PSIA AASI ROCKY MOUNTAIN DIVISION
Professional Ski Instructors of America
American Association of Snowboard Instructors

Adaptive Ski Bike Information Guide Revision 09-01-2024

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Ski bikes have been around for a long time. US ski resorts first introduced ski bikes as a fun, new “sliding toy” and some resorts now have them available for rent to the general skiing public. They are relatively easy to learn but may require innovative solutions for lift riding and safe transport uphill by guests using them as alternative sliding equipment due to a medical diagnosis. Some areas do not allow ski bikes for the general public because of lift or general slope traffic issues but will allow them on the mountain as adaptive devices. It soon became apparent the ski bike is an excellent piece of adaptive equipment allowing people with certain medical diagnoses access to a fun day on the slopes. Because a user sits on the bike and can steer it with the whole body, arms, feet, and legs, it allows people with challenges standing up or limited leg strength the chance to enjoy a day on the slopes. A ski bike is a wonderful way to fill the gap between stand-up and sit-down skiing. Ski bikes require a certain amount of balance and leg/arm coordination to maneuver safely in a mountain environment. Controlling speed on a ski bike requires the ability to turn the bike across and/or slightly back up the hill. Because of this, the ski bike may be quite easy to learn for someone who has already skied or snowboarded and understands how to make turns for speed control. Guests in Adaptive lessons are encouraged to ride ski bikes independently, but a modicum of control can be applied via tethering by the instructor.

Diagnoses Common to Students Ski Biking
This category includes a vast number of diagnoses including, but not limited to, the following:

- Amputation
- Balance impairment
- Brain injury
- Cerebrovascular Accident (CVA/stroke)
- Multiple sclerosis (MS)
- Muscular or strength challenges
- Temporary disabilities (knee injuries or hip replacement)

Guest Assessment
Thorough student assessments are necessary to determine proper equipment for students. Determining factors are mobility, balance, coordination, strength, endurance, range of motion, strength of limbs, and level of injury. Assessments should explore students' diagnosis. However, complete, and detailed assessments go beyond this and are imperative to determine the physical, cognitive, and emotional strengths abilities of each person. A thorough check of current medications provides essential information relative to stamina and sensitivity to the environment; attentiveness and interpersonal skills; and physical effects. Treat every guest as an individual; the strengths and challenges of individuals, even with the same diagnosis, can vary dramatically from person to person.

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

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 more susceptible to bruising or bleeding, listless, slow to respond, anxious, 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 and permitted by the program, school, and/or resort policies.

In addition to the physical analysis, a cognitive and affective assessment 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 a complementary teaching style and an acceptable pace, which is based upon the cognitive, affective, and physical assessments.

It is valuable to know about other sports activities in which students participate and their other interests. Bicycle riding can indicate balance, judgement abilities, and/or upper body strength. Ball activities may indicate eye-hand coordination and some spatial judgment. Knowledge of sports, activities, and interests, plus information about the 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 needs to 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 care providers can provide detailed information regarding the students' physical abilities and cognitive processing strengths and needs. This information may assist with your initial assessment of students. Just be sure not to ignore students as you are gathering additional information throughout the pre-lesson and lesson activities.

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

Equipment and Set Up

Take time to initially assess students to determine which type of equipment is best. Do not rush the set up for first time skiers. Proper time spent during the initial set up will equal success and enjoyment for students in the long term. The ski bike is a modified bicycle frame with handlebars and a seat. The front fork of the bicycle is attached to a small ski that turns in conjunction with the handlebars. The rest of the bicycle frame is attached to a second ski (without turning power) that primarily supports the weight of the skier. Skiers using the ski bike can wear specialized “mini skis” called foot skis with regular ski boots or snowboard boots. These "mini skis" should have a retention system (strap around the ankle, clip to buckle, etc.) to prevent runaway equipment. The skier’s legs help balance and steer the bike as the foot skis glide along the snow. Most ski bikers in Adaptive lessons will use foot skis due to balance needs, however individuals with good balance may be able to rest legs and prostheses on the foot pegs of the ski bike while riding.

Various individuals may need to use grip mitts to maintain contact with the ski bike handlebars. Bungie cords clipped between the ski tip(s) of foot skis and the ski bike may be required to help a rider maintain lateral control of their legs while sliding.

Safety Issues and Lift Evacuations

Be aware of these points to keep students’ safe while riding ski bikes:

- Your Responsibility Code applies to all skiers, including those ski biking.
- Instructors must understand the hand signals for communication with lift operators (i.e., slow, stop, maintain speed). Hand signals may differ by ski area.
- Evacuation is always directed by Ski Patrol, and it is at their discretion to use an alternate system.

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Skill Development for Common Ski Bike Outcomes
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<u>Beginner / Novice Zone Outcomes</u>
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 and on flat areas on the snow.

Level 2: Introduction to Flats Note: Reduced stamina of a student may limit their ability to work on straight runs and flats for extended periods of time. Pace the lesson accordingly.

- Attaching the foot skis, practice pushing, turning, pivoting, and balancing drills on flats.
- Learn how to mount and dismount the ski bike while wearing the foot skis.
- Learn how to safely fall and get up.
- Learn to slide at slow speed.
- Begin to understand the fall line and terrain changes.

- Glide and slide across the slope.
- Perform a straight run to a terrain-assisted stop.
- Perform slow-downs by pointing the foot ski tips upward to pressure foot ski tails into the snow.

Level 3: Introduction to Turning

- Develop stopping and slowing skills via turn shape.
- Turn left and right to a stop.
    - Turn left and right through balance and turning movements. At slow speeds only, turn the handlebar to create the snow bike to turn and point across the fall line to decrease speed.
    - At slow speeds, practice turning handlebars and allowing the head and torso to follow into steered turns. Abruptly turning the handlebars at high speeds might cause a crash, like riding bicycle. With increased speed the turning will happen. Slightly flex arms and shoulders as if riding a bicycle.
- Perform linked turns.
- Begin to vary shape and size of turns.
- Perform garlands and fan progression to explore turn entry and finish.
- Learn about chairlift safety.
- Learn lift loading and unloading independently and/or instructor assisted. Certain models of ski bikes are designed for users to sit atop them while loading, riding, and unloading the chairlift while other models must sit on the chair beside the user or may need to be carried across the lap of the user or instructor while on the chairlift.
- Review lift evacuation procedures.
- Develop greater skill blending.

<u>Intermediate Zone Outcomes</u>

Level 4: Mastering Green Terrain

- Explore beginner terrain – go for quality mileage.
- Introduce skidded turns. This is the most important aspect of successfully controlling speed on a ski bike once going up the mountain on steeper and/or more narrow runs. Start skidding the “tail” of bike out by flattening the ski and using hips/torso to initiate rotation.
- Learn counter steering to modulate skidding.
- Develop a short-radius braking turn.
- Vary turn shape and size for terrain and condition.
- Explore a variety of snow conditions.

Level 5: Develop and Enhance Intermediate Movement Control

- Refine proper body movement and position.
- Develop short and medium radius skidded turns with speed control.
- Perform edge control exercises.
- Perform rotary control exercises.
- Master independent lift loading, riding, and unloading if applicable. Certain models of ski bikes are designed for users to sit atop them while loading, riding, and unloading the chairlift while other models must sit on the chair beside the user or may need to be carried across the lap of the user.

Level 6: Anchor Intermediate Skills and Movements

- Practice skidded short and medium radius turns with speed control.
- Ski bike in varying snow conditions and terrain.
- Refine body movements.
- Practice hip and whole-body angulation. One or both may be attainable by the guests.
- Introduce more carving in turns to facilitate carrying speeds over flat.