Guide for Teaching Students with Cognitive Diagnoses

Students in this classification comprise a widely diverse population with many different diagnoses which may encompass cognitive processing difficulties and/or physical weaknesses.

In general, a **developmental disability** is a broad category of disabilities in which ones cognitive and/or physical abilities are impacted. The onset occurs before the age of 22 and is long-term. Some of these result from congenital abnormalities, trauma, disease, or deprivation. The disability interrupts or delays normal fetal, infant, or juvenile growth and development. It is important to note that not all people with a developmental disability have impaired mental function. Some common diagnoses considered developmental disabilities are autism spectrum disorder, cerebral palsy, Down syndrome, epilepsy, and intellectual disability.

A **cognitive disability**, on the other hand, is caused by damage to, or deterioration of, any portion of the brain. It may affect an individual's ability to learn and process information, coordinate and control the body, or move in space. A cognitive disability may be caused by trauma (e.g., a traumatic brain injury) or disease (e.g., a brain tumor, a cerebrovascular accident, Alzheimer's disease, Huntington's disease, or Parkinson's disease).

Diagnoses Common to Students with Cognitive Diagnoses
This category includes a varied and vast population with many different diagnoses; however, the levels 1 and 2 cognitive diagnoses portions of the assessment covers the following:
- Alzheimer's disease (AD)
- Attention deficit/hyperactivity disorder (ADD/ADHD)
- Autism spectrum disorder
- Brain injury
- Cerebral palsy (CP)

- Cerebrovascular accident (CVA or stroke)
- Down syndrome
- Epilepsy
- Fetal alcohol syndrome (FAS)
- Fragile X syndrome
- Intellectual disability
- Post-traumatic stress disorder (PTSD)
- Sensory processing disorder

Medications Common to Students with Cognitive Diagnoses

This category includes a variety of medications which may be used by students with cognitive related diagnoses; however, the levels 1 and 2 cognitive assessment covers the following:
Antibiotics
- Antianxiety
- Anticonvulsants
- Antidepressants
- Antipsychotics
- Antispasmodics
- Antispastics
- Psychostimulants
- Sedatives

Student Assessment

The complexity of this classification requires knowledge of many diagnoses, their causes and effects upon performance, plus commonly used medications. Assessments should explore students' diagnosis. However, complete assessments go beyond this and are imperative to determine the physical, cognitive, and emotional strengths and challenges of each person. A thorough check of current medications provides important information relative to stamina and sensitivity to the environment, as well as attentiveness and interpersonal skills. Treat every student as an individual; the strengths and challenges of individuals, even with the same diagnosis, can vary dramatically from student to student.

The physical assessment (i.e., mobility, balance, coordination, strength, endurance, range of motion, ability to rotate leg(s), and strength of limbs) provides helpful insight. The assessment provides indications to the equipment needed to create a successful learning environment. Even after an assessment is completed, adjustments may need to be made, due to students' abilities demonstrated throughout the lesson.

A thorough review of primary and secondary abilities and/or diagnoses, along with their cause and effect upon skill performance and cognitive processing, should be made. Students who have a cognitive diagnosis frequently have other involvements, some apparent and others hidden, which an evaluation will help to reveal. Often there are medical problems which are not evident. For example:
- Past surgical procedures can have a long-term impact on students. Students with

cerebral palsy frequently have orthopedic surgery to reduce spasticity by lengthening muscles and tendons.

- Secondary disabilities or conditions are common. A person with Down syndrome may have heart complications, hearing problems, cervical weakness, hypothyroidism, or even have early onset Alzheimer's disease.
- Behavioral and emotional difficulties are often the direct result of a cognitive diagnosis. A person with Alzheimer's disease or a posttraumatic stress disorder may be susceptible to mood swings or sudden outbursts.
- Poor judgment is associated with some cognitive diagnoses. A person with Down syndrome may be inappropriately friendly, even to strangers. A person with a sensory processing disorder may have difficulty assessing risks.
- Cognitive difficulties are present with some diagnoses. A cerebrovascular accident may cause short- or long-term memory problems; a brain injury can make it difficult for a person to make decisions, process information, or understand abstract concepts.
- Perceptual difficulties are present with some diagnoses. multiple sclerosis, Down syndrome and cerebrovascular accidents can sometimes cause difficulties seeing or hearing; a brain injury can affect any of the senses, depending on the location of the injury.

This list goes on and on. Never assume anything!

A review of current medications should be discussed during the assessment. Medications taken by students can have an impact and need to be reviewed. It is important to learn about any medication effects students may experience or are experiencing. Side effects of medications can, for example, make someone listless, slow to respond, nervous, sensitive to the sun, or muscularly weak. Accurate timing of medication administration is important to prevent adverse reactions due to lack of medication, or low medication levels in the body. Instructors should not administer medications unless qualified to do so.

In addition to the physical analysis, cognitive and affective assessments should also take place. This helps to determine if students have specific triggers that could cause hyper-reactivity and more as well as other activities they participate in, likes, dislikes, motivations, goals, and fears. This provides a platform from which to design the lesson plan. Determination of learning preference is ongoing throughout the assessment process and during the lesson. Students learning preferences can be matched with complementary teaching styles and an acceptable pace, which is based upon the cognitive, affective, and physical assessments.

It is valuable to know other interests and sports activities in which students participate. Bicycle riding indicates some balance, judgement abilities, and/or independent leg action. Ball activities indicate eye-hand coordination and some spatial judgment. Knowledge of sports, activities, and interests, plus information about students daily schedule can help you assess both physical and cognitive abilities. This may also be useful while teaching and the use of teaching for transfer.

Skill development should be modified to align with the physical and cognitive abilities of students. Matching learning preferences with teaching styles enhances the learning environment for students. Frequent demonstrations and a focus on small, obtainable goals and accomplishments is one of the most successful teaching strategies. Providing individual positive feedback along the way helps to maintain motivation and interest. As with all students, those who have cognitive diagnoses benefit from an individual assessment and tailored lessons.

In addition to students, other resources may offer valuable insights. Parents/guardians, spouses, or other caregivers can provide information regarding students physical abilities and cognitive processing strengths and needs. Many schools have a Special Education Team that creates an Individualized Education Program (IEP) for school and the parents/guardians of children with special needs. This information may assist with your initial assessment of students. Be sure not to ignore students as you are gathering additional information.

One-on-one phone conversations are extremely valuable prior to the actual lesson. The more communication and assessment done up front, the better!

Finally, it is extremely important to help this group of skiers develop sound fundamental skills. The lesson plan follows the alpine skill development progression with obvious modifications to maximize students' physical abilities. The focus is the development of the three skills supported by the five fundamentals, regardless of where the movements originate.

Equipment and Set Up
Students with cognitive diagnoses often have difficulty with motor planning, balance, and fine muscle or gross motor coordination. Adaptive equipment such as bamboo poles, tip and heel stabilizers, and tethers may be utilized to help the student learn increased balance and coordination. A developmental plan to decrease the use of these assists and equipment should be implemented as early as possible, whenever feasible.

Bamboo Pole
Bamboo poles (or lengths of PVC pipe) offer many options for physically assisting an adaptive ski student. Some frequently used bamboo pole assists are:
- A single pole held horizontally at the waist or chest level by both instructor and student, with the instructor skiing backwards. Beware that prolonged use of the bamboo pole may create habitual upper body or full body rotation. Be aware some ski areas do not allow instructors to ski backward.
- A long single pole held horizontally at waist to chest level by both the student and instructor or instructors, skiing side by side.
- Two poles, one in each hand of student and instructor, held at hip height with one person skiing in front, the other immediately in back (also called a horse and buggy).

Hula Hoop®, Ski-Pal®, and Sno-Wing™
Hula Hoop®, Ski-Pal®, and Sno-Wing™ offer great flexibility for teaching adaptive students.

Students can be positioned inside of these devices with you skiing directly behind. You can then guide turns in a manner similar to tethering. Another option is to ski with an instructor assistant and position students inside the device and between the two of you. In this case, the technique is similar to a side-by-side bamboo pole assist. Yet another choice is for you to ski backward in front of students with the Hula Hoop® or Ski-Pal® between the two of you. This allows you to lightly guide students' turns and give them the sense of security that comes from being able to hold onto something.

Heel Stabilizer
A spacer bar or bungie cord attaches under the ski boots at the heels and helps the skier keep his/her skis from crossing or getting too far apart.

Remember that for safety, when using a spacer bar, you should ALWAYS use a tip stabilizer, such as a tip stabilizer, fixed tip stabilizer, or slider/trombone.

Tip Stabilizer
Tip stabilizers come in various forms. Most allow the skier to maintain skis in a wedge or parallel position. Edgie Wedgie®©, Easy Wedge®, or c-clamps held together with cord offer very light tip control. They keep the ski tips in close proximity but do not prevent them from crossing. A slider/trombone offers more tip stability while still allowing the student some fore/aft movement of the skis. A metal fixed tip stabilizer prevents the tips from crossing or separating and it limits fore/aft movement. The sliders/trombones and fixed tip stabilizers have rings to which you can easily attach tethers.

Remember that for safety, students with any type of tip retention device (with or without tethers) should not ski backwards. Skiing backwards could risk injury.

Other Adaptive Equipment
Some students may require the use of more involved adaptive equipment, such as sit-skis, outriggers, or the slider. See the other PSIA-RM-AASI Adaptive Guides for information on other pieces of adaptive equipment.

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Physical Assists
Physical assists are useful methods to for students to experience how a turn should feel. You can also use them in situations where unexpectedly advanced terrain or fear can prohibit students from skiing down on their own. Remember to always ask your student's permission before making any physical contact.

Palm on Palm

A simple assist is to hold the student's hands palm on palm, vertically or horizontally, with yours as you ski backwards in front of the student. Remember that by skiing together, you increase your mass, which naturally increases your speed. It is critical that you keep your speed slow enough to maintain control at all times! Be aware some ski areas do not allow instructors to ski backward.

Tip Hold

This is an easy way to direct your student's turns. Simply ski backwards in front of your student while holding and guiding the student's ski tips. This method works best if you have an instructor assistant who can warn you of upcoming people and obstacles. However, even if you have an instructor assistant do this, you should still check often for such potential hazards. Be aware some ski areas do not allow instructors to ski backward.

Two-Point Hold

This is often used to assist students in turning and stopping. It is also an effective way to kinesthetically teach a new movement to students with a cognitive diagnosis. To perform the two-point hold, ski behind the student with one ski between the student's skis and the other ski outside of the student's ski with your hands on one hip and opposite knee of the student, both hips of the student or the coat tail of the student to exert light pressure to instruct rotary, edging, or pressuring movements, or instill confidence in the student. Remember that by skiing together, you increase your mass, which naturally increases your speed. It is critical that you keep your speed slow enough to maintain control at all times!

The following instructions are written for your left ski between your student's skis. Reverse the instructions if you are skiing with your right ski between the student's skis.
1. Ask your student's permission to make physical contact.
2. Position yourself behind your student with your left ski between your student's skis and your right ski to the right of your student's right ski.
3. Using your hands, rotate the student's hip and tip the knee as necessary to generate turns.

Stand-Up Tethering

Stand-up tethering is a physical assist that utilizes a ski tip connector and tethers attached to the device. It also puts you, as the instructor, in a potentially safer position as you will not be skiing backward and there is physical distance between your skis and your student's skis. Practice this before trying it with students as it takes skill and finesse to ensure safety and enjoyment for students.

As the tetherer, you have the ability to:
- **Control speed** by utilizing the slope and through turn shape (take care not to jerk the tethers, as this could cause the student to fall) and
- **Assist with turns and turn shape** through active tethering in different phases of the turn.

Instructor tether assistance may help students create muscle memory and, with enough practice, this newly developed muscle memory may allow students to eventually ski independently. Assess the student for possible independence of tethers and, if appropriate, implement a plan for tether removal for greater self-sufficiency by the student.

For students who can achieve some balance on the skis, this assist can be useful for those who:
- Lack the cognitive ability to understand directions (e.g., intellectual disability, Down syndrome).
- Have no fear of dangers such as speed or obstacles (e.g., sensory processing disorder, autism).
- Are easily distracted and over-stimulated in a "magic carpet" type environment where other students would normally learn to turn and stop (e.g., autism, ADD/ADHD).
- May have the cognitive ability to understand concepts but not the strength or capability to make appropriate movements (e.g., cerebral palsy, traumatic brain injury).
- Learn best with a kinesthetic approach that can develop muscle memory.

Generally, stand-up tethering is only appropriate on easy terrain (typically green trails).

Remember that for safety, students with any type of tip retention device (with or without tethers) should not ski backwards. Skiing backwards could risk injury.

Attaching the tethers to the skiers' tip device
The tethers should be attached to the D-rings or other attachment site on the sides of the skiers' tip device. This provides the maximum input for tether support in helping the skier to turn and stop and for student reassurance. Be sure to follow program, school, and/or resort practices and procedures for attachment of the tethers to the slider.

Attaching the tethers to the instructor
There are several key points to remember when attaching the tether to yourself:
You should always maintain tether contact *if you feel the student cannot or will not recognize safety concerns and react appropriately to them*. Be sure to follow program, school, and/or resort practices and procedures for attachment of the tethers to the instructor.
- Attach the tethers to your wrists using a girth hitch, maintaining skin contact. Tethers should be beneath your gloves and jacket.
- Do not attach the tethers to your upper arms. Attaching to your upper arms is less effective and efficient. Sometimes instructors attach tethers to their upper arms because the tethers are too long. Adjust tether length, if necessary.
- Use a second back-up safety attachment when required by your local program/resort. One end is fastened to the tether and the other end is fastened to your wrist, arm or waist. A carabiner is often used for this attachment.

Body position

You should be positioned behind and slightly uphill of skiers when tethering. When tethering a skier, it is good practice to maintain tension on the tether inside of the turn until skiers have passed the apex of the turn or the skier exhibits turn control point through this point.

Stay in sync with the students when tethering. Look for subtle cues, such as an ankle or knee extension or leg rotation, to time your assistance with students turn initiation.

Feet and skis
Ideally, you can make stem/step turns in sync with the slider skier. See the *Adaptive Alpine Functional Skiing Assessment Material and IDP* for details on how to perform this maneuver.

The wedge may also be used to effectively tether stand-up skiers, especially when coming into crowded areas or on flat terrain. Beginning tetherers often learn to tether using the wedge in order to master body and hand position. Progressing to stem/step turns is generally kinder to your hips and knees, is usually a stronger position from which to tether, and can impart smoother turn transition for students.

Hand and arm position
For maximum control and stability, hands and arms should be closer to your center of mass. This is known as the "power box". In this position, hands are between hips and chest; arms are flexed, with elbows ahead of your spine (similar to carrying ski poles). When hands and arms are outside of the "power box," you may reduce your ability to guide, control and stop the student. Arms should be used as extension and retraction tools while remaining neither at full extension nor retraction

Tether handling
There are several different techniques that can be employed to initiate turns, including smoothly pulling the inside tether to initiate a turn and wrapping and unwrapping the tethers to control length and tension. Regardless of what technique used, practice is critical to develop a feel for what is most effective.

Smooth tether handling is critical for student safety and skill development, skiing ability and student enjoyment. You should be able to wrap and release the tether with ease; there should never be so much slack that you risk tripping/skiing over the tethers or getting tethers caught under the students' ski brakes or skis.

The tightness of the tether lines can vary based on the needs of students. Generally, more advanced students benefit from light guiding of the tether lines, used as 'teaching tethers', not a control device. Beginning students, on the other hand, may need the greater instructor control that is available with tighter tether lines. Be aware of too much tension on tethers that may negatively affect student balance or movements during turning or stopping.

Tethering exercises

The following exercises may be used to improve tethering techniques:

- Develop strong skiing skills. In particular, mastery of the following maneuvers can improve tethering skills:
    - Stem/step turns
    - Falling leaf
    - Side slip to hockey stop
    - Synchronized skiing (with visual and verbal cues)
- Practice tether management. At home attach tethers to a chair and practice wrapping (gathering) and unwrapping (releasing) the tethers. Next, practice smoothly releasing the tether and then gathering it back up. Make sure you do not have slack to trip over.
- Practice tethering without the slider. Use a stand-up skiing partner who is skiing in front of you, just as a student in a slider would be in front of you. This partner should not be attached to the tethers but, instead, should hold them loosely (to protect his/her shoulders).
- Use guided discovery to find the "power box" hand and arm position. Hold your hands high, low, and in-between until the height of the "power box" is established. Then determine the width of the "power box" by holding your hands close together, far apart, and in-between. Finally, play with the flex of your arms, moving from straight arms to a tight-angled bend and in-between. As above, this exercise should be done with a stand-up skiing partner, not with students in a slider.
- Practice tethering and emergency stops with other instructors stand skiing. If possible, practice these maneuvers on people of varying weight and height. Have them role play different levels of ability. Practice until you consistently use effective body position and foot movements. Feel how different techniques affect the students. Notice the difference between full control and gentle guiding.
- Be tethered by another instructor while you are stand-up skiing. Notice which tethering techniques are helpful and which techniques hinder your progress.

Skill Development for Common Outcomes for Skiers with Cognitive Diagnoses

Local regulations and safety guidelines take precedence over this information. It is in your best interest to exercise due diligence in determining the appropriateness of the information for your particular circumstances. In addition, please take into account any and all factors that may affect your lesson. This includes but is not limited to the health, well-being and fitness of the student, weather conditions, terrain, other people on the slope, your own abilities, as well as those of students and anyone who may accompany you.

Beginner / Novice Zone Outcomes
Level 1: Welcome to Skiing / Build the Foundation
- Perform student assessment.
- Discuss medical history.
- Determine and share goals.
- Select, introduce, and set up equipment.
- Agree on student / instructor communication and safety.
- Perform static balance exercises and develop athletic stance indoors.
- Perform pushing, turning, pivoting, and balancing drills on flats.
- Begin to understand the fall line and terrain changes.
- Learn how to safely fall and get up.
- Learn to slide at slow speed.
- Glide and slide across the slope.
- Perform a straight run to a terrain-assisted stop.

Level 2: Introduction to Turning
Note: Turning at this level achieved through balance and a primary skill of rotary along with a blend of edging and pressure control skills.
- Develop stopping and slowing skills.
- Turn left and right to a stop.
- Perform linked turns.
- Begin to vary shape and size of turns.
- Perform braking wedge.
- Learn how to ride chairlift.
- Introduce sideslip skills in the beginner area.

Level 3: Introduction to Green Terrain
- Explore terrain – go for lots of quality mileage!
- Actively skid the skis for turn shape and speed control.
- Begin to use terrain-assisted edging and edge release movements to initiate a turn.

Intermediate Zone Outcomes
Level 4: Mastering Green Terrain
- Refine the ability to control the skis by turning and tipping the appropriate body parts.
- Perform edge and rotary control exercises.
- Explore all green terrain in a variety of snow conditions.

- Experiment with turn shape and size.
- Develop an understanding of how changes in stance affect the skis.
- Solidify a release move to initiate a turn.
- Use hockey stops.

Level 5: Developing Skills to Enhance Parallel Skiing
- Carry and use poles more efficiently.
- Learn how to use a pole swing, touch, and/or plant to help with torso stabilization, rhythm, and timing.
- Improve dynamic balance, increase range of motion, and feel the edges.
- Gain an understanding of upper and lower body separation.
- Develop simultaneous edge release for parallel turns on blue terrain.
- Control speed on green and groomed blue terrain by blending skills and using tactics and turn shape.
- Develop long- to medium- and medium- to long-radius turns.
- Ski a "green line" in the bumps.
- Freestyle: Learn how to jump, using natural terrain features, and beginner terrain parks.

Level 6: Anchor Parallel Skiing & Learning Tactics for Bumps and Variable Conditions on Blue Terrain
- Link open parallel turns with emphasis on simultaneous rotation and edging.
- Perform medium to short radius turns.
- Ski varying snow conditions.
- Carve uphill arcs.
- Refine tipping movements to become more dynamic.
- Perform short radius turns while developing upper and lower body separation.
- Create body angulation.
- Explore using skidded and carved short turns as tactics for speed control on steeper terrain.
- Explore powder, crud, and cut-up snow conditions.
- Explore various hands-off guiding and/or teaching methods.
- Ski a "blue line" in the bumps.
- Freestyle: Straight slide a funbox.

Advanced Zone Objectives
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.
- Enhance pole movements to promote rhythm and flow.
- Continue to refine skill blending for parallel turns on all blue and some black terrain.
- Explore a variety of turn shapes on groomed and variable terrain.
- Explore tactics for skiing all terrains.
- Freestyle: Land switch off a jump.
- Freestyle: Perform a rail slide on a bamboo pole or PVC practice rail.

Level 8: Mastering the Mountain and Exploring the Latest Ski Designs
- Continue to enhance upper and lower body separation.
- Carve medium- and long-radius turns.
- 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 separation in variable conditions to develop more speed control and manage terrain more efficiently.
- Ski the "black line" in the bumps.
- Become comfortable skiing all of the mountain's most difficult terrain.
- Freestyle: Introduce the halfpipe.
- Freestyle: Perform a rail slide on a funbox.

Level 9: Skiing Any Turn, Anytime, Anywhere, and in Any Snow Condition
- Increase confidence in 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.
- Freestyle: Perform a 360 off a jump.
- Freestyle: Perform a rail slide on a metal rail.