



**DISABILITY SPECIFIC COACHING
WITHIN THE
SLED HOCKEY TEAM ENVIRONMENT**

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**PURPOSE: TO EDUCATE ABLE BODIED COACHES TO THE
NUMEROUS COMPLEXITIES ASSOCIATED WITH SLED HOCKEY
RELATED SKILL DEVELOPMENT, SYSTEMS, CONCEPTS AND
DISABILITY SPECIFIC LEARNING/EXECUTION DIFFICULTIES**

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1 INTRODUCTION

Sledge Hockey in the United States has had a long, laborious developmental period. Starting out as a sport promoted exclusively by approximately twenty elite level players comprising a national travel team, the sport revolved around these players and the administration that supported them. These players struggled to develop their skills and develop new programs with very little to no experience or funding. Each player originated from a primitive local program from which they excelled. All early programs were run by physical therapists or disability advocates whose primary knowledge base was disability related. Some of these professionals had limited hockey knowledge and some relied on local rinks, players, and educators to provide them with an introduction to all ice hockey related information. USA Hockey (USAH) as an organization had little to no impact on these early local programs, including the national adult travel program.

I was first exposed to Sled Hockey as early as 1992. During my three-time participation in the Summer Paralympic Games, a Norwegian swimming colleague introduced to me to this new ice sport that the Norwegians were involved in. My exposure was strictly verbal until the 1994 Winter Paralympics at Lillehammer, Norway. Sledge Hockey made its debut appearance as an exhibition sport in Lillehammer. Countries participating in this first Paralympic Sledge Hockey competition were Sweden, Norway, Canada, Great Britain and Estonia. Politics between two different Disabled Sports Organizations (DSOs) kept the United States from entering a team. As a spectator during the 1994 Winter Olympic and Paralympic Games, I was exposed to the enthusiasm that the Europeans displayed while participating in their winter sports. I also watched highlights of the best Sledge Hockey played in those years.

When I returned home from Lillehammer, it took two years of research until I was able to get into a sled for the first time. I quickly became fully integrated into the sledge hockey culture, and began my work in earnest with the local development of Sled Hockey within Eastern Pennsylvania, New Jersey and Delaware in 1996. In those developmental years the US had a limited pool of talented players to participate in international competition, and these players had limited resources for education and advancement of the skills required to excel at this particular brand of hockey.

The United States Sled Hockey Association (USSHA) was developed early on as the recognized DSO, which dictated Sled Hockey issues for its constituents nationally, regionally, and locally. Until the 2002 Salt Lake City (SLC) Paralympics USSHA concentrated on elite athletes participating in national and international level competitions. Elite players assisted with the development of programs, individual skills and equipment that therefore enabled them to continue to participate in high-level competitions. At that time a variety of disabilities were represented by the players and each of their skill sets had to be designed and developed specifically based on the characteristics of their particular disability. Since SLC 2002 Paralympics USSHA has expanded its role and supports national team, regional development and grass roots efforts. The information I will present you a compilation of what we have learned over the years developing Sled Hockey as a sport in the US; developing programs and assisting individual players. The main objective of this project is to provide

USAH Sled Hockey coaches with the background necessary to adapt current hockey knowledge and apply this information to facilitate coaching new Sled Hockey programs, informing educators and improving individual players. Another objective is to ensure that as an organization we have the ability to provide any person with a disability the opportunity to play hockey without barriers.

2 HISTORY

I have been involved with Sled Hockey as a player, coach, team manager, club administrator and team development coordinator for over ten years. My knowledge and Sled Hockey expertise comes from a diverse background in disability sport including training for and participating in three Summer Paralympic and one Winter Paralympic games. I have a strong interest in hockey and personal development, both on and off the ice, including the USAH coaching education program.

2.1 NATIONAL HISTORY

Sled Hockey was invented in Scandinavia in the early 1970s to help paraplegic patients with rehabilitation. Roots in Canada took hold by 1980. It was another decade before being introduced into the United States. John Schatzlein, a native of Minnesota, founded the American Sledge Hockey Association (ASHA) in 1989. John can be called the father of Sled Hockey in the United States. It was John who made initial contact and nurtured the sport with several groups. Wheelchair Sports USA (WSUSA) and Disabled Sport USA (DSUSA) provided Sled Hockey programs with insurance and athlete leads. USAH and the US Olympic Committee (USOC) were contacted whenever international competitions were planned. More recently, the National Governing Body (NGB) of Sled Hockey became the USP (USP). Mr. Schatzlein took teams to Canada and Europe to compete in international competition starting in 1995. ASHA was incorporated in 1996. In 1998 John Schatzlein resigned from ASHA and Rich DeGlopper became President. At the same time paperwork was submitted to change the name to USSHA. The name change from the European term Sledge to Sled happened about this time. Executive Director of USAH during that era, Dave Olgren, was responsible for the name change. In 1999 USSHA started reaching out to sled teams throughout the country, trying to get more people involved.

During 1999 only ten teams, totaling less than 100 individual players existed across the country. In 2002 Jeff Jones was elected President. USSHA transitioned into a fully elected Board of Directors with representation from each of the USAH districts. USSHA also transitioned from an organization supporting the USA National team into one that represents regional and national grass roots efforts. Currently over 80 programs are active across the nation, with more starting each month.

2.2 REGIONAL (ATLANTIC DISTRICT) MODEL

In 1996, I was the only Sled Hockey player in the Atlantic district. I started promoting Sled Hockey in eastern Pennsylvania, New Jersey and Delaware borders that are the Atlantic

District. Development activities began in early 1998 with an 8-day immersion clinic at area rinks. These clinics, sponsored by the Pennsylvania Center for Adaptive Sport (PCAS) and Middle Atlantic Sled Hockey (MASH), were a great success. The result was a solid "core-group" of junior and adult players. PCAS is a Disabled Sports USA (DSUSA) chapter that provides insurance and makes available numerous disabled sport activities to its membership. PCAS has vast experience with disability issues and advocacy; PCAS sponsors Sled Hockey demonstrations, events and teams even today. MASH was a Sled Hockey specific sport development organization that I established to promote Sled Hockey knowledge and advocacy in the tri-state area and beyond.

Starting soon after the 1998 Paralympic in Nagano, Japan, MASH, and in conjunction with the PCAS, I started a dialog with USAH Atlantic District towards development of Sled Hockey in the district and eventual team creation. The effort began with one to six junior players as part of able bodied "learn-to-play-hockey" clinics at area rinks. PCAS/MASH continued efforts and we formed the first Atlantic district team, the Atlantic Hammerheads in 1998.

The Atlantic Hammerheads Sled Hockey team was named to reflect the Atlantic District of USAH. They had a nucleus in Bucks/Montgomery Counties in Pennsylvania, but players extended south to Virginia, east to Atlantic/Ocean Counties in New Jersey, and north to Manhattan in New York State. The Hammerheads were continually rebuilding after losing players to several establishing programs, which were more geographically friendly to traveling players and their families.

In 2000, the New Jersey Devils Youth Hockey (NJDYH), an able-bodied USAH based program from South Orange NJ, contacted me to help them start a Sled Hockey team. I was able to provide the equipment and expertise required to get the NJDYH Sled team up and running. The NY Rangers Sled Hockey program also assisted in this effort. The NJDYH junior program still functions today although they do not participate in League play.

In 2001, Tom Brake contacted me to ask what he could do to "help support these special children". I re-directed five Atlantic Hammerhead players, who were traveling over an hour each way to play Sled Hockey, and soon after the South Jersey Wings of Steel were formed.

In 2002, Vineland Sled Stars was transformed from an idea into a viable Sled Hockey program. Again, I was instrumental in team creation and program direction. The Vineland Sled Stars were also formed for geographical convenience.

In 2003, the Woodbridge Warriors, a community based Sled Hockey program, was founded with the help of USAH. Woodbridge has made quick strides to become a competitive part of the League.

These four teams, along with the long established Bennett Blazers of Baltimore Maryland, make up the first ever Sled Hockey junior league in the United States. The Bennett Blazers of the Southeast district being the only one of five teams outside the Atlantic district

that comprises the league. The Atlantic Sled Hockey League was formed under the Atlantic Hockey League umbrella. This league allows Sled Hockey teams to compete against other Sled Hockey teams in a USAH type environment.

In 2004, Jim Leatherman and I started the first adult Sled Hockey program in the Atlantic district. Jim, a Baltimore MD native, has over thirty years of elite disability sport and administration expertise, becoming a double leg amputee at age six. The PA Center-Pedes, centered in Philadelphia, is comprised of Sled Hockey players age 15 and older. In just our second season we are part of the North East Sled Hockey League; the first adult Sled Hockey league in the United States. The Pennsylvania Center for Adaptive Sport, under the Disabled Sport USA umbrella, provides our two-tiered teams with practice and competition insurance and new recruits for the team. The PA Centerpedes have an "A" or Adult Team, in effect the travel team, and an "I" or Intermediate Team concentrating on player improvement and intramural competitions.

In the Atlantic District, both for USSHA and USAH, there has been a growth and acceptance of Sled Hockey for disabled youth participants. Only the MidAmerican district boasts more players under age 18. Some have admitted that they were not even aware of two separate organizations representing Sled Hockey within eastern Pennsylvania, New Jersey and Delaware. I am an active member of USAH and until recently sat on the Board of Directors of USSHA. The USSHA member teams currently participating within eastern Pennsylvania, New Jersey and Delaware boundaries elected me as their representative to the national organization.

My self-identified role in Sled Hockey introduction, development, promotion and competition within our district is outlined below:

- ❑ Promote and be an advocate for Sled Hockey.
- ❑ Coordinate special events to promote community awareness and encourage participation. Special events include Sled Hockey demonstrations, speaking engagements and fund-raisers.
- ❑ Assist in coordinating ice times where all players are welcome to participate. Cobb's Creek and Blue Cross River Rink are examples of community-based efforts to support Sled Hockey. These are examples of community based Sled Hockey support through individual athlete development.
- ❑ Encourage team creation and provide support to existing junior teams. Adult players are asked to continue training with the existing junior programs and help with coaching duties.
- ❑ Advise USAH National, Atlantic District and other representatives on integration, equipment and special needs associated with Sled Hockey and disability sport in general.

2.3 US PARALYMPICS INFLUENCE

USP is a division of the USOC. The USP was formed in 2001 with the intention of increasing support for Paralympic sport within the United States. Their edict is the

coordination and selection of athletes to U.S. Paralympic Teams for summer and winter Paralympic and World games. They are to work in parallel with existing National Governing Bodies (NGBs) and other sport specific organizations.

USP coordinates the preparation and selection of athletes to United States Paralympic Teams, both summer and winter, in conjunction with respective NGBs and other partner organizations. USP also works with national and locally focused sport organizations that offer Paralympic programs to children and other developing athletes. Through these efforts, USP promotes Olympic ideals throughout the American population, especially among those Americans who have physical disabilities.

Prior to the USP, many disabled sports programs were loosely affiliated with national programs that were funded directly by the USOC. These national programs served as the NGB of the various sports and played both a major and vital role in the direct support and organization of those various sports programs. Sled Hockey was loosely affiliated with the DSUSA and WSUSA organizations and was self-governed by USSHA.

Efforts were made over the years to 'legitimize' the sport by elevating the level of the organizational structure to a point where more dollars and support could be obtained from the USP. This effort increased when the US Paralympic Sled Hockey Team won gold during the SLC 2002 Winter Paralympics.

Prior to SLC 2002, the sport struggled to gain the attention of the USP leadership. After SLC 2002 Gold, many of the more knowledgeable Sled Hockey individuals were no longer allowed involvement. Unfortunately, without some of those veteran players and some more knowledgeable coaches, much of the development structure is lost. Divisions within the Sled Hockey community continue to allow the USP to control the direction of elite Sled Hockey within the United States.

2.4 USA HOCKEY INVOLVEMENT

Over the 20 years that Sled Hockey has been played in the United States, members of the Sled Hockey community have tried to have a working relationship with USAH. According to the Ted Stevens Amateur Sports Act, Sled Hockey NGB should be USAH. USAH has no official involvement with the US Sled Hockey Team. Therefore USP continues direct control of the elite program.

Prior to 2004 USSHA was the primary Sled Hockey organization in the United States. USSHA's continuing efforts to form relationships with USAH never made much progress. While USAH was generous with its financial support, there always seemed to be agendas and therefore questions on how the monies were spent.

The USSHA organization suffered because of the successes in SLC 2002, as many of the regional directors were also athletes involved in the SLC 2002. Much of the same things that brought all the players and administrators together divided them in their accomplishments.

USAH requested that USSHA revitalize the organization. As a result USSHA revised its bylaws to allow USAH personnel to sit on USSHA's Board of Directors. Before USSHA had enough time to revitalize the Disabled Hockey Section of USAH allowed a new organization to represent Sled Hockey within USAH and the Disabled Hockey Section. The division between the general Sled Hockey community and the Disabled Hockey Section of USAH continues.

In 2005, USAH decided to have elections to determine representatives for each of the four disciplines of Disabled Hockey. The four disciplines of "Disabled Hockey" are Sled Hockey (about 100 teams), Special Hockey (about 30 teams), Deaf Hockey (about 10 teams) and Amputee Standing Hockey (only 1 team). Jim Leatherman was elected to represent Sled Hockey within the Disabled Hockey Section. The Disabled Hockey Section of USAH seems to appoint rather than elect representatives.

The leadership of USAH has relied on the Disabled Hockey Section to keep them informed about Sled Hockey and the other three disciplines. The Disabled Section of USAH continues in a direction without understanding the majority of Sled Hockey teams and individuals. Until the leadership of USAH recognizes that the Disabled Hockey Section is not knowledgeable about Sled Hockey issues, the Sled Hockey general membership will become further alienated, eventually causing a Sled Hockey division resulting in a departure from the USAH umbrella.

3 DISABILITY

This chapter will use general outlining to describe the most common disability groups that play Sled Hockey. This is not an exhaustive list, but will give you a background in understanding how to adjust your style to meet the learning needs of the individual and the basic equipment modifications that may be necessary to accommodate different physical levels of function. It is important to keep in mind that individuals with the same disability may present with different needs, and that some individuals may have more than one disability. You may find yourself using multiple strategies to reach players. This section will also try to explain how coaches of Sled Hockey players with disabilities will require specific knowledge and insight into how to teach sled skating, sled maneuvering and stick logistics by recognizing the weaknesses that may be presented by individuals with various disabilities. Some individuals with disabilities will require small adaptations in coaching style; others will require rethinking coaching foundations, style and presentation. Starting with the information you find here, utilizing the additional resources recommended, and contacting your local resources including players and their families, physicians, therapists, orthotists, etc; eventually, you will begin to be able to recognize learning styles and physical abilities.

First, and foremost, coaches must understand that the athletes they are working with come from diverse psychological backgrounds because of their disabilities. It is important to know the historical background of those that will be playing for you. Knowledge of each player's disability and whether congenital (from birth) or acquired (from disease, a traumatic event or accident) will allow you to know each athletes needs better. Every family with a

disabled child or adult has a story that needs to be learned. I am involved with the Positive Coaching Alliance (PCA). Last year, I was nominated for and received The Double Goal™ National Award which recognizes positive coaching involvement within the community. The PCA is an excellent resource for information and insight into treatment of children and adult athletes. I recommend both the PCA internet and classroom courses to enlighten coaches on the concept of “winning is not the only thing”.

The PCA gives some great examples of what a good coach is:

“A Double-Goal Coach™ strives to win and, even more importantly, uses sports to teach life lessons through Positive Coaching.”

“Positive Coaching believes that the foundation of our future is in its youth and that sports are an essential part of a young person’s physical, emotional, and spiritual development in the U.S. culture today. Participation in sports helps the young person build positive self-esteem, a strong work ethic, morals, and cooperation through team building.”

“Positive Coaching believes that positive influences modeled by coaches, parents, teachers, peers, media, professional athletes, and others contribute to the well being and healthy development of youth.”

It will become evident when each disability group is broken out; coaching children and adults with disabilities is more complex and requires more patience and understanding than with able bodied hockey. Sled Hockey coaches must understand hockey, but also equipment, sled dynamics, disability and sport psychology. Although a team sport, Sled Hockey demands that the coach understand all aspects of each individual participating on a team. A great reference on learning difficulties and adaptations can be found at “Teaching Strategies to Help with Special Educational Needs” which is a link in the electronic references section.

Figures 3.1 below describes arm motion during pushing cycle in Sled Hockey. Cycle includes an arm extended reach with the body, backwards pulling motion of the arms and a final backward thrust of the arms extending the sticks backward. The stick control and puck handling/shooting skills can be seen in Figure 3.2. These controls and motions will be further discussed and questioned in later text.



FIGURE 3.1 SLED HOCKEY PUSHING MOTION



FIGURE 3.2 SLED HOCKEY SEATING AND STICK POSITIONING

The following disability sub-sections provide insight into how each specific disability can affect coaching style and presentation. Some disabilities require equipment specific accommodations only, while others require coaching specific changes in style such as positive reinforcement and psychological intervention. This research is by no means a technical assessment on disability. The intention of this paper is to categorize how specific disabilities require adaptations in coaching presentation/style and provide some rationale on why these adaptations are required.

All disability groups have some common health concerns. Coaches should be aware of problems associated with specific disabilities. Athletes with disabilities can help by making their coach aware of any specifics that will directly affect hygiene and general health. The importance of good hygiene and knowledge of players' allergies cannot be over stated.

Some disabilities, such as Spina Bifida and other scoliosis related disabilities could require frequent spinal surgeries. Some of these surgeries not only take the athlete away from practice and competition for long periods of time, they can also leave the athlete with diminished performance upon return. Most disabilities, other than limb amputation, can commonly involve frequent urinary tract infections or other bladder related problems. Pressure sores can affect all but the heartiest disabled athlete. Athletes with diminished or total loss of feeling in their lower limbs are susceptible to heat related injury from bath water or any other heat sources. A coach's job in part is awareness of all possibilities regarding health issues and athlete concerns. The coach can not be expected to be as knowledgeable as a doctor; rather know some of the basic problems associated with the disabilities he or she is working with, and continue to ask questions to gain more knowledge as the different situations present themselves. A coach must always use some amount of caution with the disabled athlete, not normally needed with their able bodied counterparts.

3.1 AMPUTATIONS

Amputation is a disability that by itself causes little or no problems with following directions, learning basic skating technique or developing hockey skills. Amputation usually results from congenital (birth), traumatic (accident) or acquired disease (i.e. cancer or other bone or soft tissue diseases) causes. Common to most amputees is increased sensitivity to the skin in the area of the amputation. This skin is prone to break down causing sores or wounds from pressure or friction, and can be hypersensitive with a direct hit from the puck. Pressure and friction can come from rubbing on an improperly fitted sled, wheelchair or

prosthetic device (artificial limb). Pressure sores can also develop on hips, thighs, and/or buttocks in addition to areas of amputation. Most individuals with an amputation will feel discomfort prior to experiencing any severe skin breakdown.

3.1.1 UNILATERAL (SINGLE LEG) AMPUTATIONS

The single leg amputee has potential to have great control over their sled. The presence of fully functioning trunk muscles and the remaining leg work to this individuals benefit for controlling their sled. They are able to move their hips and leg simultaneously in a well fitted sled and they can use the one remaining leg for balance while turning and stopping. The individual with a Below the Knee (BK) or Above the Knee (AK) amputation are quite maneuverable and require few adaptations in protective equipment or sleds. However care should be taken when first setting up their sled to balance the bucket over the blades. Some BK/AK amputees are able to position their residual limb over the frame to increase balance when the sled is centered, and some require the blades to be shifted slightly away from their affected side since their center of mass is located closer to the intact limb. Single amputees with no residual limb, also called hip disarticulation, usually have more difficulty fitting appropriately into the bucket on their sled. Adaptations should be made to fill the space where their thigh would be to even out their sitting posture for improved balance and stability. This must be done on an individual basis. I recommend that this athlete consult with their prosthetist (a person who builds prosthetic limbs) or wheelchair seating specialist to assist with custom seating. An improperly fitting bucket usually translates into difficulty puck handling with the arm on the affected side. Single leg amputees often turn and stop better towards the unaffected side.

3.1.2 BILATERAL (DOUBLE LEG) AMPUTATIONS

A bilateral or double leg amputee usually posses less stability in their sled than single leg amputees do. This is because the absence of the weight of the legs shifts their center of mass towards the rear of their sled. The blades on this sled should be shifted backwards to balance the sled from front to back. They are the most maneuverable in a sled because the sled can be shorter (smaller turning radius), they are generally lighter and require less force to propel themselves, and most of their weight is directly above the skate blades. In an unbalanced sled, a bilateral amputee is likely to tip over backwards when accelerating. Individuals with bilateral amputations require seating adaptations for optimum skating ability. Most elite players have custom made buckets to stabilize their residual limbs and to provide protection from injury. Individuals with unilateral or bilateral hip disarticulations have increased difficulty getting a snug fit in their sled bucket. This often leads to an individual coming out of their sled when being checked. In order to avoid being knocked out of the bucket, the individual with hip disarticulation(s) should have additional straps to secure them in their sled. It is advisable to consult with prosthetists, wheelchair seating specialists, and other individuals with similar injuries/deformities. Decreased stability results from increased weight at the shoulders compared with the hips (these players are top heavy) and usually suffer results in reducing puck handling skills with the arm on the affected side or sides.

3.1.3 ARM AMPUTATIONS

The individual with a single arm amputation can be involved in Sled Hockey in two ways. Although an upper extremity disability limits the sled propulsion efficiency, sled speed and puck-handling abilities, these individuals can still be involved as skaters in the sport. Depending on the level of fitness and desire single arm amputees can either propel themselves on the ice with one hand, with a modified prosthesis, or they can utilize a "pusher", an able bodied skater (on ice skates) who assists with propulsion. Some unilateral and bilateral arm amputated individuals have even become proficient at playing Sled Hockey by using specially manufactured prosthetic arms with stick attachments. Another possibility is a position as net minder. Either a goalie glove or blocker can be used on the affected side in conjunction with a single stick in the intact hand. Either way the athlete enjoys the physical benefits of participating in Sled Hockey, gains the confidence of participating in disability sport, and learns the camaraderie of playing on a team.

3.2 CEREBRAL PALSY

Cerebral Palsy (CP) defines a wide range of motor related of disability. Some athletes will exhibit little or no symptoms. Others will have involvement that requires significant adaptation and creativity into teaching methods and coaching technique. Each Sled Hockey player with CP needs to be assessed individually for physical and learning needs since this disability is more difficult to categorize than limb amputation or spinal cord injury.

Physically, some athletes with CP will exhibit only small reductions in fine motor skills. Others might have difficulty maintaining balance while standing. Athletes with CP sometimes require custom seating or stick modifications because of spasticity or limitations in arm function. Some more involved CP athletes will require assistance with pushing their sled.

Athletes who are mildly, moderately, or severely affected may exhibit cognitive deficits. Athletes may hesitate during practice or games. Children who have difficulty with communication skills may demonstrate temper or aggressive behaviors. Allow for de-stressing activities as an alternative to frustration. Structure lessons and develop a pattern for the practice. Remember that sometime athletes with CP do better in areas of low distraction. Some athletes with CP may exhibit memory and concentration difficulty. Use reinforcement in instruction building on previously learned tasks. Drills for players exhibiting diminished spatial awareness should be reinforced by chalk board. Participation for these players can directly and positively support the developmental needs required for increased quality of life. Positive reinforcement of accomplishments can enhance feelings of self-worth in some athletes with CP. Patience and understanding may also be required when teaching some athletes with CP.

Not knowing about the specifics of the disability can prove frustrating for a coach. Gains in player understanding and strides towards better Sled Hockey performance can make overcoming these difficulties in coaching worthwhile. In praising the athletes with CP, always use honesty and don't go overboard with compliments. Try to keep the praise sincere and

keep it directly connected to the athlete's accomplishments. As a coach or team manager it will be your job to determine what affect CP has on each individual athlete.

Below find the specific categories of cerebral palsy and what motor skills are affected.

Cerebral Palsy describes many different disorders of movement and posture. Movement disorders covered by the term CP have several classification systems and many labels. Understanding different types of CP requires knowing about muscle tone. All athletes with CP have some reduced function to the area of the brain that controls muscle function or tone. The resulting effect can be increased or reduced muscle tone, or a combination of the two known as fluctuating tone. The areas of the body affected by abnormal muscle tone are dependent on what part of the brain has sustained damage.

The three main types of cerebral palsy are:

Spastic Cerebral Palsy is defined by stiff and difficult movement of effected body parts and is the most common type, accounting for nearly 80% of all CP cases. Spastic CP patients have one or more tight muscle groups, which limit movement or demonstrate stiff and jerky movements. They often have a hard time repositioning and have a hard time holding and letting go of objects.

Athetoid Cerebral Palsy involves involuntary and uncontrolled movement. About 10% of CP patients have athetoid CP. Damage to areas of the brain responsible for processing the signals that enable smooth, coordinated movements as well as maintaining body posture cause the symptoms. Damage to these areas may cause involuntary, purposeless movements. These involuntary movements affect speech, eating and reaching/grasping tasks, and other skills requiring coordinated movements. Individuals with athetoid CP often have low muscle tone that causes problems maintaining posture for sitting and walking.

Ataxic Cerebral Palsy gives a disturbed sense of balance and depth perception resulting in low muscle tone and poor coordination of movements. Individuals with ataxic CP can look very unsteady and shaky. Although a rare type, found only in about 5-10% of CP, it can affect sense of balance and impede depth perception. Affected persons often exhibit lack of coordination and can walk unsteadily with a wide based gait. Because of shaky movements and difficulty coordinating muscles, ataxic cerebral palsy patients may take longer than others to complete certain fine motor skill tasks.

Mixed Cerebral Palsy is any combination of the three former types for any one individual. About 10% of children with CP fall into this category. These individuals can have both the tight muscle tone of spastic CP and the involuntary movements of athetoid CP. This is because of injuries to other areas of the brain. Spasticity and athetoid combinations are most prevalent, although other combinations can occur.

It is also known that 35-40% of all CP types involve some degree of cognitive or other learning disabilities. Also 30% are affected by decreased or total loss of vocal function.

3.3 SPINA BIFIDA

Spina bifida (SB) is caused by a defect in the neural tube, involving incomplete development of the spinal cord, brain tissue and can also involve the protective coverings of the spinal chord. The cause is the failure of the fetus's spine to seal properly during the first several weeks of pregnancy. Infants born with SB often have an open lesion on their spine wherever significant damage to the spinal cord and resulting nerve damage has occurred. Even though the spinal opening is surgically repaired just after birth, the nerve damage can be permanent, which results in different severities of paralysis affecting the lower extremities. Even without visible lesions, nerve damage from deformed or missing vertebrae is usually present. Some form of learning disability can also accompany the physical manifestations.

SB also describes a wide variety of disability. As with CP, some athletes with SB will exhibit no or few symptoms. Others with SB will have involvement that requires much adaptation and thought into teaching methods and coaching technique. As with CP, each SB Sled Hockey player needs to be assessed individually as it is more difficult to categorize than limb amputation or spinal chord injury. Some SB athletes will exhibit only small reductions in fine motor skills. Others might have difficulty maintaining balance while standing. Some will be confined to wheelchairs. More involved athletes can exhibit multiple symptoms and need many adaptations to coaching style. Children with SB can have depth perception and coordination problems. Ordering of tasks can also be difficult for the player to determine. They can benefit from the systematic approach to learning. Teach them to methodically look for similar and different situations. Present similar drills in different ways. Present the SB athlete with just a few options and build from those scenarios. Break down tasks into steps. Sometimes players might have difficulty judging self performance, so describe specific criteria and what they are to do.

Sport participation for SB patients can also directly and positively support the developmental needs required for increased quality of life. Positive reinforcement of accomplishments can enhance feelings of self-worth in some more involved SB athletes. Patience and understanding will be required when teaching some athletes with SB. Not knowing about the specifics of the disability can prove frustrating for a coach. Gains in player understanding and strides towards better Sled Hockey performance can make difficulties in coaching worthwhile. Praising the SB athlete can directly affect self esteem to reinforce the athlete's accomplishments. As a coach or team manager it will be your job to determine what affect SB has on each individual athlete.

Many SB athletes have a shunt device implanted within the brain cavity. This shunt device is a valve and tube which prevents fluid pressure build up from occurring within the ventricle section of the brain. The fluid pressure is then diverted to either the heart cavity or abdomen through a tube. Shunt problems can manifest itself by disorientation or extreme headaches in affected individuals. Care should be taken if these symptoms manifest themselves during practice or games.

Below find the specific categories of Spina Bifida and what motor and perception skills are affected.

The three most common types of SB are defined below by decreasing severity. Myelomeningocele is described in patients where the spinal cord and its protective covering (the meninges) protrude from an opening in the spine. Meningocele is characterized as when the spinal cord develops normally but the protective covering (the meninges) protrudes from an opening in the spine. Occulta occurs when one or more vertebrae are malformed and become covered by a layer of skin. SB patients may also incur bowel and bladder complications, and some many have hydrocephalus, which is described as excessive accumulation of cerebrospinal fluid in the brain.

3.4 SPINAL CORD INJURY

A Spinal Cord Injury (SCI) is a result of an acute trauma or disease to the spinal cord, which subsequently causes injury to sensory and motor function. Sensory loss refers to the loss of sensations, such as pain, touch, or temperature. Motor loss refers to muscle weakness and the inability to use the body. Trauma to the spinal cord damages nerve fibers passing through the injured area and may affect all or part of the corresponding muscles and nerves below the injury site. Consequently, the injury interferes with communication between the brain and the rest of the body.

A SCI is usually a result of damage to the vertebral column. The spine can be either fractured or dislocated. A person can have a "broken back," however, without sustaining a SCI. Because the spine is longer than the spinal cord, the level of the injury to the spine may be different from the SCI it causes. The spinal cord is part of the most complex system of the human body, the central nervous system. Because of its complexity, it may be beneficial to discuss the various parts of the spinal cord and spine, as well as to take a thorough look at SCI and how it impacts on a Sled Hockey players "ability" to play the game. This may provide you with a better understanding of how a SCI affects a person's physical well being as well as balance issues.

In order to explain how the whole spine works, it is named by region of the body. By isolating different segments, we are able to better understand what can go wrong with the various parts of the spine and spinal cord. The cervical spine refers to the seven vertebrae that protect the eight cervical nerves, located at the neck. Twelve thoracic vertebrae protect 12 thoracic nerves, located at the chest region of the torso. The lumbar vertebrae are five vertebrae that protect five lumbar nerves, located in the lower back region of the body. Five sacral vertebrae, which are fused together, protect five sacral nerves at the posterior of the pelvis.

The level of SCI determines what parts of the body might be affected by paralysis and loss of function. The level of injury refers to the lowest point on the spinal cord where there is a decrease or absence of motor and/or sensory function. Generally, the higher the SCI, the more effect the injury has on movement, balance, and/or feeling. For example, an injury of the cervical spinal cord may result in full paralysis and make it impossible to breathe without a respirator, while an injury of the lumbar spinal cord may result in paralysis or weakness in the legs and cause some loss of body function in the lower extremities.

The below descriptions will be generalizations. SCI athletes will vary greatly in ability and agility for the same level injuries. Sled hockey players with spinal injury generally have balance issues as the level of injury increases.

While the level of injury tells us where the damage is, the type of injury describes the degree of damage to the width of the spinal cord. SCIs are therefore categorized as complete or incomplete in conjunction with the level of injury. A complete injury indicates that there is severe damage to the spinal cord and consequently there is no motor or sensory function below the level of injury. An incomplete or partial injury indicates that there is some evidence of motor and sensory function. The brain is able to send and receive some messages. The incomplete or partial injury manifests itself in a variety of ways. Someone who has an incomplete SCI may have feeling, but little or no movement. Another person may have feeling and movement on one side of their body, but not on the other.

When assessing a new Sled Hockey player that has an SCI, it is imperative that the coach, and those associated with the team/program understand the ramifications of having a player on the ice with this type of disability. Depending on the level of injury and whether the injury is complete or incomplete has a dramatic impact on everything from what type of equipment the player should use and what concerns there should be with regard to bowel and bladder issues as well as hyperthermia. It is critical that these issues be addressed.

SCI individuals are much more susceptible to Urinary Tract Infections (UTI) and other kidney and bladder related infections. When working with SCI players who use catheters and/or leg bags to assist with bladder issues must be extremely careful not to restrict the flow of urine; otherwise they run the risk of problems which can have serious consequences. The coach should understand each level and type of SCI and how related medical conditions can affect ability and function.

Below find the specific levels of SCI and what functional areas are affected:

3.4.1 SACRAL PARALYSIS (S5-S1)

An injury of the sacral spinal cord is rare and can generally cause loss of bladder and bowel function. Some sacral injuries can result in weakness or paralysis of the hips and legs.

3.4.2 LUMBARAL PARALYSIS (L5-L1)

An injury of the lumbar or sacral spinal cord causes paraplegia, again referring to paralysis or weakness of the legs. Because of the lower location of this injury, upper body functions are usually not affected. However, a person with a lumbar SCI may experience the loss of many of the sensory functions associated with thoracic spinal cord injuries.

3.4.3 THORACIC PARALYSIS (T12-T1)

An injury of the thoracic spinal cord causes paraplegia, which means paralysis or weakness in the legs. Depending upon where the injury is located on the thoracic spinal cord, an individual with this level of SCI may also experience weakness in their torso, although will generally possess good control of their hands. These injuries may also result in loss of sensation and loss of bladder and bowel control. Due to the rib cage, thoracic spinal cord injuries occur less often, as the rib cage offers protection from such injuries.

3.4.4 CERVICAL PARALYSIS (C8-C1)

An injury of the cervical spinal cord causes quadriplegia, also called tetraplegia. This refers to a paralysis or weakness in both arms and legs. All parts of the body located below the neck may be affected. Involuntary functioning, such as breathing, regulating body temperature, and sweating may be impaired, necessitating a respirator and other mechanical devices. A person with quadriplegia may not be able to sense touch (or other sensations) may lose bladder and bowel control.

3.5 OTHER DISABILITIES

In addition to the main categories of disability mentioned above, there are some other disabilities that deserve mentioning but the frequency with which you encounter players with these disabilities is drastically reduced.

Osteogenesis Imperfecta (OI) is a disorder also known as brittle bone disease. The primary characteristic of OI is the high risk of fracture to single or multiple bones in the body. Bone deformities, curvature of the spine, loose joints, underdeveloped muscles, respiratory problems and hearing loss are also characteristics that can be associated with the different varieties of OI. Some of these athletes are able to walk with or without crutches, but some have bones so brittle they cannot support their own body weight. Exercise is important for athletes with OI, as it promotes strength of bone and muscles which can help them prevent fractures. On the ice, your primary concern for athletes with OI is to eliminate intentional contact and reduce unintentional contact. All skaters on the ice must be instructed not to initiate physical contact or checking with the skaters with OI. The OI skater must be taught to play a less aggressive game. It is common practice in the United States to dress individuals with OI in a brightly colored orange sweater or pinnie to be sure they can be seen and easily identified by other players. The secondary characteristics listed above have additional effects on skating and learning. Bone deformities in OI present like other disabilities and can affect balance in the sled. Loose joints and underdeveloped muscles affect strength, power and the ability of the player to develop skating skills. Endurance can be decreased or limited by respiratory problems. Although an individual with OI does not have diminished learning capabilities, hearing loss can affect the participant with OI from having the ability to follow directions and understand drills on the ice, and make it more difficult to hear other players calling for passes or plays. Parents and players must be educated about the risks and responsibilities of playing with this condition, and should consult their physician prior to getting on the ice.

There are a number of neurological injuries that can leave people with the inability to skate standing up depending on the severity of their deficits. Cerebrovascular Accidents (CVA) commonly called strokes and Traumatic Brain Injuries (TBI) can occur in adults and children. When dealing with a player with a CVA or TBI, they should be evaluated in a similar manner to a player with CP. Like CP, the effects of a stroke or brain injury depend on the area of the brain that is affected. Physical deficits can include weakness or paralysis on one or both sides of the body, balance problems, incoordination, and altered sensation. Cognitive problems can include decreased awareness of deficits, inability to control behavior, inappropriate behavior, difficulty with memory, and difficulty with spatial relations. Remember to evaluate these players on an individual basis and tailor your teaching techniques to their strengths and weaknesses.

As a coach of disabled sports it is important to recognize that not all individuals with disabilities are cut out to play Sled Hockey. For individuals who are able to stand up and skate there are other programs available. Children and young adults with Down's syndrome and autism are able to participate in Special Hockey Programs that are located in some areas of the country. There is an Amputee Hockey program for individuals with amputations who choose to skate upright with their prostheses. Hearing Impaired Hockey programs exist also. It is important to be able to refer people to the appropriate hockey programs that have the capabilities of dealing with their special needs whether they are physical or cognitive.

4 EQUIPMENT

This section will outline equipment and certain modifications related to disabled Sled Hockey players. Coaches must understand sled dynamics and be able to apply disability related modifications as needed. Much can be done to increase both ability and athlete acceptance of the sport by providing adaptations to each particular disability.

4.1 STICKS

Sled Hockey sticks are one of the most over looked tools in playing Sled Hockey. A Sled Hockey player uses two sticks for propulsion. Additionally, the same two sticks are used to puck handle and shoot the puck. Each stick pair has common features defined as the shaft and blade; shaft for holding the stick and the blade end for shooting the puck. The Sled Hockey stick pair is distinguishable as there is a left and right blade. The left stick always curves inward and towards you as it is held in the left hand by the shaft with blade above the hand. Conversely, the right stick curves inward and towards you as it is held in the right hand by the shaft with blade above the hand. Unlike conventional hockey, sticks Sled Hockey sticks have metallic "picks" bolted onto the butt end of the shaft to provide secure contact with the ice, as seen in figure 4.1 below. The picks hold the ice surface to initiate the cross country skiing like motion as shown in figure 3.1 above. Two picks are used for each stick. Each pick has a minimum of three points on it; each point can have a maximum length of 4 mm which prevents severe piercing injury. Stick handling and shooting motion dynamics are pictorially described in figure 4.2 below.

Generally sticks are between 50 cm and 85 cm in length. Before the 2002 Salt Lake Paralympics Sled Hockey sticks were restricted in overall length by 75 cm with a blade

restriction of 25 cm. These stick sizes provided the shooter with a 75% to 25% shaft to blade ratio. After March 2002 the international community voted for the current stick size limit. Sled hockey sticks can now be a full meter long (100 cm) and have a blade length of 35 cm. These new sticks have a shaft to blade ratio of 65% to 35% ratio; thereby providing a full one third of the stick available as a shooting blade. Most adult players feel that a full meter long restricts shooting while providing little pushing benefit for the added length. The 85 cm stick length with the 35 cm blade seems to provide the right length for adult players as a compromise between skating speed with longer sticks and shooting/passing ability. My personal preference is an 85 cm stick pair with the original 25 cm blade length.

Sticks can be modified to accommodate certain disabilities. Players with difficulty straightening out their arms or with other upper body range of motion problems can benefit from certain stick modifications. Normal Sled Hockey sticks have a lie of about 15-20 degrees between shaft and blade. The lie is the angle created between the blade and an imaginary extension of the shaft past the blade. Regular hockey sticks have a lie of about 45 degrees. These able bodied hockey sticks can be cut down and trimmed to form a stick conducive to players not able to lower their hands close to the ice. Individuals with upper extremity involved Cerebral Palsy or stroke victims can sometimes benefit from such stick adaptations.

Like all technology driven equipment, Sled Hockey sticks have made revolutionary improvements in the past ten or so years. Initially all Sled Hockey sticks were made of wood. Some manufactures cut the sticks from a solid block of wood and others form the curve using the steam bending concept. Over the past decade the trend was towards using hollow graphite shafts and Sled Hockey blade inserts. Broken hollow shafted sticks are easily obtained from broken able bodied sticks. Most Sled Hockey stick manufactures offer wood inserts to fit adult or junior shafts. Easton now markets a graphite insert blade as part of its product line. Some foreign countries have successfully experimented with one-piece carbon fiber sticks. These advanced equipments prove to be quite expensive and are not totally unbreakable.

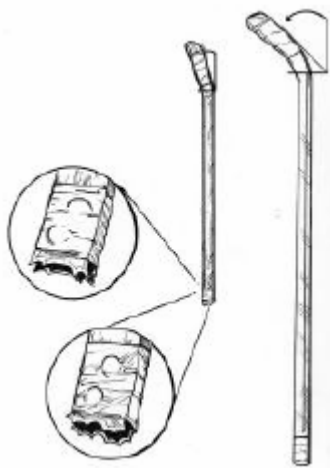


FIGURE 4.1 SLED HOCKEY STICK WITH PICK ENDS

4.2 SLEDS

A sled is constructed of tubular aluminum or steel called the frame. The frame can be seen in blue in Figure 4.2.1 below. The seat or bucket get attached at the rear on the on the top side. The seat or bucket can be seen in brown in Figure 4.2.1 below. The skate blade assembly, shown in Figure 4.2.3 below, gets mounted under the seat or bucket. The skate blade assembly mounts with the skate blades running parallel to the side tubes of the frame. The front runner, or front skid, protrudes down to the ice at the front of the sled as seen in Figure 4.2.4. Foot rest accommodations are usually provided at the forward end of the sled as seen in Figure 4.2.5.

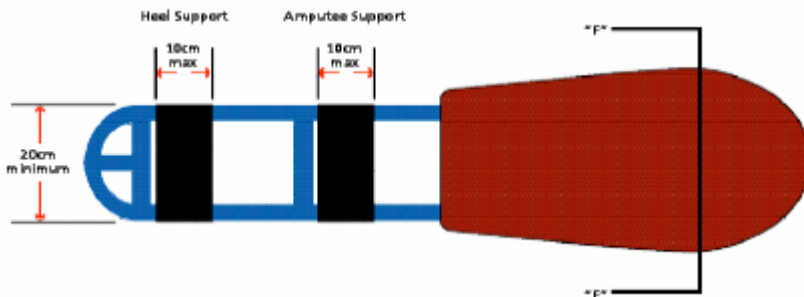


FIGURE 4.2.1 TYPICAL SLED TOP VIEW

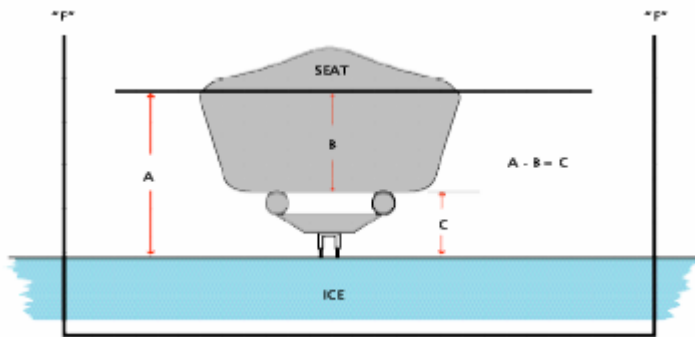


FIGURE 4.2.2 TYPICAL SLED REAR VIEW

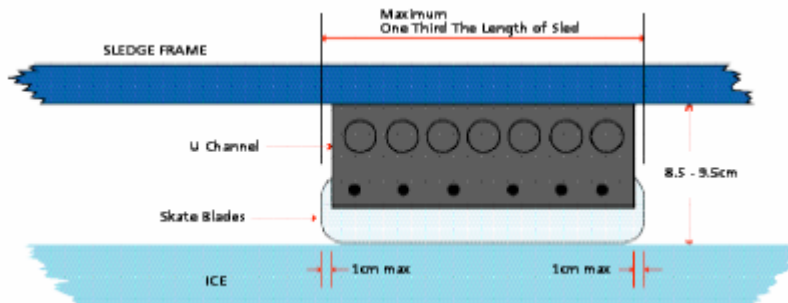


FIGURE 4.2.3 SLED BLADE ASSEMBLY SIDE VIEW

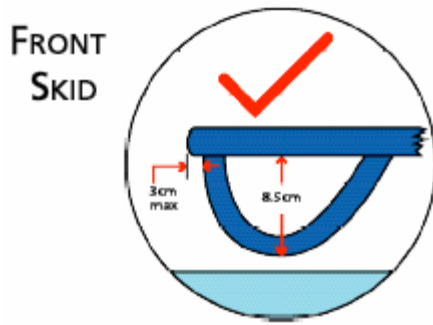


FIGURE 4.2.4 SLED FRONT SKID

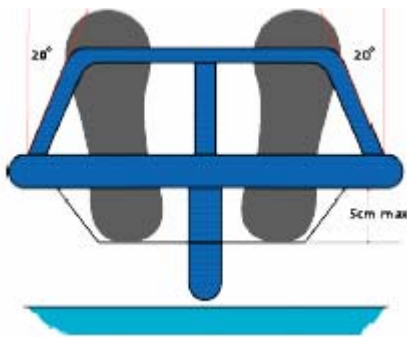


FIGURE 4.3.5 SLED FOOT POSITIONING

Sled frames are generally eight to twelve inches wide and can be as long as needed to comfortably sit with legs stretched out towards the front. The minimum length, usually for bilateral amputee players, is three times the length of the skate blades. The foot rest accommodations are mainly for positioning of feet especially with paralysis. An upward facing tube can also be provided for added foot protection during collisions.

Seats or posterior buckets come in all shapes and sizes to help players “become one with the sled”. A good seat or bucket fit is important to controlling your sled and becoming more maneuverable. Some sled manufactures have developed universal bucket seating that can be adjusted for a semi-custom fit. Custom buckets can be manufactured by prosthetic companies and can provide increased stability for players with double amputations or hip disarticulation. Although usually expensive, custom buckets provide any sled athlete increased stability and allow for better skating performance once strapped in. Other important aspects of a good bucket is to insure it is well padded with rubber or foam and that the height of back rest is high enough to provide trunk support without over encumbering torso control. The better that a bucket fits the less likely the athlete will develop pressure sores or skin breakdown.

Skate blade assemblies come in varying lengths and widths. The blade assembly is the most critical and sometimes overlooked part of sled dynamics. Blade width, or the distance between the two skate blades, defines the maneuverability and stability of the sled. Blade width can commonly be as wide as twelve inches or as narrow as one half inch. Some

players with little or no trunk control might require the full twelve inch spread. Most high functioning disabilities will require a four inch spread or less. As stability, or blade width increases, maneuverability decreases. Newer skaters with a high functioning disability might soon find that the four inch width blades that they started with now restrict their turning.

Blade assembly positioning fore to aft is also very important. Just about all the weight of the sled and the player should be concentrated at the center, fore to aft, of the blade assembly. If the players front end is dragging excessively the blade assembly needs to be moved forward. Conversely if the front end of the sled keeps popping up into the air the blade assembly needs to be moved back.

Lastly, and of lesser consequence, blade length and rocker radius can slightly effect speed and turning abilities. Longer blades and larger rocker radius can help with top end speed. Shorter blades and lesser rocker radius will enhance turning capability.

As coaches and trainers in Sled Hockey become more knowledgeable and proficient in disability and sled dynamics they will be able to make other adaptations on outfitting a sled for hard to accommodate individuals. The general rule being the skater must be comfortable and have good upright posture while seated. Always consult with knowledgeable professionals, not just parents for advice and suggestions. Physical therapists are a great source for disability specific information for those tough to seat skaters.

4.3 PROTECTIVE EQUIPMENT

Sled Hockey can involve many of the same hazards of regular hockey. Sled Hockey players need protection from the opposition where checking, picking, slashing and spearing can occur. They also need protection from self infliction of injuries. Protective equipment needs to be ice hockey certified, never substitute roller hockey or other lesser designs. Helmet with cage, gloves, elbow pads, shin guards, chest protector and neck protector should all be worn. It is obvious why most of this equipment should be worn so only a few sled specific reasons are given here. Elbows are essential as sled players are particularly vulnerable from falls or contact with the boards. In standard coaching practice even coaches should be required to wear a helmet with cage and elbow pads as a minimum when coaching from a sled. Shin pads should be worn as the player is constantly in that area when pushing along the ice. Gloves are also one of the necessities of the game. Players will find that, because of dragging hands on the ice surface, gloves might last only weeks. Sled Hockey players with feet should be wearing hockey skate boots with the blade and mounting assembly removed. Walking players need to rubberize the bottoms of the skate boots so they can stand and walk on the ice surface without slipping.

Most importantly all equipment must be properly sized for each individual. Because some people cannot feel areas on their body a visual inspection is necessary. Don't just look at fit; look for signs of chaffing or skin breakdown.

APPENDIX A: REFERENCES

Electronic References

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Positive Coaching Alliance: <http://www.positivecoach.org/>

United States Sled Hockey Assn: <http://www.ussha.com>

Disabled Sports USA: <http://www.dsusa.org/>

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APPENDIX B: USSHA RULE ADDITIONS

The following rules will be used in USSHA competitions as a complement to the current USA Hockey "Official Rules of Ice Hockey." Page Numbers adjacent to each rule indicates corresponding page in the USA Hockey Rule Book.

The International Paralympic Committee (IPC) Ice Sledge Hockey rules comply with International Ice Hockey Federation (IIHF) rules. The comprehensive new rulebook is available in draft form at:

http://www.paralympic.org/release/Winter_Sports/Ice_Sledge_Hockey/About_the_sport/Rules/Rule_book_draft.pdf

Rule 109 players' bench

P. 9

If a rink's players' benches for sleds hockey are not retro fitted to be accessible to Sled Hockey players, the players' benches shall be the area on the ice just in front of the player's bench between blue line and center line. When possible, the area adjacent to the blue lines (8-10 feet) should be left open.

If the puck enters the designated bench area and is not immediately put back in play by a player, the referee or linesman shall stop play to avoid players piling into the bench area.

Rule 110 Penalty Bench

P.10

If a rink's penalty box areas are not retro fitted to be accessible to Sled Hockey players, the penalty bench for sled hockey shall be the area on the ice just in front of the time keepers area on either side of the center line.

If the puck enters the designated penalty area and is not immediately put back in play by a player, the referee or linesman shall stop play to avoid players piling into the penalty area.

Rule 301 Sticks

P. 28

In sled hockey the stick dimensions are:

Stick: maximum length 100 cm measured in a straight line from the toe to the pick end

Shaft: maximum width 3 cm; Maximum thickness 2.5 cm; The shaft must be straight

Blade: maximum length 32 cm from the heel to the toe.

The blade may be curved, and the curvature shall be restricted in such a way that a distance of a perpendicular line, measured from a straight line drawn from any point at the heel to the end of the blade, shall not exceed 1.5 cm.

The depth of the teeth on the pick-ends shall not extend 4 mm. The pick-ends must be fixed to the lower or butt end of the stick and not end in a single sharp point, but have at least 6 teeth per stick (3 each side) to avoid player injury or to damaged the ice surface. Each tooth on a pick shall not be conical or come to a sharp needle-like or piercing point to avoid puncturing type wounds or possible slashes, intentional or accidental. The pick ends may be made of any strong material including steel but not exceed the width of the stick not be longer than 10.2 cm (4 inches). The pick-ends shall not extend beyond 1cm of the end of the solid portion of the stick.

A player may utilize two sticks, each with a single blade. The goalkeeper's sticks may be equipped with a larger blade. The blade must not exceed 35 cm in length and in height, nor anywhere along the blade be less than 7.62 cm (3 inches). The goalie stick shall have a maximum length of 100 cm (including the blade) to be measured along the centerline of the stick. The goalkeeper's stick blade may be curved similar to a player's stick (ref.5.2.5), but may have an additional pick at the base of the blade not exceeding the regular pick projection of 1cm with a corresponding pick at right angles at the butt end of the same stick to facilitate movement back and forth in the goal (i.e. push or pull). If the goalkeeper uses two sticks, the second stick must not be curved or grooved, but may have a blade, the dimensions of which shall not exceed those of a player's regular stick. The handle, shaft and blade of a stick (including goalkeeper's stick) may be made of wood, plastic or aluminum/titanium but must not have any pockets, projections, netting or other contrivance designed to catch or hold the puck, thereby giving the player or goalkeeper an undue advantage in playing the game.

Rule 302 Skates (sleds)

P. 28

The player's sled must meet the following specifications:

The height of the main frame measured from the ice to the bottom of the frame shall be between 8.5 - 9.5 cm.

The material used to construct the frame must be tubular and not have a diameter greater than 3.0 cm. The front end shall have a continuous curve with a maximum radius of 1/2 the inside width of the sled frame. No part of the outer frame should have exposed pointed edges.

The maximum blade length should not be more than 1/3 of the total length of the sled.

Devices under the sled (except for runners) are prohibited.

The puck must be able to roll on edge beneath the sled. No more than 1/3 of the sled may block the puck from going under the sled.

Seat cushions, if used, must not exceed 10 cm in height when unoccupied, and may not overlap the main frame of the sled.

The sled may be equipped with a backrest (chair back), but it must not protrude laterally beyond the armpits of the player when properly seated on the sled. The backrest may be padded and shall have rounded edges/corners with no hard or sharp obtrusions to the sides.

No external projection or protuberance beyond the seat or back support towards the rear of the sled will be allowed in excess of 10mm.

Straps shall be used to secure a player's feet, ankles, knees and hips to the sled. Repeated loss of straps or adjustment on ice causing DELAY OF GAME shall be penalized accordingly.

Rule 303 Goalkeeper's Equipment

P. 29

The goalkeeper shall be allowed to use specialized goaltending equipment such as a blocker and trapper glove. These shall be allowed to have fixed protuberances or picks protruding but must be permanently attached to the equipment. The teeth of these picks shall not exceed 4mm in length. This trapper glove arrangement may be made as an alternative for a second stick.

The goalkeeper's equipment shall be secured so as not to impede the passage of the puck, if rolling on edge. In order for the puck to pass beneath the goalkeeper's sled (i.e. goalie's pads and equipment must be 8.5 to 9.5 cm off the ice including any leg padding straps which must be secure above the goalkeeper's sled frame).

Rule 304 Protective Equipment P. 31

It is compulsory for all players in all sled hockey divisions to wear a hockey helmet and full mask certified by HECC, plus a neck guard at all times while playing and while on the player's bench, if the player's bench is on the ice.

Rule 606 Charging P. 80

In sled hockey, a minor or major penalty shall be imposed on any player who charges an opponent from behind or from the side making contact with the front end of their sled to any part of the opponents sled. When contact is to the front of an opponent's sled, it will be the discretion of the Referee, if the player was charging or playing the puck.

Rule 609 Delaying the Game P. 82

The puck shall be considered "frozen" or unplayable by the referee if the puck is out of sight or is caught between a player's skate blades. The referee shall stop play and call for a face-off at the point of initiation (if in the neutral zone) or at the nearest face-off circle.

Rule 617 High Sticks P. 96

The carrying of the blade end of the stick above the shoulders or the pick end of the stick above the waist in sled hockey is prohibited.

Rule 626 Off-Sides P. 107

In sled hockey the position of the player's sled blades and not that of his sticks shall be the determining factor in deciding on "off-side" violation. A player is off-side when both sled blades are completely over the outer edge of the blue line into the attacking zone.

Rule 639 Tripping P. 124

In sled hockey a minor penalty shall be imposed on any player who shall place his sled, stick, foot, arm or hand under the blades or front end of an opposing player's sled in such a manner that it shall cause the sled to tip or flip.

Rule 640 Unnecessary Roughness (Roughing) P. 126

In sled hockey, at the discretion of the referee a minor or major penalty and a game misconduct may be imposed on any player who purposely tips their sled over exposing the blades of the sled or raises the sled's front end to impose injury.

4 APPENDIX C: AUTHOR QUALIFICATIONS

ATHLETIC RESUME OF MIKE DOYLE

(www.sledhockey.net)

The amputation of my right leg above the knee on June 21, 1976, was caused by the collision of my motorcycle with a car that turned in front of me. The next six years were spent adjusting and adapting to the loss of a limb.

Sled Hockey Major Competitions:

- 1997 World Cup, Sollefteio, Sweden
- 1998 Winter Paralympics, Nagano, Japan
- 2000 World Championships, Salt Lake City, Utah
- 2002, 2003, 2004 Malmo Open, Malmo, Sweden
- 2003 U.S. Select Team member

Sled Hockey Administration:

- 1997 until 2002: USA Hockey “un-official” Atlantic District Representative
- 1997 until 2002 Helped initiate/revitalize close to 20 programs around country by teaching and demonstrating sled hockey
- 1997 until 2002: Formed four local (Atlantic District) junior sled hockey programs
- 1997 until 2002: Helped Administer two of the four programs
- 1997 until present: Taught Sled Hockey Administration to numerous forming programs around country
- 2001 until Present: USSHA Atlantic District Representative and Regional Board of Director member
- 2004 USSHA National Secretary
- 2004 Co founded and administered local adult Philadelphia Sled Hockey team

Sled Hockey Coaching Experience:

- 1997 until 2002: USA Hockey “in-house” midget and pee-wee coach for able bodied programs
- 2002 until present: USA Hockey “woman’s league”
- 1997 until present: Sled Hockey coach for all levels and disability types
- Level IV USA Hockey Coaching Certificate/2005 Positive Coaching Alliance National Award Recipient

Swimming Competition:

- | | | | |
|------------------------------|--------------------|----------|----------------------------------|
| • Sep. 1988 VIII Paralympics | Seoul, South Korea | 3 Silver | 1 Bronze |
| • Sep. 1992 IX Paralympics | Barcelona, Spain | | 1 Gold (relay), 1 Bronze (relay) |
| • Aug. 1996 X Paralympics | Atlanta, GA | | best finish 6th |

Swimming Administration:

1996 until 2000: Athlete representative to the International Paralympic Committee (IPC) for Swimming

Duties included

- Reviewing IPC/FINA swimming rule changes and additions
- reviewed and proposed changes to classification testing and selection issues
- Reporting directly to the Chairperson of committee with suggestions and solutions

1996-2002: Middle Atlantic Swimming (PA-east, NJ, DE)

- Chairman of the Adaptive Committee for Local Swim Committee (LSC) under USA Swimming
- Responsible for integration issues for disabled swimmers within our LSC
- Member of the Open Water Committee with same LSC under USA Swimming
- Organized an Open Water Championship (OWDC) for disabled swimmers in Atlantic City, NJ
- OWDC was held annually, the same weekend as the 22-½ mile “Around-the-Island” marathon swim since 1997.
- For three years fielded a disabled relay team to swim the 22-½ mile race as a relay
- Promoted disabled swimming and integrate disabled athletes into mainstream programs

Other Volunteer Activities:

- 1989 until present: Active member of the Institute of Electrical and Electronic Engineers (IEEE)
- 1994 until 1998: Warrington Township (PA) Park and Recreation Committee member from 1994 to 1998.

Education:

- July 1993: Bachelor of Science Degree Electrical Engineering Temple University, Philadelphia, PA
- May 1989: Associate of Science Degree Drafting and Design Bucks County Community College, Newtown, PA

Employment:

- Electrical Engineer, 400 Hz and DC Section, Naval Surface Warfare Center, Philadelphia PA
 - Responsibilities include design and in-service engineering for special frequency power on aircraft carriers and other naval ships.
 - Over 20 years experience as a civil servant and private industry employee in military aircraft and commercial/military ship electric systems
 - Work areas include research and development, system installation, integration and testing. I attended night school while working full time from 1984 through 1993 to obtain both degrees.