



Senior Specialist Manual



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Mt. Bachelor April 2008

Credits

This manual was originally compiled by a committee of PSIA-NW members with the endorsement of the Board of Directors and the approval of the PSIA-NW Education, Technical and Certification Vice Presidents and the Education & Programs Director. Manual revisions and evolutions would not have been possible without the support of the PSIA- NW Senior Specialist committee, Senior Specialist clinicians and the PSIA-NW Executive Director.

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Introduction

How old would you be if you didn't know how old you are?

-Satchel Paige

Now in its second edition this manual is designed as a starting point for snow sport instructors interested in the elements that make up a pathway for successful teaching of the senior client. The creation and subsequent evolution of this instructional guide has been made possible with research and development by PSIA-NW clinicians, vetting of current data and statistics as well as the support of originating program development members and specialist participants.

Successful instructional integration, knowledge and growth cannot come from this manual alone. Reviewing the resources referenced throughout this guide, researching information and collaborating with fellow instructors and senior clients are all valuable and necessary responsibilities. To enhance growth learned from personal experience, a summary record of lessons taught is an excellent way to maintain a senior client specific diary and a lesson planning worksheet for this purpose is included in the appendix of this manual.

The purpose of the Senior Specialist program is to provide educational training for instructors of all ages and abilities to gain the tools and knowledge necessary to provide high quality teaching and performance enhancement outcomes for the senior skier seeking lessons.

Stakeholders including resorts, member snow sport schools and mountain management are keen on recruiting and retention of visitors. As the senior visitor has been a consistent client, identification of skilled instructors to meet the senior client's specific needs is beneficial for all.

The PSIA-NW Senior Specialist program currently consists of the Foundations, Senior Specialist 1 and Senior Specialist 2 educational courses. This is a certificate program which is based on an educational framework with an assessment component. The Senior Specialist program is based upon and measured against the PSIA-NW Senior Specialist Standards, referenced in its entirety in the appendix of this manual. The Senior Specialist Standard is derived from existing National Standards including those from the Alpine, Children and Snowboard disciplines.

The premise of the Senior Specialist Standards is based upon the concepts of "levels of understanding", levels that define stages of learning within degrees of understanding. Just as certification is a measure of understanding, levels of certification represent stages of understanding. Although not a certification, Senior Specialist participants will be expected to meet levels of competency as defined by SS 1 and SS 2 standards. Participants will be held to the knowledge and performance standards of the level at which they are participating as well as the criteria for all preceding levels. Measurements of understanding are based on Bloom's Taxonomy, referenced further in the Senior Specialist Standard.

It is important to note the Senior Specialist program is an educational training opportunity, it is not an exam. However, there is an assessment component and a certificate will be awarded upon

successful completion of the SS 1 and SS 2. It is assumed each participant will pursue ownership of this material. Successful participants are expected to show an appropriate blending of skiing skills and an appropriate level of understanding of senior specific teaching knowledge and theory. Courses include written feedback and suggested personal goals for continued growth documented on feedback forms specific to each course, as noted in the appendix of this manual.

Generally speaking, one might consider seniors to be identified only by their age. It has been suggested this “defining age” might be 50 years or older. However, there are some characteristics possessed by the senior age group that are often common with younger students in today’s environment as well. These characteristics may include alterations in sensory input, fear of terrain, inability to manage variable snow conditions, injuries, medical issues, physical limitations and, likely, the pursuit of the mountain experience as a desired social experience. This training is useful to maximize ideal learning situations, for any instructor looking to develop their skill and knowledge, regardless of student age or condition.

Concepts covered in this manual include the following. The Learning Partnership as it applies to seniors: senior student profiles and subsequent instructor behaviors. The CAP Model for seniors: Cognitive (developmental milestones, behaviors, learned movement patterns, roadblocks), Affective (desires, goals and personal history) and Physical (real versus ideal movement patterns as well as anatomic and physiologic conditions). Theories and concepts include Maslow’s hierarchy of needs, VAK processes (Visual, Auditory and Kinesthetic), skill development using the low impact/continuous movement curriculum and applications of the senior teaching cycle.

Creating the Learning Partnership

Instructor Behavior and the Student Profile

The principles of good teaching are always relevant with any class. The American Teaching System (ATS) documented in the 1996 PSIA Alpine Manual is an excellent place to start. The principles of good instruction are facilitated by the instructor and are characterized by:

1. *Guest Services Driven* by developing positive interaction with the Snowsports area services and meeting the needs of the client base.
2. *Student Centered* learning facilitated by the instructor who identifies and meets the student needs throughout the lesson.
3. Establishment of a *Learning Partnership* with the student through the process of continuous communication and development of trust.
4. Development of a flexible lesson plan that is *Outcome Based*, one that caters on a real time basis to the needs of the student.
5. Allowance of sufficient time for the students to experiment and learn through *Experiential Learning* and/or trial and error.
6. Providing feedback and coaching that is *From the Heart*, that is accurate and honest yet diplomatic.

The principles of good teaching and skiing were further expanded with the PSIA Alpine Technical Manual (ATM) (2007, 2nd Edition) and Core Concepts for the Snowsports Instructor (2001). These principles of good instruction have been further nuanced and broken down into specific skiing models and teaching models. The senior specialist instructor shall be familiar and accountable to these core models as they are the foundation of all outcomes and methods utilized in the senior specialist program.

1. The Learning Partnership: student profiles and instructor behaviors.
2. The Teaching Model: including the teaching cycle for successful lessons.
3. CAP: Cognitive, Affective and Physical attributes of all learners.
4. The Skiing Model: common efficient skills and movement patterns.

The instructor's assessment and understanding of each client, i.e., the Student Profile (based on the senior CAP Model) and the instructor's subsequent development of their lesson plan, i.e. the teaching cycle (based on the senior Teaching Model) creates the Learning Partnership.



The Learning Partnership

Senior Teaching Cycle Instructor Behavior

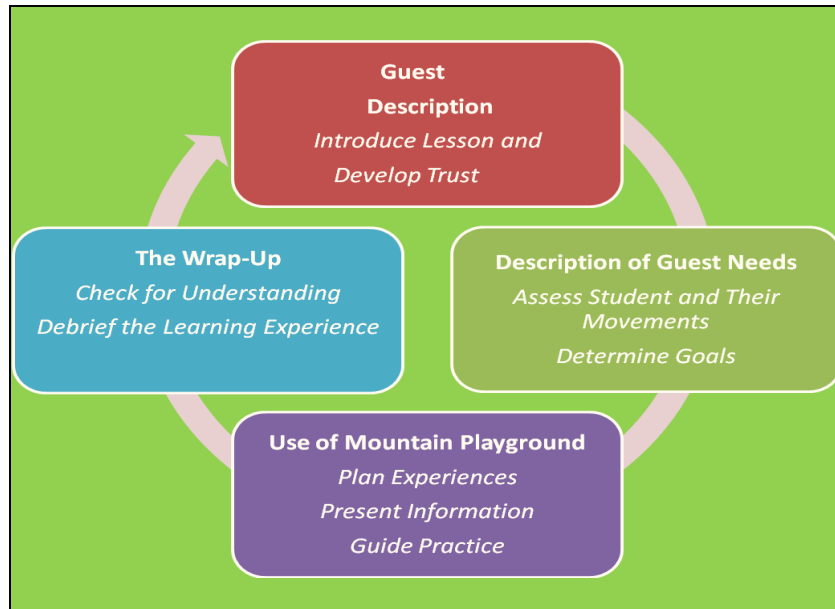


Figure 1 Senior Teaching Cycle

Senior CAP Model Student Profile

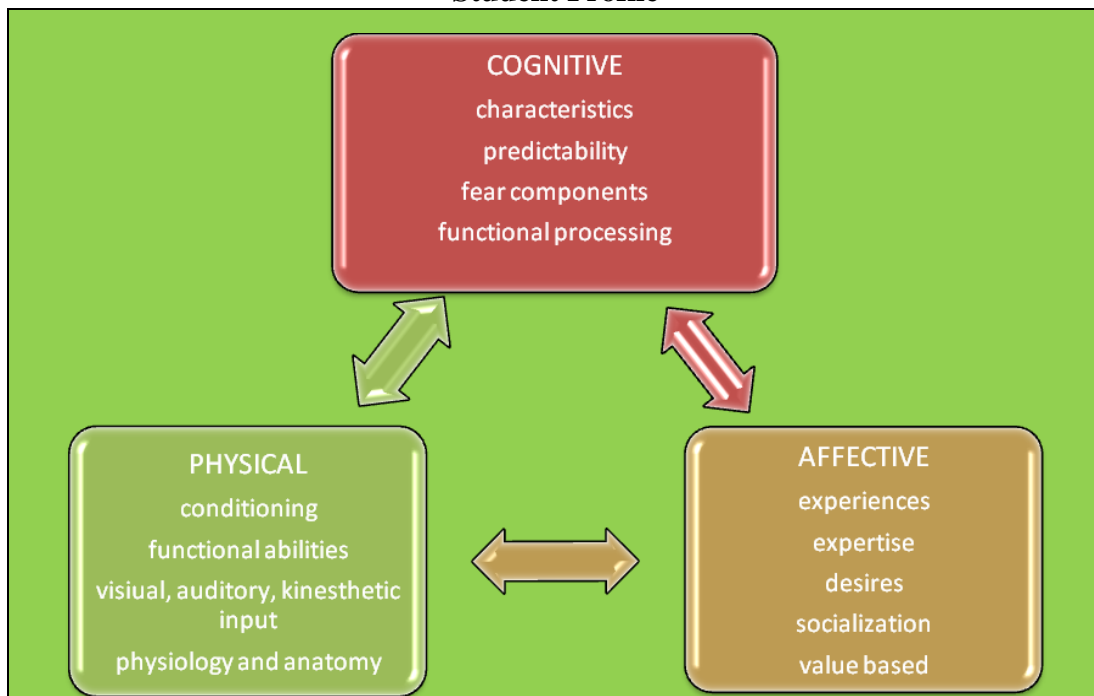


Figure 2 Senior CAP Model

Identifying the Client

Identifying the components of the student profile guide the development of the learning partnership by giving the instructor tools to utilize while assessing, interviewing and determining guest needs. There are multiple components that make up the student profile – time, study and experience will assist in ultimate mastery as a senior specialist instructor.

There are many different definitions of a senior depending upon what the reference source is and, as well, the perspective. For instance, a student in the last year of high school is referred to as a *senior*. This senior ready to graduate can suffer from *senioritis*. One who has tested extensively with the National Ski Patrol is considered a *senior* patrol member. A high level employee in the government's state department is considered a *senior* official. Restaurants cater to certain demographics depending upon their business model and may advertize *senior* specials on their menus. The PGA hosts a *senior* championship; one must be over 50 to be invited. Membership to AARP requires one to be 50 years old, what the organization considers a *senior*. Only a few decades ago, parents in their 40's were sending their children off to college. Now, parents in their 40's are just starting their families. As we age we can be irritated to be offered a senior discount when we didn't ask and flattered when carded.

Membership in the great sport of skiing still includes active skiers who are considered to be in the Greatest Generation (1914-1930) and the Silent Generation (1930-1945). Now, as the Baby Boom Generation ages (1946-1964), Generation X (1968-1979) is nipping at their heels teaching us that the only thing we really know for sure is that the definition of *senior* and consequently the definition of aging will continue to change and evolve.

Demographic Realities and the Senior Market

Anecdotally, seniors are increasingly participating in the sport of skiing at an older age than in the past. Resorts have been catering to the baby boomers for years, marketing high end accommodations and other perks this generation was expected to desire. The likelihood of an instructor giving a lesson to a "senior" student or a class of "seniors" seems increasingly likely.

The following statistics vetted over the past ten years show interesting but not necessarily concrete information regarding the senior demographic. However, used in totality, the statistics show a compilation of age, income, activity levels and trends in participation that can help the instructor, school or mountain resort identify their client base and provide opportunity to add to the learning partnership.

The 2010 US Census provided informative statistics on the aging American population. Nationally, the number of older adults will increase by 15 million over the next 10 years. In Washington State alone, the number of residents 65 and older grew 25% over the past decade with residents 85 and older increasing by 40% and most interestingly the number of residents aged 60-64 grew in population over the past decade by 81%. Statewide the percent of the population 65 and older is 12.3. PSIA-NW associated states are similar: in Oregon this

percentage is 13.5, Idaho is 12.1 and Montana is 14.6. In the US, people aged 55 years and over make up 24.3% of the total US population. Of note, this number drops to 12.7% of those 65 and older and 5.8% of those 75 and older. Since 1900 the percentage of Americans older than 65 has more than tripled. The marital status of all men older than 65 is at 72% and women at 42%; widowhood accounts for 41% of all older women as of 2009. Households containing families headed by persons 65 or older reported a median income in 2009 of \$43.7K with 87% reporting social security as their major source of income, 54% reporting income sources from assets, 25% reporting income sources from earnings and 28% from pensions.

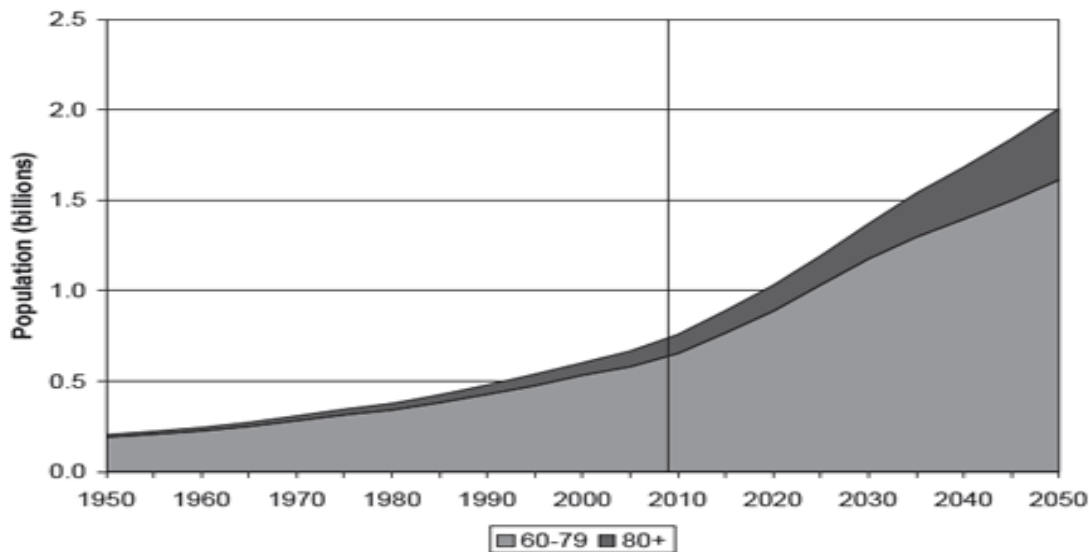


Figure 3 Population Trends

The National Ski Areas Association (NSAA) reports in the 2004-2005 ski season 31% of downhill skiers in the United States were over the age of 45 up from 21% in 1997-98. In 2006-2007, a little over seven percent of skiers were over 55. The National Sporting Goods Association (NSGA) reports that alpine skiers between age 45 and 74 increased from about 1.1 million in 2002 to 1.3 million in 2003.

Although not measured by age ranges the NSGA reported in 2010 that only 12 sports showed positive growth trends measured by participation since 2006 which included cross country skiing up 19.5% and alpine skiing up 15.6%. The Physical Activity Council (PAC) researched 117 different sports during 2009, citing trends in levels of activity. Not age specific, the data showed that 50% of Americans participated in no activity at all during the research year and that winter sport activity showed single digit growth with the exception of snowshoeing which showed a participation increase of 17.4%.

An interesting 2009 study done by the British Columbia Tourism industry measuring American travelers to the British Columbia province of Canada specifically for downhill skiing showed 18.6% of this demographic were 55 and older.

The SnowSports Industries of America (SIA) 2011 report showed that alpine skiing grew 5.4% from the 2008/09 to 2009/10 season. They also reported that the annual income of 47% of those alpine skiers was \$100,000 or more.

However, in 2008/2009 research done by (SIA) measured snow sport participation by age group. The numbers are telling:

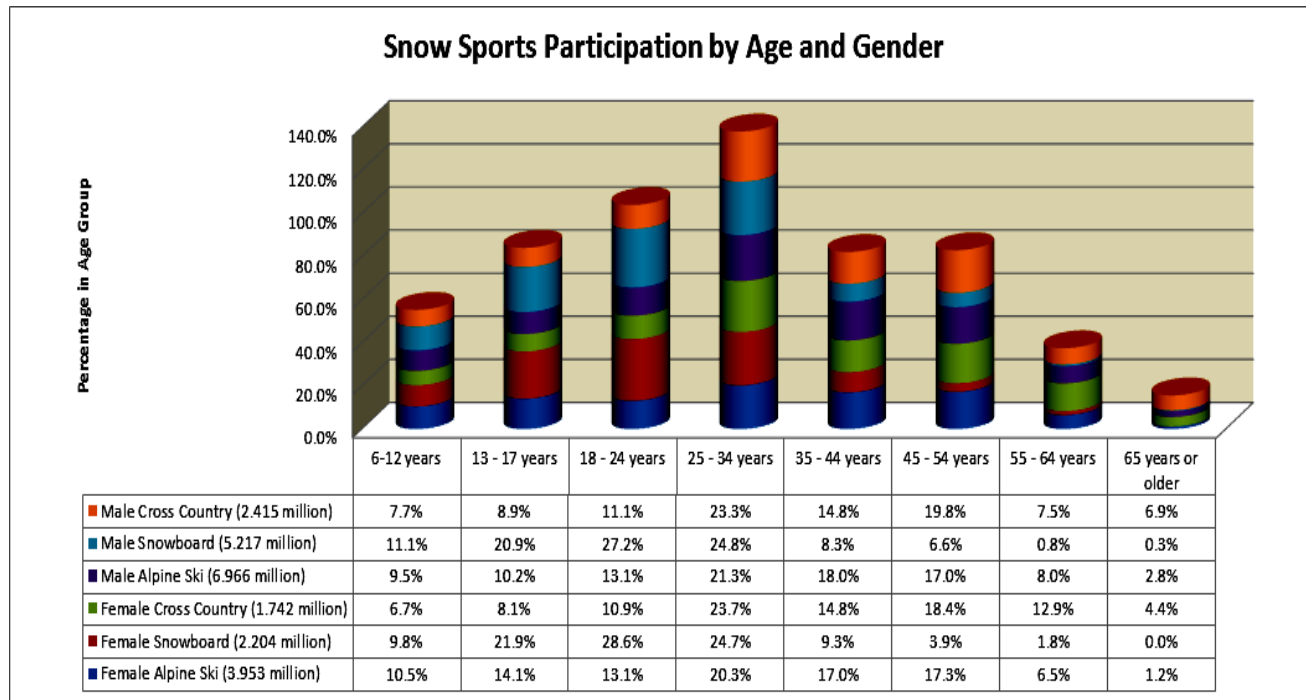


Figure 4 Snow Sports participation

The 2011 SIA's Snow Sports Market Intelligence Report looked at the snow sports industry analyzing statistics on participation, retail sales and resort information from the 2009/10 season. Gender was split 60% male and 40% female. The highest participation of skiers by age was around 20% both in the 25-34 brackets and 35-44 brackets. However, the 45-54 age brackets held strong at 16% but plummets to 5% in the 55-64 age group and 2% for those 65 and older. Overall, age trends are moving downwards compared to the 2008/09 report noted above.

The National Ski and Snowboard Retailers Association studied downhill ski participation trends from 2000 to 2009 showing the average number of days skied peaked at 12.9 in 2006, dropping back to 7.6 in 2009. Overall industry figures dipped to 57.1 million skier visits in 2009, down from 60.5 in 2007. Income trends show that 46% of skiers in 2009 had income greater than \$100,000 an increase from 23.8% in 2004. The mean age for men consistently fell between 30 and 33 years and women 28 to 35 years of age. However, in 2009 66.3% of all participants were older than 25.

In 2009, the National Ski Areas Association (NSAA) addressed the need regarding perpetuation of continued growth in alpine participation as the concern is growing that baby boomers will be dropping out of the sport as the generation ages. NSAA research during the past decade reflects that the percentage of visitors (defined as one skier or snowboarder riding a chairlift per day)

age 45 to 54 grew from 14.0 percent to 19.9 percent, with age groupings above 54 also showing increases. Today, in 2011, the tail end of the baby boom generation is turning 50 years old. The NSAA Model for Growth research project is addressing how resorts can attract new generations of skiers to replace the boomers without alienating the core group that has driven resort growth to date.

Finally, the most definitive research thus far stems from Jasper E. Shealy, Ph.D., C.P.E., “*Aging Trends in Alpine Skiing*” (Shealy, J. E., Ettlinger, C. F., Johnson, R. J., 2010). This study notes the US Census Bureau data showing the mean age of the US population in 1970 was 26.8 years and in 2007 it was 36.4 years, an increase of 9.6 years. The study spanned 34 years from the 1972/73 to 2006/07 seasons and concluded that both the US population and the US skiing population are aging, with the skiing control population increasing more so than the general population.

How individual snow sport schools and resort areas use this data to reflect upon design impacts, resource allocation and marketing is yet to be seen in all but small pockets of our industry at this time. As noted by psychoanalyst Serge Prengel, “being proactive means being reactive – ahead of time”. Will we continue to see the baby boomers come back to the sport of skiing, or take up the sport for the first time? Anecdotally, we hear of boomers coming to ski resorts with their children and grandchildren. Generational ski lessons are being marketed. The statistics alone are just one barometer to use when identifying the senior client.

While there is a tendency to use the age of 50 as a benchmark in identifying the senior client, it is only useful in providing a general frame of reference. Because age associated changes vary in onset and development and do not reflect any particular age in years, the characteristics of the individual skier are much more significant. It is important to identify who your client is, why they are participating in lessons and what their goals are. Understanding typical characteristics help in identifying the student profile.

The senior population of skiers presents broad characteristics that influence their goals, needs and expectations. A good understanding of these traits enables instructors to be more successful in meeting client expectations and should significantly influence the format of the lesson, the pacing of the activities and the specifics of the learning partnership established between student and instructor. Each class will present specific challenges; the instructor’s ability to appropriately identify the student profile and adjust accordingly creates successful outcomes.

With these generalized statistical and demographic profiles and characteristics identified, specific content will now be broken into component parts within the Cognitive, Affective and Physical (CAP) attributes of the senior population. How one thinks (cognitive), identifies, feels and operates in the word (affective) and is physically developed (physical) can help create a framework to identify and place information learned about a student. While originally developed by Benjamin Bloom (1956) in identifying three core domains of learning, and used extensively in the children’s snow sport curriculum, the CAP model is equally useful in understanding how any person functions in life, unrelated to age or discipline. Understanding

the specific elements of the senior CAP model assists in delineating instructor behaviors that can create an effective learning partnership.



Mt. Bachelor, April 2011

The Senior CAP Model

Cognitive Attributes of the Senior Skier

If everyone is thinking alike, then somebody isn't thinking. – George S. Patton

Scientists used to think that we lose a significant number of our brain cells as we age, but more sophisticated scans have debunked that theory. We now know that we hit our cognitive peak between the ages of 40 and 68. Through the years, our brains build up connections and recognize patterns; meaning we're better problem-solvers and can more quickly get to the gist of an argument. It's the reason why judges and presidents tend to be middle-aged or older, and why Captain Chesley "Sully" Sullenberger was able to land that airplane on the Hudson River. Older brains can swiftly make the right calls. (*The Secret Life of the Grown-Up Brain*, Barbara Strauch, 2010)

Intelligence generally can be thought of as including a range of abilities that allow us to make sense of our experiences; the ability to comprehend new information, the ability to think abstractly, the ability to make rational decisions, spatial ability, numerical ability, verbal fluency, etc. Some abilities (e.g. the ability to think abstractly) are heavily biologically determined and are relatively independent of particular applications, reflecting what has been called "fluid intelligence." Other intellectual abilities (e.g., verbal fluency) are more apt to reflect the knowledge and skills a person has gained through life experience, or "crystallized intelligence". Intelligence tests have demonstrated a pattern of age-related changes in intellectual functioning typically beginning after the age of 60. This 'classic aging pattern' involves somewhat poorer performance on tests of fluid intelligence, but little or no difference on tests of crystallized intelligence. Not all cognitive changes in later life are negative, however. Older persons typically exhibit greater experience-based knowledge, increased accuracy, better judgment, and generally improved ability to handle familiar tasks than younger persons. Such applied knowledge, or wisdom, may in fact be considerably more important to one's ability to accomplish most tasks of day-to-day life than are the abstract abilities tapped by intelligence tests. Most persons experience a modest increase in memory problems as they get older, particularly with regard to the ability to remember relatively recent experiences. Decrements are found both in the ability to accumulate new information and in the ability to retrieve existing information from memory storage, although there is little decline in the ability to store new information once it is learned. (*Aging Successfully; the Importance of Physical Activity in Maintaining Health and Function*, Marc T. Galloway, MD and Peter Jokl, MD)

The most common cognitive change is a decline in speed of mental processing. As we age it appears there is a decrease in the speed of evaluating the information and reacting to it. Older persons also become less capable of making a decision regarding a stimulus, thereby appearing less decisive. However, these affects may not appear until the individual is much older. (*Ratcliffe & Saxton*, 1998)

Autobiographical memory (life stories and events) tends to remain sharply intact as one ages. Habitual processes (driving a car, riding a bike) remain constant as well. However, episodic memory (remembering names, tasks) starts to recede with aging. Short term memory such as recalling someone's name, the reason one went out to the garage in the first place, is a retrieval mechanism and sorting through the retrieval brain processes can become slower and weaker over time.

Seniors are just as likely as younger adults to understand material being presented to them, but they would benefit from more time to absorb the information. . . . seniors may be less able to 'store' new material that is presented rapidly. . . . reaction time is slowed. . . . however, it is important to note that these changes are minimal in normal aging, and do not generally impair the daily functioning of seniors. Further, there is considerable variation among seniors, and all of these changes are relative to the individual's level of functioning." (*Working with Seniors, Health, Financial, and Social Issues* Society of Certified Senior Advisors, 2005)

Of course, symptoms of dementia, such as Alzheimer's disease can rob a person of capacity and memory. Individuals with memory loss (even in the earlier stages) present a unique challenge both in learning (retention) and in class handling. One attribute of someone with dementia is a lack of empathy, or tolerance of others, with behavioral outcomes of anger or irritation not commensurate with the trigger. In other words, demonstrations of needless frustration and anger out of proportion to the reality of the situation. Also, short term memory can be impaired requiring directions and coaching to be measured and possibly repeated. Consideration of "partnering" so the individual is always with someone else may be helpful. Most seniors are sympathetic to persons with such conditions and don't mind participating in helping to ensure their safety and well being when asked. If partnering is used, it is best to rotate the responsibility among those willing and able to participate to ensure others are not unduly burdened.

According to some experts, seniors tend to be more cautious in their decision making. Once they make a decision however, they are more reluctant to revise their decisions and judgments. This tends to make them less flexible in their learning which means it may be more of a challenge to convince senior students to try new movements. This challenge may be particularly difficult if they have some history which has given them the belief their current movements are appropriate, such as an earlier "good lesson", using outdated equipment or technique. Gradual changes with incremental improvement may be the best approach, rather than trying to convince the senior student to try something radically different. Habitual patterns are ingrained cognitive functions that take time to develop and, therefore, also take time to change or alter.

Generally there is no reason the senior student should have any intellectual impediments to understanding abstract concepts and in fact while learning preferences tend to remain constant, if anything seniors may tend to be more "watchers" and "thinkers" than "feelers" or "doers." (This may also reflect physical safety concerns addressed later.)

Cognitive development continues through an adult's early 20's with the brain undergoing continuous changes and remodeling. Thinking and learning occur in the amygdala,

hippocampus and temporal lobe regions of the brain. Neurological research is focusing now on the mature brain with theories that the brain remains neuroplastic meaning that functioning can change and adapt. Seniors involved in self improvement in the community setting with like minded goals help maintain healthy brains on holistic levels. (*Vibrant Minds*, Lisa Schoonerman, 2008) As an adult matures into middle age and then senior years the brain uses the greatest developed functioning areas the most. The adage “use it or lose it” is generally true.

The brain sorts and organizes information. The physical response is the motor response or outcome which starts in the brain and is involved in a feedback loop of the senses. Our senses tell us how we receive information regarding position and movement through space. Our senses are how we hear, see, feel and taste. Three sensory receptors that relate to balance are the eyes, inner ear and kinesthesia, the perception of body movements (for skiers, often starting at the soles of the feet.) Visual, Auditory and Kinesthetic: VAK. This is an important concept to understand when working with senior skiers as their senses may be diminished or impaired, impacting balance as well as other potential outcomes. The senses can be considered free standing entities as well as inter-related as the mitigation of one sense may alter applications of the others.

Visual

Acuity: vision declines with aging
Localization: orientation of people or objects in space
Details: fog, density, brightness, contrast
Overload: crowds, volume, terrain, fear

Auditory

Determines: direction and distance
Sounds: ice, crud, powder, crowds, nature, inner-voice
Acuity: limitations related to helmet usage, lack of eye contact

Kinesthetic

Primary source of sensory input
Tactile: how it feels
Pressure: sensations on body parts
Proprioception: the body's balance receptor



Figure 5 Senior VAK Model

Sensory input and cognitive functioning work towards creating physical outcomes. All the senses receive information. The brain processes this information which leads to the body having a motor response with the body then sending this information back to the brain via the sensory feedback loop. This is to be contrasted with a reflex, when the response feedback loop goes only to the spinal cord and not the brain, creating an involuntary response.

The brain is the sorter and the organizer. Again, the physical response is the motor response which creates actions and reactions which allow order and predictability. Labels attributed to senior skiers of “stubbornness” or “refusal to change ways” may really be ingrained cognitive and neurological processes that take time and coaching to alter or adapt.

For a more complete and detailed discussion of the relationship between skill acquirement and the interrelated cognitive functioning processes, see Addendum 1.

As a general rule, seniors are smart and have a work life history of being good at something. Creating “buy in” and a desire to change learned movement patterns or trialing new ski technology can be more successful when considering multiple aspects of the cognitive component.

Affective Attributes of the Senior Skier

Success is the ability to go from one failure to another with no loss of enthusiasm.
- Sir Winston Churchill

A key in the affective development of most senior skiers is the importance of the “whole skiing experience” and the social aspects it can involve. Competition is less important and the overall desire for a good social experience greatens.

Most senior skiers have learned to want to savor each run and are willing to take the time to stop, chat and observe the world around them while taking the time to “smell the roses.” Often seniors favor the social aspects of skiing with a group of like minded individuals.

Generally, seniors have a number of attributes in common. First they are middle-aged or older. They are very *goal oriented*, have *many years of life experiences* to draw from, *are experts at something* which will influence how they observe and learn and are generally *attracted to skiing more for the social environment* rather than the challenges of competition or difficult conditions.

Seniors have learned with life experience that setting specific goals in their activities creates greater outcomes. Often, this is reflected in the client’s approach to a lesson as they have specific goals identified that they want to achieve. The client may have a specific “issue” they want to address and a particular level of accomplishment they hope will be the result. The successful instructor will try to understand these goals. A more successful lesson is likely if the goal is appropriate and is one that can be reasonably achieved. This may require some moderation of the client’s initial expectation but seniors have the life experience to understand the process of achieving intermediate goals as long as they lead toward the ultimate stated goal.

As students, seniors come to you with many years of life experiences. This can be a rich source for “teaching for transfer.” Many of these experiences will allow the instructor to relate skiing movement patterns to some other life activity: tennis, sailing, hiking, musicianship. Socially, the client’s wealth of experiences can provide a great opportunity for group and individual interactions.

Throughout a senior’s many years they have become experts at something. They have experienced success and want to succeed in the lesson. An older client can understand success does not generally happen “overnight” and is generally willing to be more patient, particularly with demonstrable progress.

Few senior skiers approach the sport with the desire to conquer it. By this stage in life, the social interaction that can occur during a lesson, both with the instructor and the other students, has a greater importance. Participation in the lesson for the fun and the joy of sharing the experience with others, rather than to become “the best skier on the mountain” is of more paramount importance. Frequently, attributes of the experience include such things as the bus ride, lunch at the top of the mountain, a beer or glass of wine at the end of the day and a chance to recount the “best run of the day”. These times provide an opportunity to relive and share the day’s skiing experience with others in a comfortable social setting.

Today’s modern resorts offer a mixture of old and new amenities. High speed chair lifts get the skier onto the snow faster, a perceived benefit. For the senior client a high speed chair also minimizes the amount of rest time between runs and limits the opportunity for social discussions and visiting. Skiing is a solitary sport mixed with social opportunities, a prime mixture for most personalities.

“As we age, we are no longer willing to give up the pleasures of physical activity, nor should we be. However, it is difficult for us to maintain a clear perspective on just how much we can do. We do not have much in the way of role models. Our bodies and capabilities are constantly changing. We no longer have the same confidence in our physical ability. To feel apprehensive under such circumstances is not only understandable, it is to be expected. As an individual experiences more apprehension the less confidence he has in his ability to perform successfully. When we find ourselves physically unable to do something we had no problem with before, when we are slower to react, when we can not rectify a mistake with the same alacrity, when we take longer to recover from an injury, we lose a clear sense of our capabilities and limitations. We lose confidences and thus we become apprehensive. So how do we deal with this - with this loss of confidence and the resultant anxiety and fear? We can succumb and either give up altogether (possibly making excuses that help us save face), or perform at a level far below our actual capabilities; we can deny that any of this is happening and put up a brave but reckless front, truly endangering ourselves; or we can be realistic, see the situation for what it is and deal with it. We can learn our capabilities and limitations, set realistic goals, and build confidence. We can learn new and different ways to do things and refine skills rather than relying on an ever declining strength. As we get older, our confidence in our physical abilities will decrease and, quite likely, our anxiety and fear will increase. An instinct for self-preservation, after all, is natural and healthy. How we deal with this then is up to us. The most constructive way is to

rebuild confidence by setting attainable goals and finding ways to perform that require less brute strength, relying more on skill and finesse. With the right skiing attitude, you can enjoy a long skiing life and many happy turns.” (*Senior Skiers and the Fear Factor*, Elissa Slanger, Ph.D., 2007 PSIA-W)

“Old age is typically a time when the work role becomes less important and leisure takes on more significance in life. Leisure may be an end in itself, but moments of leisure also have a developmental pattern that is rich with purpose. Leisure, in short, can be serious business. For example, if we play sports or perform music or read a book, each moment leads to the next in some purposeful developmental pattern. It’s a mistake to resort to stereotypes about ‘old people’s’ activities, such as bingo, or singing old-time songs.” (*Working with Seniors, Health, Financial, and Social Issues*, 2005 by the Society of Senior Advisors.) In short, many seniors interest in and passion for skiing may actually increase with age.

Researcher Victor Barnes has concluded that “next to dying our recognition that we are aging may be one of the most profound shocks we receive.” (*The Psychology of Old Age*, Victor Barnes, Ph.D, 2005) Barnes concludes that in this later stage of life a sign of maturity is attaining “ego integrity.” He describes this as “coming to accept one’s whole life and reflecting on it in a positive manner.” Persons who attain this maturity have generally progressed successfully through the earlier stages of life development. Barnes identifies a number of stresses that generally come into play in old age: retirement and reduced income; isolation (loss of loved ones); reduced physical attractiveness; and a tendency to self devaluation (loss of importance or status). Citing Maslow’s Hierarchy of Needs theory, Barnes reminds us that we are not free to pursue self actualization unless basic needs are secured. Accordingly, seniors whose financial well being is more secure, for example, tend to be motivated to pursue activities concerned with aesthetics, creativity and altruistic matters. Those who are not secure will only be frustrated by attempts to focus them on such activities.

Another dominant attribute of the emotional domain for senior skiers tends to be fear of injury. In this respect the affective and physical domains intersect. Much more so than their younger counterparts seniors worry about physical injury. Risk taking is reduced with age, and with some good reason. Physical injuries may be greater or more likely with advanced age accompanied by reduced bone density, muscle loss, etc. Injury recovery time is generally much longer.

Fear for physical safety is an inhibitor for learning and thus providing a safe lesson environment can be critical for the senior lesson. So too are learning skiing movements that reduce the physical impacts of skiing and reduce the chance of wear and tear injuries. This is an appropriate goal for the senior skier and will provide emotional as well as physical benefits.

Abraham Maslow created a measurement tool to assist in evaluating when one’s emotional and physical needs are met to the point that potential can be fulfilled or “self-actualized”. Adapting Maslow’s Hierarchy of Needs pyramid to identify the known social, emotional and physical needs of the senior skier is noted in *figure 6*. In the manual’s next section on the physical attributes and needs of a senior, the physiological processes of the senior body will be explored more fully.

It's important to note, however, that the lowest most foundational level of Maslow's pyramid is about meeting physiologic needs. When children suddenly have to use the restroom, they have to go "right now". Children's cognitive functioning is at a point where the sudden urgency is more about their own egocentric developmental stage. For older adults, having immediate and known access to restrooms becomes about the physical changes in the bladder creating urgency. No one is ready to be self-actualized if their immediate worry is an embarrassing incident.

Safety and security take on unique perspectives as the senior client is fully aware of the skier's responsibility code and the implied contract between them and the resort having in place safety measurements. A ski patrol that is working and has a presence is important. Crowded hills without appropriate safety signage and controls can be the instigator for a very unhappy senior client. Old and outdated gear can manifest into physical safety issues and framing discussions about purchasing or renting newer equipment can be successful if approached from the Maslow's framework.

A sense of belonging and having positive self esteem are attributes that all people desire, from childhood to old age. According to psychologist Laura Carstensen, "aging doesn't turn a cheerful person into a grouch. To the contrary, research has shown that, as we age, we become more emotionally stable and content. In early adulthood, there are a lot of what-ifs: Am I going to find a soul mate? Have a child? Build a rewarding career? Then you spend the next few decades striving to achieve those goals. But when you're older, the what-ifs have been resolved."

The senior student that is ready to learn, one that is ready to participate fully in the lesson and enjoy the mountain experience is one who has met the basic levels of Maslow's Hierarchy of needs.

Maslow's Hierarchy of Needs
Developed by Abraham Maslow (1908-1970) as a tool to use in determining readiness to fully participate in life based upon humanistic psychology.

Maslow refers to the first four needs as *deficit needs*, needs that need to be filled to reach homeostasis. To reach the final stage, the previous needs must be met as self actualization or *being needs* relate to the continuous desire to fulfill potential. One has moved beyond deficits and stasis to completeness: the ability to be the fullest you – self actualized.

Common features of self actualization include reality centered, problem centered, ability to enjoy solitude, deep personal relationships, autonomy, resistance to social pressures, unhostile sense of humor, acceptance of self, spontaneity, simplicity, humility and respect. As well, Maslow identified qualities he referred to as “human kinship” or *gemeinschaftsgefühl* which is a social interest, compassion and humanity towards others. Maslow's postulation on the percentage of the world's population as being truly self actualized? About 2%.

Self Actualization

- ready to learn and participate fully
- ego integrity
- holistic experience
- known capabilities and limitations

Esteem

- self devaluation
- sense of physical abilities
- confidence
- fear of embarrassment

Belonging

- friendship and camaradery
- social isolation issues
- lack of competition

Safety and Security

- fear of injury
- overcrowding, lack of patrol
- trust and protection
- equipment issues
- terrain and conditions

Physiological

- clothing, gear, thermo-regulation
- hunger, hydration
- conditioning
- restroom availability
- anatomy, physiology

Figure 6 Maslow's Hierarchy of Needs

Another model of human development often compared to Maslow’s Hierarchy of Needs is Erik Erikson’s (1902-1994) psychosocial development theory, first published in *Childhood and Society*, 1950. Erikson’s model starts at infancy and looks at eight stages of human development deemed important in successfully managing life stages or life cycles. His application is useful in looking at how personality and behaviors develop in people. Erikson's psychosocial theory (psycho: mind and social: relationships) shows how people experience eight 'psychosocial crisis stages' which drive outcomes of each person's development and personality. The term crisis is used by Erikson to describe an internal struggle that must be positively navigated by an individual in order to grow and develop. Successfully navigating each crisis involves having a healthy ratio or balance which Erikson defined as “basic virtues or strengths”. The stages are subsequently built on each other, although there can be overlap as one moves into each stage over their lifetime. Successful negotiation through each stage involves striking the right balance between the extremes rather than entirely focusing on one ideal.

Looked at in depth, Erikson's theory involves explaining why too much of anything is not helpful for developing a well-balanced personality. This model is an excellent opportunity to explore the older person as they move into their last 2 stages.

Erikson's Psychosocial Crisis Stages	Life Stage/Relationships/Issues	Potential positive outcomes	Potential negative outcome
7. Generativity vs Stagnation	Mid-adult children, community, giving back, helping, contributing	Care and Production	Overextension Rejectivity
8. Integrity vs Despair	Late-adult society, the world, life meaning and purpose, life achievements	Wisdom and Renunciation	Presumption Disdain

Figure 7 Erickson’s Psychosocial Crisis Stages

These final stages look at attributes including care, love, fidelity, competence, purpose, will and hope and how social and cultural factors can influence outcomes. If a crisis stage is not resolved, an identity crisis occurs leaving a person not fully developed and unprepared to be successful. Or, in Maslow’s language, self-actualized or not. For more information on this topic, Erikson’s book *Vital Involvement in Old Age* (1986) is an excellent resource for the senior specialist.

Physical Attributes of Senior Skiers

You have to stay in shape. My grandmother, she started walking five miles a day when she was 60. She's 97 today and we don't know where the hell she is. - Ellen DeGeneres

Life threatening illnesses have steadily decreased over this past century as modern medicine has expanded. Monitoring Medicare spending trends is one way of evaluating the general health trends of the older population. Health care costs of people 65 and older were 12.9% of their total expenditures based on the 2010 US census report. However, 25% of all Medicare spending is for the 5% of seniors in their final year of life. There is now evidence for the adage 'use it or lose it', i.e.: that exercise improves health and function in old age. Regular exercise also reduces mortality by up to 25% per annum and improves mood and well-being. (Parffebarger, R. S., Hyde, R.T., Wing, A.L. et al.1993). As noted earlier, the principles of neuroplasticity hypothesize that the brain continues to rewire synapses with continuous activity, once again linking the cognitive, affective and physical domains.

Probably the most obvious attribute of advancing age is the decline in physical condition. The following breakdown of systems related to the effects of physiological aging has been accrued from the following sources: *Working with Seniors, Health, Financial, and Social Issues*, (2005) by the Society of Senior Advisors; *National Academy on an Aging Society*, (1999); *Physical Changes of Aging*, Suzanna Smith and Jennifer E. Grove; *Physical Changes in Aging*, Lopu Isbell and *The Epidemiology and Demography of Aging*, Moritz, S. J., Ostfeld, A.M. (1990).

The primary source is referenced with permission from Jasper E Shealy, Ph.D, C.P.E ("Aging Trends in Alpine Skiing Trauma and Safety: Eighteenth Edition", Shealy, J. E., Ettlinger, C. F., and Johnson, R. J., , 2010) a long term study assessing ski injury rates and trends identified that are age related as opposed to time related. The study found that overall the over 55 age group is at a lower risk of injury than the general skiing public. This study compared data collected between December 1972 and April 2006 with the authors evaluating prospectively 18,692 injuries sustained by 17,197 skiers and reported to the injury clinic operated in the base lodge of a moderate size northern Vermont ski area.

Muscular-Skeletal

In healthy young people, 30% of body weight is muscle, 20% is adipose tissue (mainly fat cells) and 10% is bone. Muscle accounts for 50% of lean body mass and about 50% of the total amount of body nitrogen. By age 75, about one half the muscle mass has disappeared; 15% of body weight is muscle, 40% is adipose tissue, and 8% is bone.

Maximum isometric strength is achieved in the third decade, plateaus till about 55 or 60, declines by 10 - 15% per decade till age 75, and then declines more rapidly at 1.8 - 4.1% per year 4. The isometric strength of a 70 year old has been estimated to be 50% that of a 20 year old.

As humans age there are inevitable age-related changes in the musculoskeletal system. In particular, as the human body ages, bone and soft tissue structure changes. Between ages 40 and 50, bone density begins to decrease in both sexes, most rapidly in women. Because bone mass is lost, fractures occur commonly at the proximal ends of long bones and the spine, often with minimal trauma. Articular cartilage shows a reduced response to growth factors, becomes more brittle, and tends to accumulate calcium pyrophosphate with aging (a painful arthritic process).

Connective tissue in ligaments and tendons loses tensile strength, elasticity, and regenerative capacity with aging. A decrease in muscle mass (sarcopenia) normally occurs with aging. Fibroblasts are responsible for growth and regeneration of the connective tissue that makes up most of ligaments and tendons. With aging, the in vitro proliferative capacity and synthetic activity of fibroblasts decrease. These changes may at least partially explain why, with aging, tensile strength, elasticity, and regenerative capacity of ligaments and tendons decrease. As a result, ligaments and tendons are predisposed to rupture and have a prolonged healing time. After about age 30, the number and size of muscle fibers progressively decrease, resulting in a decrease in skeletal muscle mass and thus lean body mass. This process is termed sarcopenia. Age-related factors contributing to sarcopenia may include reduced levels of exercise and physical activity, hormonal changes and reduced skeletal muscle protein synthesis. Resistance training has been shown to be a powerful intervention in the prevention and treatment of sarcopenia. (Roth, Ferrel & Hurley, 2000)

Bone Health

With age come reduced muscle mass (loss of strength) and lower bone density (weaker bones). The average non-exercising person loses twenty-two to twenty-three percent of muscle mass between the ages of thirty and seventy. Exercise can slow the rate of loss. Beginning at about age thirty five, the average person begins to lose more bone mineral than is replaced, especially women. Between ages 40 and 50, bone density begins to progressively decrease. This decrease occurs because bone is lost from within. Bone cortices become thinner from the inside; also, whole structural elements of cancellous bone are removed, a process that differs in detail between the central and peripheral skeletons. Interestingly, decreased bone density does not tend to result from decreased bone production; bone remodeling can actually increase with aging. Bone loss that occurs as part of normal aging can be divided into 2 mechanisms: a rapid one that affects women after menopause (menopausal bone loss) and a slow one that affects both women and men after age 40 to 50 (senescent bone loss).

Exercise and a healthy diet can cut osteoporosis risk. Dairy products are rich in calcium, which is essential for building and maintaining strong bones as is Vitamin D which helps the body absorb calcium.

Joints are built to move and unlike machinery they actually increase in strength and tolerance with sensible use. The synovial joints are specific body joints that tend to move a lot, including the knees, hips and shoulders requiring special lubrication for functionality. Hip and knee replacements are growing with data showing that from 1997 to 2007 the population of people aged 45-64 grew by 36 percent but knee replacements in this group more than tripled,

(orthoinfo.org). Half of the total hip replacement surgeries done in 2009 were in people under 65. Spinal surgeries including spinal rods for stability and/or reinforcement secondary to spinal degeneration are becoming more prevalent. Current research is looking at the possible future implications of age related joint replacements in the setting of artificial joint design generations increasing in length of functionality before requiring replacements, i.e. younger clients looking for joint replacements earlier in life knowing the replacements will last longer and better.

Cardiovascular and Respiratory

As the aging process evolves a reduced cardiovascular capacity (reduced oxygen in the blood) occurs. The heart muscle thickens reducing the heart's maximum pumping rate and negatively affecting the ability to extract oxygen from the blood. This implies a decrease in elasticity and an increase in stiffness of the arterial system.

A male's maximum oxygen capacity during exercise is reduced by about ten percent every decade. The corresponding reduction for females is about seven and a half percent. Arteries become stiffer and resistant to blood flow. Lung capacity too is decreased due generally to increased rigidity in the chest wall, decreased respiratory muscle strength, loss of elasticity in lung tissue and a reduced gas exchange surface area. This reduced respiratory reserve causes no apparent problems at rest, but compared to the young, the aging athlete may experience breathlessness at lighter workloads

Resting heart rate is not generally affected by aging; however, decreased heart rate in response to exercise and stress is characteristic of healthy aging. The age-associated decline in maximal cardiac output and cardiovascular reserve capacity may not limit usual ability in otherwise healthy elderly adults because the vast majority of daily activities are performed at low and sub-maximal workloads.

Good cardiac health includes a low sodium and proper diet, moderate alcohol intake and exercise. The status of the physical condition of the client can radically affect the measurements of cardiovascular function in the older adult and changes in physical activity can profoundly change cardiovascular function.

Urinary System

The bladder capacity generally reduces with age and the kidneys become less proficient in removing waste from the blood. Urinary incontinence is common in elderly women, approximately 10-20% of all women over 65. Bladder capacity and emptying efficiency falls in the older person. There may also be less central nervous system control and a loss of pelvic floor integrity in women after menopause. During exercise the leakage of small amounts of urine usually indicates genuine stress incontinence (GSI). GSI is more common in women who have had multiple children and is related to pelvic floor weakening.

Vision

Impaired sight and hearing are likely to accompany the aging process. Loss of close-up vision frequently occurs around the age of forty. Eyes tend to become more susceptible to glare around age fifty. At about the same time, it may become more difficult to see in low light conditions

and to see moving objects. By age seventy, there is usually a decline in the ability to distinguish fine details. Most seniors notice a diminution in their peripheral vision.

Auditory

One in three persons over age 60 and half of those over 85 have significant hearing loss. The ability to hear high frequencies decreases with age. The existence of background noise can affect the ability to understand speech. Men experience a decline in hearing more than women. Untreated hearing loss can lead to depression, isolation, irritability and a decreased quality of life. Loss of hearing and vision can be easily mistaken for impaired intellect. Older persons may be frustrated or embarrassed about not being able to understand what is being said. They may be uncomfortable asking speakers to repeat what they have said and they may hold back from participating for fear of making inappropriate comments.



Strategies to help a hearing impaired individual include: speaking clearly and in a normal tone; obtain the client's attention before speaking; maintain direct eye contact at eye level; keep hands away from the mouth while speaking; eliminate or wait for background noise to abate; attempt to express the same point different ways; build breaks into the conversation; use expressions and gestures; repeat frequently and ask questions as needed to clarify successful communication.

Stamina

Lactic acid forms in muscles when exercise intensity is fairly high. Muscles need fuel to supply energy to exercising muscles. The energy source that produces lactic acid is the glycolytic system as glycogen is broken down as the energy source; lactic acid is produced when exercise intensity requires more oxygen intake than can be supplied. The build-up of lactic acid is thought to contribute to muscular fatigue and can limit physical ability. Muscle cells can use lactic acid as an energy source and as fitness improves, muscle cells can adapt in this utilization.

A progressive reduction in VO_2 (maximum oxygen consumption) appears to be the primary mechanism associated with declines in endurance performance with age. Declines in endurance exercise performance and its physiological determinants with aging appear to be mediated in large part by a reduction in the intensity (velocity) and volume of the exercise that can be performed during training sessions. Exercise economy is measured as the steady-state oxygen consumption while exercising at specific sub-maximal exercise intensity (below the lactate threshold) and studies show that declines in exercise economy do not contribute significantly to the decreases in endurance exercise performance observed with advancing age.

Reaction Times and Proprioception

Seniors are just not as strong, don't have the same physical endurance, stamina or physical agility they once had in younger years. Appropriate pacing becomes of critical importance. The need to balance the need for rest and recovery time while not losing attention through inactivity by "standing around on the hill" is critical. Skiing in short "bursts" i.e., breaking up the run into shorter segments is a good class handling technique to keep things moving while still providing necessary pacing. These short rests are an excellent time for information sharing and positive coaching.

The somatosensory system provides information to the body regarding the orientation of body segments to one another and the support surface. Input to the system can be proprioceptive or tactile and comes from the peripheral sensory receptors located in skin, muscles and joints. Senior athletes have variations in proprioception and vestibular function perceptions that may occur with changes in the central nervous system. Decreased nerve conduction velocities can impair coordinated complex motor activities and maintenance of balance and can ultimately slow reaction time up to 20% compared to younger athletes. Of note, 40% of all women over the age of 70 have experienced at least one loss of balance fall during activities of daily living.

Meissner's and Pacinian corpuscles (the cutaneous end-organs, skin, which are part of the somatosensory system) are responsible for pressure, vibration, light touch and sensation. This function decreases to approximately one third of their initial density between the second and ninth decades of life. This implies that the elusive sense of touch that is so desired in good skiing can be diminished from a physical standpoint in the older client.

The foot as well is susceptible to basic human declines of aging. Loss of elasticity in body tissue is stressful to the intricate connections binding together the foot's 26 bones. When connecting ligaments lose their elasticity, the resultant outcomes will include foot pain and decreased functionality. This can be a particular problem for a sport such as skiing where the feet, and movements of the feet and ankles are of such significance.

Diabetes is a disease where the body cannot make enough insulin or cannot use it in the right way. In the broadest of terms, the body uses food eaten and changes it into glucose; insulin helps glucose get into the cells where it is crucial for energy. One of the major side effects of diabetes over time is the inability to heal well from skin or tissue injuries. It is important to make sure that boots are not too restrictive or too loose creating rubbing in a client who has diabetes. Encouraging this client to check their feet often and seek the advice of their physician for any circulation issues related to ski boot usage is important.

Altitude

Aging is associated with a reduced Pao₂ (arterial oxygen partial pressure) and the aging athlete is unable to deliver the same volume of O₂ to working muscles compared to the young. At high altitude the partial pressure of O₂ in the atmosphere is less so that less O₂ is available to capture and be carried to the tissues. This compounds older athlete's physiological disadvantage

creating a greater challenge. However, fitness rather than age correlates with the older athlete's ability to tolerate exercise at altitude. *Advanced Age and Altitude Illness*, Balcomb, AC, Sutton JR (1986).

Thermo-regulation

The body continually works to keep a balance between how much heat it makes and how much it loses. Too much heat induces sweating, too little warmth induces shivering. There are four ways the body transfers heat: *radiation*, *evaporation*, *conduction*, and *convection*. The senior often has difficulty regulating heat transfer because of other medical conditions, certain medications, thinning of the skin, reduced circulatory capacity and, simply, age. According to the National Institute on Aging, most people who die from hyperthermia (being too hot for too long) each year are over 50 years old. As an older person's body temperature rises, heat exhaustion can rapidly progress to heat stroke. Signs of heat stroke include fainting, a change in behavior such as confusion or agitation, nausea, weakness and dry flushed skin. Seeking attention immediately is advised.

Because so many factors can predispose the elderly to dehydration during exercise, including an impaired hypothalamic thermo-regulatory control system (reduced thirst sensations and a reduction in total body water ratios) drinking fluids routinely before, during and after exercise is recommended.

Overall the skin is thinner and more fragile. Blisters are more common. Renewal of the epidermis is slower, leading to delayed healing. The dermis is less cellular and less vascular and there is less subcutaneous tissue, thus less insulation especially in elderly women. Sweat gland numbers and function are reduced. As one ages, there is diminished important cellular functioning that manages skin, tissue and thermoregulation. This includes T cell function, Langerhans cells stop reproducing and after about age 50 melanocytes decline at 2% per year all making the aged more susceptible to hyper and hypothermia, infection, neoplasm and U.V. damage.

Aging athletes can minimize risks by drinking fluids routinely and dressing in appropriate layers. Allow breaks for the removal or addition of layers of clothing, application of sun screen and intake of fluids. Encourage newer more high tech clothing options including pants with venting zips, under layers designed to exchange heat, high tech gloves and venting helmets. Keep in mind that an older client may be very comfortable and regulating their temperature perfectly well while appearing to be over or under dressed. Teasing someone still bundled in a heavy coat and hat on a sunny day is not only inappropriate but may well disrupt the client's ability to manage their own needs.

Exercise and Stretching

Good fitness prevents injuries and the older one gets, it seems the longer it takes to recover from injuries. A strong core, flexibility and balance training all play a role in injury prevention. Regular exercise can forestall the physical effects of age, eventually though, no one is in as good physical condition as when they were younger. These physical declines can also have an effect on the cognitive and particularly the affective domain. The rate of decline of muscle mass

in virtually all physiologic changes can be reduced by means of regular weight-bearing exercise.

Skiing is a sport most do irregularly, that is, not on a daily basis. Encouraging daily activity and exercise will assist the senior skier in ability to maintain endurance and energy for a full day of slope side activity. Senior clients should be encouraged to engage in regular conditioning activities. Stress exercises and activities that will help improve strength, augment balance and enhance endurance. Low impact activities that will create minimum stress on the joints can be beneficial. Endurance exercise programs should include components related to intensity, mode, duration, frequency and progression. Functional fitness, programs that build strength and balance leading to increased abilities to function in everyday life are ideal. Sarcopenia, the loss of muscle and strength as well as decreased quality of muscle tissue, is often seen in the older adult. Delaying or minimizing the effects of sarcopenia can be managed with regular exercise. For older adults who want to stay healthy, the National Institutes of Health (NIH) recommend four types of exercises to be built into weekly routines: strength, balance, stretching and endurance.

For sports that stress the skeleton more (running, football, rugby, soccer) or any activity that involves a lot of jumping and/or changes in direction (basketball, tennis, volleyball) studies show that stretching does seem to help prevent injuries. (Witvrouw E, et al. 2004). There is little study regarding the benefits of stretching before skiing related specifically to the senior student. However, there is quite a bit of research done on stretching for endurance sports in general. In running, each time the foot strikes the ground, the joints, muscles and bones absorb approximately 12 times the person's body weight. Joint warm ups help the synovial fluid "warm up", easing the compressive forces started with activity.

Stretching exercises the senior clinician may want to incorporate into lessons after a slow warm up run and again at the completion of the lesson may include: forward, lateral and backward leg swings from a stationary position, knee tucks, leg cradles, easy forward walking lunges and side step walking lunges as well as gentle toe touching and shoulder stretches.

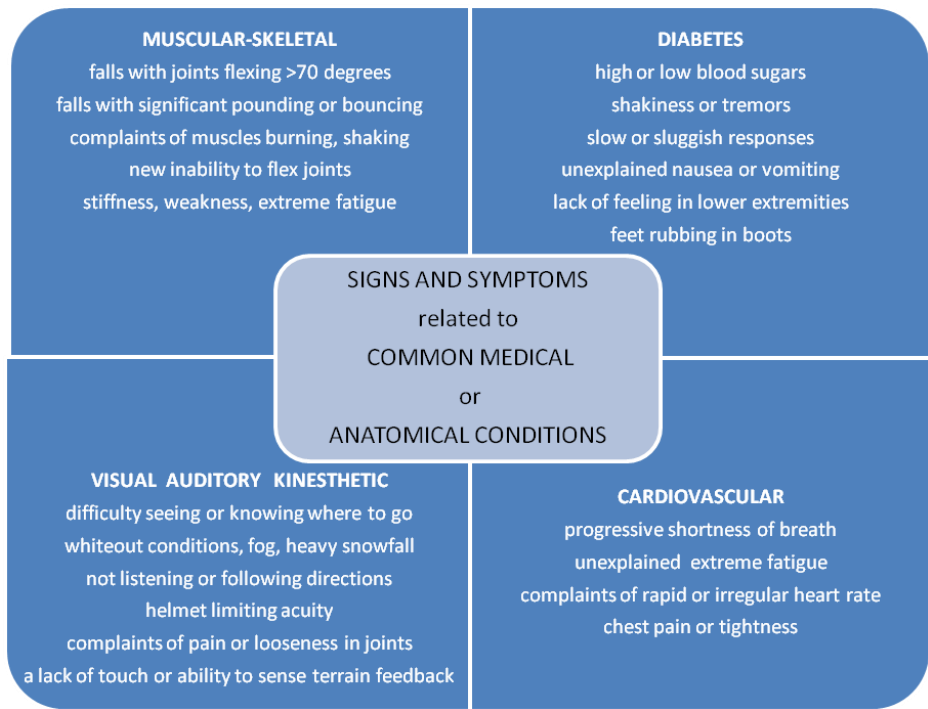
Recognition of needed rest periods is crucial. Most ski injuries, regardless of age, occur after lunchtime. In addition, injury rates increase when the injured person reports they were skiing beyond their ability trying to keep up with friends.

According to Shealy, et al, skiing does not represent an increased level of risk to skiers over 55 years of age, with the exception of the tibial plateau fracture (0.5% of all injuries). In other words for more than 99% of all likely injuries in skiing the over 55 skier either faces no incremental risk or a reduced level of risk of injury. The skiing population is getting older, but the increase in age essentially mirrors the increase in age in the US population as a whole.



Mt. Hood Meadows, May 2009

Evaluating your students for a history of common medical conditions is part of the instructor assessment in getting to know your guest and developing trust. Listed below are common symptoms relative to ailments the older student may present. Instructors are not expected to diagnose or treat potential medical issues but they are expected to be aware that students may have medical conditions. If a student complains of symptoms during a class, the instructor should at least consider whether to immediately seek advice from the ski patrol.



In 2009, 41.6% of older Americans (60+) assessed their health as excellent or very good. However, only 32% of reporters aged 65-74 and 18% of person 75+ reported they engage in regular physical activity. Most older adults have at least one chronic medical condition, in a study from 2006-2008 the most commonly occurring conditions were: hypertension (38%), arthritis (50%), heart disease (32%), cancer (22%), obesity (27%), and diabetes (18%).
-Administration on Aging

Figure 8 Signs and Symptoms of Common Medical Conditions

CAP Model for Seniors

Age Range, 20 to 50	Age Range, 50+
Cognitive	
Analytical (want details & reasoning why) Innovative Varied risk tolerance Aware of cause & effect Very goal oriented Like to be challenged within comfort zone Want to excel Skeptical Understands own learning style Goal oriented & self assured Intimidated by fear of failure Various levels of self-assurance	Selective about challenges Less risk tolerance More cautious Slowed decision making More reluctant to revise decisions/judgments Want measured progress Realistic or conservative goals More limited comfort zone Clear understanding of goals Expects positively directed feedback Retains feedback that is understood Decreased speed of mental processing Reduced ability to retrieve recent memories Taking lessons to achieve desired outcomes Expects to be treated as a peer (with respect) High expectations for success Open to learning Require clear feedback
Affective	
Very socially conscious Outgoing Want to be leader of group Independent & competitive Enjoys off-color humor Husband/wife compatibility could be issue Expect <u>obvious</u> value from lesson Sensitive to performance in front of peers Uncomfortable with what they don't know Focused on outcomes	Skiing is a social experience Value whole experience Look for purpose even in leisure activities Relies on peers for support Are supportive and "team" oriented Lack confidence in physical abilities Apprehensive of new movement patterns Fearful of injury and complications Expect value from lesson Accomplishment of outcomes are obvious Prefers process to accomplish outcomes Desires instructor who is a peer Appreciates subdued humor Comfortable with what they don't know
Physical	
Conditioning & strength highly variable Flexibility highly variable Endurance highly variable Reaction capability reasonably good Frequently uses strength over finesse Center of mass moving down Male & female differences in conditioning Potential visual and/or aural impairment	Conditioning & strength somewhat degraded Flexibility & endurance somewhat limited Reduced cardio capacity Reduced bladder capacity Needs to renew muscle memory Potential reaction/balance impairment Needs to use finesse rather than strength Center of mass moving down Past injuries may cause limits in movement Potential visual and/or aural impairment Increased sensitivity to sun and to cold

Figure 9CAP Model for Seniors

The Learning Environment

The man who views the world at fifty the same as he did at twenty has wasted thirty years of his life.
- Muhammad Ali

Equipment Considerations for the senior skier

Recent equipment developments can help seniors ski more efficiently. Ski design now enables skiers to bend the ski at moderate speeds and with less pressure against the ski and with correspondently less stress on the body from the forces necessary to bend the equipment than previously. Wider and varied camber skis have made it possible for the intermediate skier to ski powder and crud snow with much less muscular effort by allowing greater ski to snow contact. New ski technology in varied early rise and rocker configurations allow for easier and greater maneuverability. Ski length should be appropriate for the desired outcome, size and skill of the skier. Today's shorter skis provide great performance and stability in shorter lengths and can be guided with less effort. Even shorter skis (110 to 130 cm) for beginners lessen the awkwardness of moving around with extensions on their feet and also make getting up from a fall much easier. Today's ski design and materials allow softer flexing skis to have sufficient torsional rigidity to provide a good solid platform at moderate speeds. Generally a softer flexing ski will be easier to carve, load and bend at slower speeds and with less effort, however a softer ski may not hold up to high edge angles in higher speed turns.

Proper equipment adds to successful pacing, years of skiing enjoyment, ability to ski longer and manage conditions more successfully. The importance of tuning and maintaining the ski edge and base may need to be reinforced.

Because of the greater susceptibility to foot problems as seniors age boot fit becomes even more critical. The caveat that the boot should fit like a snug "handshake" (about 1 ½ finger width between the heel and the boot shell) is still true. Assessment of fit is important as an older client may have been fit in a boot too large because of the mistaken belief this would allow a greater degree of comfort. Not only are performance characteristics of a good snug fit lost, an ill fitting boot may actually increase the risk of blisters from foot movement within the boot or from the compensation of wearing socks that are too thick in an effort to try to take up excess space. This can be compounded as boot fit loosens even more with wear. Appropriate boot flex is important as the reduction in muscular strength with age, and sometimes weight loss as well, the inability to flex a stiff boot becomes more prevalent. As with any skier, proper alignment and canting is critical for an efficient and effective stance. Recommendations to a good boot fitter may be appropriate to enhance function.

Good poles are important as tactical skiing requires proper pole position and carriage. A client that comes with an older set of poles will be surprised at how much lighter and easier a current generation pole is to use. Beginning senior skiers should always use ski poles. While an aid in balance/stance and alignment, poles can also be used to provide propulsion and as an aid in getting up from a fall. Pole length is very important and should be long enough to minimize changes in stance when they are used. A good starting point for proper sizing is the forearm

should be parallel to the ground when the pole basket is ahead of the boot toe when standing on skis.

Starting and Maintaining Senior Programs

As noted above in the CAP Model, the senior client often views skiing primarily as a social experience; values the whole mountain experience, relies on peers for support and expects value from their lessons. Some of the allure of lessons can come from the perception of special consideration for the senior client by the resort, the school and the instructor. In setting up senior programs, there are a number of features that can be readily offered by different stakeholders to promote the senior clientele feeling comfortable, valued and supported. Collaboration by the resort, school and the instructor can be rewarded by growth, consistent attendance and increased ticket sales through desire of the seniors to include their immediate families in the experience.

Features a senior client may find alluring include specific designated space and terrain options. A designated indoor location or meeting place where the senior students can gather, socialize, leave their extra gear and get together after the lessons. Provision and maintenance of special terrain features that can facilitate learning without excessive physical exertion would be beneficial. One such example is the “mini-pipe” which can be used to learn gliding skills for the beginner without the fear of stopping, learn to turn as the edge of the lip is approached and can maximize mileage by using shallow traverses between each turn.

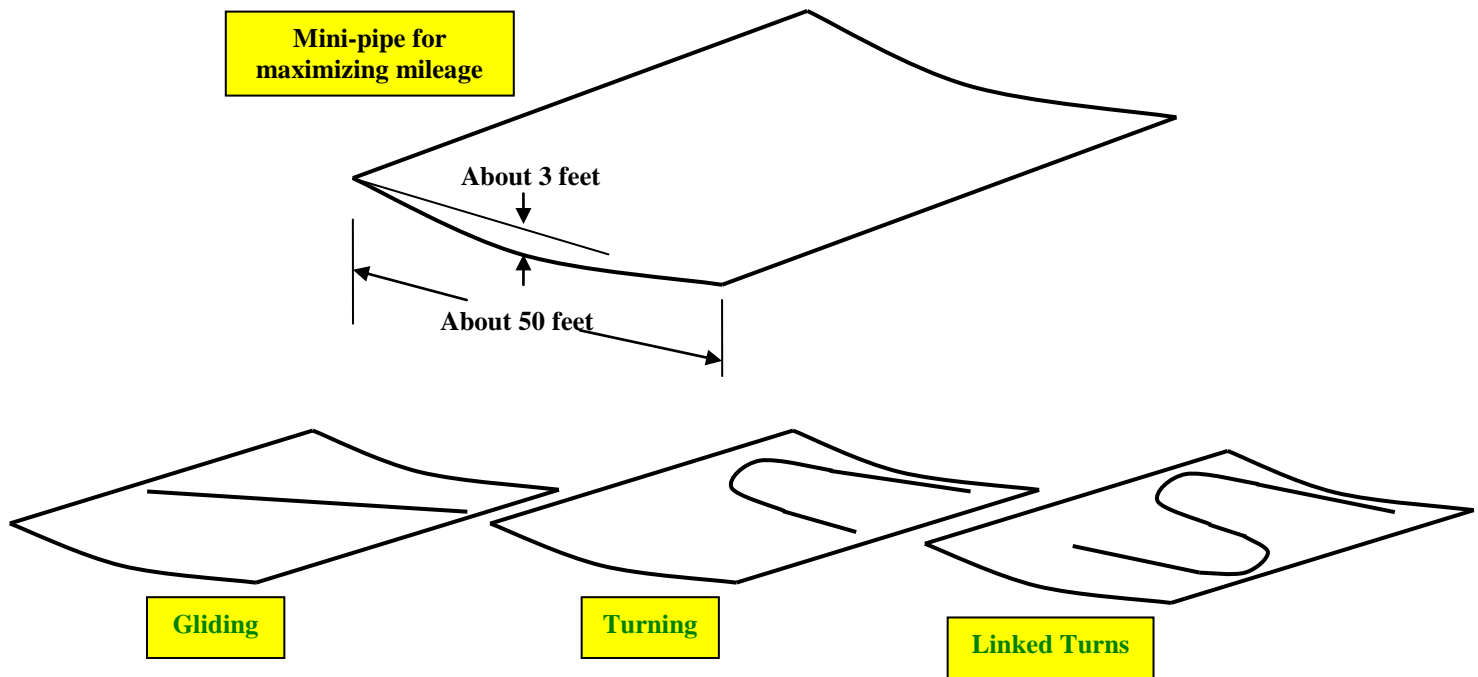


Figure 10 Mini-pipe Terrain Feature

For the beginning student, the value of having a designated indoor and outdoor meeting area is ideal so that learning can take place without having to first slide on the snow. An article in *The Professional Skier* (Winter 2008), “*Boot and Flat Work – Do They Really Matter?*” by Bill Claire presents a pretty compelling line of reasoning and data regarding the value of boots-only indoor flatwork and flat terrain drills with skis prior to on snow gliding practice. The author showed an accelerated learning curve when an average of 20 minutes was taken from the on-snow class time to experiment with some of the fundamental movements in a very un-intimidating environment. It is conjectured that for senior students this sort of approach would be enhanced if it could be done in a familiar area free from traffic and other distractions.

Senior specific programs are potentially facilitated due to the fact that this demographic tends to form support groups as they approach retirement. These groups are usually well organized and open to opportunities for activities that interest the members. In addition, most metropolitan areas have groups of skiers who band together and take a bus to one of the local areas on mid-week days when the crowds are reduced. Once started, these programs tend to become self sustaining through word of mouth contacts and communication.

The first such senior only program was established by Floyd Lambert who founded the 70+ Ski Club in 1977 as he saw seniors giving up the sport because they could no longer afford it or had no one to ski with. Another such club founded in the NW was the Ancient Skiers club, originally only taking skiers who hit the slopes before the US entered World War II. Today there are programs and clubs throughout the US including Boomers on Groomers and The Over the Hill Gang.

According to studies done by the National Ski Areas Association, mountain management stakeholders are looking at the demographics of who their clients are. If the baby boom generation ceases to drive resort operational planning, advances need to be considered to maintain not only the senior client but their extended family. Conversely, the extended family will need enticements to view the mountain resort as a place for all generations of their family. Colorado destination resorts are attempting to attract a new generation of skiers and snowboarders to replace the boomers without turning their backs on a group that has been their core customers. Among the most visible attractions are sprawling terrain parks and massive half pipes designed to appeal to Generation Y skiers and snowboarders. As the nation's skiing populace ages, a massive face-lift appears inevitable. Baby boomers, long the driving force behind the infrastructure of skiing, may or may not have reached their demographic peak on the slope. The diminishing virility of a traditionally robust skiing market has Colorado resorts searching for their own version of an antidote by marketing to multi-generations of customer.

The NSAA report did address a continuation of a “three-generation phenomenon” as the Baby Boomers continue to participate in snow sports, at the same time that persons young enough to be their children and grandchildren also take up skiing and riding, thus causing an overall broadening of the participant age profile.

The 2010 Kottke report commissioned by the NSAA commented on the statistics demonstrating that the massive Generation Y or Millennials (persons born after 1980) are a huge demographic in snowsports and will likely be driving future growth numbers in skier visits. Generational skiing can likely be optimized looking at the growth trends of the Generation Y and the still being born Generation Z (after 1991) populations.

Regardless of the demographics, or the unknowns of what is to come, the senior specialist instructor plays a valuable role as the provider of quality instruction leading to fulfilled clients, retention of clients and successful programs.



The Teaching Model

On the shady side of middle aged.....

The teaching model consists of the student profile and the subsequent instructor behaviors that make up the learning partnership. Utilizing the Senior Specialist teaching cycle can assist the instructor in identifying pathways to successful partnerships by outlining key steps required by the instructor.

The Senior Specialist Teaching Cycle

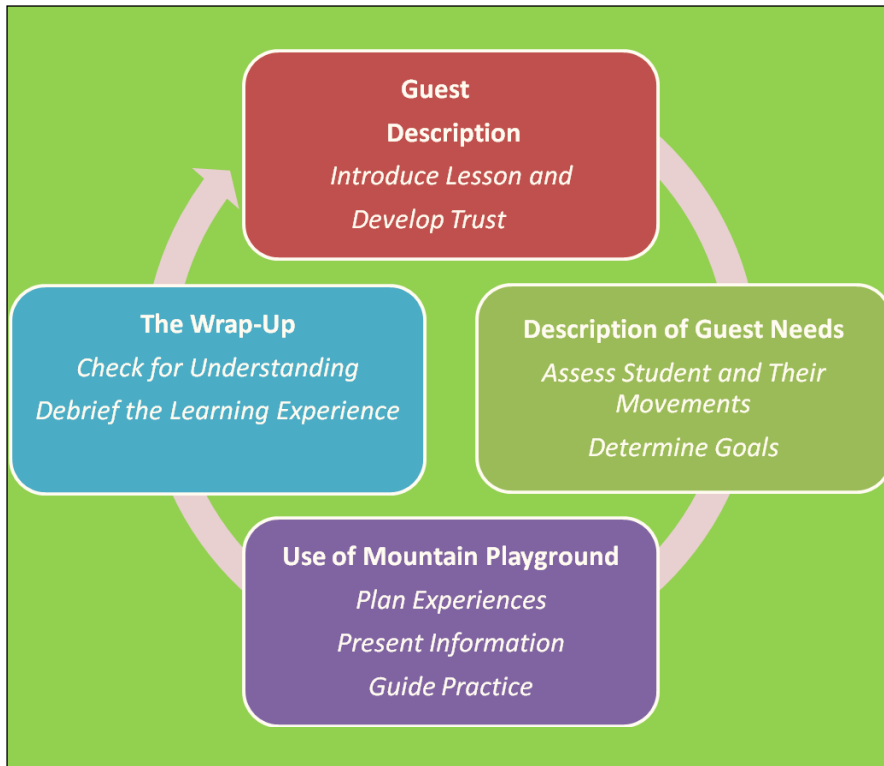


Figure 11 Teaching Cycle

The Senior Specialist teaching cycle identifies four components that, although specific to the senior client, still follow the PSIA teaching cycle as noted. This model is designed to be broken into sections for application yet remains circular in fashion recognizing that, dependent on circumstances, the instructor may pass back and forth through each component multiple times.

As noted in the 2001 PSIA *Core Concepts* manual, everything the instructor does to initiate and explore movement belongs in the realm of teaching activities. Teaching activities are the tools for bridging the gap between where the student is now and where the student wants to be by the end of their lesson experience. Some movements, or combinations of movements and sensations, lend themselves to a step by step progression. Others require holistic activities such as varying speed, intensity, duration, rate or timing. Terrain, student's past experiences, conditions of the day and ability levels all play into chosen teaching activities.

Referencing movements back to the efficient skiing skills is important to skiers of all ages, from beginner to expert. The Senior Specialist program focuses on critical skills and skill blends have been identified to help the instructor when working with the senior client. These skills are crucial for the instructor working with, demonstrating to and teaching the senior client. Assisting the client in developing their movements and movement patterns to be more efficient

is a goal of instructor behavior. Outcomes will be movements and techniques enabling the student to: minimize muscle fatigue, minimize impact on joints, conserve energy, improve confidence, improve current skills, allow for exploration of more terrain and increase their enjoyment of the mountain experience.

Guest Description

Introduction of the lesson and developing trust: this first component of the Senior Specialist teaching cycle is likely the most important. Creating the student profile involves identifying the factors discussed in the affective portion of the senior CAP model: why is the student taking the lesson, what are their motivations and desires? What are the cognitive and physical attributes the student brings to the lesson? Understanding the theories of Maslow and Erikson and incorporating that understanding into building the student profile is crucial. Creating a successful learning partnership involves establishing trust between the instructor and guest.

Interviewing clients to ascertain their goals, potential limitations and what they bring to the table allows the instructor to start building the student profile. The instructor starts to then develop their instructional plan, determining instructor behavior based upon the student profile.

Description of Guest Needs

Assessing movements and determining goals: evaluating what the student is capable of currently and how to work within that framework to achieve client goals. Goals should be outcomes students can achieve. Objectives are steps the instructor can take to reach the final goal. Goals should be an agreement between the student and the instructor of movement pattern outcomes that are both desired by the client and found to be attainable by the instructor. Goals and outcomes can be short term or long term, broad based or very specific. Being able to ski bumps better is a long term, broad goal or outcome. For example, learning to turn the foot without pivoting the hip could be a short term, specific objective.

An initial warm up and the first few runs will allow the instructor to start understanding what the student reports they can do and shows what they can do. The successful instructor compares what they are seeing and what the identified goals were and then builds a lesson around how to reach reconciliation of these two components. A successful instructor will take time to evaluate existing movement patterns, look for efficiencies that can be built upon and help the client understand how the lesson objectives will lead to goal reaching outcomes.

This part of the teaching cycle includes identifying skills, tasks, progressions and verbal instruction on how to practice attaining specific desired movements. Once the student is successful at demonstrating the desired outcome, the instructor can move on to the next component of the teaching cycle. This is where the instructor works with the client on specific ways to turn the foot without pivoting the hip by using a drill, demonstration or short progression and giving feedback.

Use of the Mountain Playground

Plan experiences, present information and guide practice: the ability to take a movement pattern and coach tactical means to achieve the goal.

Once the student has accomplished the immediate task or drill, expanding the movement pattern into new terrain, allowing mileage and practice and adding or taking away additional tasks can be done in the third component of the cycle. This is where the instructor would take the objective of turning the foot without pivoting the hip onto more challenging terrain, moving into mini bumps and finally applying the objective in terrain with bumps. Accounting for pacing, monitoring for fatigue and ensuring the social experience all play a large role in this component of the teaching cycle.

The ability to provide an accurate performance visual is an important teaching tool for the instructor. Senior specific skill blending should be focused on as well as the skill emphasis and skill blend being developed.

The Wrap Up

Check for understanding and debriefing the learning experience: the closure of the lesson can only be successful if the instructor has continually assessed student understanding and that the stated goals have either been met or have been sufficiently addressed.

A successful lesson isn't measured by whether the student can now ski bumps perfectly but by the student identifying skills they now have to reach attainable outcomes. Leaving the lesson with new skills, new tactics, refreshed and having enjoyed the mountain experience is a good sign that the learning partnership was successful.



Tailoring the Learning Process

From the perspective of good teaching practices there is nothing new or significantly different when working with senior groups. The major consideration, however, is in how these practices are applied. There are three basic principles one must keep in mind to be successful when working with this demographic. These are:

- Use of low impact drills and exercises that encourage stacking of the body over the feet to reduce the amount of muscular stress required to maintain balance and still accomplish the desired goals
- Encouragement of continuous fluid movements of body parts throughout each turn
- Pacing of the class to maintain the lesson as an enjoyable social experience while providing real value added changes without taxing the stamina and endurance of the client

Beginner Zone Skier

There are a number of guidelines to keep in mind for entry level senior students. A maximum amount of the lesson should be spent gliding with a very small percentage of the time devoted to walking, skating or climbing up the hill. This will require their first experience on skis be conducted in specially prepared areas on the hill, on magic carpets or indoors. Quite a bit of productive progress can be made indoors especially in terms of equipment familiarization, stance balancing, walking and learning to maneuver on the flat. Some resorts have carpeted areas where they can experience gliding for the first time.

Intermediate Zone Skier

Experienced senior skiers have either reached a plateau in their development or wish to improve their skills for more enjoyment, to be able to ski with their friends and relatives or ski more challenging conditions with less effort. Students at this level are likely working on blending of the skills for more efficient movement patterns. Loss of balance may require muscular effort to recover leading to fatigue and frustration. The instructor must be very aware of this during the lesson and consciously look for these signs before fatigue starts affecting client performance.

Advanced Zone Skier

Many experienced senior skiers wish to improve their skills to be able to ski with their friends and relatives or to ski more demanding conditions. These students will need to spend some time perfecting the blending of skills necessary for these more diverse and challenging conditions. Students at this level will need to effectively and efficiently blend all of the basic skills through highly efficient movement patterns that will help them avoid getting out of balance in this more challenging environment. This desired outcome can be best experienced and perfected on groomed terrain. Managing speed and direction control in varied terrain is important. Many senior skiers long to be able to ski conditions they once found exciting and challenging. More than likely their lack of good tactics and skills were off-set by younger bodies and fewer inhibitions. A return to these conditions requires a more complete blending of skills so they can

enjoy this environment with less strength, more finesse and more confidence. The key for success in these conditions is a good understanding of the appropriate tactics to be used

Skiing Movement Patterns for the Senior Skier

Just remember, once you're over the hill you begin to pick up speed - Charles Schulz

When reviewing this section, it is important to understand the tasks and drills outlined serve several purposes. The first is to provide a framework for a teaching progression emphasizing low impact, continuous movement exercises which promote accelerated learning while recognizing the unique affective and physical attributes of the senior student population. These tasks should also be regarded by the participants as an opportunity to incorporate some of these efficient movements into their own personal skill pool which will enhance their enjoyment of skiing in all terrain and snow conditions. Finally, these tasks constitute a clearly defined basis for performance evaluation. It should be emphasized the evaluation is based on the demonstrated blending of skills shown during the performance of all the tasks not on the performance of any one task. Hence, training should concentrate on using the tasks to improve the overall skill blending in all terrain and snow conditions.

Goals for all senior specific movement patterns include the utilization of a stacked skeletal alignment to reduce muscle fatigue; continuous flexing and extending movements to reduce harsh impact, balancing movements which include maintaining a strong inside half (the inside half of the body is raised and ahead of the outside half) and a tripod stance, and rotary movements where the turning of the leg is initiated with the femur rotating within the hip socket, which necessarily includes the feet, shin and leg.

Senior Specialist 1 instructors must be able to ski all green and groomed blue terrain demonstrating consistent balance and control of speed through turn shape. Demonstrations must display an “understandable picture” of the technical elements of Beginner to Intermediate zone skiing. The turn dynamics are limited by the speeds and terrain appropriate for Beginner to Intermediate zone skiing and tasks.

The Senior Specialist 1 instructor is able to:

1. General Characteristics
 - a. Consistently link turns with sustained rhythm
 - b. Maintain consistent speed by controlling the shape of a turn
 - c. Maintain a balanced stance with skeletal (stacked) alignment as needed throughout a series of turns to be able to positively affect any of the skills at any time
 - d. Ski a variety of turn sizes within a series of turns while maintaining speed control

- e. Low impact through continuous movements (flexion/extension) and lower edge angles
- 2. Balance (Level I Beginner/Novice zone terrain, speed, and dynamics)
 - a. Maintain lateral and fore/aft balance through common tasks and demonstrations
 - b. Demonstrate the *visual cues to effective skiing* relative to balance in demonstrations and tasks common to Beginner/Novice zone skiers
- 3. Rotary Movements (Level I Beginner/Novice zone terrain, speed, and dynamics)
 - a. Demonstrate a gradual steering of the skis to assist turn shaping
 - b. Demonstrate the *visual cues to effective skiing* relative to terrain, speed and dynamics
- 4. Edge Control Movements (Level I Beginner/Novice zone terrain, speed, and dynamics)
 - a. Demonstrate a gradual increasing and decreasing of edge angle throughout a series of turns
 - b. Demonstrate use of ski design in Beginner/Novice zone level skiing tasks
 - c. Demonstrate the *visual cues to effective skiing* relative to edge control movements in demonstrations and tasks common to Beginner/Novice zone skiers
- 5. Pressure Control Movements (Level I Beginner/Novice zone terrain, speed, and dynamics)
 - a. Maintain ski snow contact with both skis
 - b. Demonstrate a shift of pressure to the outside ski throughout a series of turns
 - c. Demonstrate the *visual cues to effective skiing* relative to pressure control movements in demonstrations and tasks common to Beginner/Novice zone skiers

Senior Specialist 2 instructors must be able to ski all green through black terrain demonstrating consistent balance and control of speed through turn shape. Demonstrations must display an “understandable picture” of the technical elements from Beginner to Advanced zone skiing.

The turn dynamics are managed or altered based on speed, terrain, conditions. The Senior Specialist 2 should be able to demonstrate these tasks in most conditions and terrain, in other words – real life scenarios.

The Senior Specialist 2 instructor is able to:

- 1. Demonstrate the ability to utilize forward/diagonal movements to optimize pressure and edge control throughout a series of turns
- 2. Distribute weight effectively from foot to foot through flexion and extension movements that keep the skier stacked over the feet and/or balancing on the outside ski
- 3. Use rotary movements that originate in the feet and legs and the legs turn more than the upper body
- 4. Use movements that are gradual, progressive and continuous throughout the turn
- 5. Demonstrate the ability to incorporate forward/diagonal/lateral movements to progressively assist in edge change and edge engagement

6. Demonstrate a gradual increasing and decreasing of edge angel throughout a series of turns through edging movements that are smooth and progressive, originate in the ankles and lower legs and are enhanced through the movements of the hips and upper body
7. Demonstrate the ability to turn both skis simultaneously and is able to develop different turn shapes for speed control
8. Maintain ski snow contact with both skis through stacked skeletal alignment over the feet



Senior Specialist Skiing Tasks, Drills and Movement Patterns

Skill usage in performing each of the skiing tasks is detailed herein. While the desire is to achieve a uniform blending of the basic skills in every turn exercise or drill, learning is accelerated if one of these takes precedent and is emphasized during practice. These skills are shown in **red bolded** text. For each task some of the primary movement pattern focuses for seniors are also shown. While the following tasks are one possible progression for the beginning senior skier up to open parallel, these tasks are also useful drills for every level of senior skier working on developing efficient skiing movements. In utilizing these tasks either as a progression or as individual drills, the instructor should keep in mind both the elements for efficient skiing in general and some of the particular focuses for the senior student. Utilization of a stacked skeletal alignment to reduce muscle fatigue; continuous flexing and extending movements to reduce joint impact; balancing movements which include maintaining a strong inside half (the inside half of the body is raised and ahead of the outside half) and rotary movements where the turning of the leg is initiated with the femur rotating within the hip socket

(which necessarily includes the feet, shin and leg) are all examples of some of the movements highlighted by these tasks.

While these tasks are common in our industry for developing good movement patterns, they are unique to the senior skier in that they can be used to easily highlight the senior specific movement patterns that are focused upon. A core component of the senior specific movement patterns includes a focus on low impact and continuous movements to allow for a smoother and less impacting experience, allowing flow and maneuverability. A focus on stance and alignment includes reinforcing a tri-pod alignment – a stance that highlights pressure to the balls and heel of the bottom of each foot to facilitate a more upright and neutral yet athletic position.

- **Straight Run**

Description of Task: Skis maintain a parallel relationship, gliding flat on the snow with equal weighting on each ski. The resultant tracks consist of two parallel lines of roughly equal depth. Ankles, knees and hips vary flex as required by terrain variations.

Purpose for Senior Students: This may be the first experience gliding while in motion or a drill useful for balance and stance. Focusing on incorporating a tripod stance will help retain balance while in motion.

Variations for Reinforcement Include: Weighting from foot to foot, stepping from foot to foot and shuffling the feet while moving.

Skill Blend Emphasis: **Balance.** Skier maintains a consistent open stance width, cuff pressure on both boots and a tall skeletally aligned stance. A focus on proper balancing while in motion will enhance the ability to utilize all muscle groups of the legs, in lieu of reliance on the quadriceps, to minimize fatigue as well as a strategic skeletal alignment or stacking will maximize strength in length.

- **Straight Run with Paddle Turn to Stop**

Description of Task: Demonstrate a balanced stance with the legs slightly flexed, hands and arms in front of the body while in a straight run. In a series of small steps across the fall line, starting with the inside leg, transfer the weight from one ski to the other in a scissoring fashion to a stop.

Purpose for Senior Students: Introducing or focusing on speed control through turning across the fall line by active steering of the inside leg and proper flexion and extension to maintain balance. The task focuses on movements that change direction across the fall line leading to the ability to control speed with relatively little effort, using the terrain and using turn shape while staying in a neutral comfort zone.

Variations for Reinforcement Include: Practicing from various angles to the fall line from a traverse to a straight run. Encourage flexion/extension of the ankles, knees and hips with each step as well as active inside edge engagement from a balanced platform to maintain the ability to balance along the length of the ski and move in the intended direction.

Skill Blend Emphasis: **Balance, Rotary, Edging.** Skier uses flexion and extension in the ankle, knee, hip and spine to maintain balance while moving forward and laterally and demonstrating active steering of the feet and legs to redirect the skis while stepping from the platform of a slightly edged ski. Low impact and continuous movements can assist in managing fatigue by

enhancing reliance on the whole leg turning in the hip socket in lieu of reliance of the quadricep muscle and with skeletal alignment to maximize strength in length to balance against the outside ski.

- **Gliding Wedge**

Description of Task: Demonstrate a balanced stance with the legs slightly flexed, hands and arms in front of the body to assist in stance and balancing while steering the skis into a slight wedge relationship. Balance is equally weighted to both skis with a variation of gliding on a flat ski to a progression of edge engagement with significant skidding.

Purpose for Senior Students: Introduction to or reinforcement of gliding on a flat ski in a narrow wedge to a wider wedge with subsequent progressive edge engagement. The focus is on balancing over gliding skis in a narrow wedge. Edge engagement is managed primarily through varying the size of the wedge.

Variations for Reinforcement Include: Varying the width of the wedge with progressive edging to blend speed variables and a focus on maintaining balance between the skis with the center of mass keeping pace with forward movement.

Skill Blend Emphasis: **Balance**, Rotary. Skier maintains a tall stance with pressure to the cuff of both boots, hips centered between the feet and demonstrates foot and leg steering variations between a straight run and wedge relationship. Lower edge angles may result in progressive skidding but can promote less muscle fatigue of the lower extremities.

- **Wedge Turns**

Description of Task: Demonstrate a balanced stance in a slow to moderate speed, changing direction with slight continuous rotation of both legs. The entire ski maintains contact with the snow and the wedge attitude is maintained. The legs turn more than the upper body, the inside ski will lead by the fall line resulting in a balanced, stable upper body facing slightly downhill at the end of the turn.

Purpose for Senior Students: This is the first attempt, or a reinforcement of, changing direction while gliding through gradual continuous rotary movements of the legs and feet. Such movements of the legs capitalize on the design of the ski and enable the student to execute round shaped turns with minimum effort. Turning the legs requires turning the leg within the hip socket, thus by default, the entire leg assists with turning: feet, shin, thigh.

Variations for Reinforcement Include: Balanced stable upper body faces slightly downhill by the finishing phase of each turn resulting in the legs and feet turning more than the upper body. The inside ski lead change takes place before the fall line with the inside leg actively steering in the direction of the intended turn to aid in shaping. The turn is initiated with a forward and lateral movement of the legs with subsequent continuous flexing of the ankles, knees, hips and spine as the turn is developed. Speed is controlled by the shape of the turn not the size of the wedge.

Skill Blend Emphasis: Balance, **Rotary**, Edging. A slight forward and lateral extension at turn initiation accompanied by active steering to guide both skis through round turns with the feet turning slightly more than the upper body develops a slightly countered relationship. This low impact and continuous movement pattern conserves energy and maximizes the power of the

turning legs to control the shape and speed of the turn. This is also a strategic use of ski design. The focus is on managing the arc of the turn to manage turn shape.

- **Traverse**

Description of Task: Traverse across the hill with both skis tipped onto their uphill edges. Given slope angles, slightly more weight will be on the downhill ski. Each ski should track across the hill and not slip or skid as the result of a loss of edge angle. The skier's position is upright with a tripod stance with shin contact to both boot cuffs. Ankle, knee, hip and spine joints are flexed evenly with the inside half of the body raised and slightly ahead.

Purpose for Senior Students: This is one of the key movement patterns for all advanced skill blending movements. The traverse can be used between linked turns as well to enable the skier to move to more desirable terrain or to slow the pacing to allow rest periods.

Variations for Reinforcement Include: Vary terrain and pitch to reinforce the forward and lateral movements to maintain balance and control the edge angle to slip, skid and carve.

Skill Blend Emphasis: **Balance**, Edging. A tall tripod stance with shin contact to both boots cuffs, slightly more weight on the downhill ski with sufficient counter appropriate to the pitch of the terrain. This aligned stance allows skeletal stacking to maintain a position of power and strength and minimizes the need for reliance on muscular strength.

- **Diagonal Sideslip**

Description of Task: Starting from a tall, balanced, strong inside half position with both skis pointed across the hill, tip the legs to release the edges and start a skid at an angle to the fall line. Weight should be roughly equal on both skis with slightly more on the downhill ski as appropriate for the given pitch and with the center of mass moving in the intended direction of travel.

Purpose for Senior Students: The ability to control the direction of the skis at an angle to the fall line by tipping the feet and legs while maintaining balance. Developing slipping and skidding skills in a safe environment under low speeds is an essential element to introduce or reinforce the subsequent controlling or shaping phase of the turns. A balanced, skeletally aligned position may allow for more inclination and less counter while managing a slipping or skidding movement.

Variations for Reinforcement Include: Explore starting from a standstill or while in a traverse. Experiment with varying the angle of the slip relative to the fall line. Explore the stance required to control the slip or skid in the desired direction. Explore the use of inclination and angulation to determine edge angle.

Skill Blend Emphasis: **Balance, Edging**. Maintain an open, skeletally aligned stance with slightly more weight on the downhill ski accompanied by the ability to tip both legs to vary the edge angle and control the diagonal slip of both skis. Skidding on a flatter ski at lower edge angles allows the senior skier to minimize fatigue buildup by relying more on skeletal alignment and less on muscular efforts.

- Falling Leaf

Description of Task: From a balanced, strong inside half parallel stance with slightly more weight to the downhill ski initiate linked controlled sideslips alternating in forward and backward directions by slightly moving weight fore and aft along the length of the skis. Direction is controlled by a combination of edge angle and weight distribution along the ski. The center of mass should align and maintain pace with the direction of travel moving forward and backward to maintain a balanced stance.

Purpose for Senior Students: This drill provides the ability for the student to learn how to control the ski direction and speed through the blending of balancing, pressuring and edging skills in non-threatening terrain. A progressive extension movement at the initiation allows the skis to easily move forward and laterally.

Variations for Reinforcement Include: Play with the wide range of fore/aft movements and how ski design affects outcomes. *Focus on movement that can blend into turn initiation skills.*

Skill Blend Emphasis: **Balance, Edging, Pressuring.** While maintaining an open skeletally aligned stance the skier moves forward and diagonally in the intended direction of travel to release the edges and causing the skis to slip diagonally. Continuous progressive flexing and extending movements facilitate skidding and cause lower impact and less muscle fatigue.

- Uphill Christy

Description of Task: From a traverse at an angle to the hill in an upright, balanced, strong inside half stance initiate a skidded parallel, turn up the hill to a stop by steering both feet, and legs in the direction of the intended turn. Progressively guide the arc of the turn by continuous steering of the legs with progressive flexion of the ankles, knees, hips and spine as the turn develops. Maintain body alignment slightly open to the turn as the legs turn more than the upper body and as the pressure on the outside ski increases.

Purpose for Senior Students: This drill reinforces the ability to turn both skis at the same time in the direction of the new turn. Utilizing this task, on moderate terrain, with a slight convex face will facilitate the skidding and rotary movements to more easily control the arc of the turn.

Variations for Reinforcement Include: Start with a shallow traverse and progress to steeper approaches from the fall line to explore rate, timing and intensity at which turns can be steered and pressure managed.

Skill Blend Emphasis: **Rotary,** Edging, Pressuring. Skier maintains a tall stacked stance and steers both feet and legs simultaneously to shape the turn while maintaining consistent open stance width and allowing a countered relationship between the legs and upper body to develop as the legs turn in the hip socket more than the upper body. This low impact, continuous movement explores strategies to minimizing fatigue build up and stress to joints.

- Linked Wedge Christies

Description of Task: As the previous turn is completed in a flexed, balanced and parallel stance, a new turn is initiated with an extension by steering both skis towards the fall line in a wedge relationship. The skis become parallel through more active steering of the inside leg resulting in a rounded turn shape with no traverse. The inside ski and the inside half of the body lead before the fall line with the feet and legs aiding in turn shape and managing the arc of the turn.

Purpose for Senior Students: This task can be utilized as a platform for continued progress or for reinforcement in blending of all skills. Linked wedge christie turns can allow further exploration of the mountain with reasonable control and comfort.

Variations for Reinforcement Include: Experiment with turn shape, turn size and speed. The matching of the skis may be demonstrated in a variety of places in the turn, including the beginning, middle or finish. Pole touch is optional, but if used must complement the movement of the body in the direction of the new turn. Actively steer both ski tips into the new turn. Flexion of the ankles, knees, hips and spine is progressive through the turn with subsequent progressive extension of the joints at turn initiation. Shaping of the turns is enhanced through gradual continuous rotary movements of the feet and legs.

Skill Blend Emphasis: **Rotary**, Edging, Pressuring, Balance. A slight forward and diagonal extension at the initiation of the turn allows for flattening of the skis and facilitates steering movements which originate in the feet and legs. As the turn develops, active steering of the inside leg results in a parallel open skidded finish. Shaping the turn with skidding movements allows for lower impact while continually moving in the direction of the intended turn. A strong, stacked and skeletally aligned body position will allow for greater strength from the skeleton and can assist in minimizing muscle fatigue. This can assist with managing endurance and subsequently allow greater exploration of the mountain environment.

- **Traverse - Advanced**

Description of Task: Traverse across the hill with both skis tipped onto their uphill edges. Stance should be upright and balanced over the whole foot with the ankle, knees, hip and spine slightly flexed. A strong inside half is exhibited with the inside half of the body raised and ahead of the outside half. Demonstrate the ability to: lift the uphill ski while continuing the original track of the downhill ski; lift the downhill ski while continuing the original track of the uphill ski; and alternate between the uphill and downhill ski while continuing the original track.

Purpose for Senior Students: This task explores the ability to move from ski to ski while maintaining balance and edge engagement. The skier demonstrates appropriate flexion of ankles, knees, hip and spine to maintain alignment and edge engagement.

Variations for Reinforcement Include: Addition of garlands through task exploration. Lifting of only the tail or tip of the ski while in the traverse to explore balancing while in motion. Exploration of outcomes by allowing the ski to skid while in the parallel traverse.

Skill Blend Emphasis: **Balance**, Edging, Pressuring. Skier maintains a tall, skeletally stacked alignment with appropriate ankle flex and shin pressure to the cuff of the boot while in motion. A strong inside half will promote strength and alignment to minimize an overly countered position and correspondingly reducing fatigue buildup.

- **Linked Pivot Turns**

Description of Task: From a sideslip down the hill in a flexed, balanced, strong inside half stance, extend forward and laterally in the direction of travel and simultaneously steer both skis under the torso to allow shaping of the turn with progressive skidding movements through the shaping phase of the turn until the skis are 180 degrees from the original direction of travel. The inside ski is ahead and the inside half of the body is raised and ahead by the fall line. Transfer weight to the new uphill ski and repeat.

Purpose for Senior Students: Exploration of changing direction relatively quickly while remaining in balance and controlling speed buildup from turn to turn. Managing flexion and extension movements of the ankles, knees, hip and spine while actively steering the feet and legs. Turning the legs requires turning the leg within the hip socket thus by default the entire leg assists with turning: feet, shin, thigh.

Variations for Reinforcement Include: Explore moderate to steeper blue terrain preferably where the slope is flat rather than concave or convex. Explore the range of flexion and extension of the ankles, knees, hips and spine while guiding both skis by turning (actively steering) both legs through rotation of the femur in the hip joint. Explore more pivoting (Pivot Slips) and more shaping (Pivot Turns). Explore movements shifting pressure from the downhill ski to the uphill ski at turn initiation.

Skill Blend Emphasis: **Rotary**, Balance, Edging, **Pressuring**. Skier simultaneously steers both legs under a quiet upper body while transferring weight and balance over the new outside (downhill) ski into a skidded finish. A tall, skeletally aligned stance with an awareness of a strong inside half at turn transition will allow for low impact and continuous movements with reduced muscle fatigue. A progressive drifting and skidding exploration to manage turn shape in lieu of a quick pivot action to turn feet promotes inherent strength, enhances balance and minimizes fatigue build up.

- **Linked Open Parallel**

Description of Task: Balanced, rhythmical turns with no traverse. The pole swing timing complements movements into the turn, edge change and weight transfer. The inside half of the body is raised and ahead of the outside half by the fall line with the skis remaining in a parallel relationship throughout each turn.

Purpose for Senior Students: Exploration of a blending of the skills especially on easier groomed terrain, maintaining a balanced stance throughout each turn with rounded turn shapes. Upper body alignment should be slightly open to the hill, moving in the direction of travel, with the legs turning more than the upper body as the turn progresses. Initiation is a forward and diagonal extension with shins maintaining contact with both boot cuffs as weight moves progressively to the new outside ski. As the turn develops the ankles, knees, hips and spine flex and the femur continues to rotate in the hip joint to guide the skis and shape the turn.

Variations for Reinforcement Include: Refinement of the blending of the skills by varying turn radius, seeking to increase speed on flatter terrain and controlling speed on steeper terrain through shaping of the turns. Prudent use of terrain features such as small bumps and rolls can aid in accomplishing the desired blending. Reinforcement of maintaining a balanced stance while in motion.

Skill Blend Emphasis: Balance, Edging, Rotary, and Pressuring: Skier maintains a stacked skeletal alignment when necessary and maintains an open consistent stance width. Turn initiation is with a forward and diagonal movement of the feet and legs while maintaining stacked skeletal alignment (hips over feet and perpendicular to the slope), accompanied by continuous progressive edging and rotary skill blends to manage the turn shape based on slope and pitch. The awareness of continuous progressive movements, maintaining an aligned stance, maintaining balancing while in motion and purposeful terrain choice will allow the senior skier

to manage and maintain the arc of each turn and subsequently turn shape and consequently the senior skier will be able to enjoy and explore the mountain environment.

- **Effective Pole Use**

Description of Task: Pole swing is continuous and purposeful throughout all turns. Grip is firm with direction of swing and pole touch determined by intent of direction of travel and radius of turn. Functional engagement of the core is directed by hand/arm carriage and tension.

Purpose for Senior Students: upper body discipline will allow a stronger, engaged core upon which the lower legs can turn against. Hand/arm carriage assists with the ability to ski into and out of countered relationships. Timing and direction of the pole swing varies to complement the desired movements

Variations for Reinforcement Include: Trialing pole swing and touch in a variety of turn shapes and speed ranging from pivot slips to medium radius.

Skill Blend Emphasis: Proper upper body engagement facilitates efficient stance and alignment.

- **Carved Parallel**

Description of Task: Same as open parallel with a focus on progressive edging before the fall line with minimal twisting of the feet. Tails should follow tips from transition to finish with speed and radius consistent from turn to turn.

Purpose for Senior Students: Applications for advanced terrain and pitch and mastery on all blue terrain. Progressive edging and de-edging movements facilitate flow and smoothness. Continuous movements of the center of mass to maintain fore/aft, lateral and rotary balance over the base of support. Utilization of inclination to adjust edge angles. Maintenance of ski snow contact through rhythm and flow.

Variations for Reinforcement Include: Various terrain and pitch selections altering duration, timing and rate of progressive edge engagement.

Skill Blend Emphasis: Stance and alignment can have a positive and selective effect of the blending of the skills within each turn and series of turns allowing for stability, progressive edging and de-edging and with limited pivoting and steering as controls for turn shape.

For the Senior Specialist participant, the goal is to progressively apply senior specific movement patterns and embellish the low impact/continuous movement curriculum from beginning skill zones to advanced skill zones. Application of these fundamental core identified tasks as drills for enhancement, tools for reinforcement of a particular movement pattern or as progressions for skill blending are all equally valid and useful for enhancing the ultimate goal of good, fun and efficient skiing. As the skill set and technical understanding improves, the tasks and drills can be applied to varied terrain, conditions, pitch and speed.

Summary

"We may look mild, but we're wild," says 75-year-old Bruce Sherman.



Workbooks

Workbook materials required for successful completion of the Senior Specialist 1 and 2 programs are located on the PSIA-NW website under the Senior Specialist menu. To be successful, participants must satisfactorily complete the essay questions and write a lesson plan for one of the provided scenarios. The workbooks must be completed, brought to the course and presented to the clinician on day one of the event. The completed responses will be reviewed and discussed during the indoor sessions.

Thank you for your support of the Senior Specialist Program

Addendum 1

Skill Development and Cognitive Processes: Age and Skill Acquisition

Skiing and Riding are, quite simply, acquired skills. Over the years, there has been a great deal of research in the field of 'skill' development (be it in athletics, music, surgery, piloting, etc.). Much of the focus has been on using 'experts' as benchmarks for study as to how people generically best acquire, develop and enhance skill. In recent years, there have been significant advancements in the understanding of neurobiology, that correlate well with observed, empirical research that has been going on for many decades.

To understand how skill development is affected with more senior populations, one first must have a rudimentary understanding of how skill is acquired in general. One belief held by many, is that skill expertise follows those that are naturally 'gifted' or talented. The 'ability' is innately there, and just needs some help bringing it to the surface. This belief, particularly for complex activities, has not been validated by the research. Instead, the best indicators for successful, high levels of skill development are those who employ a very focused, conscious style of practice, and a lot of it. We truly do 'learn by doing'. However that is only a necessary, but not sufficient ingredient. The practice of greatest value is when we are in a state researchers call 'metacognition'. This is where one is maintaining an 'awareness' of one's actions and activities. Mindless practice usually nets low level results.

The phrase 'Deliberative Practice' (coined a leading researcher in the field, K. Anders Ericsson) is used most commonly, and it involves reflection and analysis of the activity (before, during and after). The general characteristics of Deliberate Practice is a state where skill is advanced in modest incremental steps, usually right at the edge of one's abilities (but not entirely out of reach), at that threshold where failure and errors usually occur. At this point, the individual maintains a mental focus on his/her performance, constantly adjusting (and hence, learning). It can be very exacting. This 'small steps' approach, is best when it is structured towards larger, more integrated and complex goals (yes, this is very consistent with the PSIA principles of mini progressions, that break a given skill or task into basic components, then piece them together into an integrated whole). Another key element is also the action of doing a 'debrief' after performing. One weighs the merits, successes and weaknesses of a practice and consciously thinks of how to best approach picking up on the activity 'next time' (again, entirely consistent with PSIA practice of summarizing at the end of the 'teaching cycle').

Naturally, quality coaching can be critical to more rapid, successful skill development. This assumes that the coach can provide proper guidance on the specifics of a task (the decisions or movements that are being strived for, in small tactical manners) and relate it in a concrete

feedback as to what the athlete is doing (where the athlete is 'at' and where he needs to be moving towards). The famous UCLA basketball coach, John Wooden, the most successful in men's collegiate history, was known for his very targeted, specific feedback (directed at guiding the specific action or skill, not the person). In essence, vagueness kills, specifics advance.

In the field of neurobiology, this all appears to fit quite nicely with how our brains and nervous systems are 'wired' to learn. In essence, when a new memory (or skill...) is learned, neurons in our brains make many many new connections, establishing a memory network. The more a given activity is performed, the more that memory (skill) is used. This much has been understood, for a long time.

More recently, there has been understanding of the role of glial cells in the brain (neurons being 'grey matter', glial cells well outnumber them, and are sometimes referred to as 'white matter') regarding how our brains function. Glial cells will work to nourish neural networks, but in addition, they help to develop the robustness and efficiency of often used, important neural networks (our memory circuits, if you will). They do this by creating what amounts to a form of insulation, called myelin, that significantly increases the electrical conductivity along the length of a neuron (ease at which the electrical current will travel, speeding it along), as well as dramatically reducing the electrical signals tendency to 'hop' over to other, surrounding neural pathways. Consider it nature's version of wire insulation, but one that has the effect of allowing ever faster, more accurate use of the desired circuit. Well myelinated circuits may be hundreds of times faster and much more accurate, than those with little myelin.

However, for glial cells to expend the effort to create and wrap myelin around a given neural network, it appears two conditions must exist. First, is the neural pathway is one that get's used a lot (hence the importance of repetition/practice of a skill/activity). Secondly, and just as importantly, there must be some level of 'imperative' to that activity. If the activity is 'good enough', and can be placed on automatic pilot (so to speak), then there is no call to further reinforce that circuit. If the activity has some sense of urgency, concentration, exactitude, then the glial cells get the message that these circuits are that much more important, need more attention, and wrap more myelin. Mindless practice, where one's head is not in the game, may use the skill circuits in question, but these will not be reinforced. It will be a low level of quality practice, and one is unlikely to 'advance' in skill.

An example skill would be driving a car. High levels of concentration were involved when first learning to drive. While this was happening, skill was developing at real and measurable ways. With time, a degree of proficiency is usually met, and folks will usually start to multi-task, drive while listening to the radio, talking with others, etc. At this point, the brain is in a state of 'automaticity'. It is performing at a given level, but without a conscious concentration or imperative on doing better, the skill is being used but not advanced. However, if one were to take a week long racing course, driving at the edge of one's abilities, stop watches for feedback as to lap times, competition on one's tail, expert coaching on how best to brake to corner, accelerate, pass others, then ones overall driving abilities (and amount of myelin of those circuits), would undoubtedly be much advanced.

A characteristic of myelin is that glial cells wrap...but do not 'unwrap' myelin. If a new skill is acquired, the new circuit is just that, it is new and separate. It does not 'tear down' the old one. It is used in place of the old one. Hence, when one is not concentrating on 'the new' way, or is stressed into a quick action, the old (faster insulated) circuit is often defaulted to. Once a new and improved skill is further developed (better myelinated), the new skill will start to prevail. So yes, old dogs can learn new tricks....but just don't expect them to 'forget' the old ones. This is true of any age person; however, younger clients simply may not have as many or as well developed neural networks in place that would 'compete' with the new skill.

According to brain scans, peak myelination seems to occur in our fifties. However, the brain is remarkably 'plastic'. It evolves and rewires all our lives. All the recent evidence is that Myelin and new neurons and neural networks can be developed until we die (given normal, healthy aging, there are diseases that can interrupt or affect this process). Further, the older, more developed brain will leverage the extensive connectivity it has, and often will adjust 'strategies' as its means to development or performing.

There is an old belief that "For decades the conventional view in medicine was that once we reach adulthood, we can only lose neurons, not add them....recent research shows that none of this is true. Our brains are perfectly able to add new neurons well into old age when conditions demand it, and brain plasticity doesn't stop with age." (Pg 183 Talent is Over-rated by Geoff Colvin)

For dealing with a senior snow sport client, there are two elements to consider. If at the acquisition stage of totally 'new' skills, comparison tests between younger, middle and older age groups do suggest that the 'rate' of skill advancement may be slower in many tasks (on average). However, there is research that indicates that in many cases, advanced skill levels can still be attained, it just may take longer (so it's not a matter of 'can't do it' due to age, but recognizing the need for patience that the 'rate' of attainment may be slower, the use of Deliberative practice techniques being key). This is generally good news.

Myelin can degrade with age, but only if those circuits are not reinforced or used. In essence, it is a 'Use it or Lose it' situation (researchers will use the term 'cognitive reserve' in this context). But again, not just 'used' but 'used' with a 'deliberative practice' type of imperative. Maintenance of skills for those who already perform at high levels, studies have indicated that they can maintain highly proficient levels (hence have highly myelinated circuits) do not generally decline in those skills even after they may be showing areas of decline in other aspects of their lives. To quote:

"Studies in a very broad range of domains-management, aircraft piloting, music, bridge, and others- show consistently that excellent performers suffer the same age-related declines in speed and general cognitive abilities as everyone else-except in their field of expertise." (Talent is Overrated)

Experiments have shown that situations in which people are forced to adapt and attune themselves to new challenges (i.e. make errors, pay attention, deep practice) tend to increase cognitive reserve.” (Pg. 216 The Talent Code, by Daniel Coyle). One study showed that elderly people who pursued more leisure activities had a 38% lower risk for developing dementia.

This study did not mention skiing specifically, but the implication is clear. Other factors notwithstanding, the senior client can develop new skills (one must simply be prepared to deal with a slower ‘rate’ of acquisition), and as long as deliberative practice (staying mentally focused in a state of metacognition) principles are maintained, the brain can develop high level of skills thru-out ones Senior years.

Lesson Planning Worksheet

Guest Description

Description of Guest Needs

Use of Mountain Playground

The Wrap-up



	<p style="text-align: center;">PSIAAASI N O R T H W E S T</p> <p>11206 Des Moines Memorial Dr, Suite 106, Seattle, WA 98168-1741 (206) 244-8541 (206) 241-2885 (fax) e-mail - office@psia-nw.org</p>	<p style="text-align: center;">SPECIALIST FEEDBACK SHEET</p> <hr/> <p style="text-align: center;">SENIOR SPECIALIST FOUNDATIONS</p>
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Participant _____

Date (mm/dd/yy) _____

Location _____

Clinician(s) _____

The Senior Specialist Foundations training is an educational offering from PSIA-NW. In this foundation level the goal is to introduce the Senior Specialist program, provide you with direct feedback throughout the day and written feedback at its completion as well as to assist you in

continuing to grow and develop your skiing and teaching skill set when working with the senior client. We hope this feedback helps your current level of understanding and performance and to identify areas where you can improve when working with and demonstrating to senior clients.

SENIOR-SPECIFIC SKIING PERFORMANCE

Balancing Movements and Stance

- Maintains an open stance displaying lateral and fore/aft alignment.
- Uses forward /diagonal movements to maintain boot cuff contact.
- The skeletal frame is aligned and joints are stacked, minimizing muscle fatigue and stress.

Pressuring Movements

- Demonstrates a progressive and smooth transition of pressure to new outside ski at turn initiation.
- Demonstrates continuous flexion and extension movement patterns to enhance flow and smooth transitions and reducing impact stress.

Rotary Movements

- Demonstrates progressive steering of the legs to assist in turn shape and speed control.
- Demonstrates an ability to blend rotary movements with edging movements.
- Develops counter through turning the legs more than the upper body.

Edging Movements

- Demonstrates progressive edging and de-edging movement patterns.
- Demonstrates appropriate skidding movements to minimize pressure loading on joints utilizing a long (tall), slightly inclined stance for skeletal strength and to reduce muscle fatigue.

WRITTEN FEEDBACK



PSIA-ASI

N O R T H W E S T

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SPECIALIST FEEDBACK SHEET

SENIOR SPECIALIST FOUNDATIONS

Below are the efficient skiing skills which are important to skiers of all ages, from beginner to expert. In the Senior Specialist program, critical skills and skill blends have been focused on to help the instructor when working with the senior client. Keeping these skills in mind is crucial as we work with, demonstrate to, and teach the senior client, to help them develop their movements and movement patterns to be more efficient. Outcomes will be movements and techniques enabling them to obtain

these goals: minimize muscle fatigue, minimize impact on joints, conserve energy, improve confidence, improve current skills, allow for exploration of more terrain and increase their enjoyment of the mountain experience. The feedback topics on the front of this sheet were developed to help guide you in your pursuit in working with the senior client, to help you continue to develop your own skill set, and because they are critical skills needed in order for the senior skier to reach goals.

Balancing Movements and Stance

Skier is in balance when they can affect any of the skills throughout each turn

Entire body is involved in balancing

Flexion and Extension originates in the ankles and is supported by knees, hips and spine

The inside leg shortens as the outside leg lengthens and the skis bend from the middle

The upper body remains more vertical than the lower body and the shoulders stay level to the horizon or they level out through the turn

The inside hand, shoulder and hip lead the turn, resulting in a countered relationship

Hands are in front of the body to aid balance

Vision is directed forward and looking in the intended direction of travel

Pole swings smoothly in the direction of travel

Rotary Movements

Skier turns part of the body and combines with other skills to change direction efficiently

Turning movements originate in the feet and legs and they turn more than the upper body

Legs turn underneath a strong/stable torso to guide skis through the turn

Both skis turn together throughout parallel turn, with femurs turning in the hip sockets

Skis are tipped and turned appropriately to create a smooth, C-shaped arc

Rotary movements are matched in timing and intensity by tipping the skis

Rotary movements are progressive unless needed to recover balance

Pressure Control Movements

Skier manages pressure providing the element of touch which promotes a smooth ride

Joints work together to apply and release pressure effectively to flow evenly and smoothly over the terrain

Skis bend progressively through the turn, with entire ski length engaged

Continues to move forward along ski edges throughout the turn

Body continues to move forward with the skis throughout the turn

Flexion and extension of legs changes in response to the terrain and pitch of the slope

Pressure adjustments are made throughout the turn along the ski and from foot to foot

The pole touch or pole plant complements the turn

The upper body remains quiet and disciplined

Edge Control Movements

Skier uses edging to direct the skis to control turn radius, shape and speed

Edges are released and re-engaged in one smooth movement

Center of mass moves into direction of the new turn to change edges

Both skis tip the same amount early in the turn

Ankles, knees, and hips roll forward and laterally to move into the new turn

The shins make forward and lateral contact with the boot cuffs

Tension of the inside leg helps maintain alignment



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NORTHWEST

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SPECIALIST FEEDBACK SHEET

SENIOR SPECIALIST 1

Participant _____

Date (mm/dd/yy) _____

Location _____

Clinician(s) _____

☐ **ATTAINED** The understanding of the material and the ability to display necessary skill blends have been shown.

☐ **DEVELOPING** Before SS1 can be attained, further development in the participant's understanding of the material and/or ability to display necessary skill blends need to be enhanced.

SENIOR-SPECIFIC SKIING PERFORMANCE

Balancing Movements and Stance

- ☐ Maintains an open stance displaying rotational, lateral and fore/aft alignment.
- ☐ Uses forward /diagonal movements to maintain boot cuff contact.
- ☐ The skeletal frame is aligned and joints are stacked, minimizing muscle fatigue and stress.

Pressuring Movements

- ☐ Demonstrates a progressive and smooth transition of pressure to new outside ski at turn initiation.
- ☐ Demonstrates continuous flexion and extension movement patterns to enhance flow and smooth transitions and reducing impact stress.

Rotary Movements

- ☐ Demonstrates progressive steering of the legs to assist in turn shape and speed control.
- ☐ Demonstrates an ability to blend rotary movements with edging movements.
- ☐ Develops counter through turning the legs more than the upper body.

Edging Movements

- ☐ Demonstrates progressive edging and de-edging movement patterns.
- ☐ Demonstrates appropriate skidding movements to minimize pressure loading on joints utilizing a long (tall), slightly inclined stance for skeletal strength and to reduce muscle fatigue.

TEACHING & PROFESSIONAL KNOWLEDGE

- ☐ Shows ability to articulate, discuss and synthesize the Learning Partnership as it applies to seniors.
- ☐ Successful completion of Workbook.

Senior Student Profile

- ☐ Cognitive: Shows an understanding of developmental milestones, behaviors, learned movement patterns, roadblocks.
- ☐ Affective: Shows an understanding of client desires, goals and history.
- ☐ Physical: Shows an understanding of real versus ideal movement patterns, medical issues, VAK and Low Impact/Low Fatigue movements.

Instructor Behavior for the Senior Lesson

- ☐ Shows an understanding of Maslow's Theory, Guest Description, Guest Needs, Effective Use of Mountain Playground, Wrap Up.

WRITTEN FEEDBACK

FEEDBACK KEY



Proficient



Working On

Senior Specialist

2011

PSIA-NW Standards: Foundations, SS 1 and SS 2

November 2010

Revision December 2011

Senior Specialist Standards

Introduction

The following are the current (2010–11) PSIA Senior Specialist Standards. Referenced to the *Alpine Technical Manual (ATM, 2nd Edition, 2007)*, *Core Concepts (2001)* and the *PSIA-NW Senior Specialist Manual (SS Manual, 2nd Edition, 2010)*, terminology is consistent with these manuals and is to be used throughout this document. These standards provide a training and educational focus and represent a minimum competency for each level of specialist.

The premise of the standards is based upon the concepts of “levels of understanding” that define stages of learning in degrees of understanding. Just as certification is a measure of understanding, levels of certification represent stages of understanding. Although not a certification, Senior Specialist’s will be expected to meet levels of competency defined by SS 1 and SS 2 standards. This is a certificate based educational offering of PSIA-NW. Candidates will be held to the knowledge and performance standards of the level at which they are participating as well as the criteria for all preceding levels.

Levels of participant understanding are based on Bloom’s Taxonomy. The Taxonomy criteria are noted in italicized formatting throughout this document.

Original (Bloom et al., 1956) and Revision (Anderson, 2001)

Definitions from Bloom B. S. (1956). Taxonomy of Educational Objectives, Handbook I: The Cognitive Domain. New York: David McKay Co. Anderson, L. W., Krathwohl, D. R. (Eds.). (2001). A taxonomy for learning, teaching and assessing: A revision of Bloom's Taxonomy of educational objectives: Complete edition, New York: Longman.

Remember (Knowledge Level)

Ability to recall or recognize terms, definitions, facts, ideas, materials, patterns, sequences, methods, principles. Key verbs: name, list, state, describe, recall, label, recognize.

Understand (Comprehension Level)

Read and understand descriptions, communications, reports, tables, diagrams, directions, regulations, etc. The ability to grasp meaning. Key verbs: paraphrase, identify, explain, translate, interpret.

Apply (Application Level)

Know when and how to use ideas, procedures, methods, formulas, principles, theories, etc. The ability to use learned material in new situations or the unprompted use of abstractions. Key verbs: execute, compute, demonstrate, discover, predict, show, solve, implement.

Analyze (Analysis Level)

Break down information into its constituent parts and recognize their relationship to one another and how they are organized; identify sublevel factors or salient data from a complex scenario. The ability to distinguish between fact and inference. Key verbs: diagram, illustrate, outline, infer, conclude, differentiate, compare/contrast.

Create (Synthesis Level)

Put parts or elements together in such a way as to reveal a pattern or structure not clearly there before; identify which data or information from a complex set is appropriate to examine further or from which supported conclusions can be drawn. Key verbs: create, compose, design, reorganize, formulate, create a new ending.

Evaluate (Evaluation Level)

Make judgments about the value of proposed ideas, solutions, etc., by comparing the proposal to specific criteria or standards. The ability to judge the value or worth of material and ideas against stated criteria. Key verbs: judge, appraise, compare, contrast, criticize, justify, critique.

Senior Specialist Levels

PSIA-NW recognizes three levels of the senior specialty: Foundations, SS 1 and SS 2. Successful outcomes are based on the individual's knowledge and application of specific skill ability, educational expertise and experience related to the senior client.

General Requirements

Specialist Level	General Requirements
Foundations	The successful SS Foundations participant will demonstrate <i>knowledge</i> of the technical terms, concepts and models listed below. The successful participant will demonstrate the ability to work Beginning to Intermediate zone senior students that are learning and moving in all green and groomed blue terrain. Requirements of participation include a Registered level in the alpine discipline. Successful completion of SS Foundations is required before participation in the SS 1 educational event OR the participant may present documentation to the PSIA-NW office proving 20 teaching hours of the adult student and participate directly in the SS 1. Successful participants will be awarded a certificate of participation.
SS 1	The successful SS 1 participant will demonstrate the <i>knowledge and comprehension</i> as well as the <i>application</i> of the technical terms, concepts, and models listed below. The successful participant will demonstrate the ability to work with Beginning to Intermediate zone senior students that are learning and moving in all green terrain and groomed blue terrain. Requirements of participation include a Certification Level 1 in any alpine discipline. Participants will be awarded a Senior Specialist 1 certificate upon successful program completion.
SS 2	The successful SS 2 participant will demonstrate the <i>application and analysis</i> and the ability to <i>synthesize and evaluate</i> the technical terms, concepts, and models listed below. The successful participant will demonstrate the ability to work with Beginning to Advanced zone senior students who are learning and moving in all terrain up to and including groomed black terrain. Requirements of participation include a Certification Level 2 in any alpine discipline. Participants will be awarded a Senior Specialist 2 certificate upon successful program completion.

Movement Analysis and Technical Knowledge

SS Foundations
The successful SS 1 participant will demonstrate the <i>knowledge</i> of the technical terms, concepts, and models listed below. The successful participant will demonstrate the ability to recognize specific movement patterns in seniors who are learning and moving in all green and groomed blue terrain.
SS 1
The successful participant will demonstrate the <i>knowledge and comprehension</i> as well as the <i>application</i> of the technical terms, concepts, and models listed below. The successful participant will demonstrate the ability to recognize specific movement patterns in the Beginning to Intermediate zone senior students who are learning and moving in all green and groomed blue terrain. Workbook completion is mandatory.
SS 2
The successful participant will demonstrate the <i>knowledge and comprehension</i> as well as the ability to <i>apply, analyze, synthesize and evaluate</i> the technical terms, concepts, and models listed below. The successful participant will demonstrate the ability to recognize specific movement patterns in Beginning to Advanced zone senior students who are learning and moving in all terrain conditions. Workbook completion is mandatory.

Participants will be evaluated based on the following criteria, terms, concepts, and models:

- The Learning Partnership: Student Profile and Instructor Behavior
 - Teaching concepts
 - The Teaching Cycle
 - Guest Description
 - Guest Needs
 - Effective use of the Mountain Playground
 - Wrap Up
 - Class Handling
 - Pacing and low impact movement patterns
 - Intensity
 - Terrain choices, conditions
 - Skiing Concepts:
 - Efficient movement patterns related to the skills concept
 - Senior specific Low Impact/Continuous Movement Model
 - Skeletal alignment
 - Continuous fluid movement
 - Minimizing joint impact
 - Stance and balance
 - CAP Model
 - Cognitive:
 - Developmental milestones
 - Learned movement patterns, behaviors
 - Roadblocks to learning
 - VAK
 - Affective:
 - Client desires, goals and history
 - Gardner's Multiple Intelligence's
 - Maslow's Hierarchy of Needs
 - Erik Erikson's Psycho-social Development Theory
 - Physical:
 - Low Impact/Continuous Movement Model
 - Biomechanics specific to physical outcomes
 - Anatomic/Physiologic components
 - Fatigue minimizing movement patterns
 - Movement Analysis
 - Real versus Ideal Movement Patterns
 - Cause-and-effect relationships
- Equipment Components
 - Boot fit and design
 - Technology of ski design
 - Student centered choices
- Adjunct
 - Stakeholder partnerships
 - Senior program development
 - Anxiety, fear, risk taking
 - Neurologic feedback system

Teaching Standards

Foundations	The successful participant will demonstrate the <i>knowledge</i> of the learning partnership, concepts, and models listed. The successful Foundations participant will participate in group discussions related to the teaching cycle and senior teaching model. The successful participant will demonstrate the ability to recognize and demonstrate <i>knowledge</i> of the teaching cycle for seniors who are learning and moving in all green and groomed blue terrain.
SS 1	The successful SS I participant will demonstrate the <i>knowledge, comprehension</i> and <i>application</i> of the learning partnership, teaching concepts, and models listed. The successful participant will demonstrate the <i>knowledge, comprehension</i> and <i>application</i> of the teaching model for seniors in the Beginning to Intermediate zone in green to groomed blue terrain. The successful candidate will demonstrate active participation with the group and clinician in demonstrating understanding methodology of the teaching cycle, senior specific models and movement patterns.
SS 2	The successful SS 2 participant will demonstrate the ability to choose appropriate drills and tasks and teach a safe, effective lesson progression or teaching segment that demonstrate the <i>application and analysis</i> and the ability to <i>synthesize and evaluate</i> the technical terms, concepts, and models listed. The successful participant will demonstrate the ability to teach to a spectrum of senior clients from beginning to advanced zones and in all terrain.
SS 2	Professional Knowledge The successful SS 2 participant will be able to demonstrate the <i>application and analysis</i> and the ability to <i>synthesize and evaluate</i> the technical terms, concepts, and models listed related specifically to the senior client including the connection between movements, skills and resultant ski performance as well as the relationship between the teaching cycle and teaching model. The successful participant will demonstrate personal mastery by written, verbal and physical modalities.

Movement Standards

Movements and coordination is based on the definitions of "initial", "elementary", and "mature", as defined in *Core Concepts* (PSIA/AASI, 2001), pg. 20.

The “initial” movement stage is when a skier is unfamiliar with a movement and relies on sensory input and coaching to learn. Often, the movements are very sequential and performed individually. The skier in this stage may show signs of a movement pattern periodically but not consistently.

The “elementary” stage denotes skiers who can perform movements without looking at that body part but still need to think it through and concentrate on the parts. While movements are still sequential, the skier will link them together in a more fluid manner. The skier in the elementary stage will be able to consistently demonstrate a movement pattern but may not be able to apply it in all situations.

The “mature” stage is characterized by smooth, fluid, and automatic movements without showing obvious, conscious thought. Movements can be repeated and applied across a wide spectrum of situations. A skier with mature movements and coordination of movements will be able to smoothly blend movements for a specific outcome and be able to readily change or adapt movements to different terrain situations and snow conditions.

Foundations	Skiing
Participants will be evaluated on the following movements and coordination:	<ul style="list-style-type: none"> • Level 1 Certification Standards • Elementary stage of movement coordination • Ability to demonstrate Ideal movement patterns based on evaluation of Real movement patterns observed in the senior client in the Beginning to Intermediate zone • Ability to demonstrate senior specific tasks and drills to Level 1 Certification Standards

Foundations	Movement skills and Performance
Successful participants will demonstrate the ability to comfortably perform in the following terrain:	<ul style="list-style-type: none"> • All green and blue terrain • Ability to demonstrate senior specific tasks and drills to Level 1 Certification Standards

Foundations	Applied Movements
<p>Movements to be applied at Foundations include the efficient movement patterns of balance, edging, pressure and rotary skills that will affect the performance outcomes of the senior client utilizing the concepts of low impact, low fatigue continues movement patterns. The candidate will be asked to demonstrate movements and techniques that enable the senior skier to meet the following goals: minimize muscle fatigue, minimize high impact to joints, conservation of energy and improved confidence.</p> <p>Applied movements include the utilization of a stacked skeletal alignment to reduce muscle fatigue, continuous flexing and extending movements to reduce impact, balancing movements which include maintaining a strong inside half and rotary movements where the turning of the leg is initiated with the femur rotating within the hip socket.</p>	

SS 1 Skiing	
Participants will be evaluated on the following movements and coordination:	<ul style="list-style-type: none"> • Level 1 Certification Standards • Ability to demonstrate senior specific tasks and drills to Level 1 Certification Standards • Elementary to Mature stages of coordination • Ability to demonstrate Ideal movement patterns based on evaluation of Real movement patterns observed in the senior client in the Beginning to Intermediate zone

SS 1 Movement Skills and Performance	
Successful SS I participants will demonstrate the ability to comfortably perform in the following terrain:	<ul style="list-style-type: none"> • All green terrain • Blue groom terrain including gentle off-piste conditions and small bumps • Ability to perform senior specific tasks as requested utilizing the low impact/continues movement model including the ability to slip, skid and incline as directed.

SS I Applied Movements	
<p>Movements to be applied at Foundations include the efficient movement patterns of balance, edging, pressure and rotary skills that will affect the performance outcomes of the senior client utilizing the concepts of low impact, low fatigue continues movement patterns. The candidate will be asked to demonstrate movements and techniques that enable the senior skier to meet the following goals: minimize muscle fatigue, minimize high impact to joints, conservation of energy and improved confidence.</p> <p>Applied movements include the utilization of a stacked skeletal alignment to reduce muscle fatigue, continuous flexing and extending movements to reduce impact, balancing movements which include maintaining a strong inside half and rotary movements where the turning of the leg is initiated with the femur rotating within the hip socket.</p>	

SS 2 Skiing	
Participants will be evaluated on the following movements and coordination:	<ul style="list-style-type: none"> • Level 2 Certification Standards • Mature stages of coordination • Ability to demonstrate Ideal movement patterns based on evaluation of Real movement patterns observed in the senior client in the Beginning Zone through Advanced Zone. • Ability to demonstrate senior specific tasks and drills to Level 2 Certification Standards

SS 2: Movement Skills and Performance	
Successful SS 2 participants will demonstrate the ability to comfortably perform in the following terrain:	<ul style="list-style-type: none"> • All green terrain • All blue terrain including variable off-piste conditions and bumps • Groomed and smooth off-piste black terrain • Ability to perform senior specific tasks as requested utilizing the low impact/continues movement model including the ability to slip, skid and incline as directed

SS 2 Applied Movements	
<p>Movements to be applied at Foundations include the efficient movement patterns of balance, edging, pressure and rotary skills that will affect the performance outcomes of the senior client utilizing the concepts of low impact, low fatigue continues movement patterns. The candidate will be asked to demonstrate movements and techniques that enable the senior skier to meet the following goals: minimize muscle fatigue, minimize high impact to joints, conservation of energy and improved confidence.</p> <p>Applied movements include the utilization of a stacked skeletal alignment to reduce muscle fatigue, continuous flexing and extending movements to reduce impact, balancing movements which include maintaining a strong inside half and rotary movements where the turning of the leg is initiated with the femur rotating within the hip socket.</p> <p>Demonstration is required of the ability to utilize forward and diagonal movements to optimize pressure and edge control throughout a series of turns; distribute weight effectively from foot to foot through flexion and extension that keep the skier stacked over the feet and/or balancing on the outside ski; utilization of rotary movements that originate in the feet and legs; movements that are gradual, progressive and continuous throughout the turn; gradual increasing and decreasing of edge angle throughout a turn through edging movements that are smooth and progressive; ability to turn both skis simultaneously and ability to develop different turn shapes for speed control; and the ability to maintain ski snow contact with both skis through stacked skeletal alignment.</p>	

Certification, Level 1 Status

NW Alpine Certification Guide (2010) 23

Level I Requirements

Alpine Certified Level I – National Standards

The following are the current (2010) PSIA Standards. These standards provide a training focus and represent a minimum competency for each level of certification. The premise of the certification standards is based upon the concepts of “levels of understanding” which define stages of learning in degrees of understanding. As certification is a measure of understanding, levels of certification represent stages of understanding. Candidates will be held to the knowledge and performance standards of the level at which they are testing as well as the criteria for all preceding levels. Certified Level I members demonstrate a solid foundation of information and experience necessary to be an effective ski teacher. The Certified Level I instructor possesses an understanding of basic skiing skills, teaching skills and professional knowledge. It is not expected that Level I candidates will have in-depth knowledge and experience in each of the areas of competence listed in these Standards. It is expected, however, that candidates will be able to show basic competence and knowledge in all of these areas. In addition, it is expected that candidates will be able to demonstrate a significant level of competency with the skiing and teaching tasks listed specifically for assessment at a Level I event.

Category A: Skiing

Level I certified teachers must be able to ski all green and groomed blue terrain demonstrating consistent balance and control of speed through turn shape. Demonstrations must display an “understandable picture” of the technical elements of Beginner/Novice zone skiing. The turn dynamics are limited by the speeds and terrain appropriate for Beginner/Novice zone skiing and tasks. The general skiing characteristics are outlined in the National Standards in the Reference and Resource chapter.

Category B: Teaching

Level I Certified teachers demonstrate a solid foundation of information and experience necessary to be an effective teacher of Beginner/Novice zone skiers. A basic understanding of how to manage the learning environment for different age and gender situations is required. PSIA-NW Alpine Certification Guide (2010)

Category C: Professional Knowledge

Professional knowledge requirements for Level I Certified teachers reflect a practical awareness of general terms and concepts and an ability to use these concepts in basic lesson situations for Beginner/Novice zone students. Decision making and lesson content will most likely follow preplanned options, with consideration for different skill development emphasis. the administration of the exam.

References

Bumps for boomers

<http://www.bumpsforboomers.com/index.htm>

Bumps for Boomers.doc

BUMPS FOR BOOMERS ® is an innovative Aspen-based ski lesson program that quickly teaches aging Baby Boomers how to confidently ski mogul and powder terrain previously considered beyond their capabilities.

Aging skiers a vibrant market for industry

http://www.fiftyplusadvocates.com/ews_article.php?id=13

Aging Americans Ripe for Snow Sports.doc

Dick Arner hopped on his bicycle early one day last summer and rode 18 miles to Alta. Uphill. Pedaling high into the oxygen-thin air of the Wasatch Mountains, he arrived at the ski resort village, 8,500 feet above sea level, and purchased his season ski pass. Not bad for a guy who's 71.

Physiology of Aging

<http://ist-socrates.berkeley.edu/~aging/ModuleProcess.html#anchor157481>

Physiology of Aging.doc

As we age, we undergo a number of physiological changes which affect not only how we look, but how we function and respond to daily living. Overall, the changes in the later life span described below involve a general slowing down of all organ systems due to a gradual decline in cellular activity.

Ski resorts expand grooming for aging boomers

By Associated Press

<http://www.msnbc.msn.com/id/9917842/>

Ski resorts expand grooming for aging boomer.doc

The ski slopes that baby boomers used to shred when they were young and reckless are being toned down in a bid to keep them coming back for more.

Sports and Performance Psychology

<http://selfhelpmagazine.com/articles/sports/index.shtml>

Index of Sports Psychology Articles

Belief, self-talk and performance enhancement

By Joe Kolezynski M.B.A., M.A.

<http://selfhelpmagazine.com/articles/sports/selftalk.html>

BELIEF.doc

In many of these cases the factor that separates their performance from the competitions has been found to be rooted in their belief as to their ability to outperform the competition.

How to reach your achievement zone

By Shane M. Murphy, Ph.D. & Annemarie Infantino Murphy, Ph.D.

<http://selfhelpmagazine.com/articles/sports/achizone.html>

HOW to REACH YOUR ACHIEVEMENT ZONE.doc

What does it take to do your very best, even when the pressure is on? Have you ever watched Olympic athletes as they compete and wondered how they deal with the turmoil they experience?

Thought Awareness, Rational Thinking & Positive Thinking

<http://www.mindtools.com/stress/PerformanceStress/ThoughtAwareness.htm>

Thought Awareness.doc

In preparing for a performance, you may have a whole range of fears, anxieties and negative thoughts associated with the upcoming event. While this is completely normal and is something that everyone experiences, it is important that you deal with these; otherwise, they can undermine your self-confidence.

Senior Factoids

http://www.jfcs.org/Services/Seniors/Senior_Factoids/default.asp

Senior Factoids.doc

Facts about Seniors.

Seniors Find New Skis Short on Length

http://www.psia.org/psia_2002/education/TPSArticles/newtechnologies/tpsfall99seniors.asp

Seniors Find New Skis Short on Length.doc

Elan skis were originally designed for nevers, to make a beginner's first lessons so rewarding that he or she would continue to ski. But the skis delighted an entirely different demographic--the teachers who tried them out at an instructional clinic last season. It took only a few runs before these skilled individuals were asking where they could get a short pair of their own.

Senior Skiers Derive Parabolic Pleasure

http://www.psia.org/psia_2002/education/TPSArticles/shapedskis/tpsfall96seniorparabolic.asp

Senior Skiers Derive Parabolic Pleasure.doc

We went to custom-fitted boots and 163-cm parabolic skis. (I had previously been skiing on 185-cm skis, and Dick's were 195 cm). We're now skiing more and enjoying it more, even in questionable weather and conditions.

Aging Successfully: The Importance of Physical Activity in Maintaining Health and Function

Marc T. Galloway, MD and Peter Jokl, MD

<http://www.jaaos.org/cgi/content/abstract/8/1/37>

Aging Successfully.doc

Exercise on a routine basis is an important component of successful aging. It has been shown that many age-related declines in musculoskeletal function can be markedly reduced by participation in some form of regular exercise.

The Aging Athlete, Dr. Darrell Menard and Dr. William D. Stanish (1989)

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Colorado ski resorts alter approach as baby boomers fade away - The Denver Post

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www.tourismbc.com

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