

DRYLAND TRAINING FOR OPEN BRUSHING FOOTWORK

THE TECHNICAL COACH SERIES

GLENN PAULLEY, THROWING ROCKS CONSULTING SERVICES LTD

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OVERVIEW



In a previous article in this series - #5, entitled Dryland Training for Closed Brushing Footwork – we described a simple, wheeled apparatus that an athlete could use to practice closed brushing footwork in the off-season. The closed footwork trainer assists an athlete in (1) keeping their hips closed to the trajectory of the stone while brushing, (2) holding their body upright with a considerable proportion of their body weight on their arms, and (3) practicing half-moon movements with both feet in order to keep their feet behind the hips, in order to maximize the amount of body weight on the hands, which will translate on the ice into helping maximize the amount of vertical force on the brush head.

In this article we describe a dryland trainer for **open** brushing footwork. The unit, as illustrated above, includes several features that offer versatility in training, and we will describe each of these features below. While the unit described is a customized, commercial athletic training sled



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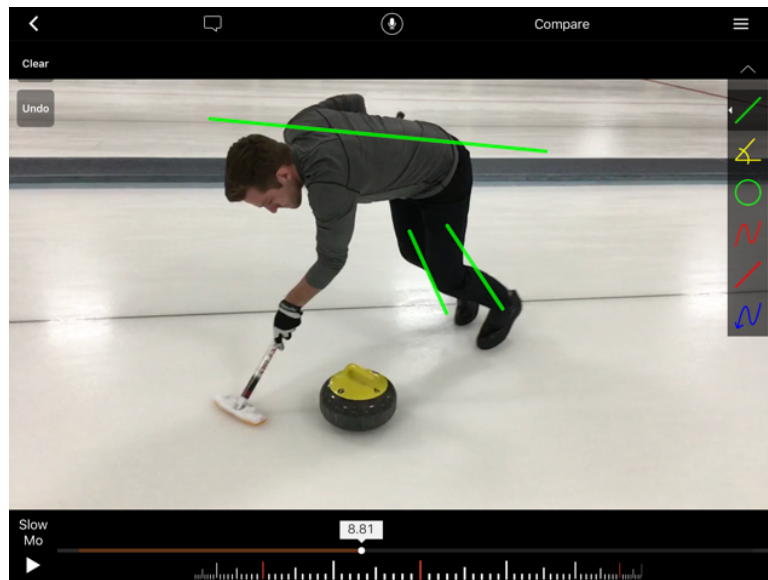
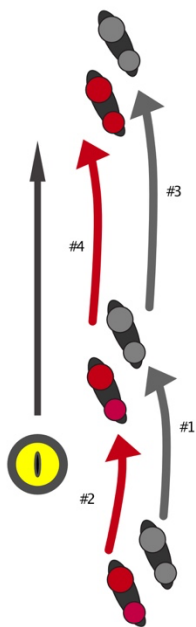
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constructed of steel, we will discuss how a trainer can be built more simply and inexpensively based on our experience with this customized, steel model and the wooden trainers for closed footwork described in Article #5.

REVIEW OF OPEN BRUSHING FOOTWORK

While brushing in the closed stance is usually preferred, it is possible to attain excellent normalized force ratios of 45%, and higher, when brushing in the open stance. The open stance

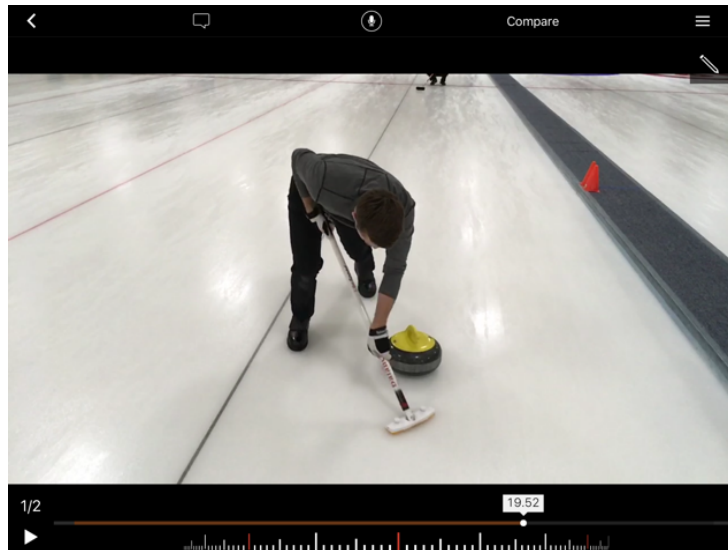


is termed “open” because the player’s body is “open” to the target broom. Open footwork differs considerably from closed footwork. When brushing open, the player faces the skip, with their body angled between 15 and 45 degrees. In that position the player brushes across the face of the stone at a similar angle, with their hips perpendicular to the brushing motion. A similar position is used in a snowplough stance, but in the snowplough position the player is positioned directly behind the stone. It can be more challenging to brush in a snowplough stance than in the open stance, as the athlete must brush far enough in front of the stone so as not to touch the stone during the pull portion of the stroke. Recall that the stone is traveling forward, and away from the brusher, at the same time. As with brushing closed, a higher normalized mean force does require mastery of the open footwork, and some top-quality athleticism from the athlete. There appears to be no advantage in force generation between brushing closed or open, at least for top male and female players. In our studies we have



measured junior male athletes with a mean normalized force of 56% of their body weight when brushing open, an outstanding result.

The photographs on this and the previous page illustrate the body position when brushing right open, featuring Fraser Reid of Wilfrid Laurier University. Note that the open stance body position is a more upright position, with the shoulders higher than the hips. Moreover, the open stance footwork is quite different from the closed stance footwork at lower attack angles. In the closed stance at a low attack angle (with the stroke roughly perpendicular to the line of travel) the feet are perpendicular to the line of travel and the feet perform half-moon motions to keep the feet outside the hip line. In contrast, in the open stance the feet are aligned with the body, pointing at 45 degrees to the line of travel. During the bout, the feet stride back-and-forth in a motion similar, though not identical, to cross-country skiing (see diagram above, at the left of page 2).



In the open stance, we are striving for:

- an orientation of the body of between 15 and 45 degrees to the line of travel;
- staying on the balls of the feet as much as possible;
- foot movements that are straight behind the athlete, and not to either side;
- a somewhat higher grip on the brush handle than is used when brushing closed, to promote a stance where the athlete's shoulders are higher – perhaps 6-8 inches higher – than their hips.

One reason for keeping the shoulders high is so that the forward movement of the legs is easier. It is very difficult to move forward, holding a brush and sweeping, when bent over 90 degrees at the waist. It is also difficult, when in a bent-over position, to use more than the arms and upper body to apply downward force on the brush. As a consequence, in the open stance the lower hand may be as much as 12-14 inches above the brush head, and the upper



hand may be in the upper third of the handle, so that the elbow of the upper arm may appear above the athlete's back during each pull portion of the stroke.

Finally, when in the open stance the athlete should constantly "thrust" their hips forward and downward in the direction of the stone during the bout. A higher position of the shoulders helps to do this. The thrust of the hips forward and towards the stone helps to keep the hips low and the feet behind the hips, which accomplishes three things:

- moving forward during the bout is easier;
- the athlete is better able to generate additional vertical force by using the weight of their upper body; and
- the athlete can use their legs to strengthen the push portion of the stroke.

USING THE DRYLAND OPEN FOOTWORK TRAINER

The idea behind the trainer is to permit the athlete to practice the body position and footwork when brushing in the open stance. The trainer, which is described in detail below, is wheeled to permit the athlete to push the trainer over a standardized distance, usually 93 feet (near hog line to far tee-line). When pushing the trainer with the long handles, the weight of the plates on the trainer forces the athlete into a position that mimics the proper position on the ice, with the athlete on the balls of their feet, and their feet behind



their hips. Different combinations of plates can be



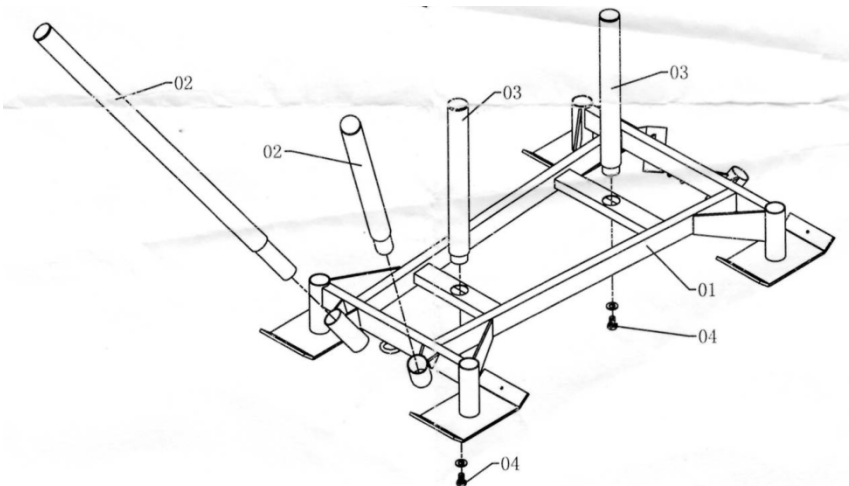
used to alter the weight of the unit, to match the physical ability and size of the athlete. The handle mounts on the trainer are oriented 45 degrees to vertical and also are angled outwards at approximately 45 degrees, closely matching the ideal brush handle position. The trainer has handle mounts on both sides, to accommodate both players who brush on the left side and those who brush on the right. Mounting brackets are installed at both ends of the trainer to permit easy directional transitions during

practice.



As with the closed footwork trainer, we have found that using the open trainer on a softball diamond is an ideal training surface, as the fine gravel of the diamond adds additional friction for the tires and the athlete is more easily able to shuffle their feet forwards and retain contact with the ground at all times, as is desired when brushing on ice.

TRAINER CONSTRUCTION



The trainer is a customized Amstaff Fitness AG017 Prowler Sled Pro. The Prowler frame is trapezoidal and is designed with footplates at each corner for dragging across an exercise surface. However, as the Prowler sled is designed to be pulled, rather than pushed, the footplates produce far too much friction when used in a

curling context. Instead, custom footplates were designed by the author and built to be fitted over the footplates of the prowler, bolted to each of the unit's footplates at each end. Each custom footplate includes a threaded $\frac{1}{2}$ inch rod, welded to the bottom, to be used as an axle for the 8-inch steel wheels. The sleeve mounts for the handles are 1- $\frac{1}{2}$ inches in diameter. Custom steel handles were built to mimic curling brush handles, though they are 1 - $\frac{1}{2}$ inches in diameter rather than the typical 1-1/8 inches of a curling brush handle. Metalworking for the unit was provided by Brent's Welding and Fabrication in Kitchener, Ontario, based on the authors' specifications and design. With the addition of the wheels, the trainer's overall dimensions are 31 x 38 x 44 inches.

EXPERIENCE

The trainer provides a realistic simulation of the movements required during open brushing. However, the simulation is not perfect, as it is difficult to duplicate the movements performed when brushing on ice. Nonetheless we have found the trainer to be a useful apparatus to teach and practice the appropriate body position and foot control when brushing in the open stance.



- Using the trainer on a gravel surface permits the athlete to better slide their feet during each bout, rather than lifting their feet to stride forward.
- As the trainer is wheeled, it is relatively easy to push the trainer across a softball infield at speed. Instead, the athlete must apply more deliberate movements and concentrate on the proper body position.
- For smaller athletes, the Olympic-style weightlifting plates provide adequate resistance during a bout, forcing the athlete into a pushing stance and position that mimics the open stance when brushing, though it is difficult for the athlete to angle their body towards the center of the trainer as if brushing a stone.
- For larger, stronger athletes, additional resistance is required. This can be accomplished by utilizing a training partner, who provides additional resistance by holding back the trainer's front end using one of the upright poles.



- As each end of the unit has two angled handle mounts, it is possible for two athletes to use the trainer at the same time.
- All of the handle mounts on the Prowler sled are welded. The handle mounts at 45 degrees are also welded, and hence robust, though a disadvantage is that they cannot be adjusted to suit athletes of different sizes.

- We have found that the 1.5-inch handles originally designed are often too large to accommodate the hand sizes of the female athletes who use it. Consequently, we fabricated 1-inch steel handles to fit the Prowler frame, which provide an improved fit.
- The angled handle mounts, while closely matching a brush handle orientation during

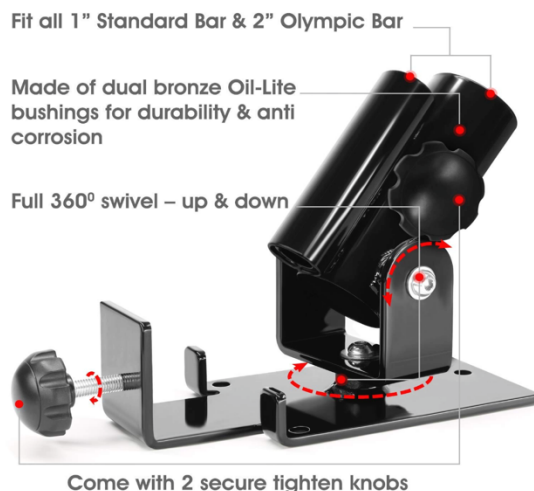


actual brushing, can cause a moment to occur while the trainer is being pushed forward. The trapezoidal frame construction and wide wheelbase largely mitigates this moment, but the athlete must be aware of the tendency for the unit to turn during a bout. Athletes using the trainer for the first time may have difficulty keeping the trainer moving forward in a straight line.



BUILDING YOUR OWN OPEN FOOTWORK TRAINER

As the unit described is constructed entirely of steel, an advantage of this trainer is its robustness, while two disadvantages are (1) its weight – including handles, the trainer weighs approximately 40kg without plates – and (2) the trainer's customization cost. Instead of a steel unit, one could construct a trainer out of less costly and lighter materials using a frame of 2x4 lumber and 36-inch threaded $\frac{1}{2}$ inch rods as the axles at each end. The 36-inch rods will provide a wide wheelbase to help mitigate the moment during the trainer's forward motion, as is the case with the steel Prowler frame.



The most important part of any unit will be the handle mounts, as the mounts must be able to accommodate the various forces applied to the handle during a bout. A universal joint, intended for weight training with a barbell and commonly known as a "T-Bar" or "landmine" mount, is a possibility – one such universal joint is pictured at left, which can be screwed onto a wooden frame. In contrast to the welded, rigid handle mounts on the Prowler sled, such a mount may positively impact the amount of core strength required when using the trainer, as it more closely mimics the mechanics of brushing on ice. For handles,

one could use a 1-inch diameter carbon-fiber handle from a Junior curling brush (note that there are few commercial parts or fittings available that fit a standard 1-1/8 inch diameter "standard" curling brush handle). Smaller diameter wheels will increase the amount of force required to push the sled forward. With the described unit, we used 8-inch diameter wheels. While wheels of a smaller size will increase the necessary force required, it is difficult to find steel wheels with a $\frac{1}{2}$ inch axle mount that are smaller than 7 inches in diameter.



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QUESTIONS

We are pleased to provide whatever assistance we can to coaches and athletes. Our contact information is below.

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