



DISCOVER CURLING



CURLING
CANADA



WORLD
CURLING
FEDERATION

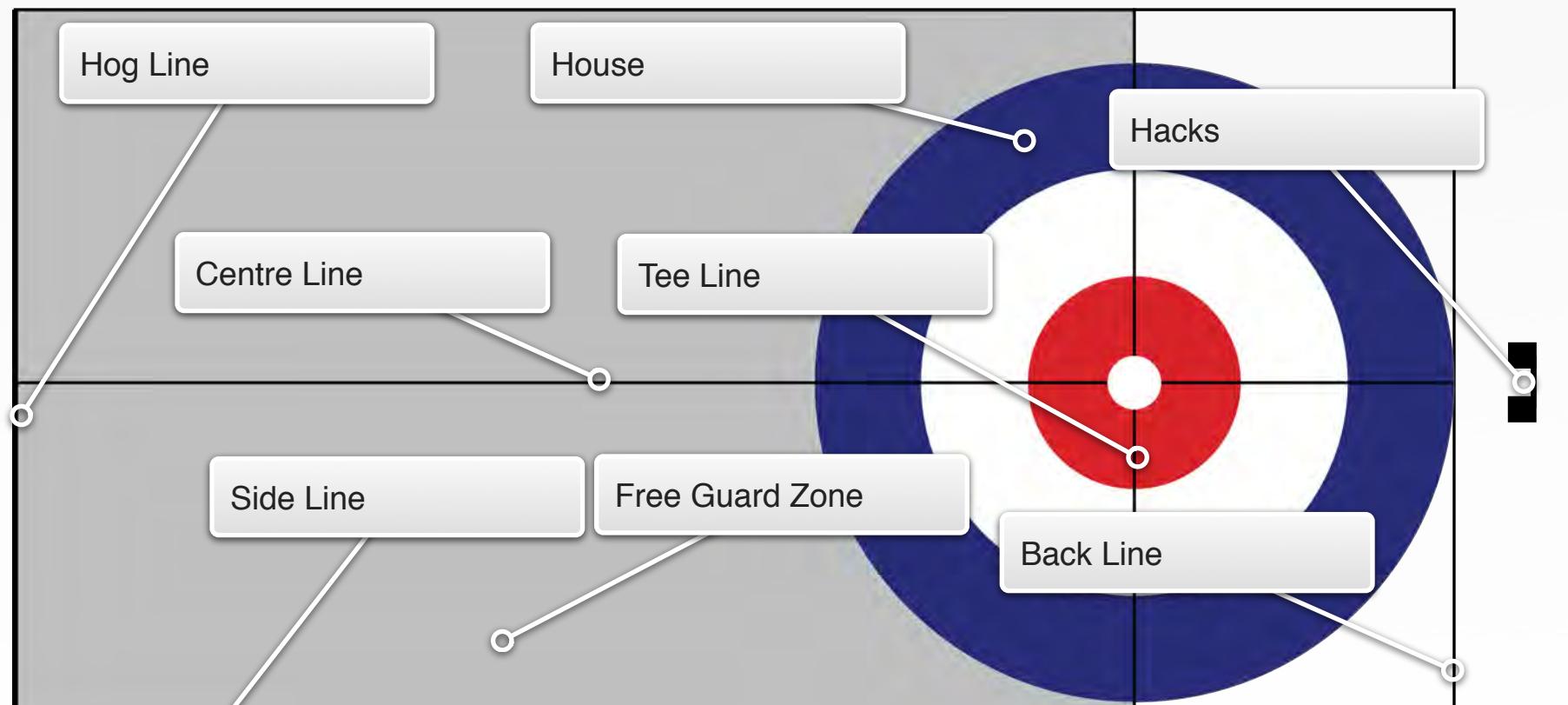
DISCOVER CURLING

© 2015 Curling Canada & World Curling Federation

Notice of Liability

The information in this book is distributed on an “As Is” basis, without warranty. While every precaution has been taken in the preparation of the book, neither the Curling Canada or the World Curling Federation shall have any liability to any person or entity with respect to any loss or damage caused or alleged to be caused directly or indirectly by the instructions contained in this book.

Interactive 1.1 Important Curling terminology



GAME ORIENTATION

To maximize your enjoyment of this great sport, it is important to become familiar with some fundamental aspects of the game such as the following:

We also recommend becoming familiar with all of the basic rules and terminology of the game.

Equipment and its proper care

Ice and **Stones**

Game Procedures and Objectives

Curling Etiquette

CURLING EQUIPMENT

Types of Equipment

Curling, like every sport, requires the correct **equipment** to ensure safety, success and comfort. There are various levels of quality reflected by ranges in price.

Footwear



To be able to deliver a **stone** with a flat footed slide, a curler requires a proper sliding shoe, one having a slick, low friction material that covers the entire sole and heel.

Various types of **slider** materials are available. One example of a synthetic material that is very popular is Teflon plastic. Teflon **sliders** come in a variety of thicknesses. Generally, the thicker the Teflon, the faster the **slider**. Stainless steel **sliders** are the “fastest” **sliders** available and are used by a small percentage of players.

Entry level curlers may begin with a low-friction plastic tape applied to the sole of an athletic shoe. Duct tape, or any type of plastic tape may be used. Plastic tape has reasonably good sliding properties but is not overly fast, allowing the beginner to adjust to develop balance easily. It is important that both the sole and the heel of the sliding shoe are covered with the sliding material because both are in contact with the ice

during the **delivery**. Quickness of the sliding surface becomes important as the curler’s ability to slide develops and improves. While it is quite acceptable to learn how to slide and to develop confidence with a material that is not overly fast, once the basics have been learned reasonably well, the curler should progress to a less resistant material that will allow for a much longer slide **delivery**.

The sliding shoe should only be worn on the curling ice. Protectors should be placed over the **slider** to prevent damage to it while walking off the ice. A very effective type of **slider** protector is made of soft rubber. It can also double as a gripper or anti-slider for the sliding shoe when the curler is **brushing**.

While a **slider** is essential, it is equally important to have the non-sliding shoe equipped with a surface that will grip the ice well. Common types of grippers/anti-sliders are soles made of a pebbled type of rubber or those made of soft crepe-like rubber.

Brushes



Synthetic **brushes** are the most popular and are usually made with a nylon fabric. **Brushes** are also made with either hog hair or horse hair. Various adaptations to the “standard” **brush** including handle shape, handle width and **brush** head angle have been made by manufacturers in their attempts to make **brushing** easier and more effective.

Brush heads come in assorted sizes and shapes. Variable handle/head angle **brushes** are the most common. **Brush** handles come in different sizes but common dimensions are forty-eight inches (120 cm) in length and one inch (2.5 cm) in diameter. Handles may be made of wood or fibreglass.

Gloves

Gloves and mitts provide warmth and protection for the hands during **brushing**. The palm of the glove should be made of a material that will grip the **brush** handle and not slip.



Clothing

Most of the top competitive **teams** wear matching slacks and jackets. Slacks need to allow for easy movement during the **delivery**.

Jackets that allow for layers of clothing underneath are very popular. It is important

that the clothes are warm and allow for ease of movement.

When choosing clothing it is important to choose clothing that does not shed lint on the ice. For that reason, wool sweaters and



ICE AND STONES

Pebble



It is important to have some idea of how and why a **sheet** of curling ice is prepared prior to play. Factors that determine the “**weight**” or “speed” and “curl” of the ice include ice temperature, humidity, and type of **pebble** applied to the **ice surface**.

Pebble is the many tiny frozen bumps found on the surface of the ice. They vary in size, texture and amount. **Pebble** is applied by a special type of handheld sprinkler.

Generally, **pebble** is put on the **ice surface** before the start of each **game**.

Pebble has a tremendous influence on “**draw weight**” because the delivered **stone**, as it travels along the ice, rides on top of the **pebble**. Without **pebble** most curlers would be unable to throw the **stone** hard enough for it to reach the **house** at the distant end of the **sheet**. **Pebble** raises the cup at the bottom of the **stone** off the surface and allows only a portion of the **stone** to be in contact with the ice. Too much **pebble** can

actually be detrimental by slowing down the **stone** because more of the running edge is in contact with the ice and the cup must cut through the rough, protruding edges of such **pebble**.

There are three inevitable results as the crests of **pebble** become worn down with the passage of **stones** up and down the **sheet** and by **brushing**:

The ice becomes keener (less **stone** speed required).

The **stone** curls more as the **pebble** wears down and more of the running surface contacts the ice. With a large portion of the running edge in contact with the **ice surface**, friction will be increased.

When the **pebble** is worn down even more until it is almost flat, the ice may become heavier since much of the running surface is now contacting the ice.

Curling Stones

A curling **stone** is circular in shape, made of hard, dense granite and weighs approximately 40 to 42 pounds (20kg). A curling **stone** must be able to resist abrasion, be uniform in colour and non-absorbent. This latter quality is very important because moisture penetrating a **stone** and then freezing will cause chipping of the **stone**.



Each side of a curling **stone** has a concave area commonly referred to as the cup. The edge of the cup is appropriately called the running edge and it is this thin edge that actually contacts the **ice surface**.

The running edge is not polished like the rest of the **stone**, but is comparatively rough. For curling to be played correctly the running edge must never be allowed to wear smooth or be damaged. When the running surface has become smooth from wear, the **stone** must be reconditioned to restore a like-new running edge. When the edge loses its texture, the **stone** will **curl** very little because there is nothing on the edge to cause friction with the ice. As a result, the **stones** will glide a lot further when they are slowing down, making it difficult to judge **weight** when delivering or **brushing**.

The dull grey band around the greatest circumference of the **stone** is the striking band and is designed to absorb the shock when one **stone** strikes another. On a new **stone** the striking band is a slightly convex shape.

Over years of pounding, the striking band may wear away to a flatter contact surface. Flat spots on the striking bands are caused when the granite beneath the surface has been crushed as a result of an extreme impact. Eventually the outside granite will break loose and a large chunk will be missing from the outside of the **stone**. When chunks come out of the striking band, the **stones** are non-repairable.

Proper care of curling **stones** is essential. Curlers should not take the **stones** off the **ice surface**. The running edges can be easily damaged from contact with abrasive surfaces. The ice technician is the only person who should decide where the **stones** are to be placed when they are off the **ice surface**. Curlers need to be encouraged to keep the playing surface as clean as possible by ensuring their footwear is clean.

GAME PROCEDURES & OBJECTIVES

A curling **team** consists of four players, each delivering two **stones** during an interval called an **end**. When completed, a total of sixteen **stones** have been delivered.

The **lead** is the **first player** to deliver two **stones**, alternating with the opposing **lead**. When the **lead** has delivered his second **stone**, he then takes over **brushing** duties with the number three player while the **second player** delivers two **stones** alternately with the opposing **second**. In turn, the third delivers two **stones** that are brushed by the **lead** and **second**. The **fourth player**, known as the **skip**, is the last to deliver two **stones** while a player designated by the **skip** – called the **vice-skip** or **mate** takes over the skipping duties. The **skip** stands within the **circles** (called the “**house**”) at the end of the ice opposite to the **delivery end** and directs the play except when it is his/her turn to deliver.

The opposing **team** must yield the ice to the **team** whose **stone** is being delivered and must not interfere in any way. The opposing **skip** remains behind the **house** to watch the opposition **stone** being played in order to study the action of the **stone** in motion.

Curling success depends upon the cooperative efforts of all four players on a **team**. It is important that each player is content with his or her role. Because of the strategy required in directing the play, the **skip** must be knowledgeable on strategy and have a good memory for ice reading.

LEAD: The **lead** must be able to **draw** effectively at all times and to execute **take-outs**. Both the **lead** and the **second** should be strong brushers because they have the responsibility of **brushing stones** delivered by both the third and **skip**. Effective brushers therefore, require strength and endurance.

SECOND: The **second** must be able to execute **take-outs** well. Good **seconds** are noted for their ability to execute **peels**, run throughs, double **take-outs**, **hit and rolls**, etc., and yet provide perfect **draw weight** when called upon.

THIRD: The third is usually the **vice-skip** and is a very key member on any successful **team**. The third must possess the knowledge and shot-making ability of the **skip** and also be an effective brusher. Thirds must be able to execute delicate shots with precision and hopefully make the **end** easier for the **skip** who otherwise may have to function under great pressure. The third must be able to anticipate the path of the **skip's stones** very well as they play a major role in calling the line (direction) for their **team's** last two **stones**.

SKIP: The **skip** is the **team** leader who calls strategy and determines where the **brush**, which is the thrower's target, should be placed. **Skips** must be able to execute shots with poise, finesse and confidence. The **skip's** responsibility is to manage the overall performance of the **team** by maximizing their various skills.

Game Objectives and Scoring

The basic object of curling is to complete each **end** with your **stones** closer to the centre of the **house (circles)** than those of your opponent. Generally, competitive **games** are ten **ends** and most club **games** are eight **ends**. At the conclusion of each **end**, the **team** with the **stone** closest to the centre of the **house scores** one **point**, and then **scores** an additional **point** for every other **stone** closer to the centre than the closest **stone** belonging to the opposing **team**. **Stones** must be in or touching the **house** to be potential **counters**.

The **vice-skips** determine the **score** at the conclusion of the **end**, and must agree or request a decision by an official or another person not playing in the **game**. All other players must stay out of the **house** at the conclusion of an **end** until the **vice-skips** have determined the **score**.

Score Boards

There are two types of score boards that are currently in use. The traditional score board has the **score** in the middle and a place to hang the marker indicating in which **end** the **scoring** occurred.

Red	1	2	4	6	8					
SCORE	1	2	3	4	5	6	7	8	9	10
Yellow		3	5		7			9		

Baseball type score boards are used as well. The numbers on the board represent the **end**, numbers hung indicate **points scored**.

END	1	2	3	4	5	6	7	8	9	10	11	TOTAL
Red	0	0	2	0	1	0	2	0	4			9
Yellow	1	1	0	2	0	1	0	2	0			7

Measuring

At the conclusion of an **end**, if the two **vice-skips** cannot agree as to which **stone** is closer to the centre, the **stones** must be measured. The **vice-skips** do the measuring in most **games**. In some **competitions** however, an official will measure the **stones**.



Prior to a measurement taking place:

- Remove all other **stones** from the playing surface.
- Only the **vice-skips** are in the **house**, all other players move out of the **house**.
- Carefully place the feet of the measuring stick on the ice and then the end of the measuring stick in the centre hole location (**tee**) and slide the instrumented end slowly towards the first **stone**, get a

reading, then move slowly forward to the second **stone** to be measured.

- Opposition **vice-skip** should be on the same side of the measuring stick as the person doing the measuring, so that they can observe the reading.
- Set the dial first on the odd coloured **stone** when performing a three **stone** measure.

At times, it is not possible to visually determine if a **stone** is in the **house** or in the **free guard zone**. This possible **counter** may be measured during the **end**, if it is prior to the **delivery** of the fifth **stone** and the **skips** need to determine if the **stone** is in the **free guard zone**. A six-foot measuring stick is used to determine if a **stone** is in the **house** and therefore a potential **counter**.

CURLING ETIQUETTE & PROCEDURES

- Curlers must have clean, appropriate footwear that does not damage or affect the quality of the playing surface.
- Most curling clubs discourage players from bringing food and refreshments onto the **ice surface**.
- Curling **games** begin and end with all opposing players individually shaking hands.
- At the beginning of the **game**, opposing **vice-skips** (thirds, mates) will toss a coin to decide last **stone** advantage.
- Always be ready when it is your turn to deliver.
- When the opposition is preparing for **delivery**, stand well to the side of the **sheet** between the **hog lines (courtesy lines)** if installed) and be careful not to distract them in any way.
- Players not involved in delivering or **sweeping** should stand along the sides of the **sheet** between the **hog lines**, well out of play. When you finish **sweeping**, walk along the sides of the **sheet** as you return to the **delivery end**.
- Only **skips** and **vice-skips** are allowed to congregate behind the **tee line**. They should stay still and ensure their **brooms** are not on the ice when the opposition is preparing to throw.
- At the conclusion of an **end**, all players should remain outside of the **house** until the **vice-skips** have agreed upon the **score**.
- Be very careful when pushing **stones** into the corners in preparation for the next **end**. Ensure that all players are made aware of any **stone** being pushed in their direction.



2

DELIVERY

There are many variations of the **delivery** currently being employed by players across the world. We suggest that the entry level curler use the flat footed, no lift **delivery**.

Learning Progression

The curling **delivery** is a complex activity that requires the coordination of a number of different body movements. To correctly develop the **delivery**, every curler should divide the skill into specific phases of development:

Delivery A Stance, forward slide from the **hack** (without a **stone**).

Delivery B Entire pullback and forward motion combined with the forward slide (initially without a **stone** and then with a **stone**).

Delivery C Entire **delivery** motion (with a **stone**) including grip, turns, release and **line of delivery**.

Flat Foot Slide

The flat-footed slide is the recommended method of **delivery** because it provides for optimum balance by allowing the weight of the body to be distributed over the entire under-surface of the sliding foot. The flat foot slide places less stress on the knee than do a number of other deliveries.

No Lift Delivery

New curlers and experienced curlers alike, will find that balance and timing problems are reduced when they do not have to concentrate on swinging a 40 pound granite **stone** off the ice.

Line of delivery problems are frequently reduced with a no lift **delivery**. The **stone** is placed on the **line of delivery** during the stance and it should stay on this line during the pullback motion, forward slide and the release. This approach makes consistently hitting the target **brush** at the far end much easier to attain.

DELIVERY LESSON A

Delivery Lesson A introduces the stance, hip elevation and the forward slide.

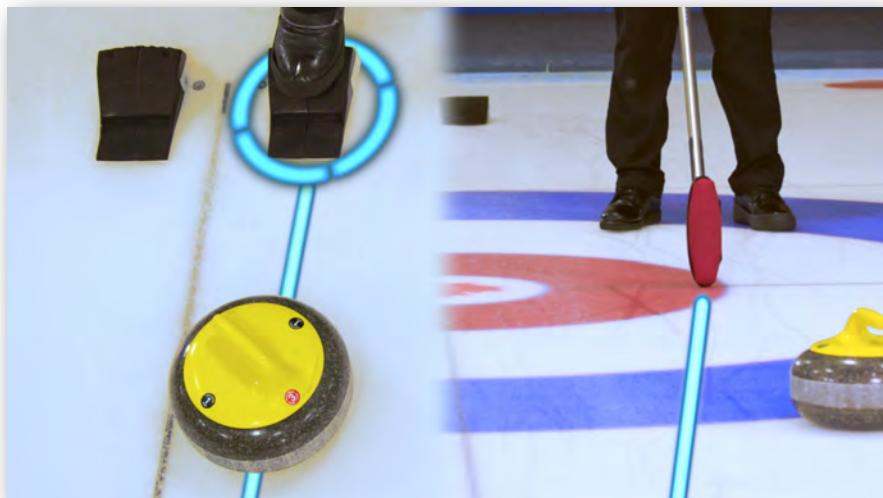
Stance

The initial positioning of the body in the **hack** prior to the **delivery** is commonly referred to as stance, and is of primary importance if the **delivery** is to be successful.

Proper stance involves:

- placement of **hack** and sliding foot
- positioning of knees, hips and thighs
- position of delivery arm and **brush** arm

Hack Foot



One of the keys to the **line of delivery** in the slide is the placement of the gripper foot in the **hack**. Always step into the **hack** from behind. While stepping into the **hack**, ensure that the foot is pointing to the target. Place the ball of the foot

(**metatarsus**) firmly and squarely against the back of the **hack**.

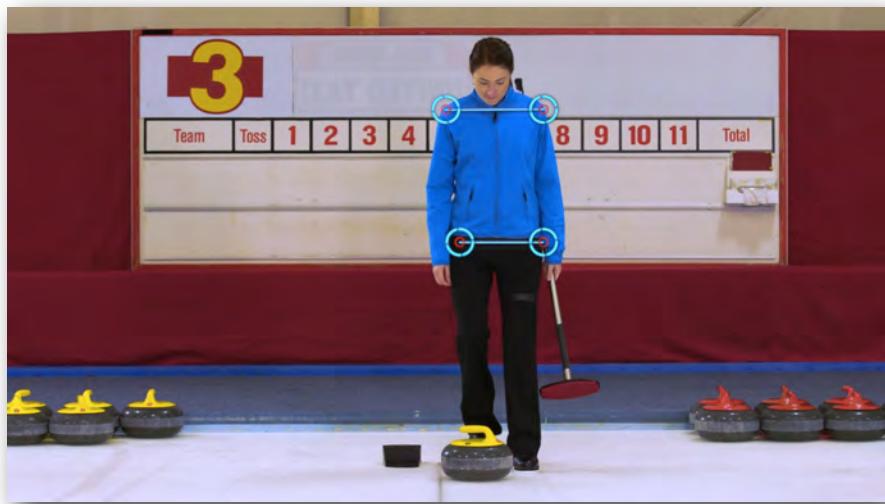
Sliding Foot



The sliding foot is positioned flat on the ice, parallel to but slightly ahead of the hack foot. The heel of the sliding foot is approximately adjacent to the toe of the hack foot. Body type may impact the positioning slightly for each curler. It is necessary to have some body weight on both feet, so that both legs can assist in elevating the hips.

The sliding foot needs to be parallel to the hack foot and placed so that during the pullback and back-step motions the foot can move straight back.

Shoulders and Hips



When the curler enters the hack ready to assume the stance position, the shoulders and hips should be parallel with the **line of delivery**.

When lowering the body into the stance position, it is important to keep the thighs parallel to the **line of delivery** to help keep the hips square to the target.

Upper Body



The knee of the hack foot is kept off the ice, enabling the trunk, head and shoulders to maintain a fairly upright position. The shoulders must be level and square. The head should be erect with the eyes concentrated on the target.

Delivery Arm



The delivery arm must be comfortably extended at all times, without rigidity or tension. The arm is in front of the body, elbow down and hand in a handshake position. The **stone** is placed just far enough forward to allow for the comfortable extension of the arm. During the Delivery Lesson A, you will deliver without a **stone**. When the **stone** is introduced later, the stone will be placed directly on the **line of delivery**. The **line of delivery** extends from the target at the far end to the middle of the hack foot.

Balance Arm



The major sources for balance in the stance position are the positioning of the hack foot and the sliding foot. However, positioning of the balance arm during the stance and forward slide is also important. There are at least three

positions for the balance arm that will assist with balance.

1. Stretch the **brush** arm out comfortably from the body with the **brush** handle extending under the arm toward the back. The head of the **brush** should be resting lightly on the ice, slightly ahead of the sliding foot. The **brush** head is inverted so that the **brush** head is facing up and the wooden/plastic part of the **brush** is resting on the ice. The wooden/plastic side of the **brush** head sliding on the ice produces less friction than if the **brush** head was in contact with the ice.
2. Curlers who have difficulty keeping the **brush** handle against their back during the forward slide should bend the arm slightly so that the upper arm may be used to hold the **brush** handle tightly against the back to assist in achieving stability.

3. Some curlers prefer to have the **brush** flat on the ice. This method will assist with stability but in many cases it forces the upper part of the curler's body to be very low. An adaptation to the **brush** flat on the ice is to use a delivery device such as "The Crutch" or "The Stabilizer".



The top bar of these **delivery** aids is the same height as the **stone** handle. They therefore assist the curler to keep the upper body erect and their shoulders level.

Stance Review

- Step into the **hack** from the rear.
- Line up hack foot with the target.
- Place ball of the gripper foot firmly against the back of the **hack**.
- Place sliding foot slightly ahead and parallel to the hack foot.
- Ensure both thighs are parallel to the **line of delivery**.
- Position shoulders level and square to the **line of delivery**.
- Position the upper body in an erect position with eyes looking at the target.
- Place the **stone** directly on the **line of delivery**.
- Ensure your balance arm is correctly positioned.

Forward Slide

The key to a successful curling **delivery** is to develop a smooth, balanced forward slide. From a balanced position it will be easier to accomplish the consistent **line of delivery** and release motion needed to make shots.

Sliding Foot Position



The main element for balance in the **delivery** is the position of the sliding foot. The sliding foot should be positioned under the body's vertical axis between the chest and the abdomen during the entire sliding motion. The sliding foot is flat on the ice with the weight of the body distributed over the sole and heel. The sliding foot should be turned out slightly to increase the surface base and therefore enhance the stability of the slide.

Balance Arm Position

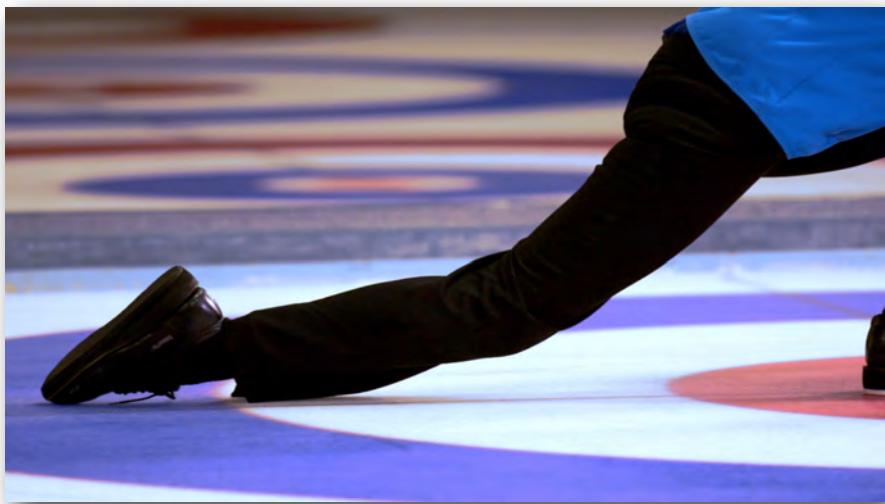


As the body comes forward from the **hack**, the **brush** should be positioned with the handle extending toward the small of the back and the **brush** head resting along the top of the ice. The **brush** head must be positioned ahead of the sliding foot during the entire sliding motion. A **brush** head, even with or behind the sliding foot, may have a tendency to turn the curler's shoulders off line. Curlers using a sliding device also need to keep the hand position slightly ahead of the sliding foot.

Delivery Arm

The delivery arm and hand should remain comfortably extended in front of the curler, with the hand off the **ice surface** once balance has been achieved.

Trailing Leg



The trailing leg and foot should be extended behind the body as far as possible during the forward slide. The position is initially accomplished by flipping the hack foot back into the **hack** as leg drive reaches completion, thus providing a complete extension of the trailing leg. In most cases, this motion turns the trailing foot over into one of 3 desirable positions:

1. Turned over and slightly in.
2. Straight up and down.
3. Turned slightly out. The heel should not be in contact with the **ice surface**.

Note: Curlers may find that the resistance on the trailing foot may be reduced with the application of sliding tape or toe dip.

Upper Body Position



A fairly upright position is preferred as it allows a correct grip and a high wrist position over the **handle** of the **stone** to produce a consistent release of the **stone**. The shoulders should remain level and square to the **skip's brush**.

Forward Slide Review

- Sliding foot flat on the ice under the centre axis of the body.
- Sliding foot slightly toed out to provide a wider base for balance.
- Trailing leg extended out behind — preferably toed in or straight.
- Upper body erect, hips low.
- Shoulders and hips square to the **line of delivery**.
- **Brush** head resting lightly on the ice, slightly ahead of the sliding foot.

Development Drills

Development Drill #1

- Find a position along the sideboards.
- Place your **brush** on the sideboards.
- Slowly stretch out into a final slide position while holding on to the boards with both hands.
- Check for a balanced position by trying to lift the **delivery** hand off the boards, directly in front of the body. Lift the balance arm, off the boards to the side.
- Check the slide foot and trail leg positions.
- Hold the slide position for 10 to 15 seconds and then stand up.

Development Drill #2

- Pick up your **brush** and turn around so that you face away from the sideboards.
- Assume the stance position but with your **brush** flat on the ice, sideways in front of your body.
- Elevate your hips into a semi-crouch position and stretch out into the slide position using two hands on the **brush** handle for easier balance.
- Add a small amount of leg drive after 3 or 4 stretches from the sideboards.

Development Drill #3

Now that you have developed a certain comfort level with sliding with your **brush** on the ice in front of you, it is time to place your **brush** under your balance arm.

- Assume the correct stance position.
- You may now repeat Drill #2 from the sideboards with the **brush** in the correct position.

Each time you slide from the sideboards, focus on one aspect of your slide. Since the key to balance is the sliding foot position, this is the primary focus of the drill.

Development Drill #4

Once you have gained a comfort level sliding you can move to the **hacks**.

- You will now progress to performing the stance, hip elevation and slide from the **hack**.

Another drill may include:

- Stretching out into the slide position and grasping the **brush** handle of a second curler (wearing 2 grippers).
- The curler with the **brush** will then pull the curler in the slide position down the ice.

DELIVERY LESSON B

This lesson adds the pullback motion and the forward slide motion skills to the **delivery**.

This component teaches the sequencing (timing) and weight transfers necessary to perform the whole skill. Good technique and timing are essential to ensure that both **stone** and body movements are coordinated into a smooth, consistent execution.

Pull Back Motion

As both legs begin to elevate the hips into a semi-crouch position, the **stone** is pulled back on the **line of delivery**. The **line of delivery** is a line traveling from the target **brush** at the far end to the middle of the hack foot. During the hip elevation into the semi-crouch position both legs are supporting the body weight.



back movement position assists with keeping the hips square to the **line of delivery**.

The sliding foot moves straight back so that the toe of the sliding foot is parallel or slightly behind the heel of the hack foot. The body weight moves back with slightly more weight being transferred to the sliding foot. At this point there is a very definite pause or stop in the motion.



Once this hip elevation has occurred, a motion backwards with the delivery arm is followed by the sliding foot beginning to move straight back. The sliding foot should remain flat on the ice and continue to point toward the target. This straight

Pull Back Motion Review

- Elevate hips into a semi-crouch position (hack knee bent approximately 90 degrees).
- Pull **stone** back directly on **line of delivery**.
- Move sliding foot straight back.
- Definite pause or stop in the motion.



Forward Motion



Commence the forward motion of the **stone** by shifting some body weight forward on to the hack foot while maintaining a semi-crouch position with the hack knee remaining bent at approximately 90 degrees. As the transfer of the body weight proceeds, the upper body will continue to lean forward and gradually begin to drop down behind the **stone**. The forward movement of the sliding foot should be delayed slightly to allow the **stone** to get out in front of the body and to create space for its eventual position which will be behind the **stone** and under the chest. The sliding foot will now move



gradually forward under the chest to provide balance and slowly in behind the **stone** in the direction of the target **brush**. As this is occurring the hack leg will provide the necessary leg drive to produce body and **stone** momentum as the

majority of body weight is transferred on to the sliding foot.

The sliding foot, after staying in the back position for so long, must move quickly forward to take its position under the body.

Once the sliding foot has moved forward, under the body, the body weight is transferred to the sliding foot. At this time, the hack leg provides the forward thrust from the **hack**. The leg drive should occur as the hack leg approaches the extended position.

Forward Motion Review

- Transfer upper body weight forward.
- Move **stone** along **line of delivery**.
- Delay movement of sliding foot.
- Move sliding foot forward.
- Provide thrust with hack leg.

DELIVERY LESSON C

Grip, Turns, Release and Line of Delivery

This lesson completes the **delivery** instruction for the no lift **delivery** by adding the grip, turns, release and **line of delivery**.

The Grip



You should grip the **handle** of the curling **stone** firmly. The index finger and the thumb provide the major guiding force. Place the index finger close to the gooseneck (the front part of the **handle**) followed closely by the other fingers. The thumb presses firmly against the other side of the **handle** and combines with the index finger to provide grip control. The "V" found between the thumb and the index finger should point to the opposite shoulder. The **handle** should rest on the second joint of the fingers. The wrist must be kept in a "high" position above the **handle**. The palm of the hand should not be in contact with the **handle**.

Turns

Clockwise or In-turn for Right Handed Curler

In order to determine which direction a **stone** will bend or curl, you must apply a turn to the **stone**. For many new curlers, the terminology of **in-turn** and out-turn can be confusing. It may be easier to classify turns as either a clockwise rotation or a counterclockwise rotation. Using this terminology makes the turn the same for left handed curlers and right handed curlers.

For a clockwise rotation (commonly referred to as the **in-turn**), place the **handle** while in the stance position so that the **handle** is slightly counter-rotated (approximately 60 degrees) against the turn. The **handle** position must remain in the same position during the pull back and the forward slide. Approximately one meter before release, the **handle** is turned with a distinct clockwise rotation of the wrist and forearm.

This handshake position is used as a point of reference to allow the **stone** to be released in exactly the same manner every time. Some curlers may have difficulty in relating to the use of degrees to describe relative position. Another way to describe the turn is to relate to 12:00 being at the front of the **stone**. In the stance position adjust the **handle** so that the gooseneck is positioned pointing at approximately 10:00.

The **handle** remains at 10:00 during the pull back and forward slide. One metre prior to release, the **handle** is rotated in a positive manner to the 12:00 position [diagram]. The thumb and forefinger release the **stone** at the same time. This rotation will cause the **stone** to rotate in a clockwise direction. The **stone** should rotate 2 to 3 times as it travels the length of the **sheet** of ice on a **draw** shot. A consistent release is necessary in order for the **stone** to react in a predictable manner. If there are too many rotations (a **spinner**) the **stone** will not curl. If the **stone** does not have a positive rotation it may lose its turn or act in an unpredictable manner.

Counterclockwise or Out-turn for Right Handed Curler

It is desirable to use the same reference point at release for both turns, that is the handshake position. The counter-clockwise turn (commonly referred to as the **out-turn**) begins by adjusting the **handle** approximately 60 degrees against the turn. This adjustment must be maintained during the pull back motion and the forward slide. One metre prior to release, the counterclockwise turn (out-turn) is applied by a distinct rotation of the wrist and forearm to the handshake position.

To use the analogy of the clock again, the **handle** is positioned in the stance at 2:00 and one metre prior to release the **handle** is rotated to the 12:00 position.

Position of the Delivery Arm

At the beginning of the forward slide, the delivery arm is comfortably extended. As the body moves forward from the **hack**, the delivery arm should develop a small bend at the elbow (hardly noticeable). During the forward slide, the arm must remain in this position until just prior to release when the arm is extended slightly towards the **skip's brush**. This slight extension of the delivery arm assists in developing the correct release motion. Keep in mind that the controlled extension of the delivery arm during release is not a push.



Position of Body

As the body slides forward from the **hack**, the hips are fairly low. The upper body remains in a fairly upright position allowing for a correct grip and a high wrist position over the **handle** of the **stone**. The upper body may lower gradually during the final release motion.

Release Point



The release point is that location on the ice when the **stone** leaves your hand. In actual fact, the release occurs over a distance of approximately one metre.

The release point will vary depending on the amount of forward momentum applied to the **delivery**. It is important that the point of release be relatively consistent. A curler releasing **draw** shots near the **hog line** and **take-out** shots near the **tee line** is not releasing in the preferred manner. The type of shot requested by the **skip** governs the speed at which the curler leaves the **hack**, whereas the release zone should remain relatively constant.

Curlers on competitive **teams** should strive to develop a similar release zone. When all four players release in the same manner and in the same zone their **stones** should react in a similar manner. It is much easier for the **skip** to determine the amount of ice required for specific shots when all four curlers' **stones** react in a similar manner. If one curler uses the same release motion but in a much earlier zone, their **stones** will have more time to curl. As a result of an early release they may require more ice.

To develop similar slides from the **hack**, the players should determine the ideal zone for their team. Factors that will influence how far you slide include: the force you push from the **hack**, the quickness of the **slider** and the amount of friction produced by the trailing foot.

The **stone** must be released before it reaches the **hog line**. You should develop a release point that is well back of the line. Occasionally a curler may drive too hard out of the **hack** and need this extra space in order to release without violating the **hog line rule**.

Follow Through



A proper follow through requires that the eyes concentrate on the **skip's brush**, the delivery arm reaches forward and the sliding motion continues behind the **stone**. The delivery arm, hand and fingers are still pointing along the **line of delivery** to the **brush** until the **stone** is at least a metre away from the release point.

Many shots may be unsuccessful as a result of an improper follow through. Actions such as quickly dropping the delivery hand or attempting to stand up immediately after release can affect a shot if they commence just prior to release. The delivery hand dropping to the ice after release often indicates a balance problem. A quick

motion at follow through may make the release of the **stone** inconsistent.

Curlers are urged to allow the slide to come to a stop and to then stand up. Curlers who put their hands or knees on the ice at the end of their **delivery** may slightly melt the ice producing a flat spot. When a **stone** moves over a flat spot on the ice the direction and line may be affected. The **stone** will act as if there is a piece of debris under the **stone**.

Line of Delivery



The **line of delivery** is a line extending from the hack foot to the **skip's brush** or target at the **playing end**. During the course of a curling **game**, the target is moved across the **sheet**. You should visualize an imaginary line running from the target to the middle of your hack foot. To correctly deliver a **stone** at the target, you must also position the **stone** on this line.

Development Drills

You and your partner can line up on both sides of the **sheet**, between the **tee line** and the **hog line**. The purpose of this drill is to practice grip, turn and release while pushing **stones** back and forth between partners.

Grips, Turns & Release Drill

Development Drill #1

- Curlers should position themselves in two rows, facing each other.
- A **stone** is provided to curlers on one sideline.
- Assume the stance and grip the **stone**.
- Signal for desired turn given by partner. [need a definition of the signal]
- Adjust the **handle** for a turn. Perform the pull back and slide the **stone** forward rotating the **handle** to the handshake position sliding the **stone** to the partner.
- Repeat the drill with both turns and each partner taking a turn as the thrower and the **skip**.

While you are performing the drill, you should focus on:

Grip: Thumb on side of **handle**.

Forefinger close to the gooseneck.

Fingers close together.

Wrist high, palm off the **handle**.

Turn: **Handle** counter-rotated 30 degrees in the stance.

Handle released at 12:00.

Drill #1 may be repeated from the **hack**. Curlers will execute deliveries with a target on **centre line** at the top of the near **house**. You are encouraged to maintain the **handle** adjustment throughout the pull back and forward slide prior to applying the turn.

Line of Delivery Drills

The purpose of this drill is to learn how to direct the body and **stone** at the target.

Development Drill #2

- Position an object, like a plastic cup on the ice at the front of the **house** and directly between the hack foot and a **brush** held between the near **hog line** and the **top of the house**.
- Slide at the target and attempt to hit the target with the sliding foot.
- Reposition the “target” at various points on the ice within the maximum **line of delivery** adjustments.

Development Drill #3

- Position target (plastic cup) at near **hog line** or closer for curlers with a shorter slide.
- Slide at target without **stone**.
- Visualize **line of delivery**.

- Take stance, close eyes and repeat slide.
- Visualize **line of delivery**.

Development Drill #4

- Position a plastic cup at near **hog line** on **centre line**.
- Deliver **stones** at the cup. When the **line of delivery** is accurate the **stone** will travel directly in a straight line and hit the cup.
- Execute deliveries with both turns.
- Reposition the target at various points on the ice within the maximum **line of delivery** adjustments.
- Deliver **stones** at target (paper cup) positioned 6 feet (2 metres) past near **hog line**.

WEIGHT CONTROL

It is important for curlers to understand how to control the **weight** (speed) of the curling **stone** relative to the shot requested. **Weight** control skills should be developed after you have spent time practicing **line of delivery** skills and the release of both turns.

Take-Out Weights

In order to increase **weight** (speed from the **hack**) for **take-out** shots, you must apply more thrust or leg drive. This can be accomplished by:

- Positioning the gripper foot higher in the **hack**.
- Transferring the body weight further back in the pullback motion.
- Transferring more body weight on to the sliding foot in the pull back motion.
- Delay sliding foot during forward movement.
- Increase leg drive from the **hack**.

The position of the hack foot will vary with the amount of momentum required to make the desired shot. For **draw** shots on quick ice, the hack foot may need to be placed lower in the **hack**. With the foot lower in the **hack**, your ability to drive out of the **hack** will be reduced. For shots requiring increased momentum, leg drive can be increased by placing the ball of the gripper foot higher in the **hack**. This higher

position will ensure that the ball of the foot has a solid foundation to push against.

During the pullback motion for **take-out weights**, the hips must remain low and move further backward. As a result of the hips moving further back the sliding foot must move further back. (To support the weight of the hips, so that the body doesn't tip over backward.) The sliding foot should move straight back. At all times, the sliding foot must remain pointing at the target. The hack foot may actually rock out of the **hack** as the body weight is transferred to the sliding foot.

At the beginning of the forward motion, both knees bend slightly. This knee bend causes the upper body to lean forward and starts the **stone** moving forward. The shoulders and upper body move forward. The sliding foot stays back as long as possible before beginning the forward motion. The longer the sliding foot stays in the back position the stronger the effect of weight transfer. Therefore, the heavier the desired **weight**, the longer the sliding foot remains back.

The sliding foot, after staying behind the **hack**, quickly moves forward to take its position behind the **stone**. In order to move quickly enough on heavy **weight** hits, the foot may actually be lifted off the ice in order to increase the speed of movement and to facilitate its positioning.

Draw Shots

The majority of **stone** momentum in the no-lift **delivery** is produced by leg drive and body weight transfer. The muscles that produce this forward momentum are part of large muscle groups. These large muscle groups are capable of producing **stone** and body momentum close to the desired **weight**. For finesse shots, close may not be good enough. To apply a finer control of **draw weight**, some curlers use smaller muscle groups to fine tune the control provided by large muscles. You may add small amounts of **stone** momentum by using either an arm extension, a shoulder drop or a gradual lowering of the upper body.

Development Drills

Development Drill #1

Take-out Weight or Draw Weight

- Position gripper foot appropriately in the **hack**.
- Slide from the **hack** without a **stone**.
- Allow the slide to come to a complete stop.
- Place a plastic cup at the spot where the sliding foot came to rest.
- Experiment with gripper foot position.
- Repeat slide, transfer body weight further back.
- Observe where sliding foot came to rest.
- Repeat drill attempting to slide to predetermined spots.

Development Drill #2

Take-out Shots or Draw Shots

- Deliver a **stone** with predetermined **weight**.
- Allow slide to come to a stop.
- Mark spot where slide finished.
- Repeat **delivery** attempting to duplicate amount of momentum.

Development Drill #3

Take-out Shots or Draw Shots

- Deliver **take-out** shot.
- Partner will use a stopwatch to time **stone** from first **hog line** to far **hog line**.
- Repeat **delivery**, attempting to deliver **stones** with the same traveling time.

FINE TUNING MECHANISM

Finesse shots require a slightly different mechanism for adjusting the **weight** (speed) of the **stone**. The large muscles of the delivery shoulder and arm and the leg drive from the **hack** are used to make major **weight** adjustments. The smaller muscles of the arm are used to make minor **weight** adjustments in **draw weight**. What do we mean by minor adjustments? A minor adjustment is perhaps the difference of 3 to 6 feet (1 to 2 metres). It is difficult to make minor adjustments with large muscle groups. To make small **weight** adjustments, curlers use a fine tuning mechanism. The two major methods to achieve fine tuning are using an arm extension or a lowering of the upper body.



Using the arm extension method, you will develop a bend in the delivery elbow once balance has been achieved.

As you approach the release area and apply the rotation on the **handle**, extend your arm. If the **weight** of the delivered **stone** is correct, you will extend your arm at the same speed as the **stone**

is traveling. You have not applied any extra **weight** to the **stone**. If you determine that the **stone** is not traveling quickly enough, you will extend your arm faster than the **stone** is traveling. This extension will add some **weight** to the **stone**. If you determine that the **stone** is traveling too quickly, you need to slide farther than normal and this extra distance will decrease the momentum of the **stone**. You would be well advised to develop a release zone that is well back from the **hog line**. Incorporating this extra room into the **delivery** allows you to occasionally slide farther if needed without fear of violating the **hog line**.

In order to use an arm extension as a fine tuning mechanism, you must keep the upper body high during the forward slide. A high upper body position also allows the wrist to be maintained in a high position so that the turn can be applied in a positive manner.



Another method used to add a small amount of **weight** is by gradually lowering your upper body. Slide forward with your upper body in a high

position during the final release motion and gradually lower your upper body. If you determine that an additional amount of **stone** speed is required, lower your upper body faster than normal.

STICK DELIVERY

Curling with a **delivery stick** is an alternative way for curlers to enjoy or continue the sport. It is appropriate for people with physical disabilities such as knee, back, heart, shoulder, elbow, wrist, hip, ankle, or foot problems, or just simply advanced age. The **stones** are delivered with a **delivery stick** from a standing or sitting position (i.e., wheelchairs) enabling everyone to continue to participate.

Curlers can use **delivery sticks** within their regular club **games** as an alternative to the traditional **delivery** and continue to **brush** or **skip**. Alternately, leagues, **bonspiels** and championships are being created across the world composed only of curlers using the **delivery stick**. These **competitions** do not always involve **brushing** and many have their own rules. Currently, stick curling is only allowed in wheelchair championships at the world level.

Equipment

Footwear

Footwear with two gripping surfaces is recommended even for the most seasoned curler. It allows the curler to safely maneuver on the ice. Curlers can use clean athletic shoes with two removable grippers covering the soles or actual curling shoes with a permanent gripper surface and a removable gripper covering the sliding surface.

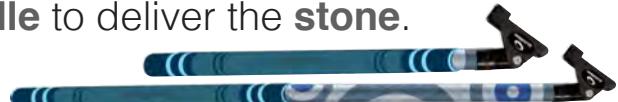
Clothing

Clean, non-shedding, flexible clothing is recommended for any curlers. Curlers should dress warmly in layers. Gloves or mittens with leather palms should be used for proper grip on the **delivery stick**. (Many stick curlers, like their traditional **delivery** fellow athletes, remove the glove on the **delivery** hand when delivering the **stone**.)

Delivery Device/Stick

Like other curling **equipment** there are many different **delivery sticks** on the market for purchase. Each has their own merits and some are easier to use than others. Be sure to do some research before purchasing a stick.

A stick that resembles a **brush** handle with an attachment on the end that secures over the **stone handle** to deliver the **stone**.



Cleaning the Stone

Bend over in the **hack**, rotate the **stone** over and clean with a mitten or with a **brush**. (Standing behind the **hack**, placing the **stone** between the **hacks** and using the **hacks** to help tilt the **stone's** running surface for cleaning is a suggestion for some who find this task difficult.)

Delivery of the Stone

Technique for delivering a **stone** with a curling stick is an adaptation of the normal curling slide **delivery**. The fundamentals are the same:

Line - direct the **stone** to the target (the **skip's brush**)

Weight - release the **stone** at the appropriate speed

Rotate - release the **stone** with the rotation that will cause it to **curl** in the intended direction, as it moves down the ice.

Stance

The rules of curling state that the curling **delivery** must be initiated from the **hack**. This applies to curlers who use **delivery sticks** as well. Right handed curlers must start with their right foot in the left **hack** and left handed curlers must start with their left foot in the right **hack**.

While standing behind the **hacks**, place the **stone** so that the **stone** is centred on the imaginary line between the centre of the appropriate **delivery hack** and the **skip's brush** head (target). Begin with the **handle** of the **stone** placed so that the gooseneck of the **handle** is at the 12 o'clock position.

Grip

Grip the **delivery stick** so that the "V" formed by your thumb and index finger is on the top of the **handle** — this grip should remain the same during the entire delivery. Place the **delivery stick** on the **handle** of the **stone**.

Rotate your wrist/forearm so that the **handle** of the **stone** is positioned at either the 10 or 2 o'clock position depending on the rotation indicated by the **skip**. The **handle** of the **stone** should remain in this position until the **stone** is just about to be released.

Slowly move the **stone** forward on the intended line until you have placed the appropriate foot in the **hack**. Attention should be given to pointing the toe in the **hack** towards the **skip's brush**. Your other foot should be parallel to the **hack** foot with the hips and shoulders square to the **line of delivery**.

The delivery device should be positioned on the **line of delivery** and the arm should be bent (soft elbow) so that the hand of the delivery arm is touching the body at the hip joint.

At this point, the forward motion must be applied using either — the long delivery or the short delivery.



Forward Motion

Long Delivery



The long delivery consists of pushing off the **hack** and walking/running forward to gain momentum before releasing the **stone**. It is the common form of delivery in Canada, Scotland and the United States.

From the stance position the delivery arm must remain bent but firm so that the **stone** begins to move before the body, the **stone** must precede the curler so that both the **stone** and curler can remain on the **line of delivery**.

The curler must walk on the **line of delivery**. The speed at which they walk or run will determine the speed of the **stone**. i.e. for a **guard** the curler will walk slower, whereas if a double **take-out** is required, the curler may walk quickly or run slowly to create enough momentum for the **stone** to complete the intended shot.

At least 6 or more feet before the **stone** reaches the **hog line**, smoothly rotate the stick (in about 2 seconds) so that the “V” of your hand comes back to the top of the stick, or the gooseneck of the **handle** re-rotates to the 12 o'clock position. At the same time the delivery arm is extended on

the **line of delivery**. Like the conventional curling delivery 2 to 3 rotations down the ice is desired for a **draw** shot. Remember the stick must be removed from the **stone's handle** prior to the leading edge of the **stone** touching the near side of the **hog line**.

Short Delivery (WCF Rules)

WCF rules state that the **stone** must be clearly released from the **delivery stick** before either foot of the player delivering the **stone** has reached the **tee line** at the **delivery end**. The short delivery abides by this rule and will accommodate curlers who are not comfortable walking or running to the **hog line**.

At the same time the delivery arm extends forward on the **line of delivery**, imparting the rotation during the extension. To impart the rotation the “V” of the hand comes back to the top of the stick, or the gooseneck of the **handle** re-rotates to the 12 o'clock position.

The short delivery makes judging **weight** a little tougher, but with practice curlers can become quite good at it. The long delivery can also allow for some fine tuning with regard to **weight** by adding more or less arm push upon extension. Regardless of the technique used, curlers must ensure the **stone** is kept on the **line of delivery**.



3

BRUSHING

Brushing is an important aspect of the game of curling. Too often curlers spend most or all of their practice time delivering **stones** and spend very little time perfecting their **brushing** techniques.

Effective **brushing** enables the **stone** to maintain its momentum longer than it would have had it not been brushed thus allowing the **stone** to travel further. Since the amount the **stone** curls is dependent on time, a brushed **stone** will not have as much time to **curl** and, as a result, the **stone** will travel straighter.

Learning Progression

Brushing is a skill that should be developed in specific segments:

- **Brushing** effectiveness.
- **Equipment** and its care.
- Stance.
- Grip.
- Footwork.
- **Brushing** action.

Brushing Effectiveness

There have been many theories regarding the effectiveness of **brushing** and what it actually does. **Brushing** reduces the friction between the **stone** and the **ice surface** in three ways:

1. Smoothing the **pebble**.
2. Removing frost and debris.
3. Causing the **pebble** to warm briefly to create a thin film of moisture that acts as a lubricant between the ice and the **stone**.

To become an effective brusher, the curler must develop endurance, **brush** head speed, downward pressure on the **brush** head, **weight** judgement skills and the ability to communicate the **weight** to the **skip** or **vice-skip** in the **house**.

Equipment

In order to develop an effective style of footwork that can be used to brush on both sides of the

stone, the use of grippers/anti sliders on both feet is highly recommended. A slip-on gripper is placed on the sliding shoe when the curler is not delivering.

Grippers should be inspected prior to each and every **game**, to ensure that they are in a suitable condition. Any **equipment** that comes in contact with the **ice surface** must not cause any damage to the **ice surface** or leave debris on the **ice surface**. Grippers are generally made of a soft crepe-like rubber or a pebbled type of rubber. Grippers made of a pebbled type of rubber eventually tend to shed small pieces as they become worn. Examine your gripper to ensure that it is not shedding. Grippers should be washed regularly on the inside and the outside with soap and water to remove loose debris and dirt buildup.

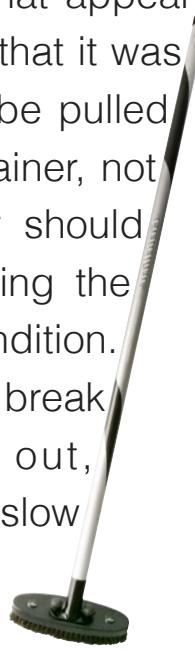


There are many types of **brushes** on the market today. **Brushes** may be made of hog hair, horse hair or a fabric covered **brush** head. The **brush** heads come in a variety of sizes and shapes, some with a fixed angle between the shaft of the **brush** and some with a flexible angle. New curlers are encouraged to try a variety of different brushes to determine which **brush** "feels" right for them.

Regardless of the type of **brush** that the curler selects, the **brush** must be cared for.

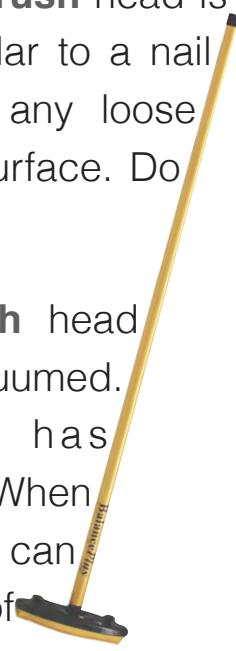
Hair **brushes** should be inspected after every shot that involved **brushing**. This is done simply by rubbing their hand across the bristles to remove any frost or debris from the **brush**. A

quick glance will also allow the curler to inspect the **brush** for loose hairs – those that appear to have “grown” since the last time that it was checked. These long hairs should be pulled out and deposited in a refuse container, not on the ice. Periodically, the curler should check to see if the adhesive holding the bristles in place is still in good condition. After a period of time, the glue may break down, allowing hairs to fall out, potentially causing the **stone** to slow down or travel off line.



Synthetic **brushes** need to be cleaned on a regular basis. Between shots the **brush** head is scrubbed with a small **brush** similar to a nail brush. This will help to remove any loose debris that has collected on the surface. Do this over a refuse container.

Between **games**, when the **brush** head has dried, the head may be vacuumed. This will remove dust that has accumulated in the **brush** head. When the surface of the head is dirty, it can be washed. Spray a small amount of



TECHNIQUE

Stance

Stand beside the path of the **stone**. Position your feet so that they are shoulder width apart, parallel to the **centre line** (path of the **stone**). Bend your knees so that your weight is on the balls of your feet. The heels may be raised slightly off the ice. This stance position will permit you to move efficiently down the ice and ensure that you have a clear line of vision toward the target and your **skip** or **vice-skip**. A clear line of vision enables the brushers to see **stationary stones** and is beneficial for **weight** judgement and communication.



Grip

Place the **brush** handle across the front of your body. Grip the handle with both hands, dividing the handle of the **brush** into thirds. Position the hands so that the hand closest to the **stone** is approximately one third of the way up the handle from the **brush** head. This hand is the bottom hand and is in a palm down position. Place the

top hand a further one-third of the way up the handle, palm up.

Hold the top part of the handle against the rib cage with the upper part of the arm. Lean forward and place the **brush** head on the ice. Transfer some body weight onto the **brush** head by lifting the heels slightly off the ice. The bottom arm should be relatively straight. Remember the weight is on the balls of the feet. [**metatarsal**]

Footwork

Bend your knees slightly and place some body weight on the head of the **brush**. Take a step (with the outside foot) to initiate forward momentum down the **sheet**. From there you will use a gliding cross country (nordic) ski style of footwork down the ice.

Both feet remain in contact with the ice at all times. Remember to remain on the balls of your feet (metatarsus) to ensure that the upper body weight remains on the **brush** head.

Alternate Footwork Method

Curlers are strongly encouraged to use double grippers for footwork. If this is not possible due to the lack of a second gripper, you may need to learn a push-glide motion to propel yourself down the ice. With this type of footwork, the new curler will only be able to **brush** from one side of the **stone**.

The side of the **stone** you brush on will be determined by the sliding foot. If your **slider** is on your left foot, then you must brush on the left side of the **stone**.

Position your hips at a 45 degree angle to the path of the **stone**. Your feet should be slightly more than shoulder width apart. Lean forward so that most of your body weight is on your sliding foot, leaving the gripper foot free to provide momentum. Simply push with the gripper foot, slide on the sliding foot and **brush** in front of the **stone**. When more speed is required to keep up with the **stone**, bring the gripper foot up to the sliding foot and extend the back leg to produce momentum.

Brushing Action



Apply as much downward pressure as possible through your lower arm onto the **brush** head. Implement a small push-pull action with your top hand/arm onto the **brush** handle. Develop a series of short (6 inch / 15 cm) rapid strokes to brush/scrub the path of the **stone**.

Development Drills

The objective of the on-ice drills is to develop confidence with the stance, grip, footwork and **brushing** action on both sides of the **stone**. The objective will be accomplished by the following drill procedures.

Development Drill #1

Footwork (no brushing yet)

- Position yourself on the left of the **centre line** facing down the **sheet**.
- Assume the correct stance and the correct grip on the **brush** handle.
- Place the **brush** head on the ice on the **centre line**.
- Implement footwork action without **brushing**.
- Travel slowly with the cross-country ski style of footwork. Gradually increase the travel speed.
- Repeat the drill on the right side of the **centre line**.

Development Drill #2

Stationary Brushing (no footwork motion)

- Position yourself to the left of the **centre line**.
- Hold the top part of the handle tightly against your body with your upper arm.
- Apply downward pressure through the lower arm onto the **brush** head.

- Apply a slow back and forth motion with the top hand.
- Vary the speed on the strokes; slow/medium/fast.
- Repeat the drill positioned to the right of the **centre line**.

Development Drill #3

Footwork and Brushing

When you have practiced stance, footwork and stationary **brushing** as individual drills, it is time to combine footwork and **brushing**. Using the same format as the footwork drill, move along the ice on the left side of the **stone** and then perform the mirror image of the drill from the right side.

- Position yourself to the left of the **centre line**.
- Practice slow stationary scrubbing.
- Incorporate slow cross-country ski footwork.
- Increase/vary travel speeds for **draws** and **take-outs**.
- At the far end of the **sheet** move to the right side of the **centre line** and repeat the drill from the other side.

Development Drill #4

Add **Stones**

It's time to incorporate the **stone** into the practice.

- Repeat Drill #3 using a **stone**. The curlers work in pairs. One curler pushes the

stone slowly down the ice with a **brush** while their partner brushes. Gradually increase the speed of the **stone** so that a more realistic **brushing** action is experienced. The partner can help to monitor the brusher's **brushing** action – stroke length. When the **stone** has traveled the length of the **sheet** of ice, repeat the drill reversing the positions of brusher and pusher. Repeat drill on the opposite side of the **stone**.

- The next step is to arrange the curlers into groups of three. One curler pushes the **stone**, one brusher brushes from the left side and one brusher brushes from the right side.

Right from the beginning the curler is encouraged to learn to **brush** from both sides of the **stone**. Footwork is easier when the two brushers are on opposite sides of the **stone**. From a safety point of view, brushers on opposite sides is much preferable. There is less chance that one brusher will trip the other brusher. The closer the two brushes are to the **stone**, the more effective they will be. It is easier to get the brushes close together when they are on opposite sides of the **stone**.

Repeat the drill with a curler delivering **stones** rather than pushing the **stone**.

The curler **brushing** next to the **stone** is referred to as the inside brusher. The inside brusher has the main responsibility of judging the traveling speed (**weight**) of the **stone**, and to do so must consistently scan the distance from the **stone** to the final destination. The inside brusher should position their **brush** head close to the **stone**. This allows the outside brusher to also move in

close. The outside brusher must observe the path of the **stone** and be cautious not to interfere with the inside brusher. The outside brusher will assist the inside brusher in judging the speed of the **stone**.

When the two brushers are waiting to commence **brushing**, they should stand well to the side and position themselves between the **back line** and the **tee line**. As the thrower begins the forward motion, both brushers begin to move forward, slightly ahead of the player delivering the **stone**, so both may begin **brushing** as soon as the **stone** is released. Both brushers must be sure that they brush directly in front of the **stone** at all times.

BRUSHING TIPS

- Practice **brushing** on both sides.
- Be prepared to brush from the hog to the **tee line** and beyond if necessary.
- Follow all **stones** to their conclusion. Don't give up on them part way down the ice!
- Know what shot is being called to understand what **weight** is wanted.
- Develop good communication with the **skip**. Let the **skip** know what **weight** was delivered.
- Prior to every shot, check the intended path of the **stone**. Remove all visible debris.
- The inside brusher should brush as close as possible to the **stone**. The outside brusher should brush as close as possible to the inside brusher.
- Brush all shots lightly to keep the path clean.
- Check **brushes** after each shot. Ensure that they have not accumulated debris. Deposit debris in the refuse container, not on the ice.
- As you brush down the ice, remember to breathe normally. Do not hold your breath.
- Alternate your vision from the **stone** to the far end and continually judge and rejudge the **weight**.
- The brushers are responsible for judging the **weight** of the delivered **stone**. The skip/**vice-skip** is responsible for judging the line or path of the **stone**. Communication between the brushers and **skip** is vital.

WEIGHT JUDGEMENT

Many times throughout the course of a curling **game**, the question is asked “What is the **weight**?”

The person asking the question may be the thrower. The thrower needs assistance to determine how hard to deliver the **stone**. In many instances, the person asking may be the **skip**. The **skip** needs to know the speed of the **stone** to determine if the delivered **stone** will finish in the desired location. **Weight** judgement skills and the ability to communicate this knowledge are a primary responsibility of the **lead** and **second**. Their judgement must include knowing the speed of both **draw** shots and **take-outs**. Excellent **weight** judgement skills are critical to the success of **teams** playing a finesse **game**.

Curlers need to develop their observation skills and memory of various paths on the **sheet** of ice.

Observations include:

- How many **stones** have been played in the area?
- Has the **pebble** been worn?
- Is there frost present?
- Is the **stone** moving from an area of quick ice into an area of slower ice?
- How much impact does **sweeping** have?

- Has the speed of the ice changed from the previous **end**?

The **lead** and **second** are the primary judges of **weight** because they stand near the **hog line** at the **delivery end** of the ice, and therefore are in a position to see the released **weight** of every **stone**. There are several ways of reading **weight**: using a stopwatch, comparing the **weight** with your home club **draw weight** and comparing the **weight** with a previous game’s **weight**.

Many brushers use a stopwatch to aid their judgement. Curlers time a variety of aspects of the game but we must remember that the stopwatch is a tool to assist them to judge.

Timing Draw Shots

Many curlers time **draw** shots to give the thrower a good indication of the **weight**/speed needed to deliver a specific **draw** shot. Timing the **draw** shot would assist the thrower with:

- comparing the speed to well known ice;
- identifying any changes in ice conditions; and
- identifying paths that may be fast or slow.

There are a variety of systems used to time **draws**:

1. **Hog line** at the **delivery end** to stop in the **house**.
2. **Back line** at **delivery end** to stop in the **house**.
3. **Hog line** to **hog line**.
4. **Back line** at **delivery end** to **hog line** at **delivery end**.

Once the curler knows the time it takes a **draw** shot to travel over a specific distance interval, they can use this information to deliver a **stone** of the same speed. Curlers must practice delivering **stones** that take specific lengths of time to travel the length of the **sheet**. The key word here is “practice”. In order for the information to be useful, the curler must practice delivering **stones** of different **weights** or speeds.

If a **draw** shot requires substantial speed and therefore a short period of time to travel down the ice, it requires a relatively significant amount of force. Therefore the ice is “slow” or “heavy”. If a **stone** takes a longer period of time to travel the same distance, it requires less force and is moving slowly. The ice is, therefore, relatively “quick” or “fast”.

During a practice, the team may determine that it takes a **stone** 23 seconds to travel from **hog line** to **tee line**. If they were to practice for ice that is 24 seconds, they would practice delivering **stones** that would stop just short of the **house**. Each extra second of time is equal to about 6 to 8 feet (2 to 2½ metres) of distance. Practicing on 23 second ice, for 25 second ice is a matter of delivering **draws** which stop 12 feet (plus) (approximately 4 metres) short of the **house**.

Knowledge of upcoming ice conditions is very useful for practice planning. Call ahead to **competition** sites and ask the ice technician what interval time is required for a **draw** shot to stop on the **tee line**. (Make sure that you know where he is starting the stop watch – **back line**, **tee line** or **hog line**.)

Timing from **hog line** at the **delivery end** to stop in the **house** assists the thrower prior to **delivery** of a **draw**.

Interval Timing for Sweepers

Interval timing was developed to assist brushers to evaluate where the delivered **draw** shot would stop. This type of timing is useful for the **stone** that is currently in motion.

- START the stopwatch at the first **back line**.
- STOP the watch at the first **hog line**.
- Note the time on the stopwatch.
- Observe where the **stone** comes to rest.

For Example: The first **stone** is delivered at a time of 3.5 seconds and it comes to rest in the top of the 12 foot circle. The next **stone** delivered down the same path is timed at 3.6 seconds. The brushers would expect that the second **stone** would stop short of the **rings**.

The longer a **stone** takes to travel from the **back line** to the **hog line**, the slower it is thrown and hence the momentum is decreased.

Stopwatch timing, using interval times, is a technique that helps the brushers develop their skill in judging the delivered **weight**. The brushers must constantly observe the **stone** as it

Near Hog Line to Far Hog Line	Near Hog Line to Far Tee Line	Near Back Line to Far Tee Line	Near Back Line to Near Hog Line
12 seconds	21.5 seconds	24.8 seconds	3.3 seconds
13 seconds	23 seconds	26.5 seconds	3.5 seconds
14 seconds	24.5 seconds	28.2 seconds	3.7 seconds
15 seconds	26 seconds	29.9 seconds	3.90 seconds

travels down the ice and re-evaluate their initial judgement.

Many factors may influence the accuracy of the interval method of judging **weight**.

- Curlers who slide out slowly and then give a push to the **stone** will have different times than curlers who deliver with only a small amount of fine tuning mechanism.
- The running surface of the **stones** may vary and as a result the **stones** may vary in speed and curl.
- The number of **stones** delivered down a particular path in the **sheet** of ice will influence the speed of ice in that path.
- Human error may occur in stopping and starting the stopwatch. (It is advisable that the same person on a team does all the interval timing. Some curlers may start and stop the watch early or late. A difference of 1/10 of a second is significant. The error is not important as long as the error is consistent. If the same curler times all their teammates' shots, the error will be constant.)

Note: When timing **stones**, use your first finger to stop and start the watch. The finger is more accurate than the thumb.

The second brusher should be observing the **delivery** of the **stone**. Did the curler add a push at the end or pull back at release? This brusher must watch carefully as the **stone** is released. The timer will confirm or deny the initial judgement. As the **stone** travels down the ice, the two brushers need to constantly fluctuate their line of sight from the **stone** to the **house** and evaluate the final destination of the shot.

Timing Take-outs

Competitive **teams** select three or four distinct **take-out weights** to use. These specific **weights** must be communicated, during a **game**, to each team member and must be understood by each team member.

To promote consistency in **weights** for **take-outs**, a team may use timing. Timing **take-outs** is usually used in practice situations. We can all see what a **skip** means by **hack weight** – enough **weight** for the **stone** to reach the **hack**. What does the **skip** mean by normal, control or **peel**?

During practices, **take-out weights** are predetermined so that everybody on the team understands what **weight** is requested.

When working on a set team **weight** for a specific **weight**, for example “normal”:

- Team members deliver **take-outs**.
- Time shot from **hog line** to **tee line**.
- Determine a comfortable time for all team members.
- Identify the time (for example 11 seconds).
- All team members attempt to deliver **stones** with this speed (within 1/2 second of the designated time.) Developing a consistent speed assists in making more shots.

The drill is repeated for other **weights** (control, **peel**). **Take-out weights** should be at least two-seconds apart.

Shots delivered with the requested **weight** present fewer problems for the **skip** when he is calling line. Shots that do vary from the designated **weight** may present problems. Communication of the exact **weight** delivered is vital.

Weight judgement and communication of the exact delivered **weight** is vital for success. Brushers must practice observing and determining the **weight** of the delivered **stone**.

Weight	Near Hog Line to Far Hog Line
Peel	7 to 8.5 seconds
Normal	8.5 to 9.5 seconds
Control	9.5 to 10.5 seconds
Bumper / Barrier	10.5 to 11.5 seconds
Hack	11.5 to 12.5 seconds

READING THE ICE

Each team member must know the layout or shape of the **sheet** of ice. Even though the **skip** takes prime responsibility for reading the ice, each team member must observe each delivered shot. On occasion, **skips** need help to remember what happened at a particular time or at a specific spot on the ice. All team members must therefore watch all shots that are thrown (their own and their opponents') in case the **skip** needs assistance.

- Brushers must have knowledge of how the ice is reacting.
- Brushers need to be able to anticipate where the break (sudden curl) occurs on shots.
- Brushers need to know where the **pebble** has worn down.

A **draw** that travels straight down the “well used” middle section of the **sheet** might require less **weight** than a **draw** that initially travels down the middle and then curls over the unused ice on the outside of the **sheet**. On the other hand, a **draw** down the unused, outside section of the **sheet** in the early **ends** usually requires much more **weight** than one that travels down the used or broken-in centre section. A **draw** shot that has a pronounced **curl** needs more **weight** than a straight running **draw** (assuming uniform ice) because a curling **draw** shot has a slightly longer path and digs into the ice more as it takes on its **curl** than a straight running **draw**.

- The brushers must know the path of the **stone**.
- Brushers must know whether the **stone** curls quickly from the keener, used ice onto the heavier, **pebbled** side ice so that they can judge and brush the ice.
- Brushers must be able to judge when the ice has gone flat (the **pebble** has been worn down too much.)

Experienced brushers generally display good anticipation when **brushing**. If a **draw** shot is expected to **curl** from **fast ice** to heavier ice, it is often necessary to begin **brushing** before the **curl** begins. Furthermore, on many **take-outs**, **brushing** must begin before the anticipated curling occurs. Inexperienced brushers too often do not use their **brushes** until the **stone** begins to **curl** quickly – and then it may be too late. The ice usually changes during the **game**. Knowledgeable brushers recognize when this change occurs and use their skills to adjust to the new conditions.

BRUSHING COMMUNICATION

Good communication during **brushing** may give an advantage to a team succeed that does not deliver as well as another. The **skip's** ability to communicate the intended shot clearly to each team member ensures that each curler is aware of the team's primary objective. It is important for all four players to take on an active role in communication.

Signals

Verbal instructions can be used very effectively in some situations. However, in most cases, it is difficult to hear instructions that are shouted from one end of the **sheet** to the other. An appropriate solution is to develop a set of hand signals to signify specific **weights** (touch shoulder – throw **peel weight**, touch hip – throw control weight). Each member of the team can see exactly what **weight** is requested and the appropriate decisions can be made by the thrower and the brushers.

It is a good practice to have the thrower and the brushers return the signal to the **skip**. This return signal tells the **skip** that all team members know exactly what **weight** is being requested. Giving the **weight** signal back to the **skip** assists the other team members to focus on the desired **weight**. At release, the outside brusher should quickly signal the delivered speed of the **stone**. The **weight** signal improves communication and increases the chance for a team's success.

Before the Shot

The **skip** must communicate to the thrower and the brushers the specific shot and **weight** desired. The specific **weight** should be signaled and the signal returned by the teammates. The brushers, knowing both the intended shot and the required **weight**, must visualize the intended path of the **stone**. It is very beneficial if the team knows what Plan B (back-up plan) is as well. Knowing the game plan is a must. The brushers and thrower must know: what do we want, what are we prepared to accept and what is not acceptable. If we are not sure of the exact **weight**, is it better to be a little **light** or a little on the **heavy** side?

During the Shot

Once the thrower has initiated the **delivery**, both brushers move down the ice with the **stone**. On **draw** shots, one of the brushers may be timing the **back line to hog line** interval. The other brusher is observing the slide and release to judge the speed of the delivered **stone**. Immediately at release, one of the brushers will inform the **skip** of the speed. The **skip** will use a short command to inform the brushers of any off-line **delivery (wide or narrow)**. Communication should continue as the **stone** moves down the **sheet**. Brushers must always be prepared to brush until all **stones** have stopped. Brushers must continually move their line of sight between the **stone** and the intended target.

Shots requiring judgment for **weight** and line are the most challenging. The person in the **circles** usually has control. Such shots might go as follows:

A **come around hit** is being played; as the **stone** is released, the **skip** calls “sweep” (the **stone** is **narrow**). The brushers respond with “control weight”. If the **skip** continues to call “sweep” the brushers identify that the call is for line.

A **come around draw** is released and both brushers immediately start **brushing**. The **skip** knows the **stone** has to **curl** a considerable amount and for that reason calls “whoa” (the **stone** is **wide**). The brushers originally started **brushing** because they knew the **stone** was **light** and therefore reply “not enough **weight**”. The **skip** must then decide whether to continue **brushing** and get the **stone** into the **circles** without cover or to not brush and allow the **stone** to **curl** and probably stop short.

Many inexperienced **skips** and **vice-skips** tend to call **brushing** too late. Curlers should not wait to call **brushing**; rather, they should develop the habit of calling at the first indication of need.

After the Shot

The team must communicate upon completion of the shot. The thrower should recognize the efforts of the brushers. “Well done, thanks.” The **skip** should congratulate both thrower and brushers if the comment is appropriate or say “My error” if it applies. Positive communication after each shot makes each member feel as if he played an important role in the execution of the shot.

On the other hand, if a shot was missed, a simple “Tough luck, sorry” should be conveyed to the appropriate members. The reason for the miss should be determined and expressed by those who erred so that if the same shot is called later, everyone will know the adjustment required. Negative comments should not be uttered at any time unless they are constructive criticisms.

RESPONSIBILITIES DURING BRUSHING

The thrower, brushers and **skip** or **vice-skip** have distinct responsibilities during **brushing**.

Thrower

When determining whether or not a **stone** requires **brushing**, the team should use the thrower's opinion as an initial indication of execution. Curlers with experience usually know at the time of release whether they have made an error, that is, turned the **stone** in, flipped it out, or thrown the wrong **weight**. In such cases, the thrower will offer advice to the brushers at release.

Brushers

The primary function of the brushers is to judge the **weight** of the shots and to brush accordingly. Both brushers must function as a unit in judging **weight**. One may be the timer and the other judges by feel and observation. On open **draws**, the brushers have complete responsibility for **brushing**, but on line calls, direction on **brushing** comes from the person in the **house**.

Skip or Vice-Skip

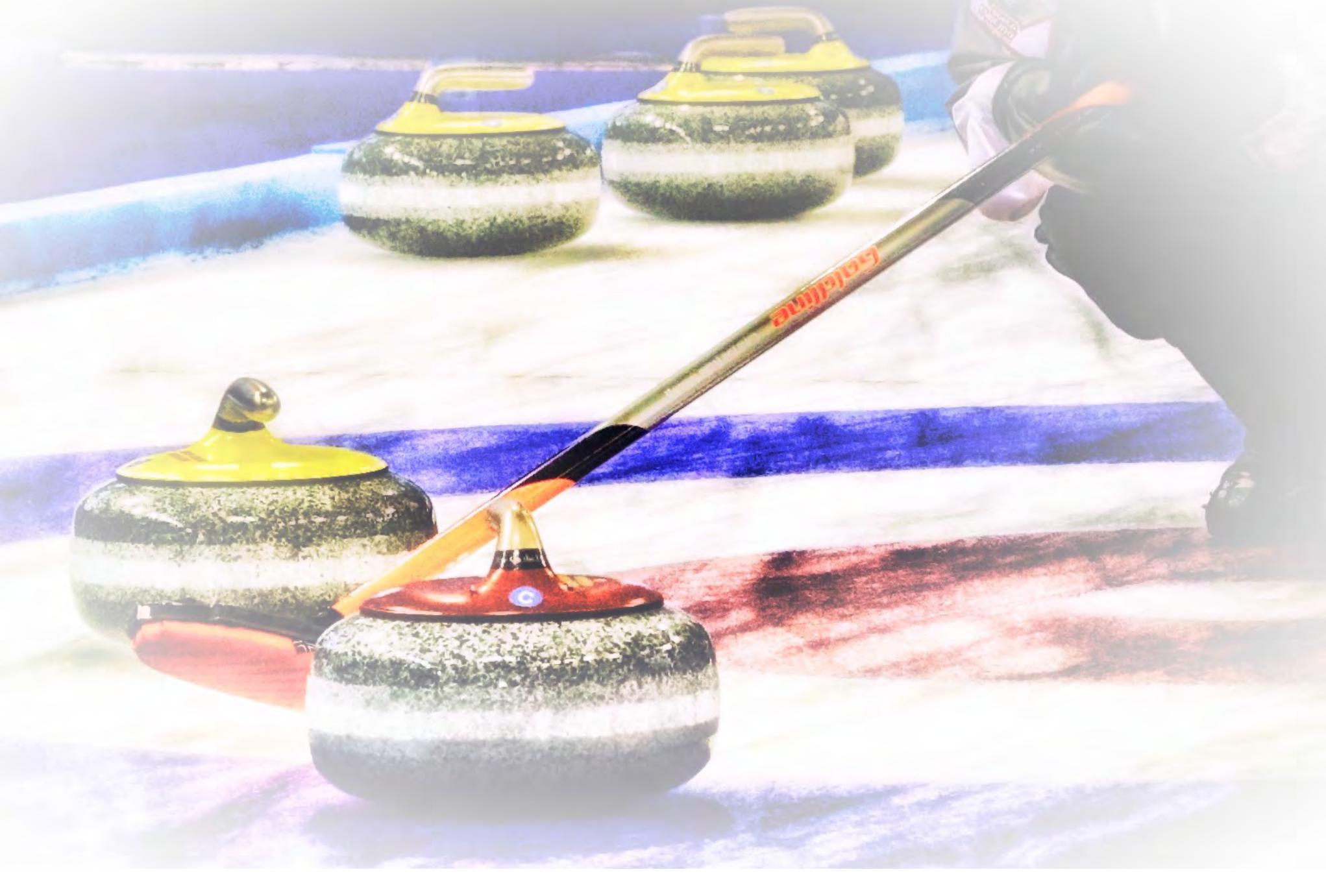
On all shots on which line is a consideration, the **acting skip** has total control. The brushers advise him of the **weight** and he must believe their call and use that information to call the correct **brushing** for line. Teamwork is very important because many shots require both line and **weight** calls.

Hits and rolls and **freezes** demand precise teamwork. Line is vital, but calling line requires that **weight** be identified accurately. Any deviation of **weight** from the expected will cause the **stone** to take a path different from that which the **skip** expects. Thus, both the **skip** and the brushers must communicate well during the shot to achieve the desired result.

Guards are a difficult shot to execute perfectly: both line called by the **skip** and **weight** judged by the brushers are important. A joint effort is therefore necessary to produce the desired result. However, because the most critical factor on a **guard** is the line, the **skip** should have the final decision on this shot.

On tap-backs, **come arounds** and **draws**, both **weight** and line are important but the **skip** should have the final say in calling because of the importance of the line call.

In conclusion, the **skip** makes the final decision about line and the brushers have primary responsibility for **weight**. In cases where an interaction of **weight** and line judgement is needed, good communication between the **skip** and brushers greatly increases the team's ability to produce excellent shots.



4

STRATEGY

Strategy is commonly defined as "deciding what shot to play". Although this is an important element, it is not all there is to strategy. More broadly defined, it is "the decision making process a team goes through before, during and after a **game**". This includes setting goals, making game plans, deciding game style, shot selection, and game evaluation. With this in mind it is essential that all team members contribute to "team strategy" and as a result require a solid understanding of the following:

1. Basic terminology relative to strategy.
2. The factors that influence shot selection decisions.
3. How the **Free Guard Zone** Rule affects strategy and shot selection.
4. Basic strategy relative to the advantage of last **stone**.
5. Methods for playing different ice conditions.

TERMINOLOGY

When considering strategy, the terms used for different styles of play must be clearly defined and understood. The words offensive and aggressive generally means that the **game** has more **stones** in play and involves **guards**, **raises**, **come arounds** and **freezes**. Teams using this strategy are attempting to **score** more than one **point** or to steal **points**. Associated with this style of play is the word **finesse**, referring to a more delicate type of shot such as **come around draw** shots. Other terms synonymous with this strategy are risky or complicated. A general name for this kind of strategy is the offensive approach or “offense first” approach.

On the other hand, the words defensive and cautious generally refer to a **take-out** style of play where there are relatively few **stones** in play. Other terms used for this style are conservative, safe and open; as a result of very few **stones** being in play most shots are relatively simple. A general name for this kind of strategy is the defensive approach or “defense first” approach.

The following table provides for a clearer understanding of this terminology:

Offense First	Defense First
aggressive	cautious
finesse	conservative
stones in play	open
guards	hits
freezes	peels
come around draws	run throughs

Most **teams** will combine offensive strategy with defensive strategy and will therefore have a “balanced attack”.

FACTORS INFLUENCING SHOT SELECTION

The six major factors that influence shot selection are:

F Free Guard Zone Rule

The **Free Guard Zone** Rule influences shot selection relative to the first four **stones** of an **end** and impacts strategy decisions throughout the course of a **game**.

E End

The FGZ Rule provides substantial opportunities for offense including comebacks in the middle and late **ends** of a **game** with or without last **stone**.

S Score

The **score** in relation to the **end** you are playing will greatly influence shot selection decisions.

R Last Rock/Stone

Last **stone** advantage plays a key role in shot selection decisions. Having last **stone** advantage may result in a more offensive approach. Not having last **stone** may dictate a defensive approach.

A Ability

The skills of opponents and teammates required to successfully play both offense and defense are critical to planning strategy and making appropriate shot selection.

Knowing the position by position strengths and weaknesses of your team and your opposition will have a great impact on the strategy you employ. The key element is knowing how to maximize your own team's strengths.

The strategy you design for your team and the shot selections you make during a **game** should be based on the abilities of the individual players and the team as a unit.

I Ice

Ice conditions will play a key factor in determining the strategy a team is able to apply. Fast, **swingy ice** will produce optimum playing conditions. Straight ice conditions will restrict the aggressive **come around** approach and may dictate a **raise** style game plan.

It is important to note that, of these factors, last **stone** advantage and the relative skills of both your team and the opposing team are the main factors that influence shot selections for the developing curler. To be successful however, all team members, but especially the **skip**, must have a good understanding of how the six factors influence shot selection.

BASIC CONCEPTS

The **Free Guard Zone** Rule provides a number of offensive and defensive options to well prepared **skips**. Strategy and shot selection relative to the first four **stones** of each **end** will provide **teams** with numerous interesting and challenging decisions.

1. The ability to think on your feet and make shot selection decisions based on "FESRAI" is very demanding and is influenced by the number of **stones** in play. **Teams** are constantly faced with reevaluating their game plan and shot selection options as they analyze the relative "risk vs reward".
2. "Flexibility" plays an important role in designing game plans and developing strategy as **teams** are faced with having to change their strategy within many **ends** as they move from defense to offense and vice versa.
3. The terms "patience" and "caution" cannot be ignored an over-creative **skip**. **Teams** who cannot back up their creative and aggressive strategy with precision shot making will find themselves on their way home ahead of schedule.
4. Effective skipping requires the ability to think two or three shots ahead, thus the common reference that curling is "chess on ice".
5. Establishing the relative ability of your team compared to the opposition and the "playability" of the **ice surface** will play a major role in developing your team strategy.
6. The ability of a team to score 2+ **points** with last **stone** or give up only 1 **point** without last **stone** will have a significant effect on shot selection, particularly in mid to late **ends**. A two to four **point** variance with two or three **ends** remaining cannot be considered an insurmountable lead.
7. **Teams** with last **stone** may prefer to score their 2+ **points** to the side of the **sheet** but will often find themselves forced to the centre in search of offensive opportunities and to defend against a potential steal. **Teams** without last **stone** will be presented with many opportunities to steal but will also be challenged with trying to defend against multi **point ends** being scored against them by offensive-minded last **stone skips**.
8. The main challenge will be on how to defend against an offensively adept team.

GENERAL STRATEGIES

Without Last Stone

Defense

In situations where the **score** is close or a team is ahead in **points**, defense is the word that will best describe the approach of **teams** without last **stone**. In these situations, **skips** will attempt to apply a strategy that will limit the opposition to the **scoring** of only one **point**. To accomplish this, knowledgeable **skips** will direct play towards the centre of the **sheet**, thus restricting the opposition's ability to spread their **stones** out. This may ultimately block the opposition's path to the four-foot circle, thus enhancing the opportunity to steal a **point(s)**. **Teams** without last **stone** are usually more cautious in their shot selection, in that **take-outs** are played rather than **draw** shots when opponents have **stones** in the **house**.

Teams without last **stone**, who as a result of **score**, **end**, ice or opposition, would prefer to play a defensive style of **game** are faced with an interesting dilemma. Their **lead** cannot remove any opposition **stone** from the FGZ and as a result, they have a few shot selection options available with the final decision being greatly dependent upon the skill level of the **lead**. Remember - giving up two **points** in many situations will be perfectly acceptable.

Offense

Orchestrating offense without last **stone** is very easy with the **Free Guard Zone** Rule. The placement of centre **guards** which cannot be removed by the opposition until the 5th **stone** of the **end** can produce a number of opportunities for a team to control centre ice and potentially steal a **point(s)**. The only major concern the **skip** without last **stone** is faced with relative to the placement of a centre **guard** is "if" the last **stone skip** will elect to **come around** it. The further out the centre **guard** is the more likely the last **stone skip** is to play an aggressive **come around draw** in search of 2+ **points**.

With Last Stone

Offense

In situations when early **ends** have passed and the score is close or a team is down in **points**, offense is the word that best describes the approach of **teams** with last **stone** advantage. In these situations, **skips** will attempt to apply a strategy that will result in the **scoring** of more than one **point**. To accomplish this, knowledgeable **skips** may direct play to the sides of the **sheet**, thus enabling them to spread their **stones** out. This also tends to keep the path to the four foot circle open for a possible end-saving last **stone draw** shot.

Last **stone teams** will attempt to initiate their offense to the side of the **sheet** by establishing a corner **guard(s)** but may also find themselves developing offensive opportunities on centre ice as a result of attempting to prevent a potential steal. Aggressive last **stone skips** will take advantage of centre **guards** by playing **come around draws** in an effort to score 2+ **points**, even though this strategy will put them at greater risk to a potential steal. Ice conditions may also force last **stone skips** to direct play towards the centre of the **sheet** if **stones** are not curling much from the **centre line** out.

It is important to note that it is common practice for a **skip** who cannot score more than a single **point** to throw the final **stone** through the **house** or to **hit and roll** out, thus blanking the **end** and keeping last **stone** advantage.

Defense

Teams with last **stone** advantage who would prefer a defensive style of play because of **score**, ice conditions or the relative abilities of the opposing **teams** have a number of shot selection options available to them. Their objective may well be to ensure the opposition does not have the opportunity to steal a **point(s)** and therefore controlling centre ice will be a key factor. If the opposition **lead** places a centre **guard** the last **stone skip** will have to decide which of several defensive options best suits the situation.

GROUPING OF ENDS

Game strategy may vary dramatically as the **game** progresses. For the purpose of developing a game plan including shot selection, we recommend dividing the **game** into segments based on an 8 to 10 **end game**.

Shot Selection Options

Early ends (1 - 3) - Without Last Stone

Most **teams** will attempt to implement a defensive game plan during this segment of the **game** especially as it pertains to avoiding high risk finesse shots. Remember, you do not have to **score** (steal) in the early **ends** without last **stone** to ensure victory. It is more important to keep the score close as you build your team's confidence while learning the ice and assessing the abilities of the opposition. A general objective is to limit the opposition to **scoring** a single **point** when you do not have last **stone**. Even allowing two **points** is acceptable. There are three basic options relative to the placement of the first **stone** of the **end**:

Shot option #1 - long centre **guard**

Shot option #2 - short centre **guard**

Shot option #3 - top of the four foot or eight foot

The safest choice is selection #3 (defensive).

Note: In all situations, your team's familiarity with the game plan and ability of the opposition and knowledge of ice conditions may influence your decision to be more offensive or defensive in your shot selections.

Early Ends (1 - 3) - With Last Stone

Teams may be a little more aggressive in early **ends** when they have the advantage of last **stone** but generally speaking, still try to avoid risky situations that require the making of finesse shots. Last **stone skips** will also tend to play a defensive style of play as they build the confidence of their teammates while assessing the ability of the opposition and learning the ice. They will attempt to score their 2+ **points** to the side of the **sheet** but will not be overly concerned about **scoring** a single **point**, blanking the **end** or giving up a steal of one. There are three situations **teams** with last **stone** are likely to face when they go to throw their first **stone** of the **end**:

Situation #1 - long centre **guard**

Situation #2 - short centre **guard**

Situation #3 - top of four foot or eight foot

The following early **end** shot selection suggestions represent the safest choice (defense first).

Shot option - situation #1 - **draw** to the 8 foot behind the **tee line** and to the side of the **sheet**

Shot option - situation #2 - **draw** to the 8 foot behind the **tee line** and to the side of the **sheet** or bump the short **guard** into the **house** on an angle

Shot option - situation #3 - **hit** and stay on opposition **stone**

There are many other options that last **stone teams** have when presented with the above situations. Remember to apply the FESRAI factors and choose the shot that best suits your team.

Middle Ends (4 - 6) & Late Ends (7 - 9) - Without Last Stone

The middle and late **ends** of a curling **game** often present **teams** without last **stone** many interesting and difficult strategy situations. **Skips** must continually analyze the situation, apply the FESRAI factors and determine the most appropriate shot for their team. The ability to "think on your feet" is critical as **game** situations will force **teams** to switch back and forth between offense and defense.

Teams who are comfortable with the score relative to the **end** of play may well continue their defensive approach and attempt to limit the opposition to only one **point** or try to develop a safe steal. **Teams** who are either down in **points** or prepared for the challenges of finesse shot making will move to a more offensive style of **game**.

There are three basic options relative to the placement of the first **stone** of the **end** when the score is reasonably close:

Shot option #1 - long centre **guard**

Shot option #2 - short centre **guard**

Shot option #3 - top of four foot or eight foot

Teams who are comfortable with the score relative to the **end** of play will probably stay with shot selection #3 or consider #2 as the option with the potential for a safe steal.

Teams who are either down in **points** or prepared to move to a more aggressive **draw** style **game** will choose shot selection #1 or #2.

Teams who are protecting a substantial lead late in a **game** may well choose to throw their first two **stones** of the **end** through the **house**.

Remember, your team's strategy in the middle to late **ends** of a curling **game** should be to position yourself for the win. Aggressive shot selection must be backed up with excellent shot making.

Middle Ends (4 - 6) & Late Ends (7 - 9) - With Last Stone

The middle and late **ends** provide last **stone teams** with their greatest opportunity to take control of the **game** and position themselves for the victory. The ability of the opposition and condition of the ice should no longer be a mystery. Your team should be mentally and physically prepared to implement both the strategy and shot making required by the **game** situation.

In **games** where the score is close or the last **stone** team is down in **points**, the ultimate objective will be to **score** two or more **points**. As a result, **skips** will apply offensive minded tactics while attempting to avoid the steal. The more desperate the situation relative to score and **end** of play the more offensive the shot selections will be.

When the score is close, last **stone skips** would likely prefer to develop their offense to the side of the **sheet**. Last **stone skips** who are down in **points** will take their offensive opportunities wherever they can find them. "To take a chance or not take a chance" will be the most often asked question.

Teams who enjoy a comfortable lead during this stage of the **game** or wish to avoid a **draw** style game will maintain the defensive tactics of the early **ends**.

There are three situations **teams** with last **stone** are likely to face when they go to throw their first **stone** of the **end**:

Situation #1 - long centre **guard**

Situation #2 - short centre **guard**

Situation #3 - top of four foot or eight foot

Most common "offense first" approaches:

Shot option - situation #1 - **come around draw** shot

Shot option - situation #2 - **come around draw** shot

Shot option - situation #3 - corner **guard**

Most common "defense first" approaches:

Shot option - situation #1 - **draw** to the 8 foot behind the **tee line** and to the side of the **sheet**

Shot option - situation #2 - **draw** to the 8 foot behind the **tee line** and to the side of the **sheet** or bump the short **guard** into the **house** on an angle

Shot option - situation #3 - **hit** and stay on opposition **stone**

There are many other options that last **stone teams** have when presented with the above situations. Remember to apply the FESRAI factors and choose the shot that best suits your team.

Final End - Without Last Stone

The intricate strategies applied in the final **end** with the **game** on the line will provide **skips** with their greatest challenges. **Teams** without last **stone** with a one or two **point** lead will be faced with some interesting choices as the **end** progresses. Those **teams** who initiate the **end** with defensive tactics designed to provide them with last **stone** in the **extra end** may well find themselves having to switch to offense in fear of not making it to the **extra end**. Most **teams** who do enjoy a two **point** lead will probably start the **end** with defensive tactics while some **teams** with a one **point** lead will play the final **end** to steal a **point**. The four basic shot selection options for all situations remain the same.

Shot option #1 - long centre **guard**

Shot option #2 - short centre **guard**

Shot option #3 - top of four foot or eight foot

Shot option #4 - through the **house**

Teams who are tied or down in **points** will choose either shot selection #1 or #2.

Teams who are one **point** up have the choice of all four shot selections with #2 and #3 being the most common choices.

Teams who are 2 or more **points** up in score will probably choose shot selection #3 or #4.

The ability to immediately recognize situations that warrant a change in game plan will be a skill critical for final **end** success. A flexible game plan is critical to winning in these situations.

Final End - With Last Stone

Every **skip** dreams of having the opportunity to win the **game** with a dramatic last **stone**. The trick is to create this opportunity by implementing sound strategy.

Last **stone skips** who enter the final **end** anywhere from two **points** up to two **points** down are going to be in for some fun. The shot selection options will be endless with the **game** hanging in the balance. A one or two **point** lead may prove to be difficult to defend even with last **stone** and yet a one or two **point** deficit may well put the last **stone** team in a position to win.

The most interesting situation will be a one **point** variance on the score board and two offensive minded **skips** dictating the strategy!

Last **stone teams** will typically face four situations in the final **end** when their **lead** plays his/her first shot.

Situation #1 - long centre **guard**

Situation #2 - short centre **guard**

Situation #3 - top of four foot or eight foot

Situation #4 - **stone** through the **house**

Teams who are either tied or up in **points** will probably be looking at situation #1 or #2. A defensive approach is recommended early in the **end** as the key factor is controlling the four foot area. A **light weight** “**chip**” or “**tick**” on the **stone** in the Free Guard Zone that only pushes the **stone** off to the side of the **sheet** or into the **house** on an angle is the best choice of shot.

Teams that are one **point** down playing the 10th **end** should anticipate having to deal with any one of the four situations.

Teams that face situations #1 or #2 have some interesting choices to make. There will be a great deal of variation in the way that last **stone teams** **skip** this scenario. A couple of the shot options are:

Shot option #1 - situation #1 or #2 - play a corner **guard**

Shot option #2 - situation #1 or #2 - play a **come around**

Shot option #3 - situation #1 or #2 - play the open side in the **house**

Teams that face situations #3 or #4 will usually respond with a corner **guard**. Remember, in

analyzing last **end** situations it is a good idea to base your strategy on the opposition making their shots, not missing them! As well, you should be playing to your own team's strengths.

There are many other options that last **stone teams** have when presented with the above situations. Remember to apply the FESRAI factors and choose the shot that best suits your team.

Basic Summary:

Offense First	Defense First
after early ends	early in the game
with last stone	without last stone
down in points	up in points
team strengths	team strengths

THE HUMAN FACTOR

One of the key ingredients to being a good **skip** is maximizing the abilities of your team while trying to take advantage of any opposition weaknesses you may be aware of or knowledge you may have relative to their game plan.

Your Team

The recommended approach to developing a team game plan and making shot selection decisions is to factor in the strengths of your individual players. This approach should include consideration of type of shot, preferred **weight**, most consistent turn and even **weight** judging skills and **sweeping** ability. Confidence comes with success and is the key factor in developing a winning attitude. Whenever possible, allow your players to play the shots they have the greatest chance of making!

The Opposition

Like other sports, knowledge of the opposition is essential for the development of a winning game plan. The type of information that will assist you in developing your strategy includes individual strengths and weaknesses in all components of the **game** as well as an analysis of their strategical approach to the **game** in a variety of situations. Scouting the opposition prior to a big **game** is well worth the time and should provide you with the opportunity to enter the **game** completely prepared regarding your opponent.

Reading of Ice

The reading of ice is every player's responsibility. Players should make an effort to familiarize themselves with the **curl** of both turns from the centre of the **sheet** to the outside, and from the outside towards centre. Learn the ice for both **draws** and **take-outs**, commit this knowledge to memory and update it as the **game** progresses.

From the start of the **game**, the **skip** must gather information from every shot. This task can be made easier by calling shots while using the **tee line** as a reference point and watching closely when the opposition delivers. The **skip** must memorize where the **stone** stops relative to the type of release as release may vary from player to player.

The importance of **reading ice** cannot be overemphasized. It is often the difference between making and missing shots and separates the great **skips** from the rest of the field. The key is to concentrate for the entire **game** because ice conditions may vary from early to middle and from middle to late **ends**. This critical skill can be improved with practice.

Key Team / Athlete Factors

“Attitude” A positive attitude and knowing your team’s strengths are strongly recommended.

“Confidence” Your confidence in delivering the shots and making the right strategical choices will increase with experience and comfort.

“Game Plan” Your game plan should be based on what works best for your team. Developing pre-determined responses to specific **game** situations is the recommended strategy.

“Scouting” Knowing the strengths and weaknesses of your opposition on a player by player basis will positively affect your game plan.

“Flexibility” There will be a need to remain flexible within your game plan as you will often be kept hopping from offense to defense and vice versa.

“Communication” Both **sweeping** and shot communication are of great importance given the number of precision shots that are attempted.

“Conditioning” Physical conditioning will lend itself not only to the vigorous demands of **sweeping** but the strain of a long tough **competition**.

“Mental Toughness” The number of key decisions and difficult shots places great importance on all of the mental components.

“Finesse” Depending on your game plan, your ability to execute difficult shots requiring the combination of touch and accuracy will be of paramount importance.

“Release” Controlling the release will play a major role for **teams** striving for consistency when ice conditions do not lend themselves to a **come around** game. Players will need to develop the ability to vary the release and thus influence the amount a **stone** will curl. This is a high performance area.

“Creativity” Creative skipping is a key factor as the ability to think on your feet while the **game** hangs in the balance will be critical.

“Ice Reading” The ability to consistently execute finesse shots is, to a great degree, based on ice reading skills. This requires a total team effort.

“Ego” Too much ego can prove to be a major detriment to **teams** who cannot back up “risk vs. reward” strategy with consistent execution.

“Team Strengths” Maximizing the abilities of your players will contribute greatly to your success.

“Risk vs Reward” The ability to consistently evaluate “risk vs reward” will always have a positive impact on strategy discussions.



5

PHYSICAL PREPARATION

Curling, like other sports, requires players to perform skills using movements that go beyond normal everyday activities. A warm-up provides a stepwise progression to prepare a player for the transition from pre-game to **game** activity. Failure to properly warm-up can lead to discomfort, poor performance, and possible injury.

WARM-UP

Warm-ups, prior to getting on the ice, can play an important role in preparation as a means of performance enhancement. An appropriate Warm-up may improve performance by:

1. Activating the body's circulatory system by enhancing blood flow will improve the body's ability to utilize oxygen and remove waste product. Blood vessels open up increasing blood flow thereby maintaining muscle temperature.
2. Engaging the musculoskeletal system will further Warm-up muscles to reduce muscle stiffness, to provide a more forceful contraction and to help prevent injuries.
3. Exciting the neuromuscular system allows the brain to coordinate the nervous system's ability to fire muscles effectively and efficiently. It will also increase speed of contraction and relaxation of warmed muscles. Warm-ups are also known to delay fatigue.

Warming up should at least consist of the following:

- 5 to 10 minutes of continuous movement such as jogging, stepping, stair climbing - to activate the circulatory system (step)
- 5 to 10 minutes dynamic stretching exercises - to engage the musculoskeletal system (stretch)

- 5 to 10 minutes general and specific drills
 - to excite the neuromuscular system (slide)
- Technical aspects such as slide and **brushing**

Development of a Warm-up Routine: The “Step-Stretch-Slide” Approach

Curling, like other sports, requires players to perform skills using movements that go beyond normal everyday activities. A warm-up provides a stepwise progression to prepare a player for the transition from pre-game to **game** activity. Failure to properly warm-up can lead to discomfort, poor performance, and possible injury.

A proper warm-up has three components:

1. Vigorous whole body aerobic exercises – affecting the circulatory system.
2. Dynamic stretching exercises – affecting the musculoskeletal system.
3. Simulation exercises – affecting the neuromuscular system.

We can apply each of these three components to curling in a warm-up routine that we call “step-stretch-slide”.

Step:

The first phase of a proper curling warm-up is a whole body aerobic activity such as stepping exercises. The purpose of these exercises is to generate body heat and to raise the level of function of the cardiovascular system. These exercises should be done for approximately 5 to 10 minutes just prior to the 5 to 10 minutes of stretching that should occur before going on the ice. The stepping movement should initially be light and rhythmical and gradually progress in intensity, but not to the point of "breaking a sweat".

The goal is to elevate the heart rate, increase blood flow, and heat the deep parts of the body such as the muscles and joints. While warming up, the intensity should be mild, with a good rule of thumb being that the curler should be able to maintain a regular conversation without working up too much of a sweat. Progressive exercises such as skipping, stair climbing, jogging/marching on the spot, or full body calisthenics might be suitable to a curling venue. The participant starts slowly and steadily increases the pace. The athlete should be provided the opportunity to develop his/her own routine as long as it meets the aerobic content requirement.

The imagination and creativity of the coach, instructor and athlete can find many possibilities when designing a "step" routine to be done in a curling facility. Here are a few activities that could take place in a club:

- marching on the spot
- alternating bum kicks on the spot
- jogging on the spot

- stepping up and down on a stair tread
- stepping up and down on a low bench
- hop scotching on the patterns of a rug
- hop scotching over a number of **brushes**
- walking rapidly backward, forward, and side ways in a limited space
- dancing to music supplied on a personal listening device
- rapid free movement exercises
- shadow boxing while facing a glass trophy case

Stretch:

Dynamic Stretching is defined as slow controlled movements through the full range of motion. Dynamic stretching is the most appropriate form of exercises for the Warm-up. By contrast, static stretches are more appropriate for the Cool-down. Dynamic stretching involves moving parts of your body and gradually increasing reach, speed of movement, or both. In dynamic stretches, there are no bounces or "jerky" movements. An example of dynamic stretching would be slow, controlled leg swings, arm swings, or torso twists.

Dynamic stretching should be done immediately after the "step" portion of the warm-up and for 5 to 10 minutes before going on the ice. Perform your exercises (leg raises, arm swings, etc...) in sets of six to ten repetitions. If after a few sets you feel tired - stop. Tired muscles produce waste product, which causes a decrease in the coordination of your movements. Do only the number of repetitions that you can do without

becoming fatigued. For best results, athletes should run through their dynamic stretching routine twice.

If static stretching is to be used at all as part of the warm-up, the static stretch should only be held for a few seconds (3-5) or no longer than it would be used in the sport. Static stretches held longer than 10 or 15 seconds will induce a relaxation response and will not allow powerful muscles to contract as forcefully at the start of the **game**.

Dynamic Stretching and Mobility Exercises:

The following are examples of dynamic stretching and mobility exercises, which could form part of the Warm-up program in a training session.

Neck Mobility

- Flexion/Extension - Tuck your chin into your chest and then lift your chin upward as far as possible without straining. Complete 6 to 10 repetitions.
- Lateral Flexion - Lower your left ear toward your left shoulder and then your right ear to your right shoulder. Complete 6 to 10 repetitions.
- Rotation - Turn your chin laterally toward your left shoulder and then rotate it toward your right shoulder. Complete 6 to 10 repetitions.

Shoulder Rolls

- Stand tall and relaxed. Raise your shoulders towards your ears, take them

backwards, down and then up again in a smooth action.

- Complete 6 to 10 repetitions.

Arm Circles

- Stand tall and relaxed with your hands 12 inches from your sides.
- Keeping your body still, move your hands in small circles gradually increasing the speed up to 10 repetitions. Reverse the direction for 10 repetitions.
- Repeat the small arm circle action with your arms straight out at 90° from your sides. Complete 10 repetitions.
- Finally complete large arm circles both forwards and backwards for 6 to 10 repetitions.

Overhead Reach

- Stand tall with good posture, feet slightly wider than shoulder-width apart.
- Bend smoothly first to one side while reaching overhead with the arm on the side that you are stretching and then repeat on the other.
- Repeat 6-10 times on each side with a slow rhythm, breathing out as you bend to the side, and in as you return to the centre.

Golfers Twist

- Extend your arms out to your sides, and twist your torso and hips to the left, shifting your weight on to the left foot.

Then twist your torso to the right while shifting your weight to the right foot.

- Complete 6-10 repetitions on each side.

Leg Swings – Backward and Forward

- Stand sideways to the wall place your hand on the wall for balance.
- Swing your leg furthest from the wall forward and backwards for 6 to 10 repetitions.
- Turn and repeat with the other leg.
- Leaning slightly forward with both hands on a wall and your weight on your left leg, swing your right leg to the left in front of your body, pointing your toes upwards as your foot reaches its furthest point of motion.
- Then swing the right leg back to the right as far as comfortable, again pointing your toes up as your foot reaches its final point of movement.
- Complete 10 to 12 repetitions on each leg.

Half Lunges

- Standing tall both feet together (starting position).
- Keeping the back straight, lunge forward with the right leg approximately 1 metre.
- Bend knees to slightly load the quadriceps muscles and return to start position.

- Repeat with the left leg and alternate for 6 to 10 repetitions on each leg.

Heel Raises

- Leaning forward with your hands on the wall and your weight on your toes, raise and lower both heels in a controlled manner.
- Each time, lift your heels one to two inches from the ground while maintaining ground contact with the ball of your feet.
- Complete 6 to 10 repetitions.

Slide:

The final phase of the curling warm-up is done on-ice using the sliding movements associated with the **delivery** and **brushing** skills. These are the most traditional of curling warm-up exercises. Sliding from the **hack** should progress from an initial easy leg drive and high upper body position to a full **take-out** leg drive with the upper body in the actual **delivery** position. Footwork during simulated **brushing** should progress from short to long foot strokes with a gradual increase in **broom** pressure.

If a curling team meets at a designated time before a **game** in order to warm-up together, several other benefits can happen. The overall standardization of the warm-up habit can be helpful in developing the pre-game routine. This routine has been shown to be successful in optimum preparation for competitive performance.

COOL DOWN

The goal of the Cool-down is to return the body to its original state of homeostasis or equilibrium. Curling can leave the body with a build up of cellular waste product such as lactic acid, carbon dioxide and other products that can hamper recovery. Intense **brushing** and stressful **delivery** positions can also push the body to its limits resulting in fatigue, stiff and sore muscles as well as micro-tears or other injuries.

What are the benefits of a Cool-down?

An appropriate Cool-down will:

- aid in the dissipation of waste products - including lactic acid which may have built up during activity
- reduce the chances of dizziness or fainting caused by the pooling of venous blood at the extremities
- relaxing muscles and returning them to their ideal range of motion
- if necessary, icing aches and pains to facilitate recovery

Cooling down period should consist of the following:

- 5 to 10 minutes jogging/walking - decrease body temperature and remove waste products from the working muscles
- 5 to 10 minutes static stretching exercises - decrease body temperature, remove

waste products from the working muscles and to increase range of movement. Static stretches are more appropriate to the Cool-down as they help muscles to relax and increase their range of movement. Studies have concluded that little benefit occurs prior to 15 seconds in holding a static stretch and that 30 seconds will provide a much better result.

Decreasing Aerobic Intensity

In the Cool-down, the reverse of the aerobic component of the Warm-up routine should be employed. If the heart rate and body temperature are high, then work to gradually bring the heart rate down by starting the activity briskly for a minute or two and then gradually slowing down. This should take between 5 to 10 minutes depending on the body temperature and heart rate at the end of the **game/training session**. Dynamic, no impact exercise can also be incorporated to attain the required results.

Static Stretching

Static stretching is more commonly and correctly used after the curling **game** or practice session. Since sliding and **brushing** stress the muscles at a high intensity, some tightening of the muscles are expected after playing or practicing. A chronic tightening of muscles, due to not stretching them back to their original flexibility, will eventually create an overuse injury. Muscles that continually get tighter will eventually create a

misalignment thus creating a weakness in the body. As soon as that weakness is stressed beyond its capacity, an injury will occur. Therefore, to prevent chronic tightening, regular stretching should become a part of a team's routine once a **game** or practice has finished.

Static Stretching Exercises

The following are examples of general static stretching and mobility exercises, which could form part of the Cool-down program at the end of a training session. The aim is to relax the muscles and facilitate a return to pre-game/pre-training range of motion. In all exercises breathe easily while performing them and hold the static stretches for 20 to 30 seconds.

Hamstring Stretch

- Sit on the ground with both legs straight out in front of you.
- Bend the left leg and place the sole of the left foot alongside the knee of the right leg.
- Allow the left leg to lie relaxed on the ground.
- Bend forward keeping the back straight and hold for 20-30 seconds.
- You will feel the stretch in the hamstring of the right leg.
- Repeat with the other leg.

Calf Stretch

- Stand tall with one leg in front of the other, hands flat and at shoulder height against a wall.
- Ease your back leg further away from the wall, keeping it straight and press the heel firmly into the floor – hold 20-30 seconds.
- Keep your hips facing the wall and the rear leg and spine in a straight line.
- You will feel the stretch in the calf of the rear leg.
- Repeat with the other leg.

Lunge Stretch

- Kneel on your right knee with your left leg further forward.
- Keep your back straight and gradually move your hips forward until you feel a gentle stretch along the front of the right thigh and/or along the hamstrings of the left leg – hold 20-30 seconds.
- Repeat by turning and facing the opposite direction.

Cobra Stretch

- Lie face down on the floor, fully outstretched.
- Bring your hands to the sides of your shoulders and ease your chest off the floor, keeping your hips firmly pressed into the ground – hold 20-30 seconds.
- You will feel the stretch in the front of the trunk.

Inner Thigh Stretch

- Sit with tall posture.
- Ease both of your feet up towards your body and place the soles of your feet together, allowing your knees to come up and out to the side
- Resting your hands on your lower legs or ankles and ease both knees towards the ground – hold for 20-30 seconds
- You will feel the stretch along the inside of your thighs and groin
- Bring your hands to the sides of your shoulders and ease your chest off the floor, keeping your hips firmly pressed into the ground – hold 20-30 seconds.
- You will feel the stretch in the front of the trunk.

Quadriceps Stretch

- Lie face down on the floor, resting your forehead on your right hand.
- Press your hips firmly into the floor and bring your left foot up towards your buttocks.
- Take hold of the left foot with the left hand and ease the foot closer to your buttocks – hold for 20-30 seconds.
- Repeat with the other side of the body.
- You will feel the stretch along the front of the thigh.

Worship Stretch

- With your hands and knees on the floor, slide hands forward and sit back onto your heels.
- Place your forehead on the floor and hold for 20-30 seconds.
- Keeping your forehead on the floor, reach your left hand to the left followed by your right hand to the left and the rest of your upper body - hold 20-30 seconds.
- You will feel the back stretch under your right arm.
- Repeat in the other direction and hold for 20-30 seconds.

Chest Stretch

- Stand tall, feet slightly wider than shoulder-width apart with knees slightly bent.
- Hold your arms out to the side parallel with the ground and the palms of the hand facing forward.
- Stretch the arms back as far as possible – hold 20-30 seconds.
- You should feel the stretch across your chest.

Posterior Shoulder Stretch

- Stand tall, feet slightly wider than shoulder-width apart with your knees slightly bent.
- Place your right hand on your left shoulder and your left hand on your right elbow.
- Ease the right arm closer to you chest and across your body – hold 20-30 seconds.
- You will feel the stretch in the back of the shoulder.
- Repeat with the other arm.

Upper Back Stretch

- Stand tall, feet slightly wider than shoulder-width apart with knees slightly bent.
- Interlock your fingers and push your hands as far away from your chest as possible, allowing your upper back to relax – hold 20-30 seconds.
- You should feel the stretch between your shoulder blades.
- Stand tall, feet slightly wider than shoulder-width apart with your knees slightly bent.
- Place your right hand on your left shoulder and your left hand on your right elbow.
- Ease the right arm closer to you chest and across your body – hold 20-30 seconds.

- You will feel the stretch in the back of the shoulder.

- Repeat with the other arm.

Triceps Stretch

- Stand sideways to a wall and place your elbow on the wall with your hand behind your neck.
- Gradually move your elbow up the wall until you feel a gentle stretch – hold 20-30 seconds.
- You will feel the stretch in the shoulders and the triceps.
- Repeat on other arm.

Forearm Stretch

- Standing with your right arm held out directly in front of you, and your palm facing down, place your left hand on top of your right hand.
- Gently apply pressure downwards until a stretch is felt on top of your arm towards your elbow, hold 20-30 seconds and repeat on other arm.

PHYSICAL PREPARATION

Introduction

There are four components of physical training for curling that are required for all four positions:

- Aerobics
- Flexibility
- Strength
- Nutrition

Aerobics is needed for stamina, weight control and general health.

Flexibility is required for proper technique and injury prevention.

Strength is needed because of the forces required to deliver the **stone** and sweep under various (particularly **heavy**) ice conditions.

Nutrition is needed to generally provide the necessary energy to perform and particularly to provide stable energy to the brain for prolonged mental activity.

Aerobics

The particular form of aerobic training required for general fitness for curling is the sub-threshold type, i.e. intensity below anaerobic threshold. Usually this consists of some form(s) of rhythmical, whole-body activity such as running, brisk walking, swimming, biking, rowing, etc. which the curler can do continuously for at least

20 minutes at a mild-to-moderate pace. The average heart rate during such activity should be approximately 80% of age-adjusted maximum ($220 - \text{age}$). This type of training should be done three times per week, on alternate days, during the summer pre-season months. Progression in training should be accomplished by adding about 5% per week to the original time of exercise.

Example: At the end of the season, John has a few weeks rest and now has started jogging again. He can jog for 20 minutes, after a proper warm-up, before beginning to feel tired. His aerobic program starts with 20 minutes jogging 3 times a week and he adds 1 minute (20 minutes \times 5%) to his time each week.

Flexibility

The particular form of flexibility training for general curling fitness is a combination of static active used during warm-up and dynamic used during cool-down.

A good routine of static stretches systematically progresses from one end of the body to the other, i.e. head-to-toe, center-to-ends, etc.

Dynamic stretching exercises used as a part of cool-down should emphasize stretching using curling specific movements in the following joints:

- ankle
- knee
- hip, including groin
- shoulder

Strength

Strength training increases the ability of muscles to produce force. Strength is generally needed in curling, particularly in the leg drive movement within the **delivery** and in the abdominals and low back to stabilize the body during **sweeping**. These strength requirements are increased on slow (**heavy**) ice.

Abdominal-low back strength may be particularly useful in preventing low back pain, one of the most common complaints among curlers.

Strength training for curling can best be accomplished by initially using calisthenics and then progressing to free weights (isotonics) if needed.

Calisthenics should concentrate on ankle, knee and hip movements which simulate the angles at which the leg drive action occurs. Examples of suitable calisthenics would be stair-climbing or stride walking uphill.

Four to six sets of 6-8 such exercises is sufficient for one work-out.

For abdominal strength use sit-up "crunches" where curlers lie on their back, thighs perpendicular to the floor, knees bent, feet supported on a chair or bench, and raise their trunk about halfway to their knees. Sets of 20 crunches can be alternated with back raises where curlers lie on their stomach, hands behind head, and arch up so that the trunk is lifted off the floor.

Like aerobics, strength exercises should be done 3 times a week on alternate days. Gradually increase the number of sets from your starting point to a maximum of six.

NUTRITION

Introduction

The purpose of this section is to build on the base of information below with two additional concepts specific to the nutritional requirements for curling:

- fast and slow carbohydrates
- stimulants
- a well balanced diet
- the carbohydrate pre-competition meal
- adjusting the carbo pre-competition meal relative to the time available from meal to performance
- maintaining fluid intake
- sugar and salt (electrolyte) replacement drinks
- things to avoid in the pre-competition meal

Nutritional Requirements for Curling

As with all competitive types of performance, both the training for, and the playing of, the sport of curling increases nutritional requirements over basic levels.

Activation of the stretch receptors in the stomach by the presence of an amount of food sufficient to distend it (full stomach feeling) causes the

nervous system to send blood to the stomach to participate in the digestive process. This is detrimental to performance because that blood is better used elsewhere, either in the working muscles or the brain especially.

The level of circulating blood sugar has a direct effect on mental function. This is because blood sugar is the primary fuel of the brain. Low blood sugar results in reduced mental performance and can affect how you feel, how you interact with others, how you remember, and how well you solve problems.

The presence of easy to obtain stimulants such as caffeine, nicotine, and fast acting sugars in our everyday diets produces a stress on the nervous system. This happens because our nervous system tries to smooth out the rise and fall of body functions between activation and relaxation. Stimulants tend to push the activation cycle and the nervous system will try to compensate by creating rebound effects to offset the stimulation. During the rebound (down) periods performance is impaired particularly in the more complex mental functions.

Curling requires some complex mental functions combined with physical performance. Visualization of the ice pattern, memorization of characteristics of individual players, and the complexities of strategy are a few examples of such mental function. The need for a stable physical basis for mental function lies in nutritional practices which provide sufficient

blood sugar over 2 - 3 hours without rebound effect.

Good nutrition and good training go hand in hand and allow the athlete to enter training and **competition** at peak ability. During the training season what you do and do not eat is important. If an athlete's diet is deficient in a specific nutrient, body reserves will decline and physical capabilities will be limited. During **competition** however, most often what you do eat is the critical element. If you eat the wrong kinds of foods, or the right foods at the wrong time work output can be adversely affected.

No single food or "magic meal" will ensure top performance, however some foods taken in the 2 - 3 hours prior to training or **competition** can hinder an athlete's performance. The goal is to ensure adequate energy for exertion without any discomfort or fatigue.

Too much food causes the nervous system to send blood to the stomach to help with digestion. This is detrimental because we want the food going to the muscles.

A protein meal takes 3 to 4 hours to digest.

A fat meal takes 3 to 4 hours to digest

A carbohydrate meal takes 2 hours to digest.

A good meal the day of **competition** (to store energy) would include a high proportion of carbohydrates (grains, pastas, cereals). Snacks prior to and during **competition** should be small in quantity and include carbohydrate foods that are slow to moderate in speed.

Fast carbohydrates eaten alone are rapidly absorbed, causing the blood glucose levels to rise sharply. In turn the pancreas is stimulated and secretes insulin to return the glucose levels to normal. Often in response to a rapid rise in blood, levels will drop below normal. This condition can produce dizziness, lack of steadiness, nausea and low energy.

It would be better to eat nothing prior to a **game** than to eat fast carbohydrates.

Fast carbohydrates may be eaten after **competition** but not before or during **competition**. Protein meals are best served after **competition** or on days when the curler is not competing.

If you have less than 2 hours until competing only eat small amounts of slow carbohydrates.

Water

Water is often a neglected part of an athlete's diet. Water is very important for an exercising athlete. It supplies the body with necessary blood volume and therefore, oxygen to the muscles. Water makes up 60 percent of your total body weight and 70 percent of your muscles. Without enough water you can't work at your top level of performance.

If you start a **game** or a practice without having enough water in your body or if you sweat during a **game** or practice and do not replace the lost water, you may become dehydrated. You can become dehydrated even when you lose just a few pounds as sweat.

How can you avoid dehydration?

- Drink plain, cool water before, during and after the **game** even if you do not feel thirsty.
- Avoid sports drinks before or during the **game**. Because they contain salt or sugar, they are not absorbed by the body as quickly as water.
- When you exercise in a cool environment (arena or curling club) your body still sweats. To keep warm and yet allow the sweat to evaporate wear several layers of loose clothing. Layers of clothing will trap the warmth from your body while absorbing your sweat. If you become too warm a layer can be removed. Curlers would be advised to drink approximately a third of a cup of water during every **end**.

those requiring fine muscular coordination and intense concentration such as curling) since it may cause increased heart and respiratory rates and associated increases in psychological tension which may be detrimental to performance.

Caffeine is a stimulus for acid secretion in the stomach. Restrict caffeine ingestion when traveling abroad since it may add to gastrointestinal upset already brought about by foreign foods, drinks and climate. Avoid caffeine ingestion while flying since it causes increased urine production and water loss and adds further to the condition of dehydration which is prevalent during most high altitude flights.

Limit the amount of caffeine ingested at all times, but particularly just prior to **competition** and when the stomach is relatively empty.

Caffeine

Caffeine is contained in varying amounts in several foods and beverages. Tea, coffee, colas and cocoa all contain caffeine. As with most drugs, caffeine has both favourable and unfavourable effects on the body. Coffee does appear to relieve psychological fatigue. Studies have shown that caffeine ingestion may impair learning of new manual skills and movements requiring fine muscular coordination (such as the curling **delivery**). As a result of these studies a curler who normally relies on caffeine to calm his nerves should then try it in a weaker form (diluted tea).

Caffeine ingestion causes an increase in resting heart rate, possibly stimulates cardiac muscle and tends to increase the amount of work done by the heart. Ingestion of caffeine should be limited prior to some sports **competitions** (e.g.



6

PRACTICE PLANNING

Planning is an essential part of any successful activity and planning practices is no exception. If you and your team are to achieve the goals that you have set together, you need to know where you are headed and what you have to do to get there. Many **teams** and individuals never develop as they should in curling because they spend hours in meaningless practice. Practice time must be planned so that the entire time is spent profitably.

FACTORS TO CONSIDER

When planning your practices, there are a number of factors to consider if they are to be effective and meaningful. Practices should:

- Be consistent with season goals.
- Be well planned.
- Have a specific function.
- Have a variety of activities.
- Meet team and individual needs.
- Vary according to season.
- Be meaningful and beneficial.
- Be enjoyable.
- Keep players active.
- Build confidence.

The practices should consist of three types of activities:

1. Warm-up – consists of stretching and simulation exercises which will prepare the player for activity and reduce the chances of injury.
2. Skill development – the players practice conditioning, **delivery, brushing/ sweeping**, and strategy skills with the coach providing feedback on performance.
3. Cool-down – consists of progressively less physical activity and stretching exercises to bring the player to a resting state.

The practice plan should contain the following:

1. List of objectives – what this particular practice is designed for.
2. List of activities – the drills and routines that will accomplish the objectives.
3. Description of each activity – a detail of how each activity is to be run.
4. Time frame for each activity – appropriate times set so that objectives can be met.

VARIATIONS IN PRACTICES

The plan for the season should include practice sessions designed to identify and to eliminate faults. The corrections needed depend largely on the individual, his or her ability and the amount of time left before an upcoming **competition**. When planning practices, consider the time of the season and the schedule of important **competitions**. Early season practices will focus on fundamentals and elimination of major faults. At this time of the year, you will have a good deal of time to work on major changes in technique, if they are required. On the other hand, in the late season you will have time for only very minor corrections. Practices prior to **competition** must focus on being positive and attempting to instill confidence in all team members, and therefore should vary according to the time of the year. They can be categorized under early, mid and late season.

Early-Season

Early season planning should take into account the following elements:

- Conditioning – improve fitness.
- Emphasizing fundamentals.
- Focusing on major faults.
- Introductory strategy.
- Simple shot-making drills.
- Introduction of communication skills.

Notice that the emphasis here is in identifying all major faults and then designing practices to eliminate them. Drills used should include conditioning elements. At this time of year, strategy training can be introduced.

Mid-Season

Mid-season planning should focus on:

- Conditioning.
- Fault correction.
- Expanding strategy.
- Finer shot-making drills.
- Solving major problems that have developed.
- Developing communication skills.

At this time of the year, major **competitions** are approaching. Major faults should be largely corrected by now. Finer shot-making drills should now be used in practice. Strategy goals for the season should be largely accomplished by this time.

Late-Season

Late-season planning should incorporate the following elements:

- Conditioning – maintenance.
- Focusing on minor faults correction.
- Strategy to meet different situations.
- Specific shot-making drills.
- Competitive practice sessions.
- Fine tuning communication skills.

Now only minor corrections in technique can be made. It is too late in the season to work on major faults if any are still present. Because this is the time of major **competition**, strategy sessions now can be quite specific. Competitive practice sessions are used as simulation for actual **game** situations.

Pre-Competition

Practice sessions just prior to **competition** should consider the following:

- No conditioning.
- Only very minor corrections.
- Strategy for **competition** itself.
- Simple shots for confidence.
- Positive feedback.
- Team meeting for the **competition**.

During any pre-competition practice, the main objective is to instill confidence in team members. Drills based on simple shots are confidence builders. The coach also can be very instrumental in instilling positive feelings amongst the team members. If the practice is at the **competition** site, players should concentrate on getting a feel for the ice.