tells the student there is imminent danger and the student should stop immediately or fall to the ground. If the student falls to the ground he or she should cover his/her head and protect their body as much as possible.

Adaptive Equipment

Students with visual impairment are usually independent skiers or riders however some adaptive equipment may be useful for the beginning student. For safety purposes, both the student and the instructor should wear bibs to identify themselves to other skiers and riders on the mountain.

Other adaptive equipment that may be used:

- Tip connector devices (ski bra, Edgie Wedgie, Wedgease, Hookease, etc.)
- Board clips
- Bamboo pole(s)
- Reins/tethers
- Personal two-way radios
- Ski-Pal®
- Sno Wing®
- Horse and Buggy

COGNITIVE DISABILITIES

Students in this classification comprise a widely diverse population, representing many different cognitive disabilities. The commonality in this diverse population at the bottom of the trail flats is that the student usually has some difficulty processing information. The complexity of this classification requires knowledge of the many disabilities, their causes and effects upon skiing or riding performance, plus commonly used medications. *A complete and detailed student analysis is imperative to determine the physical, cognitive and emotional strengths / weakness of the student*. A thorough check of present medications will provide important information relative to stamina and sensitivity to the environment, as well as attentiveness, and interpersonal relations.

Students with a cognitive disability usually ski or ride standing up. Sometimes students with multiple disabilities including cognitive-related diagnosis will use sit down equipment such as a bi-ski. The skill progression needs to be modified to comply with the physical and cognitive skills of the student. Matching learning preferences with teaching styles enhances the learning environment for the student. Frequent demonstrations and a focus on small, obtainable goals and accomplishments provide positive feedback to maintain motivation and interest of the student.

Common Intellectual/Cognitive Disabilities

Intellectually Disabled	Down Syndrome	Traumatic Brain Injury (TBI)
Fragile "X" Syndrome	Learning disability	Attention Deficit Disorder
Epilepsy	Stroke	Friedreich's Ataxia
Deaf	Dyslexia	Neurological Impairment
Seizure Disorder	Autism Spectrum Disorder (ASD)	Fetal Alcohol Syndrome

Student Evaluation

A thorough review of primary and secondary abilities, their cause and effect upon skill performance and cognitive processing, should be made. Students with cognitive issues frequently have other involvements, some apparent and some hidden. A thorough evaluation will indicate this. Often there may be medical problems that are not evident. For example:

1. Secondary or hidden disabilities – A person with Down syndrome may have heart complications, hearing problems or cervical subluxation.
2. A person with an acquired or traumatic brain injury may be impulsive, unable to evaluate dangers, have aphasia, and other processing issues.
3. Speech and/or language disorders may be evident.
4. Behavior can frequently be an issue within this population. Determine and review any behavior management techniques being used by the student's caregivers and family. Use these techniques in your lesson. Refer to the Behavior Management section.
5. Seizures are a common medical issue within this classification. Determine if the student has had seizures, the nature and frequent of such incidents. Make sure you follow your program's guidelines for working with students with seizure disorders.

Medications

Depending upon the cognitive disability, the student may be taking various medications (meds) which may cause side effects and need to be reviewed. Side effects of medications can, for example, make a student listless, slow to respond, nervous, sensitive to the sun, tire easily, and/or muscular weakness. Medication schedules are important because adverse reactions to lack

of medication, or low medication level, are common. It is not unusual for students to stop taking some of their medications over the weekend or while on vacation.

Much information can be gained by asking your student about other sports and activities in which they participate. Bicycle riding indicates some balance and independent leg action; ball activities indicate eye-hand or hand-foot coordination and some spatial judgment. Knowledge of sports activities and interests, plus information about their daily schedule can help you to access both physical and cognitive abilities.

Adaptive Equipment

Balance and fine muscle coordination difficulties are commonly found within the cognitive-related classification. Some of the adaptive equipment used frequently with this population to increase balance and coordination:

- Tip connector devices (ski bra, Edgie Wedgie, Wedgease, Hookease, etc.)
- Board clips
- Bamboo pole(s)
- Reins/tethers
- Ski-Pal®, hula hoops
- Sno Wing®
- Horse and Buggy
- Snow Slider

Stand-Up Teaching Overview
Three-Track and Four-Track

Summary

This classification includes a varied and vast population, the only commonality is the students stand-up to ski or ride. Maintaining dynamic balance can be a challenge for our stand-up students so they may use outriggers, Snow Slider or Snow Legs, a rider bar, tethers or other stand up equipment to help them with their balance. As a skier, the student may use one or two skis. Adaptive equipment is used to compensate for any balance issues and/or weakness or involvement of limbs to enhance dynamic skiing and riding movements.

Some examples of disabilities included in this classification are cerebral palsy, muscular dystrophy, multiple sclerosis, and post polio syndrome. Limb amputations, arthritis, spina bifida, spinal cord injury (SCI), traumatic brain injury (TBI), polio, neuromuscular disease, cerebrovascular accident (Stroke), and cancer are other types of disabilities an adaptive instructor can encounter in his or her Stand-Up students.

Student Assessment

A complete and detailed student assessment is needed to determine the adaptive equipment that is appropriate for the student. A primary concern with these disabilities is a review of physical strengths such as range of motion, strength of limbs, length of residual limbs, ability to balance, and ability to move in all directions – right/left, fore/aft and up/down. A review of current medications and any other disability involvements should be discussed during the evaluation. The assessment will support the selected equipment needed to create a successful learning environment. Even after the preliminary assessment, adjustments may need to be made as the student demonstrates his or her abilities during the lesson.

In addition to the physical evaluation, an assessment of the student's makeup (characteristics, background, learning styles/preferences, motivations, understandings, desires and emotional states) is an important part of the learning partnership. During this process the instructor builds trust with the student and helps determine the student's goals for the lesson. This provides a platform from which to design the lesson plan.

The student's learning preference can be matched with a complementary teaching style and an acceptable pace established which is based upon the physical, cognitive and affective assessment. The lesson plan will follow the skill development progression with obvious modifications to accommodate physical limitations. The focus is the development of the skiing or riding skills, regardless of where the movements originate!

For a skier, an athletic stance where hips are aligned over ankles and shoulders in a

stacked , upright position is very important to enable the student to develop sound fundamentals skills. Similarly a snowboarder wants "an active, athletic, ready stance." The goal is for the student to ride with his or her weight centered over the split between his or her feet. The student wants to be balancing over both feet with his or her hips centered between the feet to create even pressure distribution. The instructor must work with the student to get the student into the desired athletic stance for skiing or riding.

Common Stand-Up (3 Track/4 Track) Disabilities

Students in this classification will ski or ride while standing up with or without adaptive equipment. The variety of disabilities within this classification is wide and new causes arise occasionally. The following are some of the causes and types of disabilities seen within this classification.

Cerebral Palsy
Muscular Dystrophy
Multiple Sclerosis
Polio
Post Polio Syndrome
Neuromuscular Diseases
Amputations
Arthritis
Spina Bifida
Spinal Cord Injury (SCI)
Traumatic Brain Injury (TBI)
Cancer
Cerebrovascular Accident (Stroke)

THREE-TRACK

Three-track is primarily a skiing discipline since many snowboard students with a leg amputation may be able to ride while wearing his or her prosthetic leg. This specialty includes any person who can stand and ski/ride on one leg and use outriggers to assist balance while in motion. Some advanced 3 track skiers develop to a level of proficiency such that they can eliminate the use of outriggers and ski only with poles.

The student evaluation should explore the student's disability and include a thorough physical evaluation. The student may be a 3 track skier due to a congenital or other disability. Amputations are the most common cause for a person to ski as a 3 tracker. The amputation can be the result of cancer, diabetes, blood clots, or accidents. A stroke, traumatic brain injury, or polio can cause the loss of function or ability to use one or both legs. Additional physical or motivational challenges may also be present and need to be explored.

Student Evaluation

During the student evaluation, some key considerations are:

Amputations

- When did the amputation occur? Has the residual limb healed adequately?
- What is the length of the residual limb?
- What is the present condition of the residual limb?
- Is the residual limb wrapped and padded?

Physical Ability and Endurance

- How does the student ambulate vs. how would they ski? (with or without prosthetic?)
- How athletic is the student?
- Are there physical limitations that should be known by the instructor?

Other considerations

If one of the student's legs has atrophied:

- Amount or quality of circulation
- Amount of feeling, sensation of hot or cold
- Ability to control or initiate movement of the atrophied leg

Medications

The student evaluation should also include a review of medications. Insulin, chemotherapy, and radiation are some common medical issues encountered in the three-track specialty. Some medications increase fatigue levels; others increase sensitivity to sun. Exploration and research of present medications currently in use provides some insight into their effects upon the student.

Adaptive Equipment

Three track students usually have a limited need for adaptive equipment. Outriggers are the biggest need however as the student progresses he or she can decide to ski with poles instead of outriggers. Refer to the Adaptive Equipment section for a detailed discussion of the use of outriggers. Typical adaptive equipment for a three track skier follows:

Outriggers
Harness
Poles
Tethers/Reins
Horse and buggy

FOUR-TRACK

This specialty includes any people who can stand/ski/ride on both legs or with their prosthesis. The student may need assistance with balance so they can use outriggers with or without tip connectors. Four track skiers may use a Snow Slider, Ski Legs or a walker to assist balance while in motion. A snowboard student may use outriggers or a Rider Bar. Some 4-track students develop such good balance that they no longer need or use outriggers.

Student Evaluation

The student evaluation explores the causes and extent of the disability. Balance problems or a general weakness in the lower extremities are frequently caused by strokes, traumatic brain injury, and polio or spinal cord injuries. The student's gait and stance should be closely observed.

The student evaluation should include a review of medications. Insulin, anti-convulsives, anti-bacterials, antispasmodics, antibiotics and analgesics are commonly encountered in the four-

track specialty. Some medications increase fatigue levels, interfere with the ability to balance, or increase sensitivity to sun. Exploration and research of currently used medications provide insight into their effects upon the student.

Some key concerns include whether a skier or rider:

- Can the student balance without assistance?
- What type of assistive devices does the student use in daily life?
- What is the student's gait and stance?
- Will the student use outriggers?
- How is the student's stamina?
- Student's sense of hot or cold?
- Any other physical, emotional or motivational problems?

For skiers:

- Will the student's stance be parallel or in a wedge?
- Is the student capable of keeping the skis flat without adjustments to boots?
- Will the student use a Snow Slider or Ski Legs or other types of adaptive equipment?

For riders:

- How will the student's bindings be set?
- Will the student use a rider bar?

Adaptive Equipment

The stand-up student often has many mobility and balance issues so the instructor will be challenged to set up the student to be in a balanced athletic stance. However an instructor can also "over-equip" the student by putting on or using every conceivable piece of adaptive equipment for a four track/stand up student. The instructor's and student's goal should be maximum independence for the student so use the minimal amount of equipment need to let the student be successful.

Equipment adjustments, physical assists and terrain selection all enhance flow of movements and maintenance of balance in motion.

Outriggers provide a three- or four-point balance system. Length of the outriggers and the degree of the claws are adjustments that are individual to each student. Ongoing student assessment is necessary in order to determine whether outrigger length and/or claws need adjusting. As the student develops skills, movement options may increase, necessitating a review of outrigger settings.

For skiers:

Ski Legs or the Snow Slider offers more support than outriggers but may limit the student's ability to become an independent skier. Ski Legs and the Snow Slider offer a very stable base of support for the skier, are easily adjustable for any skier and allow the skier to move with the unit, while being tethered by the instructor. Ski Legs and Snow Sliders are always tethered and generally used on green and moderate (blue) terrain.

Tip connectors are often used to enhance lateral strength and to keep the skis from spreading apart. Tethers are often used to assist in the development of rotary movements and they assist with flat land crossings.

For riders:

A stand-up snowboarder with balance issues can use one or two outriggers, Sno Wing or rider bar.

Refer to the Adaptive Equipment section for a detailed discussion of the use of outriggers.

Here is the adaptive equipment available to a four track/stand up student.

Bamboo Poles
Harness
Reins
Tethers
Horse and buggy
Outriggers
Rider Bar
Snow Slider/Ski Legs
Tip Connectors
Sno-Wing®
Ski Pal®
Walker
Spacer Bar
Snowboard Clamps
HulaHoop™

SIT-DOWN TEACHING OVERVIEW
MONO-SKI / BI-SKI

Summary

The mono-ski and bi-ski are two types of adaptive equipment designed for any student who has significant problems standing and balancing while in motion. These standing and balancing problems could be caused by physical trauma, neurological issues and neuromuscular diseases.

Equipment Selection

A crucial component for success in teaching people to ski using sit down equipment is the selection of the best piece of equipment for the student. A thorough student evaluation of the effects of an injury or disability assessment guides the instructor and student in the selection of the best piece of equipment for that person.

The first decision is whether the student should use a mono-ski or bi-ski. There are differences and similarities between mono- and bi-skis. The most noticeable difference is in their visual appearance. The bi-ski has a medium base of support. The mono-ski has the smallest support base, requiring good balance and independent skill development. There are also performance and suitability differences within the various bi-skis and within the family of mono-skis.

Student Assessment

Treat every student as an individual; the effects of an injury or disability can vary for each person. Only a thorough student evaluation enables the instructor and student to determine which piece of equipment is best suited for the student. Factors to consider in selecting the equipment are the student's physical strength, mobility, and the ability to maintain balance.

Take time to initially set up and evaluate a student to determine which type of equipment is best for them. Decide with the student whether the student should use a mono-ski or bi-ski. Then discuss the various types of mono- or bi-ski available for the student.

Do not rush the set up for the first time skier. Proper time spent during the initial set up will equal success for the student in the long term and a better return and enjoyment of the sport for the participant.

Additionally, the instructor can obtain valuable information by learning what other activities the student may participate. The student, parents, guardians or other care givers are a valuable source of information is available from the student, parent or guardian along with the information provided in the student's application or evaluation.

<u>Spinal Cord Injury</u>

A person with a spinal cord injury is one of the most common disabilities seen within the

Sit Down disability classification. No two spinal cord injuries are the same. Factors to consider are the level of the spinal cord injury (where on the spine is the injury) and whether the spinal cord injury is complete or incomplete. The answers to these and other questions guide the instructor and student in selection of the most appropriate sit down equipment.

A quick rule of thumb is a person with a spinal cord injury at T-6 or lower level will use a mono-ski. A person with a T-5 or higher level might use a bi-ski. Each injury is different so the effects of a T-6 injury in one individual may vary from the same level of injury in another person. Student assessments and evaluations are important factors to the student's success.

Medications

A sit down skier can take a variety of medicines and have other medical concerns that both the student and the instructor need to monitor. The medications for each sit down student is different but the most common medications seen in this disability classification are analgesics; antibiotics; anticholinergic (treatment for bladder spasms); anticonvulsives; antispasmodics; sedatives (anxiety); and antidepressants. The student may have other medical conditions requiring medication such as diabetes, high blood pressure, etc. Review the student's medications carefully and ask the student any questions about the medications. The student's parents/caregivers are another resource to explain any unfamiliar medications. When in doubt, research the medication online to learn what the medicine is treating and any potential side effects.

Common Sit Down (Mono-Ski/Bi-Ski) Disabilities

The types of disabilities associated with students using sit down equipment are extremely diverse. Some examples are spinal cord injuries (SCI), traumatic brain injury (TBI), neuromuscular diseases, amputations, cerebral palsy, multiple sclerosis, muscular dystrophy, stroke, and cancer. In addition to traumatic or congenital disabilities some students can have a progressive or generative type of disability. The person may have been a Stand Up student but will eventually become a Sit Down student due to the progressive nature of the disease.

The following are some of the causes and types of disabilities seen within this classification.

Cerebral Palsy
Muscular Dystrophy
Multiple Sclerosis
Polio
Post Polio Syndrome
Neuromuscular Diseases
Amputations
Arthritis
Polio
Spina Bifida
Spinal Cord Injury (SCI)
Traumatic Brain Injury (TBI)
Cancer
Cerebrovascular Accident (Stroke)
Autism Spectrum Disorder (ASD)
Intellectual Disabilities
Dwarfism
Post Polio Syndrome

Spinal Cord Injuries Considerations

A person with a spinal cord injury can have some medical issues unique only to someone with damage or injury to his or her spinal cord. Depending upon the location and extent (complete or incomplete) of the injury the person may use bladder management devises (leg bag, catheter, etc.) and be concerned about pressure sores, temperature sensitivity and poor circulation.

Autonomic Dysreflexia (AD)

According to the Christopher & Dana Reeve Foundation's Paralysis Resource Center, "Autonomic dysreflexia (AD) is a potentially life threatening condition that can be considered a medical emergency. It mainly affects people with injuries at thoracic T6 or higher. If left untreated, it can lead to a stroke, seizures, or even death."

Christopher & Dana Reeve Foundation's AD Wallet Card

What happens during an episode of AD?

Autonomic dysreflexia (AD) means an over-activity of the autonomic nervous system – the part of the system that controls things you don't have to think about, such as heart rate, breathing, digestion, etc. AD can occur when an irritating stimulus is introduced to the body below the level of injury. The stimulus sends nerve impulses to the spinal cord, where they travel upward until they are blocked at the level of injury.

Since the impulses cannot reach the brain, a reflex is activated that increases activity of the sympathetic portion of the autonomic nervous system. This results in spasms and a narrowing of the blood vessels, which causes a rise in the blood pressure. Nerve receptors in the heart and blood vessels detect this rise in blood pressure and send a message to the brain.

The brain then sends a message to the heart, causing the heartbeat to slow down and the blood vessels above the level of injury to dilate. However, the brain cannot send messages below the level of injury, due to the spinal cord lesion, and therefore the blood pressure cannot be regulated.

Medications are generally used only if the offending trigger/stimulus cannot be identified and removed - or when an episode persists even after removal of the suspected cause. Potentially useful agents include: Nitroglycerine, Clonidine, Hydralazine, Minipress, Catapres.

What to do

The first thing to do if AD is suspected is to have the student sit up, or raise his or her head to 90 degrees. If the student can lower their legs, do so. Next, loosen or remove anything tight. Most importantly, locate and remove the offending stimulus, if possible.

The signs of AD include:

- High blood pressure
- Pounding headache, flushed face
- Sweating above level of spinal injury
- Nasal stuffiness, nausea
- Slow pulse, lower than 60 beats per minute
- Goose flesh below the level of injury

AD is caused by an irritant below the level of injury, usually related to bladder or bowel function. Among causes are:

- Irritation of bladder wall, urinary tract infection
- Blocked catheter
- Overfilled collection bag
- Over-distended or irritated bowel
- Constipation/impaction
- Hemorrhoids or anal infections
- Skin infection or irritation, cuts, bruises, abrasions
- Pressure sores (decubitus ulcer)
- Ingrown toenails
- Burns (including sunburn, burns from using hot water)
- Tight or restrictive clothing
- Sexual activity
- Menstrual cramps
- Labor and delivery
- Abdominal conditions (gastric ulcer, colitis, peritonitis)
- Bone fractures

AD can be prevented:

- Relieve pressure in bed/chair – frequently
- Use #15 sunscreen, watch water temperatures
- Adhere to bowel program, faithfully
- Keep catheters clean and stick to catheterization schedule

Sources: Paralyzed Veterans of America, Spinal Injuries Association, London, National Spinal Cord Injury Association, Miami Project to Cure Paralysis/University of Miami School of Medicine

AD is a serious condition so both the student and instructor need to know the signs and what action to take if AD is suspected. If the instructor or student suspects AD take immediate action to eliminate any possible causes. Keep the person upright (head at 90 degrees), loosen all straps and clothing and readjust the student to eliminate any pressure areas. Follow your program's or ski area's protocols for medical emergencies such as call ski patrol and advise it is a life threatening emergency.

MONO-SKI

The mono-ski is a single ski unit, which includes a seating system often referred to as the "bucket seat" (that acts like a boot) mounted on a suspension/shock absorption system. The bucket seat acts as mono-skier's ski boot. Therefore the bucket/boot should have a snug fit with no major air spaces, so that the forces from the mono-skier's body are easily transferred to the ski. Foam and other forms of padding are a good way to fill any air spaces so the mono-skier's movements are transmitted to the ski.

Some of today's mono-skis have a mechanism that enables the mono-ski to be loaded onto a chair lift. Most mono-skis enable the skier to self-load onto the chair lift. The various mechanisms, levers or devices enable the mono-skier to position him/her to facilitate the

skier to be able to load him/herself onto the chair. Often mono-skiers develop the ability to position themselves on the loading platform to push him/her up onto the chair (self loading) which allows for independent skiing.

Mono-skiers use outriggers to assist with balance and loading the chairlift. Outriggers are like ski poles. They can be used for timing, turn initiation, base of support and helping to load and unload. Adjustment of the outrigger is equally as important as set up of the mono ski. For starters think of the student's arm and shoulder in a relaxed position, the cuff of the outrigger should be midway between the wrist and the elbow. The ski of the outrigger should be between the knee and the ankle. The adjustment of the outrigger needs to be long enough to allow independent loading, but not so long that it effects turn initiation. This is a starting point and further adjustment might become necessary. As a skier progress or snow conditions change, additional adjustments may become necessary.

Some outriggers may have an adjusting bolt mounted on the ski behind the pivot mechanism. This is usually referred to as the drag adjuster; when backed out it will prevent the ski from opening up fully. This may be beneficial for beginners to create additional friction. This may help with balance and/or to help initiate turns. As the beginner progresses this friction can become difficult to manage and the bolt should be wound in or removed altogether.

Similar to any skier, a mono-skier needs to be in a balanced position while in the mono-ski. Proper balance is when the student can easily engage the tip or tail of the ski by moving fore and aft. A “dowel test” is one method to evaluate the student’s balance and the position of the bucket seat on the ski. With the mono-skier sitting in the bucket, place the dowel under the ski at its boot center to see if the ski tip or tail rests on the floor. Ask the student to lean fore and aft to see how the ski reacts while on the dowel. Can the student push the ski tip to the floor? Can the student lean to place the tail on the floor? Move the bucket forward or back on the ski until it is balanced over the center balance point of the mono-ski. A good rule of thumb to see if a mono-skier is balanced is that mono-skier should be able to “teeter totter” on the dowel with minimal or no body moment.

Step-In Bindings

With step-in binding systems for mono-skiers, the dowel test is still required. Some mono-skis' frames allow for some adjustment on the foot plate. Some skiers such as those with less or no mass in front of the binding (such as double leg amputees) might need to have the binding mounted slightly forward of boot center.

Student Evaluation

Spinal cord injuries, double leg amputation, muscular dystrophy, multiple sclerosis, and spina bifida are the main disabilities of student who mono-ski. Good upper body strength, balance and agility are helpful in becoming a successful mono-skier.

For a person with a spinal cord injury a general rule of thumb is for the injury to be at the T6 level or lower (this is a reference point only). All spinal cord injuries are unique

therefore an assessment of the student's strength and balance is essential.

Here are some general factors to evaluate in assessing the student's ability to mono-ski:

Strength

- Person's grip ability and strength (ask to shake hands, both)
- Ability and strength to push or pull against the instructor's hands
  - Forward (towards the instructor) and back (away from instructor)
  - Out to sides; towards the middle (bringing hands together)
- Ability to retrieve an object from the floor – inside of student, on each side (look to see if the student uses the other hand to push or pull themselves back up)
- Ability to self-transfer

Balance

- Able to sit in wheel chair without side aids; or level of aids
- Ability to twist torso in both directions

BI-SKI

Like the mono-ski, the bi-ski has a bucket (seat) that is mounted to a suspension system. However, the bi- ski is mounted on two short skis with a radical side cut. The bi-ski can be used with fixed outriggers mounted to the frame or with the student using handheld outriggers.

Tethers

All bi-skis have locations for the tethers to be attached to the equipment. The tethers allow the instructor to assist the skier in turning, speed control or in emergency situations. **If fixed outriggers are used, it is mandatory to also use a tethering system with the bi-skier.** With fixed outriggers attached to the bi-ski in some situations it is very difficult if not impossible for the student to stop the bi-ski so the instructor with tethers are able to stop the bi-skier similar to a ski brake.

A bi-skier using handheld outriggers may be able to ski independently however **each ski area and adaptive program has different rules for the tethering requirements for bi-skiers.** Some ski areas require that all bi-skiers must be tethered at all times regardless of their ability. Other resorts may allow a bi-skier to ski without a person tethering the bi-ski subject to certain requirements. However, it is suggested for someone using handheld outriggers to remain on tethers until they demonstrate that they can control their speed and can stop the bi-ski independently. The student will have to be an upper level intermediate or advanced skier to ski un-tethered.

Outriggers

If the student possesses the necessary strength, balance and agility, he or she can use handheld outriggers. However, if the student cannot grip and/or control handheld outriggers, the instructor can attach "fixed outriggers" to the bi-ski's frame. Fixed outriggers can be adjusted (height or width) as needed or use only one fixed outrigger if the student can use one handheld outrigger.

Some bi-skis have a self-loading mechanism that allows a bi- skier to become an independent skier. However, most bi-skiers will still need one or two lifting/loading assistants.

Student Evaluation

People with extensive physical and/or cognitive disabilities are the most common bi-ski students. The radical sidecut of the skis allow the ski to turn with as little movement as a tipping action. With proper adjustments, the student can do as much as he or she is capable of with the instructor able to assist (if needed) through the tethering system.

A complete physical evaluation will help determine how the bi-ski should be adjusted such as fixed, handheld or a combination of outriggers. Similar to the mono-ski, the bi-ski must be properly balanced with the student fitted properly to the bucket. It can be a challenge to get a bi-ski student positioned to keep the bi-ski balanced. Use the same strength and balance evaluation tools as with a mono-ski student.

A cognitive evaluation is also important. The student may have a traumatic brain injury or other cognitive-related disability that affect the person's ability and speed with which he or she can process information. In terms of physical disabilities, a bi-skier may have the same types of disabilities as a mono-skier but with a much higher level of involvement. The student can have a spinal cord injury, multiple sclerosis, muscular dystrophy, cerebral palsy, severe epilepsy, severe balance impairments, and/or traumatic brain injury.

Safety: Lift Loading and Unloading Procedures – General Overview

Each ski area, resort or resort has its own guidelines for the loading and unloading of people using sit down equipment. Make sure you know and understand the procedures for using the lifts at your ski area. Whenever going to a new ski area or resort, research its rules and guidelines for loading and unloading from its various lifts. The procedures can vary by type of lift (double, triple, quad, gondola, etc.). Know the types of lifts and procedures before you try to load yourself or another person in a piece of sit down equipment. It is recommended to check the information board at each lift to find out the chair lift height.

Communicating with Lift Operators

Again each ski area has its own procedures for communicating with its lift operators. Remember never interfere with a person while they are operating or monitoring lift operations.

Communicating with the lift operators is important for all adaptive lessons not just sit down. The instructor may need the lift to be slowed down or stopped to load or unload an adaptive student. So make sure all instructors know the methods for communicating with the lift operators.

One of the main topics of discussion is whether the lift is to be slowed or stopped for the loading or unloading process. Some areas mandate the lift must stop, others slow the chair and some older chairs cannot be slowed. Also discuss with the lift operator/attendant whether you want their assistance with the load such as a "pull back."

Hand Signals

Since you can't talk to the lift operator at the top before getting on the lift it is important to know if there are certain hand signals to use with the attendant. The main signals are to stop, slow or maintain the lift's speed. Hand signals can differ by ski area so please check with your area how you should communicate with lift attendants.

For Sit Down Equipment

Each ski area has its own lift loading and unloading procedures so check with the ski area for its

protocols.

The following procedures are general and can be adapted to meet the procedures for each ski area.

- Do a practice lift before entering the lift line and before the first load of the day for timing and safety.
- If the student is not helping with the lift and load, outriggers should be placed in his or her lap, or have an assistant carry them.
- If the student is assisting with the lift and load to learn how to self-load, the outriggers should be long enough for the person to boost the mono-ski to the height of the lift chair. When self-loading the student should place outriggers close in next to the bucket seat.
- Communicate with the lift attendants regarding the lift speed and if you want any assistance.
- For the equipment lift, the lead instructor calls a count or cadence (agree on the cadence before doing it), for example, "Ready, 3, 2, 1, Lift Up and Back," when in the loading zone of the chair lift.
- Instructors should sit in the chair just after the student is on the chair.
- Once on the lift, first put the restraint bar down as far as it will go and then attach the restraining strap to the chair.
- Keep the restraint bar down during entire ride. Do not lean on the restraint bar since it may apply pressure to the student's body or tip the sit down equipment forward.
- Disconnect the restraining strap as you approach the unloading platform or ramp. Do not lift the restraint bar until the chair is over the netting of the unloading ramp.
- When at unloading area, lead instructor calls a count or cadence, for example "Ready, 3, 2, 1, Go (or Lift up and down). The lead instructor continues to guide or "bucket assist" the student away from the unloading area to a safe place to prepare the equipment and student to ski.

Lift Evacuations

The NSAA Your Responsibility Code applies to all adaptive skiers and riders. One of the points of Your Responsibility Code is "Prior to using any lift, you must have the knowledge and ability to load, ride and unload safely." An important part of knowing how to ride a lift is to know what to do in the event you need to be evacuated from a lift. The ski area's ski patrol or other safety personnel are responsible for guiding guests through the evacuation process. However it is helpful for all adaptive instructors to know and understand the procedures for evacuating sit-skis, mono-skis and bi-skis (SMBs) from a lift.

For the instructor's home ski area, check with resort management and its ski patrol to learn their lift evacuation procedures. Check to determine the best way to interface the sit down equipment (SMBs) to the current evacuation equipment used at that resort.

Should the need arise for a rope evacuation of a chairlift, the instructor when accompanying an adaptive skier or rider is to prepare and assist the student with the evacuation process. The evacuation team will provide guidance to both the instructor and student in the evacuation process. However the instructor should inform the evac team if there are any special considerations for your student due to his or her disability.

Each piece of sit down equipment should have an evacuation system. Some SMBs have a single strap system and others have a three point strap system.

- Prior to riding the lift become familiar with the type of evacuation system installed by the SMB manufacturer on that specific piece of equipment. Know how the evac system works.
- Check and make sure that the SMB evacuation system is complete, in good working condition such as all straps in good condition, readily accessible and has a locking carabineer.
- Once the student is in the SMB make sure the evacuation system is readily accessible; not intertwined with the bucket straps or other adaptive equipment; and always ready for an evacuation.
- In the event of an evacuation:
  - Help prepare the student to be evacuated
  - Set up the SMB evacuation system so it is ready to interface with the ski area's evacuation equipment
  - The evacuation carabineer should only be mounted to a manufacturer suggested or installed evacuation strap.
  - Make sure the evacuation strap(s) have no slack and the carabineer is in place. For three strap evacuation systems, all three straps must be connected to the carabineer.
  - Work with the evacuation team to get the student onto/into the evacuation device and lowered to the ground.

It is paramount for every adaptive instructor to be familiar with the ski area's evacuation procedures and equipment. If possible, either watch or participate in a lift evacuation practice at your area annually.

COMMON DISABILITIES

AMPUTATIONS: Congenital, surgical or traumatic loss of a limb or part of a limb

AK
Above knee - usually skis without prosthesis.

BK
Below knee - An agreed upon guideline is if the stump is four inches or longer and the skin is in good condition, the individual may ski with prosthesis.

AE
Above elbow

BE
Below elbow

Hip Disarticulation
Amputation at the hip joint, this preserves the pelvis and the soft tissue to the buttocks - usually skis without prosthesis

Syme's
Amputation at the ankle.

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

Shoulder Disarticulation
Amputation at the shoulder joint.

Unilateral
Amputations on the same side. Although obtaining and maintaining dynamic balance when skiing is difficult, unilateral amputees do ski. (i.e. a unilateral BK/BE could ski on both skis with one outrigger).

Bilateral
Amputations on both sides. This can include: 1) amputation of both legs, 2) amputation of both arms, 3) amputation of an arm on one side and leg on the other (arm and leg amputees usually ski on one ski with one outrigger).

Look for the hidden causes: if due to cancer, recent or current, chemotherapy may cause fatigue or impaired temperature control. If amputation is due to Diabetes, the individual may lack sensation in other areas (often hands or feet), plus may need to eat or take medication on a certain schedule. Injuries resulting in amputation may encompass other hidden disabilities for example, minimal brain damage, need for a bladder control device, or hearing impairment. The residual limb (stump) needs to be protected while skiing. An ace wrap should be applied to prevent swelling and/or the limb should be padded and covered to avoid damage from falls or cold. Skiing with a prosthesis is determined by the length of the residual limb plus advice from a prosthetist to be sure it is strong enough to withstand the stresses of skiing.

APHASIA: Aphasia is an acquired communication disorder that impairs a person's ability to process language, but does not affect intelligence. Aphasia impairs the ability to speak and understand others, and most people with aphasia experience difficulty reading and writing. The disorder ranges from having difficulty remembering words to being completely unable to speak, read, or write. Aphasia disor-

ders usually develop quickly as a result of head injury or stroke, but can develop slowly from a brain tumor, infection, or dementia, or can be a learning disability. To communicate, give the person with aphasia time to speak and do not finish the person's sentences unless asked. Be sensitive to background noise and turn off competing sounds such as radios or TVs where possible. Be open to means of communicating other than speech, e.g., use drawing, gesturing. Confirm that you are communicating successfully.

ARTHRITIS: An inflammatory disease of the joints as well as other parts of the body. It causes pain and loss of movement. This disease is chronic.

Ankylosing Spondylitis
Chronic inflammation of the spine. Bones will often fuse together.

Juvenile
A general term that is used to define any arthritis that affects children.

Osteoarthritis
Degenerative joint disease common in seniors, the most common form of arthritis.

Rheumatoid
Total body inflammation of moving and weight bearing joints. Most disabling form of arthritis.

ATTENTION DEFICIT HYPERACTIVITY DISORDER (ADHD/ADD): Many people use the generic term of ADD for all types of ADHD but ADHD is the official clinical diagnosis term. According to the Attention Deficit Disorder Association (ADDA, http://www.add.org/), approximately 4% to 6% of the U.S. population has ADHD which is 8 to 9 million people.

Children and adults who consistently display certain characteristic behaviors over a period of time are diagnosed with ADHD. The most common features include:

- Distractibility/Inattention (poor sustained attention to tasks)
- Impulsivity (impaired impulse control and delay of gratification)
- Hyperactivity (excessive activity and physical restlessness)

The exact nature and severity of ADHD symptoms varies from person to person. Approximately one-third of people with ADHD do have the hyperactive or overactive behavior component.

There three subtypes of ADHD: Combined Type, Predominantly Inattentive Type, and Predominantly Hyperactive-Impulsive Type.

PREDOMINANTLY HYPERACTIVE-IMPULSIVE
Most of the person's symptoms are in the hyperactivity-impulsivity categories with fewer symptoms of inattention.

PREDOMINANTLY INATTENTIVE TYPE
The majority of symptoms are in the inattention category and fewer than six symptoms of hyperactivity-impulsivity.

COMBINED
Six or more symptoms of inattention and six or more symptoms of hyperactivity-impulsivity. Most people have the combined type.

Hyperactivity symptoms include:

- Fidgeting, squirming when seated

- Getting up frequently to walk or run around
- Running or climbing excessively when it's inappropriate
- Having difficulty playing quietly or engaging in quiet leisure activities
- Being always on the go
- Often talking excessively

Impulsivity symptoms include:

- Impatience
- Difficulty delaying responses
- Blurting out answers before questions have been completed
- Difficulty awaiting one's turn
- Frequently interrupting or intruding on others to the point of causing problems
- Initiating conversations at inappropriate times

Inattention symptoms include:

- Difficulty paying attention to details and tendency to make careless mistakes
- Producing work that is often messy and careless
- Easily distracted by irrelevant stimuli and frequently interrupting ongoing tasks to attend to trivial noises or events that are usually ignored by others
- Inability to sustain attention on tasks or activities
- Difficulty finishing paperwork or performing tasks that require concentration
- Frequent shifts from one uncompleted activity to another
- Procrastination
- Disorganized work habits
- Forgetfulness in daily activities (missing appointments, forgetting to bring lunch)
- Failure to complete tasks
- Frequent shifts in conversation, not listening to others, not keeping one's mind on conversations, and not following details or rules of activities in social situation.
- Have difficulty processing information as quickly and accurately as others.

Treatment of ADHD

The most effective treatment for ADHD is a combination of medication (when necessary), therapy or counseling to learn coping skills and adaptive behaviors. Many adults receive ADHD coaching.

Medications

The most common type of medication used for treating ADHD is a stimulant which may have a calming effect on people with ADHD. The medications can reduce hyperactivity and impulsivity and improve the person's ability to focus, work and learn. Medication may also improve physical coordination. Common ADHD medications are: Adderall, Concerta, Dexedrine, Focalin, Ritalin and Strattera.

Teaching Tips

Many children with ADHD may have a specific behavior management or therapy program. If possible ask the student or parents how the behavior program works so you can support the student. Additionally, Try to limit distracting stimuli; give one direction at a time; try to maintain eye contact; avoid complex instructions; and be clear and concise. Since these children are easily frustrated, maintain a calm attitude. Some students may exhibit inappropriate fear in new situations. Due to side effects of the

medications, some students do not take their medication during the weekend or holiday periods.

Sources:

- *National Institute of Mental Health* (http://www.nimh.nih.gov/health/publications/attention-deficit-hyperactivity-disorder/complete-index.shtml) T
- *Attention Deficit Disorder Association* (http://www.add.org/?page=ADHD_Fact_Sheet)
- *WebMD* (http://www.webmd.com/add-adhd/guide/adhd-symptoms)

AUTISM SPECTRUM DISORDER: ASD is a developmental disability caused by differences in the brain. The disorder can cause significant social, communication and behavioral challenges. According to the Centers for Disease Control and Prevention (CDC), it estimates that about 1 in 68 children has been identified with autism spectrum disorder. It is almost five times more common among boys than among girls.

There are three different types of ASDs:

Autistic Disorder (also called "classic" autism)
This is what most people think of when hearing the word "autism." People with autistic disorder usually have significant language delays, social and communication challenges, and unusual behaviors and interests. Many people with autistic disorder also have intellectual disability. Characteristics can include impaired social interaction, impaired communication, and restricted and repetitive behavior.

Asperger Syndrome
People with Asperger syndrome usually have some milder symptoms of autistic disorder. They might have social challenges and unusual behaviors and interests. However, they typically do not have problems with language or intellectual disability.

Pervasive Developmental Disorder – Not Otherwise Specified (PDD-NOS; also called "atypical autism")
People, who meet some of the criteria for autistic disorder or Asperger syndrome, but not all, may be diagnosed with PDD-NOS. People with PDD-NOS usually have fewer and milder symptoms than those with autistic disorder. The symptoms might cause only social and communication challenges.

From the CDC website, Signs and Symptoms

Possible "Red Flags"

A person with ASD might:

- Not respond to their name by 12 months of age
- Not point at objects to show interest (point at an airplane flying over) by 14 months
- Not play "pretend" games (pretend to "feed" a doll) by 18 months
- Avoid eye contact and want to be alone
- Have trouble understanding other people's feelings or talking about their own feelings
- Have delayed speech and language skills
- Repeat words or phrases over and over (echolalia)
- Give unrelated answers to questions
- Get upset by minor changes

- Have obsessive interests
- Flap their hands, rock their body, or spin in circles
- Have unusual reactions to the way things sound, smell, taste, look, or feel

Social Issues

Social issues are one of the most common symptoms in all of the types of ASD. People with an ASD do not have just social "difficulties" like shyness. The social issues they have cause serious problems in everyday life.

Examples of social issues related to ASD:

- Does not respond to name by 12 months of age
- Avoids eye-contact
- Prefers to play alone
- Does not share interests with others
- Only interacts to achieve a desired goal
- Has flat or inappropriate facial expressions
- Does not understand personal space boundaries
- Avoids or resists physical contact
- Is not comforted by others during distress
- Has trouble understanding other people's feelings or talking about own feelings

Communication

Each person with ASD has different communication skills. Some people can speak well. Others can't speak at all or only very little. About 40% of children with an ASD do not talk at all. About 25%–30% of children with ASD have some words at 12 to 18 months of age and then lose them.[1] Others might speak, but not until later in childhood.

Examples of communication issues related to ASD:

- Delayed speech and language skills
- Repeats words or phrases over and over (echolalia)
- Reverses pronouns (e.g., says "you" instead of "I")
- Gives unrelated answers to questions
- Does not point or respond to pointing
- Uses few or no gestures (e.g., does not wave goodbye)
- Talks in a flat, robot-like, or sing-song voice
- Does not pretend in play (e.g., does not pretend to "feed" a doll)
- Does not understand jokes, sarcasm, or teasing

Unusual Interests and Behaviors

Many people with ASD have unusual interest or behaviors.

Examples of unusual interests and behaviors related to ASD:

- Lines up toys or other objects

- Plays with toys the same way every time
- Likes parts of objects (e.g., wheels)
- Is very organized
- Gets upset by minor changes
- Has obsessive interests
- Has to follow certain routines
- Flaps hands, rocks body, or spins self in circles

Other Symptoms

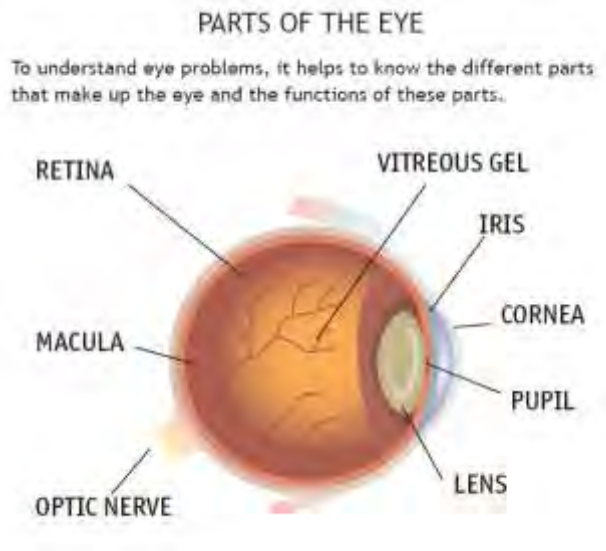
Some people with ASD have other symptoms. These might include:

- Hyperactivity (very active)
- Impulsivity (acting without thinking)
- Short attention span
- Aggression
- Causing self injury
- Temper tantrums
- Unusual eating and sleeping habits
- Unusual mood or emotional reactions
- Lack of fear or more fear than expected
- Unusual reactions to the way things sound, smell, taste, look, or feel

Resources

- Autism Speaks - http://www.autismspeaks.org/?utm_source=autismspeaks.org&utm_medium=web&utm_campaign=primarymenu
- Autism Society - http://www.autism-society.org/
- National Institute of Neurological Disorders and Stroke - http://www.ninds.nih.gov/disorders/autism/detail_autism.htm
- Temple Grandin, Ph.D - http://www.templegrandin.com/

BLIND / VISUALLY IMPAIRED: Partial or total loss of vision which may include, but not be limited to: tunnel vision, peripheral vision, myopia, or loss of depth or distance perception. Some causes include: Diabetes, Glaucoma, Detached Retina, Eye Injury, Multiple Sclerosis, Brain Tumor or Head Injury. Ask specific questions and define the student's range of vision.



Source - http://www.nei.nih.gov/nehep/programs/visionandaging/materials/EyeHandout_508.pdf

Here are descriptions of some of the main parts of the eye:

- *Cornea*: The cornea is the clear outer part of the eye's focusing system located at the front of the eye.
- *Iris*: The iris is the colored part of the eye that regulates the amount of light entering the eye.
- *Lens*: The lens is a clear part of the eye behind the iris that helps to focus light, or an image, on the retina.
- *Macula*: The macula is the small, sensitive area of the retina that gives central vision. It is located in the center of the retina.
- *Optic nerve*: The optic nerve is the largest sensory nerve of the eye. It carries impulses for sight from the retina to the brain.
- *Pupil*: The pupil is the opening at the center of the iris. The iris adjusts the size of the pupil and controls the amount of light that can enter the eye.
- *Retina*: The retina is the light-sensitive tissue at the back of the eye. The retina converts light into electrical impulses that are sent to the brain through the optic nerve.
- *Vitreous gel*: The vitreous gel is a transparent, colorless mass that fills the rear two-thirds of the eyeball, between the lens and the retina.

See Well for a Lifetime: An Educational Series on Vision and Aging

Myopia:

Also known as nearsightedness. Common type of refractive error where close objects appear clearly and distant objects appear blurry. Images are focused in front on the retina rather than on it.

Glaucoma:

A group of diseases that can damage the eye's optic nerve and result in vision loss and blindness. It is one of the main causes of blindness in the United States. Glaucoma is an eye disease in which the normal fluid pressure within the eye raises slowly. The increased pressure may damage the optic nerve causing partial or total blindness.

Cataracts:

A clouding of the lens that affects vision and is mostly related to aging. The lens is a clear part of the eye that helps to focus light, or an image on the retina. Light passes through the transparent lens to the retina. The lens must be clear for the retina to receive a sharp image. If the lens is cloudy from a cataract the image is blurry. If bad enough, vision can be improved by surgery where the cloudy lens is replaced with an artificial lens.

Diabetic Retinopathy:

Is a complication of diabetes and is a leading cause of blindness. It occurs when diabetes damages the tiny blood vessels inside the retina, the light sensitive tissue at the back of the eye. As the condition worsens it causes eye damage. It usually affects both eyes. The retinal blood vessels may (1) swell; (2) become blocked which signals the body to grow new blood vessels; (3) advanced stage (proliferative retinopathy) when new blood vessels grow; (4) new vessels are fragile and leak causing severe vision loss and even blindness.

Retinitis Pigmentosa (RP):

A group of inherited retinal diseases that causes progressive deterioration of specialized light-absorbing cells in the retina. RP damages the retina's light-sensitive photoreceptor cells that connect other nerve cells to transmit visual information to the brain. As the cells slowly degenerate, the rod photoreceptors that control night vision are impacted most often so the person develops night blindness and gradual loss of peripheral vision. By about age 40, most have tunnel vision but may retain good central vision. Between the ages of 50 and 80, they typically lose their remaining sight.

Age-Related Macular Degeneration (AMD):

Disease associated with aging that gradually destroys sharp, central vision (the macula) because of damage to the retina. It affects the macula, the part of the eye that provides vision of fine details for reading, writing, driving and central vision. AMD occurs in two forms "dry" and "wet."

Wet AMD:

Abnormal blood vessels behind the retina start to grow under the macula. The new blood vessels are fragile and leak blood and fluid raising the macula from its normal place at the back of the eye. The damage occurs rapidly so the loss of central vision can occur quickly. It also known as advanced AMD and does not have stages like dry AMD.

Dry AMD

The light-sensitive cells in the macula slowly break down, gradually blurring central vision. As it worsens, a blurred spot in the center of vision may develop. Over time, as less of the macula functions, central vision is gradually lost in the affected eye.

Retinal Detachment:

The retina is lifted or pulled from its normal position. If not treated promptly it can cause permanent vision loss. In some cases small areas of the retina are torn (retinal tears or retinal breaks) which can lead to retinal detachment. There are three types of retinal detachment.

Rhegmatogenous:

A tear or break in the retina that allows fluid to get under the retina and separate it. This is the most common type.

Tractional:

Scar tissue on the retina's surface contracts and causes the retina to separate. (Less common)

Exudative:

This type is frequently caused by retinal diseases, including inflammatory disorders and inju-

ry/trauma to the eye. Fluid leaks into the area underneath the retina without any tears or breaks in the retina.

Tunnel Vision:
Loss of peripheral vision with retention of central vision resulting in severely constricted visual field. http://en.wikipedia.org/wiki/Tunnel_vision.

Nystagmus:
Constant involuntary, cyclical movement of the eyeball. There are many causes for this disease including multiple sclerosis. Congenital nystagmus is a condition that begins at birth or early infancy where the eyes oscillate continuously and uncontrollably.

Ophthalmoplegia or Ophthalmoparesis:
Paralysis of one or more of the extra-ocular muscles responsible for eye movement.

Diplopia:
Double vision is the simultaneous perception of two images of a single object occurring in one or both eyes. It is usually the result of impaired function of the extra-ocular muscles, where both eyes are still being used, just not in focus. It can be one of the first signs of a systemic disease and may disrupt a person's balance, movement, and/or reading abilities. (http://en.wikipedia.org/wiki/Diplopia) Seen in diseases of the eyeballs, cranial nerve affections, and disease of the cerebellum, cerebrum, and meninges.

CEREBRAL PALSY: A non-progressive disorder caused by brain damage before, during or after birth. It is characterized by abnormalities of muscle tone and difficulties with voluntary motor control. It usually results in delayed motor development. The individual may have one type or a mixture of types. Individuals with cerebral palsy may or may not have cognitive impairment. Medical associations and text varies as to types and numbers of classifications.

Common types of CP classifications.

Spastic (hypertonic)
Increased muscle tension and difficulty with relaxation, may have lack of full mobility at some joints. *Tense contracted muscles.*

Low Tone (hypotonic) (FLACCID)
Decreased muscle tension, may appear floppy, often have joint hyper-mobility (double jointed). *Diminished muscle tone.*

Athetoid
Muscle tone fluctuates from high to low therefore motor control is inconsistent. *Extraneous uncontrolled movements.*

Ataxic
Muscle tension often appears okay but control of movement and balance is impaired so that the individual may appear drunk. *Jerky uncontrolled movements*

Rigid
Muscle tension often is very tense. *Stiff uncontrolled movements.*

DEAF/HEARING IMPAIRED: Hearing Impairments refer to a reduction in sensitivity to sound. This may also be accompanied by some loss in the ability to correctly interpret auditory stimuli even after amplification. The deaf/hearing impaired population is often noted as being the largest of all chronic

physical disabilities. Hearing loss occurring after 19 years generally does not affect speech. Hearing losses occurring from birth to three years are referred to as *pre-lingual deafness*. Deafness occurring from three years to 19 years is termed as *prevocational deafness*.

Hearing Impairments fall into three categories:

Conductive Impairments:
Defects in the auditory system that interferes with sound waves reaching the cochlea. Damage or lesion lies in the middle or outer ear (i.e. ruptured ear drum). Generally, conductive losses are often lesser in degree not exceeding moderate impairment.

Sensorineural Impairments:
Defects to the auditory pathway beginning with the cochlea and auditory nerve, brain stem and cerebral cortex. Damage here prevents or disrupts interpretation of the signal (i.e. maternal rubella and noise).

Mixed Impairments:
Defects involve both Conductive and Sensorineural impairments (middle ear infections).

DIABETES: A disease in which the body cannot properly metabolize glucose. In Type I diabetes the pancreas cannot produce insulin. In Type II diabetes, cells are resistant to insulin and/or the pancreas does not produce enough insulin. Two possible concerns with diabetes are:

Hyperglycemia:
High blood sugar level.

Hypoglycemia:
Low blood sugar level. Hypoglycemia is a major concern, as it can be triggered by exercise (skiing), and delays in meals. Sugar is needed immediately if it occurs.

DOWN SYNDROME: A birth defect, which is a type of intellectual disability. Down Syndrome is caused by a chromosomal abnormality, usually chromosome #21. Down Syndrome may sometimes be referred to as Trisomy 21. Individuals with Down Syndrome often have loose joints and low muscle tone. Additionally, there may be a predisposition for cervical subluxation, whereby a cervical vertebra dislocates and can cause a spinal cord compression. This can easily detected by X-Ray. Surgical repair may be necessary to prevent injury.

EPILEPSY / SEIZURE DISORDER: A seizure is an abnormal electrical impulse in the brain. Seizures may consist of a brief suspension of activity (focal or petit mal) where an individual stares into space, or may be generalized tonic clonic (grand mal) with full body involvement. There are many types of seizures that range between focal and tonic clonic in appearance. Most seizure disorders are controlled my medication. If a seizure occurs, try to protect student from injury. Discontinue skiing as the individual may be disoriented.

Tonic Clonic (Grand Mal)
Seizures are generalized and affect the entire brain. An aura (strange feeling, taste, vision or smell) may indicate the start of a seizure. The seizure proceeds with loss of consciousness and movements alternating between contraction and relaxation of the muscles. Incontinence may occur. Seizures may last from seconds to minutes.

Focal (Petit Mal):
Seizure with loss of consciousness, eye or muscle fluttering, and sometimes loss of muscle tone. There may be a period of unconsciousness so brief that neither the individual nor observers would

be aware of it.

Psychomotor Seizures:
Seizures characterized by a loss of contact with surroundings. The individual is mentally confused, may stagger, perform purposeless movements, and make unintelligible sounds. Possibly individuals do not understand what is said and may refuse aid. These seizures can develop at any age and are usually associated with structural lesions in the temporal lobe.

INTELLECTUAL DISABILITIES: According to the Centers for Disease Control and Prevention, "Intellectual disability is characterized by a significantly below-average score on a test of mental ability or intelligence and by limitations in the ability to function in areas of daily life, such as communication, self-care, and getting along in social situations and school activities. Intellectual disability is sometimes referred to as a cognitive disability or mental retardation."

The National Dissemination Center for Children with Disabilities states:

> Intellectual disability is a term used when a person has certain limitations in mental functioning and in skills such as communicating, taking care of him or herself, and social skills. These limitations will cause a child to learn and develop more slowly than a typical child.
>
> Children with intellectual disabilities (sometimes called cognitive disabilities or mental retardation) may take longer to learn to speak, walk, and take care of their personal needs such as dressing or eating. They are likely to have trouble learning in school. They will learn, but it will take them longer. There may be some things they cannot learn.

The most common causes of intellectual disabilities are: (From The National Dissemination Center)

- *Genetic conditions.* Sometimes caused by abnormal genes inherited from parents, errors when genes combine, or other reasons. Examples of genetic conditions are Down syndrome, fragile X syndrome, and phenylketonuria (PKU).
- *Problems during pregnancy*. An intellectual disability can result when the baby does not develop inside the mother properly. For example, there may be a problem with the way the baby's cells divide as it grows. A woman who drinks alcohol (fetal alcohol syndrome) or gets an infection like rubella during pregnancy may also have a baby with an intellectual disability.
- *Problems at birth.* If a baby has problems during labor and birth, such as not getting enough oxygen, he or she may have an intellectual disability.
- *Health problems*. Diseases like whooping cough, the measles, or meningitis can cause intellectual disabilities. They can also be caused by extreme malnutrition (not eating right), not getting enough medical care, or by being exposed to poisons like lead or mercury.

Teaching Tips (Modified from National Dissemination Center)

- Learn as much as you can about intellectual disability.
- Recognize that you can make an enormous difference in this student's life! Find out what the student's strengths and interests are, and emphasize them. Create opportunities for success.
- Talk to the student, his/her parents or caregivers and teachers. They can help you identify effective methods of teaching this student, ways to adapt the lesson, and how to address the student's goals.
- Be as concrete as possible. Demonstrate what you mean rather than giving verbal directions. Rather than just relating new information verbally, show a picture. And rather than just showing a picture, provide the student with hands-on materials and experiences and the opportunity to try things out.

- Break longer, new tasks into small steps. Demonstrate the steps. Have the student do the steps, one at a time. Provide assistance, as necessary.
- Give the student immediate feedback.
- Teach the student life skills such as daily living, social skills, and occupational awareness and exploration, as appropriate. Involve the student in group activities as appropriate.

LEARNING DISABILITIES: An abnormality in cognitive processing (deficits in vision, perception, linguistic processes, attention or memory, or combination thereof) that results in a substantially below standard achievement in academic skill testing (i.e. reading and math). These individuals have difficulties processing messages to the brain making it difficult for the individual to learn in one or more areas. However, normal or above normal intelligence is not uncommon. It is conservatively estimate that approximately 1.8 million children between the ages of 3 to 21 in the United States have learning disabilities severe enough to warrant special education services. The prevalence of learning disabilities is far greater among boys than girls. The ratio seems to range from 15:1 to 25:1.

MULTIPLE SCLEROSIS (MS): A progressive disease that causes the myelin sheath around nerve cells to disappear so that they no longer transmit the necessary signals. The disease may go into remission, but generally worsens over time (varies from individual to individual). It occurs more often in women than men; initial onset is usually in the late twenties or early thirties. Fatigue and heat tends to make the symptoms worse. Muscle paralysis may be partial or full in any limb and loss of sensation may also be partial or full in any area. Visual problems are very common.

MUSCULAR DYSTROPHY (MD): A progressive degeneration of muscles. Caused by a defective gene that is passed from parent to child. MD is more prevalent in boys.

Duchenne Type:
The most common and most severe form of MD. Onset is usually between ages 3 - 10. Males are affected more than females. Generally a delay in learning to walk with frequent falls. A waddling gait is usually apparent by 6 years of age.

Facio-Scapular-Humeral Type:
The most common form of MD in adults. Symptoms do not appear until adolescence and are not recognized until adulthood. Prognosis is good. The disease may arrest itself at any stage. Effects facial, shoulder, and arm muscles.

Limb Girdle Type:
This type may occur at anytime from age 10 or after. The onset usually occurs during the second decade. Both genders are equally affected. Effects movement in upper/lower extremities including ability to move.

Mixed Type:
Rapidly progressing and usually fatal within five years. Affects all voluntary muscles.

NEUROMUSCULAR DISEASES: A group of central nervous system diseases affecting the motor system, causing weakness or clumsiness with voluntary motion and involuntary movement. These diseases include: Huntington's Disease, Parkinson's Disease, Friedreich's Ataxia, Amyotrophic Lateral Sclerosis (ALS), Guillain-Barre Syndrome, and Myasthenia Gravis.

POLIO: Muscle weakness or paralysis in any specific muscle or muscle groups caused by the polio virus. The involvement is specific to each person.

POST POLIO SYNDROME: A progressive, degenerative disease impacting nervous and skeletal systems. The disease can be disabling since resulting problems are added to preexisting damage that occurred at the initial polio infection. There is no cure. Symptoms include: fatigue, muscle atrophy, muscle spasms, disc disease, and nerve damage resulting in muscle weakness, scoliosis, and other symptoms.

STROKE (Cerebrovascular accident [CVA]): Interruption in circulation to the brain that diminishes oxygen supply and commonly causes serious brain damage. Typically individuals will suffer from hemiplegia (one sided paralysis) of either upper or lower extremities or both. Balance may also be an issue. Some stroke victims have difficulty speaking or processing auditory input.

SPINA BIFIDA: A birth defect resulting in abnormal development of the spinal column during the early stages of pregnancy. The covering over the spinal column forms a sac-like pouch; the vertebrate fail to enclose the spinal cord which may affect the connection between the brain and the spinal cord. Damage may occur anywhere along the spinal canal. Disability may range from weakness in the legs to full paraplegia with trunk weakness.

SPINAL CORD INJURY: Spinal cord damage due to some type of insult to the spinal cord, such as trauma, infection or tumor. Some of the most common levels of injury are C5-C6, T6-T7 and T12-L1.

Damage that occurs in the cervical region is described as quadriplegia. Damage in either the thoracic, lumbar or sacral region is considered paraplegia. Approximately 50% of all spinal injuries cause quadriplegia.

Individuals are classified as complete or incomplete based on preservation of function in the S4/5 spinal segment. However, the function of each individual will vary depending on the level and severity of the injury and the spinal segment where it occurs.

Spinal cord injury terminology:

Paraparesis:
Partial paralysis affecting the lower limbs.

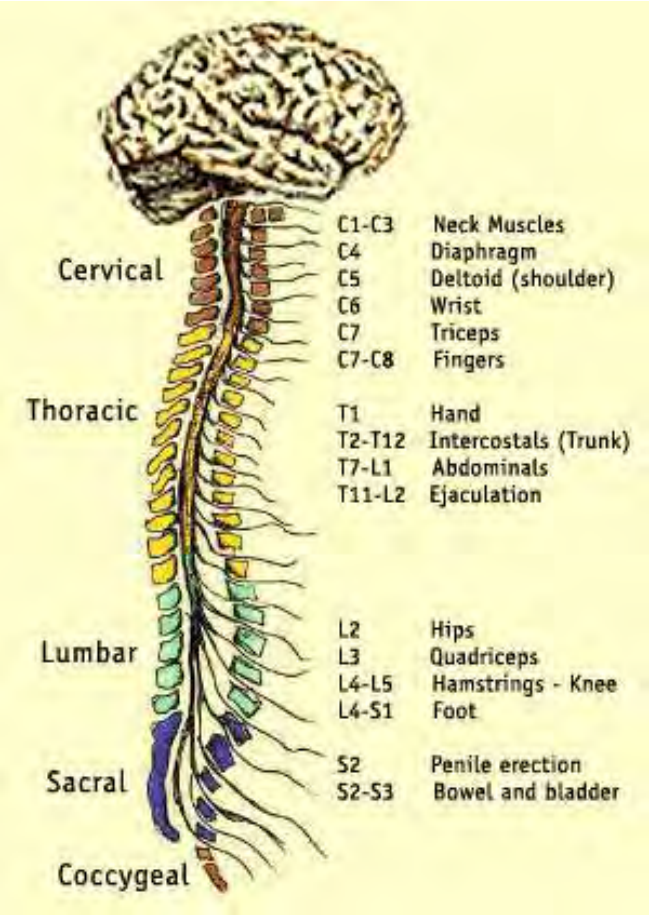
Paraplegia:
Paralysis of lower portion of the body and of both legs.

Quadriplegia (Also called Tetraplegia)
Paralysis of all four extremities and usually the trunk

The Spinal Column is divided into five regions:

1- **Cervical Region** (Neck):
This region contains the first seven vertebrae and the first eight spinal nerves.
2- **Thoracic Region** (Chest):
This region contains the next twelve vertebrae and the next twelve spinal nerves.
3- **Lumbar Region** (Lower Back):
This region contains the next five vertebrae and the next five spinal nerves.
4- **Sacral Region** (Tail Bone):
This region contains the next five vertebrae fused into one and the last six spinal nerves.
5- **Coccyx**:

This region contains four vertebrae fused into one and no spinal nerves.



Autonomic Dysreflexia (AD) is a potentially life threatening condition that mainly affects people with spinal cord injuries at thoriac T6 or higher. Refer to the Sit Down (Mono-Ski/Bi-Ski) Teaching Overview section of this guide for important information about AD.

TRAUMATIC BRAIN INJURY (TBI): According to Brainline.org (http://www.brainline.org/content/2008/11/tbi-inform-introduction-brain-injury.html), An acquired brain injury indicates damage to the brain caused by an event or disorder, such as a tumor, stroke, or traumatic injury. Traumatic brain injury (TBI) is more specific as it implies trauma to the brain caused by an external force affecting the head and brain. An example of an external force is a car crash.

Closed Head Injury (CHI) means the cranial contents have not been penetrated and there is no air inside the protective layers of the brain.

Open Head Injury (OHI) means the skull and other protective layers are penetrated and exposed to air (gunshot wound to head).

A blow or jolt to the head or a penetrating head injury that disrupts the function of the brain. Brain damage caused by some type of insult to the brain. The central nervous system (CNS) is made up of the brain and spinal. The peripheral nervous system (PNS) is made of nerves. Together the CNS and PNS control everything a person does – breathing, blinking, reading, etc.

The ***Cerebrum*** or cortex is the largest part of the human brain, associated with higher brain function

such as thought and action. The cerebral cortex is divided into four lobes:

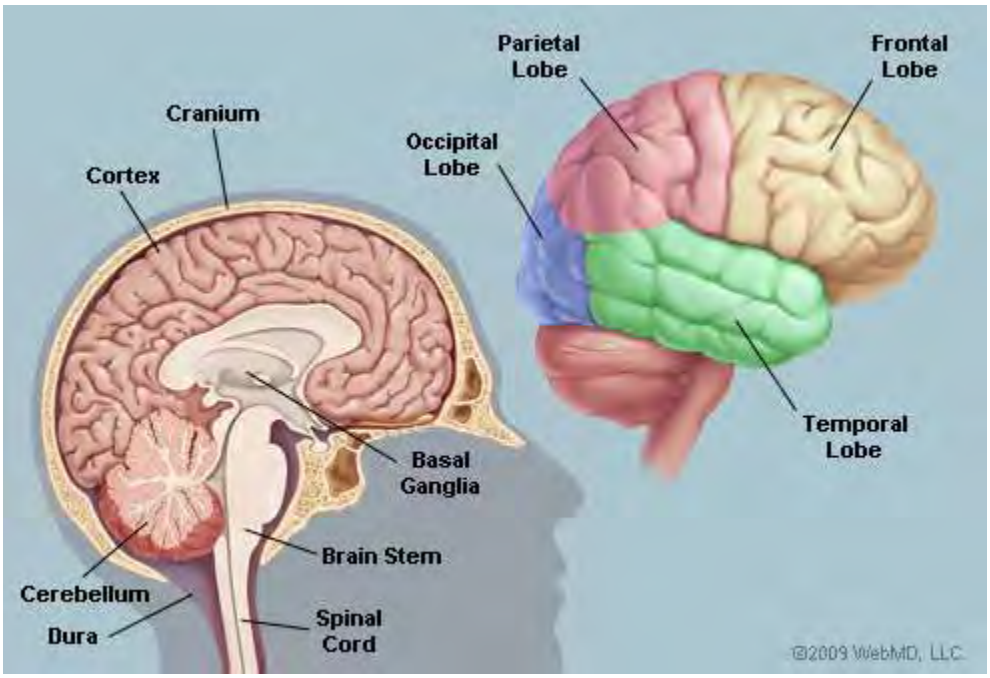
Frontal Lobe – Associated with reasoning, planning, parts of speech, movement, emotions, and problem solving.

Parietal Lobe – Associated with movement, orientation, recognition, perception of stimuli.

Occipital Lobe – Associated with visual processing

Temporal Lobe – Associated with perception and recognition of auditory stimuli, memory and speech.

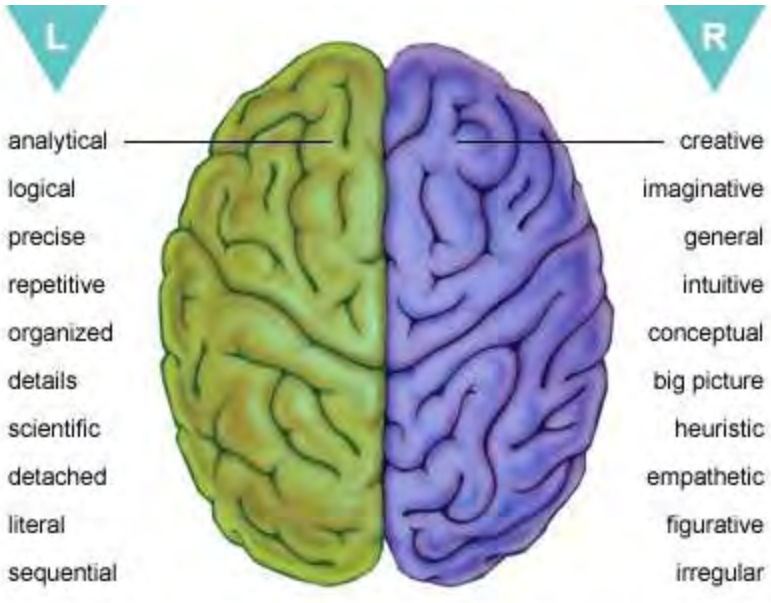
Source: http://serendip.brynmawr.edu/bb/kinser/Structure1.html



http://www.webmd.com/brain/picture-of-the-brain

Right or Left Brain

The functional sections or lobes of the brain are also divided into right and left sides. The right side and the left side of the brain are responsible for different functions. General patterns of dysfunction can occur if an injury is on the right or left side of the brain.



Source: Brain Injury Association of America http://www.biausa.org/living-with-brain-injury.htm

The above information is a general overview of some common physical disabilities. In all cases, ask questions to learn as much as you can about the individual. Each student is an individual and each individual will be affected differently by his/her disability.

MEDICATIONS

People with disabilities can take medications for a variety of reasons. Any medication has the potential to cause a side effect. Some of these side effects may impact the student's performance. As an adaptive instructor, a basic understanding of medications, their use and the side effects is important. The following is not a complete list. Several resources for information on medications are available, including the "Physician's Desk Reference" (PDR), nursing or physician drug guides, and most importantly the world wide web.

A word about medication side effects: When you look up a drug, all side effects will be listed. Researchers are required to list ALL side effects that occur, whether one person or one hundred people had the side effect. Your student may have none of the side effects or several. Check with the student or their guardian about his or her response to medications.

As you read through the medication section, recognize that ANY medication has the potential to cause nausea, vomiting or diarrhea. Therefore, these three side effects will not be listed.

ANALGESICS: **PAIN RELIEF** (two categories, narcotic and non-narcotic)

Tylenol Aspirin	Non-narcotic:
Codeine Oxycontin Demerol	Narcotic: Sedation, lethargy, dizziness, confusion, increased sweating

ANTIBIOTICS: **TREATMENT OF INFECTION**

This drug category has a wide array of medications that fall into a variety of classes. Generally, the side effects are nausea, vomiting, diarrhea or sensitivity to sun. Examples of common antibiotics include:

Amoxicillin, Augmentin, Levaquin, Zithromax, Bactrim, Keflex, Cipro, Pen V K.

ANTICHOLINERGIC: TREATMENT OF BLADDER SPASM

Ditropan	Decreased sweating, dizziness, rapid heart rate, constipation, dry mouth
Detrol	Dry mouth, headache, constipation, abdominal pain

ANTICOAGULANTS: PREVENTION OF BLOOD CLOT FORMATION

Coumadin	Easy bruising, excessive bleeding (nose bleeds, cuts)

ANTIEMETIC: **CONTROL OF NAUSEA AND VOMITING**

Compazine Phenegran Zofran	Drowsiness, lethargy, dry mouth, blurred vision

ANTICONVULSIVE: TREATMENT OF SEIZURE DISORDERS

Side effects for anticonvulsives are very similar. Many anticonvulsives are used in conjunction with each other. Also, some anticonvulsives are used for non-seizure problems, so be sure to check why your student is taking the medication: Examples of anticonvulsives are:

Dilantin, Depakote, Tegretol, Clonopin, Phenobarbital, Neurontin, Keppra and Gabitril.

ANTI-INFLAMMATORY: PREVENTION OR REDUCTION OF INFLAMMATION

Ibuprofen	Non-steroidal: headache, dizziness
Decadron	Steroids: Dizziness, headache, fluid retention
Prednisone	

ANTISPASMODIC: REDUCTION OF MUSCLE SPASM

Dantrium	Drowsiness, dizziness, fatigue, dry mouth
Lioresal	
Valium	

ANTI-HYPERTENSIVE: CONTROL OF HIGH BLOOD PRESSURE

Norvasc	Dizziness, headache, fatigue, lethargy
Toprol	
Tenormin	

SEDATIVES: REDUCTION OF ANXIETY

Ativan	Drowsiness, sedation, fatigue
Xanax	

ANTIPSYCHOTICS: MANAGEMENT OF SYMPTOMS FOR PSYCHOTIC DISORDERS

Haldol	Drowsiness, dry mouth, tremors
Thorazine	Drowsiness, vertigo, dry mouth, nausea, urinary retention
Clozaril	

ANTIDEPRESSANTS: TREATMENT OF DEPRESSION

Zoloft	Headache, drowsiness, dizziness, sweating
Paxil	
Prozac	
Effexor	

CNS STIMULANTS: BEHAVIORAL CONTROL

Dexedrine	Decreased appetite/weight loss; sleep problems; headaches; jitteriness
Ritalin	Over-stimulation, restlessness, dizziness, dry mouth, high blood
Adderall	pressure
Concerta	
Focalin	
Vyvanse	

Daytranna

CNS NON-STIMULANTS: BEHAVIORAL CONTROL

Strattera	Tiredness; loss of appetite/weight loss; dizziness, trouble sleeping; worsening of condition; mental/mood changes; unusual behavior changes
Intuniv	
Kapvay	

Adapted from: Adaptive Sports Foundation, 2004

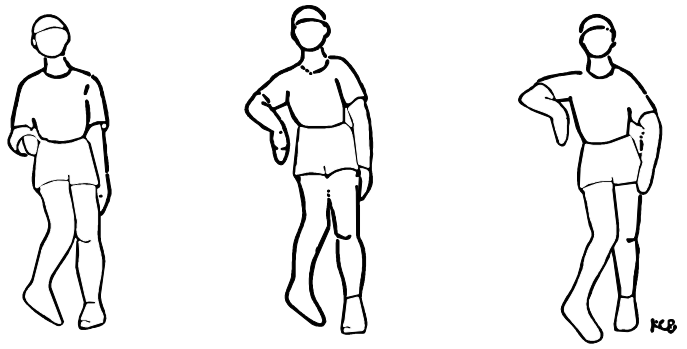
Additional Information sources: Many new drugs are being introduced annually. Drugs not found in this guide can be referenced through the "*Physician's Desk Reference*", any nursing drug guide or web sites such as www.webmd.com.

COMMON GAITS FOUND IN ADAPTIVE STUDENTS

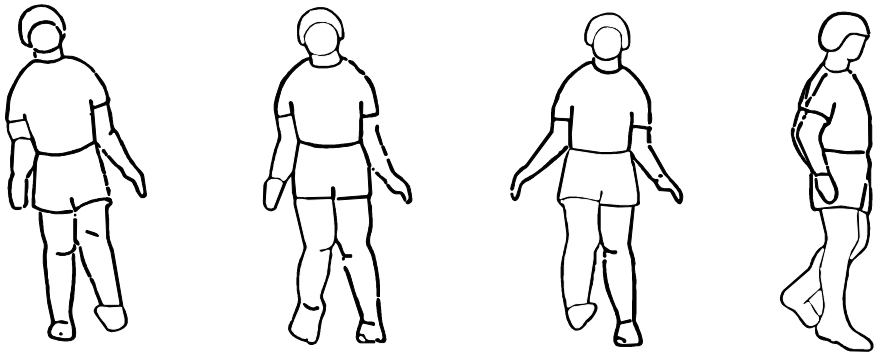
Gait - Manner of walking

Careful observation of the student as they walk into the ski lodge can reveal what muscles are affected and what the degree of impairment is. Sometimes impairment of gait may be caused by mechanical factors, such as disease of bones, tendons, joints or muscles. Damage or lesions at different levels of the nervous system are very important causes of gait abnormalities. A few of the most common gaits are listed and illustrated below:

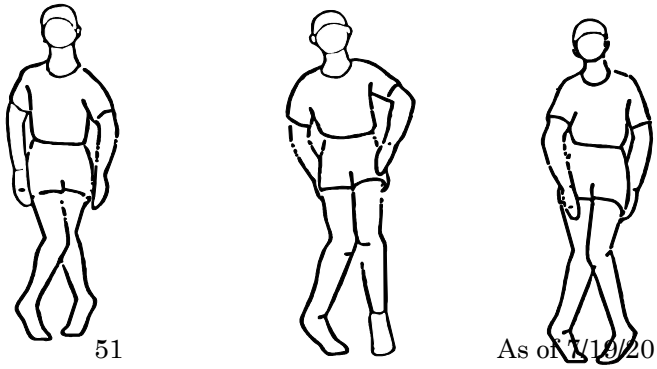
Hemiplegic gait. Both arm and leg on the same side are involved. Individuals lean to the affected side, may use alternate muscle groups to move into the next step and the arm on that side is held in a rigid, semi flexed position.



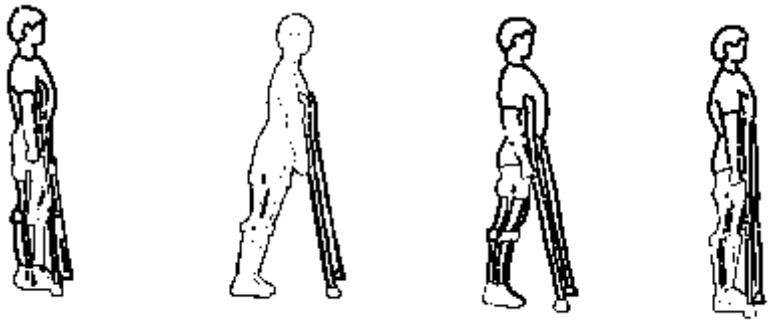
Cerebellar gait. Irregularity of steps, unsteadiness, and tendency to reel to one side. Problems are increased when the ground is uneven. Individual will often lean to the weighted side in order to move the opposite side through to the next step.



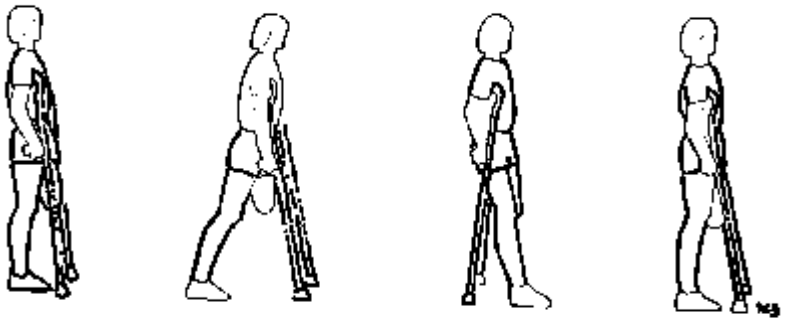
Scissors gait. The legs are flexed and abducted at the hip joint causing them to cross alternately in front of each other with the knees scraping together.



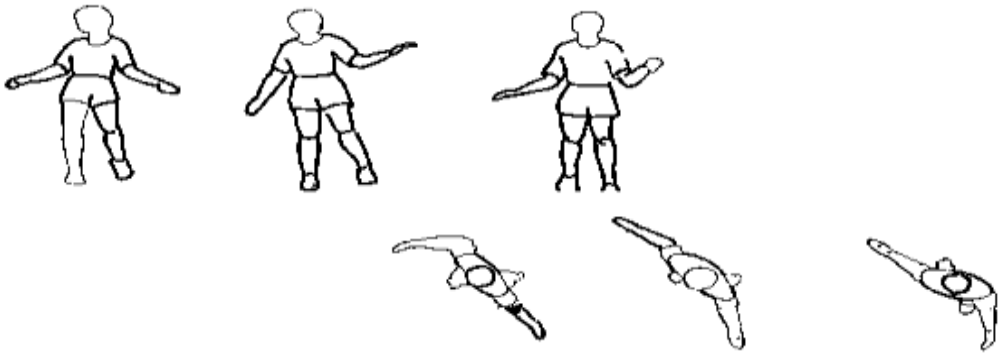
Step to, swing to, or drag to gait. All the weight is taken by the arms while the legs are lifted and swung or dragged forward. The pattern is lift and drop, lift and drop. A good example would be a person with spina bifida in long leg braces.



Swing through gait. The body is swung through the crutches so that the good foot lands in front of the crutches. Then the crutches are brought forward and the sequence is repeated. This gait is used by most leg amputees.



Waddling gait. This gait is very similar to the muscular dystrophy gait. Characterized by an awkward side to side waddle, the muscles are often used to initiate stepping.



Illustrations by Kathryn Bevier

BEHAVIOR MANAGEMENT

Behavior management is used frequently in special education, particularly with some adaptive students. It is essential that the adaptive ski instructor be familiar with some of the common procedures. The first step is to discuss with the parent/guardian which techniques they use with the student. When possible, the instructor should utilize the same technique.

DEFINITIONS:

Behavior:

The manner in which one acts; the actions or reactions of individuals under specific circumstances.

Behaviorism:

A theory of conduct that regards normal and abnormal behavior as the result of learned responses (conditioned reflexes) For example, behaviors learned as a response can be re-learned to respond in another, more effective/or acceptable way.

Behavior Management:

Behavior management is the use of behavioral teaching techniques in order to decrease instances of inappropriate behavior and to replace them with appropriate behavior.

Behavior management is based on the concept of cues & consequences.

1) Cue is the term for a signal, condition, command or instruction that elicits the desired response.
   The following are three recommended rules to follow when giving cues:
   - Make the cue as clear/brief as possible.
   - Use the same cue each time. (i.e. come, go, stay, or "ready, ski").
   - Do not repeat the cue until the student makes some kind of response. If correct response is made reinforce. If no response or incorrect action is demonstrated use a correction procedure (i.e. No, do it this way - demonstrate again).
2) Consequence is immediate feedback or information relative to a behavior that increases or decreases that behavior or response.
   - Aggressive behavior (i.e. hitting, scratching kicking, etc.) may require negative feedback followed immediately by positive feedback relative to desired outcomes. It may also require removing the student from the environment and activity.
   - Noncompliant behavior (i.e. I can't, I won't, I'm scared etc.) ignoring, diverting their attention, or engaging in an activity that is comfortable for them.
3) The following are recommendations to be followed when enacting consequences:
   - Give immediate feedback for the student's actions.
   - Accompany nonverbal (food, tokens, hugs, etc.) with words.
   - Ignore noncompliant behavior.
   - Address/punish aggressive behavior by emphasizing positive behavior and desired result (non-physical).

Behavior Management Steps:

1) Determine/specify desired behavior.
2) Establish baseline.
3) Apply intervention (intervention can be as simple as praising desired behavior and ignoring other types or as complex as punishment).
4) Evaluate if intervention is effective (i.e. desired behavior increases).

Behavior Modification and Teaching Strategies:
Behavior modification teaching strategies are numerous and vary in their applied techniques. Some commonly used in teaching, they are: Operant Conditioning, Reinforcement, Punishment, Contracts and Token Economy.

- Operant Conditioning: Producing desired responses identified by the results rather than the stimuli. Key element in this theory is reinforcement.
- Reinforcement: Anything that reinforces the desired behavior or response is called reinforcement.
- Reinforcements come in the form of physical, verbal, visual, edible, rewards, positive, negative, immediate, delayed, group, and individual.
    - Physical: A pat on the back, hi-five etc.
    - Verbal: "That was a great demo-excellent!"
    - Visual: Giving the "thumbs-up" sign.
    - Edible: A piece of candy.
    - Rewards: "You have done so well; now let's take a free run".
    - Positive: All the above and more that reinforces the positive desired response.
    - Negative: The removal of non-desired action. Outlining unmet goals ("you did not do xxx) or unacceptable behavior.
    - Immediate: Spotlighting movements, actions while they happen, most likely verbally.
    - Delayed: Noting movement or desired behavior after it happens.
    - Group: Including the entire group for combined efforts or team work.
    - Individual: Working with individual to reinforce desired reaction.
- Punishment: A consequence that is not pleasing given in response to undesirable behavior. Anything (non-physical) that decreases the frequency of an undesired behavior. Punishment can include but not limited to the removal of a desired event or removal for desired or present environment (time out) Potential problems with punishment:
    - Punishment demands the instructor's constant attention.
    - There are ethical (and legal) constraints on its use.
    - The instructor may be viewed as a negative reinforcer.
    - The student may experience behavioral paralysis or may react emotionally or aggressively.
    - The student may attempt to avoid the instructor or program.
    - Punishment may lead to learned helplessness.

Contracts: An understanding/agreement between student and teacher clearly stating what is to be learned (behavior required) and consequences of both learning (behavior required) and not learning.

Reward: A token/point system where the student is rewarded tokens/points for appropriate behavior. The tokens/points should be meaningful to the student and should be traded in at the end of the day for a reward or privilege (i.e. hot chocolate, play instructor for the last run etc.).

Token Economy: Secondary reinforcers that are earned, collected and then redeemed for other reinforcer such as trinkets, pins, food etc.

Timeout: Removal from activity to a predetermined quite place if activity becomes so stimulating that a student cannot control negative behavior.

Concluding comments about behavior management:

1) Reinforce desired behavior.

2) Praise student when student attempts or does a task correctly (Catch them being good).
3) Aggressive behavior needs firm action followed by information and positive reinforcement of desired behavior/outcomes.
4) Discuss techniques with parent/guardian that other instructors have used with student.
5) If a system that works well, tell the parent/guardian so they can tell the instructor next time.

ADAPTIVE EQUIPMENT AND TECHNIQUES

The equipment listed below is the adaptive equipment, which is currently available. All equipment should be checked before and after use to ensure that it is in working order.

BAMBOO/PLASTIC POLES

Bamboo or other poles are used frequently to help students improve their balance and/or turning skills. Some of the pole assists used with adaptive students.

1. Single pole held horizontally at waist, chest or shoulder height by student as instructor skis or rides backwards holding on to the pole.
2. A *long* single pole held horizontally at waist to chest level by both student and instructor, skiing side by side. Have the student hold the pole with palms up which helps to avoid the student from "hanging" on the pole
3. Horse & Buggy - Two poles, one in each hand of student and instructor, held at hip height with student skiing in front and the instructor skiing in the back. Instructor can shake or gently push one of the poles to help the student learn how to turn in the direction of the shaken or pushed pole.
4. Clam Shell - two heavy/strong poles (or two poles taped together) held by *two* instructors; one pole being placed under the buttocks, the other placed waist-chest height for student's hands. The two instructors or assistants ski on the side of the skier to help with balance and turning.

BI-SKI

XL, ADULT & JUNIOR

A seat (called a "bucket seat") is mounted to a tubular frame that is attached to two short and wide, radically side cut skis. The attachment device for the skis allows them to be set on edge by just tipping the seat and tubular frame. Fixed outriggers and/or handle bars can be attached to assist the skier. The bi-ski is usually tethered with either a dual or two single tether lines. The bi-ski must be tethered whenever fixed outriggers are used. Some advanced skiers may use individual hand held outriggers (not fixed), self load, and ski un-tethered (based upon the rules of each ski area's and/or adaptive program's rules).

BLIND (VI) SKIER (RIDER) and GUIDE BIBS

A bib worn by a student with a visual impairment or blind while skiing or riding. The instructor and any assistants wear a Guide bib.

HARNESS

A strapping device which is usually a climbing harness that goes around the student's hips and waist. Tether lines or reins are attached (usually by carabineers) to each side of the harness. The instructor uses the tether lines to manage the student's turn shape and speed. The harness

system can be used for both skiers and riders.

HELMET
A protective head covering usually made of a hard material (i.e., plastic, composite, polycarbonate, etc.) Worn when skiing or riding.

HORSE & BUGGY
This term has two similar but different meanings. It was originally used to describe the use of two (2) bamboo poles to assist students with their turning skills (see description under Bamboo/Plastic Poles). The newer version is two (2) six foot PVC pipes with a bicycle inner tube or webbing strap attached. The inner tube is wrapped around the student's hips or pelvis and the instructor holds the poles while behind the student. The instructor uses the poles to gently rotate the skier's or rider's pelvis to initiate a turn.

MONO-SKI:

The molded seat and foot support are mounted on tubular frame and which is connected to a shock absorber attached to a single ski. The Dual Ski and the Twin Ski are units that make use of a device similar to the bi-ski to allow the attachment of two skis. These units perform most like a mono-ski and require good balancing skills. Outriggers are used by the student to maintain balance. Skiers can self load by raising the bucket to chairlift height.

OUTRIGGERS

Outriggers are used by students that either stand-up or sit-down to ski or ride. The main difference between sit-down and stand-up outriggers is the length of the outriggers. Outriggers are "Canadian" style crutches with a ski tip mounted at the base. The tips can be made of plastic or other lightweight material or the tips of alpine skis. The back end of the ski tip can have a "claw" or row of small screws to provide drag when the student leverages the tip or uses the outrigger in the "walk" position. The claw is often referred incorrectly as the "brake" but this system will not stop a student.

A string and spring mechanism allows the student to “flip” the tip up to create a more stable crutch position for walking or pushing. When the tip lay on the snow enabling it to slide it is in the “ski” or “ride” position. Outriggers are manufactured in different sizes, weight, and tips styles as well as bent or straight arm sections. The outriggers are also adjustable to make a custom fit for each student.

Outriggers provide a three- or four-point balance system. Outrigger length and claw adjustment are individual to the student. For stand-up students, outrigger length should be adjusted to allow for a standing athletic stance. For sit-down students, outrigger length should enable the outrigger to lie on the snow with the handles near the student’s knees (or personal preference). As the student’s skills develop, the claw adjustment is usually reduced or eliminated. Equipment adjustments, physical assists and terrain selection all enhance flow of movements and maintenance of balance in motion.

A common problem when using stand-up outriggers is "paper-clipping". This occurs when the student bends forward at the waist and relies excessively on the outriggers. Paper-clipping is seen more often in a 3-Track skier than a 4-Track or Stand up student. Equipment issues such as outrigger length and/or boot alignment can also cause the “paper clipping”. Do not confuse this with the normal stance of a CP 4-Track/Stand Up student because of muscle/tendon strength/ surgery.

Common traits of a "paper-clipped" student:

A. Underdeveloped balancing ability:
   1. Little or no dynamic balance on leg(s).
   2. Relies on outriggers to remain in balance.

B. Underdeveloped ability to control rotary movements:
   1. Lack of controlled rotary movements to initiate and control a turn.

C. Underdeveloped ability to manage pressure (flexion/extension, pressure distribution) movements:
   1. Uses little or no flexion/extension.
   2. Pressures only front of the ski or board.

D. Underdeveloped ability to control edging (tilt, pivot, twist) movements:
   1. Poor upper/lower body separation.
   2. Little or no angulation.

<u>REINS</u>

Approximately twenty (20) foot long straps (usually made with webbing) with carabineers or steel triangles that are attached to tip connectors, snowboard clamps or a climbing harness. The other end of each rein has a small loop for the instructor to thread the rein through to create a noose that goes onto the instructor’s wrists (on skin, not the glove). The reins enable the instructor to manage the student’s turn shape and speed. Reins can be used for both skiers and riders. The length of the reins can vary based upon instructor’s preference and the size and skill level of the student.

RIDER BAR

A device attached to a snowboard to help the rider with balance and turning.

SNOW SLIDER OR SKI LEGS

The Snow Slider and Ski Legs are adaptive equipment used to help students stand up to ski (considered a part of Four Track skiing). They originate from the concept of a walker on skis. These devices utilize a tubular frame for trunk and forearm support. Height is adjustable and depending upon the piece of equipment, the joints may articulate; adjustable edge angle; and ski orientation (wedge or parallel) adjustment. The instructor must use tethers attached to the device whenever working with the student.

TETHERS

The terms "reins" and "tethers" are often used interchangeably however reins tend to made with slightly lighter webbing since the reins are attached to the skis, snowboard or harness. Tethers are two (2) straps made with heavier webbing used to tether certain types of sit-down equipment, primarily bi-skis or twin/dual skis, and the Snow Slider or Ski Legs. The length of the tethers ranges from six (6) to ten (10 feet) based upon instructor preference. Each tether strap has a carabineer or other method to attach the strap to the adaptive equipment. The other end of each tether has a small loop for the instructor to thread the strap through to create a noose that goes onto the instructor's wrists (on skin, not the glove).

Some instructors use a single tether which is one (1) continuous strap so the two ends attach to the adaptive equipment. There are various techniques for attaching the single tether to the instructor.

TIP CONNECTORS

Tip connectors can be used if the skier has decreased lateral control of one or both legs or has difficulty maintaining his or her skis in either a wedge or parallel position. The various connectors are used to prevent the student's tips from crossing or separating while keeping the skis in a parallel or wedge position. Whenever the student has tip connectors on his or her skis,

extreme care must be taken to prevent the skier from sliding backwards.

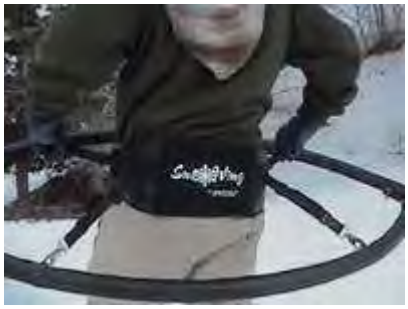
- *Ski Bra* - A metal clamp type device which screws onto the student's ski tips. The device will not damage the skis. These metal devises were originally designed when straight skis were the norm. Therefore the part that clamps to the ski tips is usually too small to fit on today's skis but may work with children's skis. There are several types of ski bras.
  - Hook and Eye – the two tip devises are joined by a hook and eye assembly.
  - Trombone – The two tip devises are joined with a hook and eye assembly but the eye piece can slide fore and aft like a trombone slide. The trombone ski bra enables the student to shuffle the skis forward and backwards to "walk" across the flats or in the lift line. It is much heavier than a hook and eye ski bra.
- *Edgie Wedgie* ™- A lightweight (6") piece of rubber tubing with a small clamp and a thumb screw at each end. It does not prevent the ski tips from crossing, but loosely holds the tips together.
- *Wedgease*™ – A device with plastic clamps connected by a bungee cord. The device helps the student maintain a wedge while working on his or her turning skills.
- *Blocks & Bungies* - A permanent type of tip connection system where holes are drilled through the tip of the ski, and they are held together by means of a chain or heavy bungee cord. Blocks can be installed on skis to prevent crossing.
- *C-Clamps* – A homemade tip connector with two small (1 or 1 ½ inch) c-clamps connected with bungee cord, surgical tubing or rubber trailer ties. The length and strength of the connecting material can vary based upon the height and weight of the student.

TWO WAY RADIOS

A two way radio head set that attach to the student's and instructor's helmets to provide two way communication. Motorcycle headsets are one type of radio communication system. Students with visual impairment and his or her guide primarily use these radios.

SKI-PAL

SNO – WING



WALKERS

Adjustable hospital walkers with skis attached are utilized for students with severe balance problems and who can not totally support themselves. Recommended height selection is approximately hip high. Usually two instructors are required to assist students.

SAMPLE EXAM QUESTIONS

1. Which of the below disabilities would be more likely to have an allergic reaction to latex?
   a. Down Syndrome
   b. Post Polio
   c. Spina Bifida
   d. Cerebral Palsy

2. Which of the below is the largest group of mental retardation?
   a. Mild
   b. Moderate
   c. Severe
   d. Profound

Refer to this manual, Appendix #1 Common Disabilities under Mental Retardation.

3. In Adaptive Ski Teaching a pro should look for what each student can do, instead of what he or she can't
   True or False

Refer to Core Concepts page 82.

4. Autonomic Dysreflexia should be considered an emergency condition.
   True or False

5. There are two types of Attention Deficit Disorder. The first type is ADHD (attention deficit hyperactivity disorder; the second type is
   a. Attention Deficit Non Hyperactivity Disorder (ADNHD)
   b. Undifferentiated Attention Deficit Disorder (UADD)
   c. Variable Attention Deficit Disorder (VADD)
   d. Sublesion Attention Deficit Disorder (SADD)
   e. Progressive Attention Deficit Disorder (PADD)

Refer to this manual; Appendix #1 Common Disabilities, under Attention Deficit Disorders.

6. Paper-clipping is most often a problem associated with which of the following types of adaptive skiing?
   a. Mono-Skiing
   b. Bi-Skiing
   c. Four-Track skiing
   d. Two-Track skiing
   e. Three-Track skiing

Refer to this manual, 3-Track & 4-Track Teaching Overview.

7. Hypoglycemia is a term used to describe a low blood sugar.
   True or False

Refer to this manual; Appendix #1 Common Disabilities, under Diabetes

8. An individual who is said to be mildly retarded would most likely have an IQ in which of the below ranges?
   a. 72-85
   b. 55-70
   c. 40-55

d. Below 40

Refer to this manual; Appendix #1 Common Disabilities, under Mental Retardation

9. How many vertebrates are located in the Cervical Region of the spine?
   a. five
   b. seven
   c. ten
   d. twelve

Refer to this manual, Appendix #2, Spinal Cord Injuries.

10. Contracts, timeouts, and reward systems are examples of Behavior Management Techniques.
    True or False

Refer to this manual, Appendix #7, Behavior Management

11. Leverage is
    a. The application of pressure fore or aft of the mid-foot balance point of the ski.
    b. flexion and extension movements for pressure control.
    c. the application of pressure to one ski by active weight transfers.
    d. the application of pressure opposite to the skier's direction of travel.

Refer to the PSIA Alpine Technical Manual.

12. It is important to establish trust and rapport with the student so that learning can occur. Real trust is built over the course of the entire experience and requires patience, thoughtfulness, and care.
    True or False

Refer to Core Concepts page 24.

13. One student following another student and giving feedback would be known as the reciprocal style of teaching.
    True or False

Refer to the PSIA Alpine Technical Manual.

14. Adaptive snowboarding is possible for both AK amputees and BK amputees.
    True or False

Refer to the PSIA Adaptive Snowsports Instruction Manual - Snowboard Section

ADAPTIVE RECOMMENDED RESOURCES

AVAILABLE FROM PSIA/AASI NATIONAL OFFICE OR WEB SITE (http://www.thesnowpros.org/)

PSIA-AASI National Standards

PSIA Adaptive Alpine Certification Standards 2014
PSIA Adaptive Alpine Standards Exam Supplement (June 2014)
AASI Adaptive Snowboard Certification Standards 2014
AASI Adaptive Snowboard Standards Exam Supplement (June 2014)
PSIA Alpine Certification Standards 2014
AASI Certification Standards 2014
PSIA-AASI Children's Specialist Standards 2014
PSIA-AASI Freestyle Specialist Standards 2014

Additional PSIA-AASI Resources

Adaptive Snowsports Instruction Manual. PSIA Education Foundation (2003) (PDF)
AASI Adaptive Snowboard Guide – AASI, 2103
Alpine Technical Manual: Skiing and Teaching Skills, 2nd ed., PSIA, 2007
Core Concepts for Snowsports Instructors, PSIA-AASI, 2008
Children's Instruction Manual, 2nd ed., PSIA/AASI, 2008
Children's Alpine Teaching Handbook, PSIA (2010)
Adult Alpine Teaching Handbook, PSIA (2011)
Alpine Stepping Stones Pocket Guide, PSIA (2005)
Visual Cues to Effective/Ineffective Skiing, 2nd ed., PSIA, 2010
Cues to Effective/Ineffective Teaching, PSIA – AASI, 2008
Tactics for All-Mountain Skiing 2006
A Ski Instructor's Guide to the Physics and Biomechanics of Skiing, 1995
Park and Pipe Instructor's Guide, 2005
Ski and Snowboard Movement Guide, 2005
Captain Zembo's Ski & Snowboarding Teaching Guide for Kids, 2nd ed., 1996
Snowboard Instructor's Guide, 2007
Focus on Riding DVD, 2005
Snowboard Instructor's Handbook, 2012
Snowboard Movement Analysis Handbook, 2003
The Pathway to Superior Snowboard Lessons: The "Tiny Bubbles" Approach

32 Degrees – The Journal of Professional Snowsports Instruction

AVAILABLE FROM PSIA/AASI EASTERN DIVISION WEB SITE

Coaching Fundamentals for Adaptive Skiers, 2013 (DVD)
PSIA-E Alpine Standards DVD, 2010
Adaptive Exam Guide, 2014
Adaptive Study Guide, 2014
Alpine Exam Guide
Alpine Study Guide
AASI Level I Exam Guide
AASI Level II & III Exam Guide

Snow Pro PSIA-E/AASI newsletter

AVAILABLE ELSEWHERE

Skiing and the Art of Carving, Ellen Post Foster, Turning Point Ski Foundation, 1998
Technical Skills for Alpine Skiing, Ellen Post Foster, Turning Point Ski Foundation, 1995
Total Skiing, Chris Fellows, Human Kinetics, 2011
Alpine Exam Tasks, Video produced by David Capron, 2010
Images & Concepts of Skiing 2008, video produced by Sean Warman (Bootleg Films, 2008)
Images and Concepts Going South, video produced by Sean Warman
Blind Skier's Edge, Serac Adventure Films, 2009
Heroes of the Slopes, One Track Productions, a film by Mark Romero, 2007
Bold Tracks, 3rd ed., O'Leary, Hal Colorado, Cordillera Press, 1994. Out of print
Supporting Individuals with Autism Spectrum Disorder in Recreation, Phyllis Coyne and Ann Fullerton, Sagamore Publishing, 2004 (ISBN: 1-57167-498-5)
Ten Things Every Child With Autism Wishes You Knew, Ellen Notbohm, Future Horizons, Inc., Arlington, TX, 2005
Adapted Physical Education and Recreation (3rd ed.), Sherrill, Claudine, Time Mirror Higher Education Group, 1986

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Medical Economics Staff, (2002).**Physicians Desk Reference (PDR)**, NJ, Thomson Medical Economics Co.
Nat'l. Ctr. for Health Statistics (1998). **Professional Guide to Diseases** (6th ed.) Springhouse
Venes, Donald (2001). **Taber's Cyclopedic Medical Dictionary**, F.A. Davis Co.
Sherrill, Claudine (1986). **Adapted Physical Education and Recreation** (3rd ed.) Time Mirror Higher Education Group
Stolov & Clowers (1981). **Handbook of Severe Disability U.S. Department of Education Rehabilitation Services Administration**
Weisberg, Strub & Garcia (1983). **Essentials of Clinical Neurology University Park Press Chairperson of Reporting Task Force**
Frances, Allen (MD) (1994) **Diagnostic & Statistical Manual of Mental Disorders** (4th ed.) (DSM-IV) American Psychiatric Association
Campbell, Claire RN (2002) **Illustrated Manual of Nursing Practice** Springhouse Corp.

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