

2.7 DRILLS *by: Mike Purcer*

Drills provide an opportunity to break down the rowing stroke and allow focus on specific muscle movements or body and blade positions. Drills can be developed by separating the rowing stroke into specific parts, isolating muscular tasks and actions, and allowing the athlete to focus mentally and physically on a particular part of the technique.

Drills are used to develop movement. The drills used should be reviewed related to sequence, speed, position and momentum.

Drills that do not simulate the movements within the rowing stroke should be reviewed for what they are trying to accomplish. The drill that teaches incorrect movements or deviates from the stroke cycle should be avoided or used sparingly not to teach incorrect movements.

Drills often relate to many different parts of the stroke and are listed below at the end of each section by number.

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2.7.1 Grip Drills

The grip on the oar handle is the beginning of the learning practice. The grip should be consistently monitored for hand position on the oar handle, tension with the fingers and wrist movements. The proper size of oar handles is essential. Grip drills, including wrist movement drills, will provide additional comfort and oar control for the athlete.

2.7.1.1 Piano Fingers on Recovery

The athlete moves their fingers independently, like playing piano during the recovery. This drill ensures that the grip on the oar handle is not tight.

2.7.1.2 Inside Hand Only

The athlete uses their inside hand only and keeps their outside hand on their hip or lower back. The pressure is low, and the movements of the turning (feathering, squaring) are emphasized. The hand placement should be monitored to ensure proper grip.

2.7.1.3 Outside Hand Only

The athlete uses their outside hand only and keeps their inside hand on their hip or lower back. The pressure is low, and the emphasis is on a straight wrist and gripping with the fingers. The blades are kept square, and there is no feathering.

2.7.2 Posture Drills

Body posture is the second step in rowing technique development. Body posture includes the positions of the legs, torso, arms and head throughout the stroke. The posture of the torso (spine) is critical as this part of the body is the vertical link between the legs and arms. The spine should be in a straight (neutral) position throughout the rowing stroke. Excessive back curvature forward at the catch should be avoided; however, there will be some stretch in the shoulders and upper torso. During the late

drive, it is critical that the lower spin (lumbar) does not collapse. A bend in the lower spine reduces the power transfer and moves the body weight vertically in the boat.

2.7.2.1 Pause One

The athlete pauses in the finish position, the torso lying back with the hands at the body and blade feathered. The pause time can be of various lengths, from a micro-pause (stop and go) to 3 or 4 seconds. The pause allows the coach and athlete to review the athlete's position, including layback, shoulder, arm, and hand positions. The pause one drill is also an opportunity for the athlete/crew to practice boat balance.

2.7.2.2 Pause Two

a) This drill has the athlete pause just after the legs start to move the athlete on the slide. The torso has begun to pivot forward, and the oar handle starts to move away from the body. The legs, torso and arms have begun to move but only a few inches in all cases. The pause two position is meant to teach the initial movement of the legs, torso, and arms are simultaneous.

b) Typically, with novices, coaches can separate the arm movement without torso swing or leg engagement. The athlete moves the hands away from the body until the arms are straight. The torso remains in the finish position with the legs flat. The drill helps to emphasize that the arm movement starts from the finish of the stroke.

2.7.2.3 Pause Three

The body's position in this pause drill has the legs at the one-quarter slide, the torso is almost perpendicular, and the arms bent with the hands over the knees. In pause three, the athlete's legs are bent and sitting at about a quarter slide. The torso is almost perpendicular with a neutral spine. The arms are bent, and elbows about ninety degrees to allow the oar handle and hands to be over the knees. In the cyclical rowing stroke, the legs, torso, and

arms move out of the finish together. Following the pause, the athletes should accelerate towards the catch as in the regular, continuous stroke.

2.7.2.4 Pause Four

In the Pause Four position, the athlete is at half slide, knees about ninety degrees, with the torso pivoted forward to about eighty percent of its swing movement. The arms are slightly bent with the oar handle and hands over the footstops. The blade is above the water high enough to be able to square and move down to the water on the catch approach.

2.7.2.5 Pause Five

Pause five, the athlete is at three-quarter slide, with the torso at the catch angle and the arms straight. Following pause five, the athlete completes movement on the slide to achieve the full reach position.

2.7.3 Balance Drills

Balance is a learned skill; balance drills are critical to helping the athlete learn to balance in the boat. Understanding and having body awareness to keep the boat balanced takes time. Starting an athlete out in a single is the easiest way to teach and learn the balance skill. However, balance can be learned in other boats as well. Balance begins with good posture and comfort.

There is a short Section 1.0.11 on Balance in the first section of this book, and it is sometimes worth reviewing.

2.7.3.1 Stationary Blade Dips

Sitting at the catch or finish and dropping the blade in and out with the focus on the balance of the body.

2.7.3.2 Stationary Catch, also called Roll-Ups

This is a stationary drill with the boat not moving. Start with five (5) Stationary Blade Dips and then continue with the recovery until the athlete places the blades in the water

at the catch. The focus is on the recovery and movement up the slide concentrating on balance.

The stationary catch drill that includes a 2-second wait at the pause four position adds to the opportunity to develop balance.

2.7.3.3 Blades Up

Sitting stationary in the boat with blades off the water challenges the athlete to sit in the middle of the boat to attain balance. At the end of continuous rowing, the crew can stop rowing and let the boat run out with blades up, working to balance the boat for as long as they can. The emphasis is to try and sit balanced. Oars should be stationary. In the beginning, you could have the athletes gunnel the oar handles to keep them stationary.

2.7.3.4 Blades Just Above Water

Athletes are asked to row with their blades just above the water to help balance the boat. The coach should emphasize the proper hand levels and move the oar handles horizontally parallel to the gunnels.

2.7.3.5 Release Feather Hands Away

This is a stationary drill. Start in the finish position with the blades square in the water. The athlete should stabilize the boat in the finish position and get comfortable. When ready the athlete begins with the release feathering the blade and moving the hands and shoulders away. The athlete should stop at the position of Pause 3 and try and balance the boat.

2.7.3.6 Cut the Cake

While rowing, the athletes start on the recovery moving their hands and body out of the bow into a reaching forward position but do not move their slides. After the forward reach position, they return to the finish position, keeping their blades feathered and off the water. Once they are in

the finish position, they continue with a regular recovery back to the catch.

2.7.3.7 Air Strokes

Rowing with the blade out of the water. Being able to balance the boat during the drive phase with the blades out of the water.

2.7.3.8 Offset Handle Grip

This drill involves holding the oar handle offset or further to one side to exaggerate the discomfort and increase the difficulty of balancing the boat. In sweep rowing, the outside hand can be placed 10cm from the end of the oar, and the inside hand can be placed an extra 15cm down the handle (towards the blade). In sculling, one hand can be in the regular position and the other 15cm from the end of the oar.

This is a very awkward rowing position for the athlete. The athlete will compensate for the position by engaging and using the core, upper body and arm muscles to a greater extent. Both drive and recovery will be affected dramatically in this offset balance drill.

This drill should not extend more than 20 strokes. Stop the crew/athlete and startup immediately with the proper grip and posture. The athlete will experience a heightened sense of balance from an increased comfort level. The athlete should make a conscious effort to feel balance and relaxation.

2.7.4 Entry Drills

The entry, also referred to as the catch, can be broken down into three parts: 1. the approach, 2. entry, and 3. connection (initial pull). The torso in sculling reaches forward, while in sweep rowing, twists with the oar handle. The exact path of the blade must be fully understood by the athlete, as well as the rotation (squaring) timing and speed.

It is imperative that the athlete fully understand the exact movements of what they are searching for to understand and get the most benefit from the drills.

Coaching the entry requires addressing the seat movement, torso compression on the legs, torso position and arm movements.

A demonstration of the ideal catch approach movement by the coach can provide the crew a visual understanding of the movement. With the crew in the boat the coach holding a square blade above the water will throw it towards the bow. As the blade moves toward the bow gravity will accelerate the blade downward until it touches and enters the water. Demonstrate this several times, highlighting the path of the blade is moving toward the bow and downward at the same time. Identify the critical point of contact between the edge of blade as it hits the water. The entry is the beginning of the stroke and can be referred to as hooking into the water close to full reach.

2.7.4.1 Stationary Catch.

This is also known as a blade placement drill. This drill helps the athlete develop the skills to place the blade entry at the full reach position. The focus is on a quick lift of the hands at the catch and also emphasizes proper recovery movements. Separating the movements of lift and pull or entry and drive promotes and enhances blade entry at full reach.

The drill is performed with the boat in a stationary position and initially with two athletes keeping their blades on the water to maintain balance. The other athletes start in the finish position with blades (square) in the water. On the coxswain's command, the athletes release, swing and flow on a controlled recovery and quickly plant the blades at the catch without pulling on the oar handle.

The movement of placing the blades in the water at full reach without pulling separates the entry from the drive and promotes the development of a muscle pattern that emphasizes the lift before the pull and increases the effective stroke length in the water.

2.7.4.2 Three Quarter slide rowing at full power.

This drill is rowing at $\frac{3}{4}$ slide at full pressure. The three-quarter slide position is a much stronger position for the athlete to apply power and therefore allows a quicker movement.

The three-quarter slide position requires the athlete to place the blade in the water at a perpendicular location where the blade must move at a much higher rotational velocity. Quickness is required to maintain the quick entry of the blade.

It is also important that the pressure is full pressure to maintain a higher shell speed to ensure the athlete is challenged to connect quickly with the water.

2.7.4.3 Catch Pic Drill

The catch pic rowing only. Two athletes balance while all others row only the catch part of the stroke. No upper body swing. The focus is on the application of the legs quickly applied at the catch to lock onto the water.

This drill is about teaching the legs to contract quickly to pick up the boat's speed.

Note that this drill can be hard on the back and should be limited in use.

2.7.4.4 Exaggerated Quick Catch

This drill involves the athletes making a conscious effort to affect the blade entry as quickly as possible. Total focus on hooking the blade into the water as quick as possible using the momentum of the oar and the quick contraction of the shoulder muscles to provide the exaggerated quickness to the catch.

2.7.4.5 Hold Body Catch Angle Extended Length

This drill holds the body catch angle after the catch for an extended time. This drill exaggerates the body position to ensure the catch is locked in with the legs.

The stroke is taken and the body angle is held for.

2.7.4.6 Catch on Command Drill

This drill involves steady state rowing allowing the coxie (or coach) to dictate the catch at random times during the recovery part of the stroke. Athletes prepare themselves to take the catch on command putting their bodies in a catch position sooner in the stroke.

2.7.4.7 Catch Backsplash Drill

On the recovery, the athlete will backsplash slightly at the catch to learn the movement of bringing the blade down to the water on the recovery when reaching out.

2.7.4.8 Catch Evolution Drill

Start with a pick drill to emphasize quick hands. Move quickly to one-quarter slide and work on bringing the blade to the water on the recovery. Move to half slide and keep the entry quickness with the blade. The legs will be in a stronger position and able to apply the force quicker. The ability of the legs to apply force quickly allows the hands to lift quicker, improving blade entry.

The drill continues by moving to three-quarters slide, still emphasizing the quick catch. If the catch quickness begins to deteriorate, move back to the previous slide-length exercise.

Move to full slide as the catch appears quicker at the entry.

2.7.4.9 Sky Recovery Drill

This drill requires the athletes to carry their hands as low as possible during recovery. The blade will be very high off the water during the recovery, and the movement of the hands into the catch will require them to rise and lift the oar handle up in order to bring the blade back to the water. This drill teaches good hand movement into the catch.

2.7.4.10 Choke Up On Skulls

The athlete grips the skulls further down from the grips. This allows the athlete to reach out further with the blade angle and widens the arm extension at the catch.

This drill can also be done on the square, as holding the sculls on the large part of the shaft reduces the control of feathering.

This drill teaches extension.

2.7.4.11 Arm Pointing Pivot Catch

The athlete holds their inside arm directly out from the body and rows with the outside arm only. On the recovery, as the oar crosses the perpendicular the hand and arm point at the blade of the oar. The hand and arm continue to point at the blade as the athlete approaches the catch.

The arm and hand pointing at the blade cause the upper body to pivot from the hips as the upper body approaches the catch.

2.7.4.12 Catch Blade Bobbing

The goal of this drill is to strengthen shoulder muscles and to develop quickness aimed at increasing the speed of the blade entry. The drill also allows the shoulder muscles to control the entire vertical range of oar handle movement without moving the upper body, which stays at the catch angle.

The athlete(s) sit in the catch position with their blades fully buried in the water. When learning the drill part of the crew should keep their blades flat on the water and be responsible for keeping the boat balanced. On command, athletes performing the drill lift the blades out of the water by moving their hands and arms down by rotating at the shoulder joint. Arms should be straight. It is important that the upper body remain stationary. The drill is to bob the blades up and down with the use of their shoulder muscles.

The drill can be adjusted to increase the rate at which the oar bobs up and down. The crew might start slow and increase speed bobbing the oars until the timing breaks down and they stop. The height of the blade above the water can be increased or decreased to alter the range of motion.

This drill can be completed in three of four sets of 10 to 20 repetitions and two or three times per week. Following the drill, athletes should stretch out their shoulder joints with big arm circles in the boat.

2.7.4.13 Early Square Drill

This drill involves squaring the blade early on the recovery to emphasize the hand level moving toward the catch. The early square can be starting to square the blades as the hands pass the knees on the recovery. The blade should be fully squared as the hands pass the footstops.

2.7.5 Drive Drills

The drive portion of the stroke is the application of power following the catch and continuing through to the finish.

2.7.5.1 Exaggerated Acceleration (zero to 100)

The athlete is rowing and takes the catch at zero pressure and accelerates the blade through the drive phase and finishes the stroke at full pressure.

This drill can be done at varying levels of acceleration. For example three quarter pressure catch and full pressure finish.

2.7.5.2 Drive Blade Depth

The consistent depth of the blade during the drive phase is critical to the efficiency of the stroke. The blade must maintain the depth throughout the drive.

The drill involves rowing at a reduced pressure and focusing on maintaining the correct depth

2.7.5.3 Legs Only Through 90

The athlete focuses on the constant acceleration of the leg drive with a conscious effort to push harder on the legs as the knee joint moves through the 90 degree angle.

2.7.5.4 Segmented Drive

Splitting the parts of the drive (legs, body, arms) into individual movements. Starting with legs only all the way down then return to catch no body or arms 10 strokes. Next legs first all the way down then body but no arm 10 strokes. Next legs first all the way down, then open the body to the finish position then pull the arms in, 10 strokes.

2.7.5.5 Outside Arm Only

Focusing on the power application with the outside arm getting to a strong position with the outside shoulder and arm into the finish of the stroke.

2.7.5.6 Pause One

Emphasizing strong finish position. Coach and athlete to check finish position on pause stroke

2.7.6 Late Drive (Finish Drills)

There are many drills that assist in the efficiency of the finish. These drills focus on the last third of the drive part of the stroke.

2.7.6.1 Rowing on the Square

Rowing on the square requires the athlete to keep the blade squared without feathering throughout the stroke cycle.

2.7.6.2 Square Release

The square release drill involves extracting the blade without feathering and holding the blade square until the blade starts moving on the recovery. As soon as the hands move away from the body during recovery, the athlete should feather the blade at the normal position.

2.7.6.3 Arms and Body Only

The athlete rows with arms and body only to emphasize the movements of the finish.

2.7.6.4 Last Half of Drive

The athletes row using a quarter slide, including torso swing and arms, as they do the last half of the drive phase.

2.7.6.5 Big Send

The athlete rows with an exaggerated power through the finish of the stroke. This is done every stroke, ensuring that the blade remains covered until the last moment.

2.7.6.6 Exaggerated Layback

The athlete rows with an exaggerated layback to emphasize the torso movement at the finish.

2.7.6.7 Reduced Pressure Finish

The athlete rows, and they reduce the force on the oar handle just before the release. The reduced force on the oar handle is matched with a reduced force on the footstops, allowing the boat to continue to accelerate. The blade extraction is clean, and the blade is released without dragging water.

2.7.6.8 Feet Out of Footstops

The athletes row with their feet out of the footstops. As they approach the finish of the stroke they must reduce the pressure on the footstops and use their bodyweight as the base to support their arm pull into the finish.

2.7.7 Release Drills

There are many drills that assist in the efficiency of the release, extracting the blade from the water. These drills limit the negative effects of the blade movements at it releases from the water.

2.7.7.1 Square Release

Square release drill involves extracting the blade on the square and holding the square until the blade starts moving

on the recovery. After the blade starts to move on the recovery the athlete should feather at the normal position.

2.7.7.2 Tap Down Drill

Rowing on the square requires the athlete to Pause one body

2.7.7.3 Pause One on the Square

Pause one rowing on the square emphasis the tap down movement and the position of the hands immediately after the release.

2.7.7.4 Outside Arm Rowing

The athlete rows with the outside arm only to emphasize the use of the outside arm in the movement of the release. Athletes should stress the use of the triceps muscle movement of the forearm from the stationary elbow joint.

2.7.7.5 Back End Suspension

The athletes sit stationary at the backstops with their arms extended. This position would be the start of the finish. On command athletes pull on the oarhandles lifting themselves off the slide. The purpose of this drill is to teach body suspension in the finish part of the stroke.

This drill can be further developed when the athletes start at quarter, half or three quarter slide on the drive phase.

2.7.7.6 Reverse Release

The athlete sits stationary with blades feathered and arms away from body (elbows 90 degrees). The drill is to start from this stationary position and in a reverse motion place the blade square in the water.

2.7.7.7 Release Backing

The athlete sits at backstops in the finish position with the blades square and buried. Athlete pushes on handles backing blades in water lightly. When arms are extended the athlete then pulls on the handles keeping wrists flat and the blades buried until just before the hands reach the body the blade is released and feathered.

2.7.7.8 Finish Position Blade Bobbing

The athlete sits stationary in the finish position with the blades square in the water. The blades are then bobbed in and out of the water with flat wrists using a tap down from the elbows.

The feather movement is added to end the bobbing after a number of strokes.

2.7.7.9 Release Pressure

The athletes begin rowing with regular strokes. Next, they do a ten (10) emphasizing the acceleration of the oar handle right to the body. This is followed by a ten (10) with no pressure after the hands are about 20 cm from the body and just drift into the release. The blades should pop out when the pressure is released. Finally, the athletes will do ten (10) strokes to find the medium between full-pressure finishes and no-pressure finishes.

Knowing when to let go of the pressure is the key to a clean release that keeps the boat moving. (personal conversation, Mark Henry, May 2024)

2.7.8 Recovery Drills

There are many drills that assist in improving the efficiency of the recovery movements from the finish position to the full reach position. The recovery at practice rates is traditionally broken down to moving the hands and arms away from the body before the torso pivots forward, followed by a slow, controlled slide forward on the seat. This document promotes rowing technique movements in

practice that match racing, including the coordinated and simultaneous movements of the legs, torso and arms. The movements of the recovery draw the footstops towards the seat and the body's centre of mass. These movements at race rate accelerate the footstops towards the seat and increase boat speed. During practice, as in racing, the movement should accelerate the footstops towards the seat, and the athlete should increase speed towards the full reach position. At practice rates, the recovery starts slow and continues to accelerate toward the next catch.

The best drills strongly relate to the biomechanical movements of the body performing at a racing rate. Drills must be monitored for body posture (position), balance and speed (acceleration). Recovery drills should be used in conjunction with catch drills to ensure equivalent improvement of the continuous stroke. Coaches should ensure that the athletes are fully aware of the movements and the objective of the drill to maximize its effectiveness.

2.7.8.1 Pause One

Pause drills are an excellent way to develop body movements during the recovery. Pause one, the body is in the finish position. The torso is lying back in the finish position with the blades feathered and the hands at the body. The athlete/crew should display good posture (neutral spine), shoulders back and be able to balance the boat. This is a good position for the coach to check the position of the body and arms and make adjustments as required.

2.7.8.2 Pause Two

This drill has the athlete pause just after the legs start to move the athlete on the slide. The torso has begun to pivot forward, and the oar handle starts to move away from the body. The legs, torso and arms have begun to move but only a few inches in all cases. The pause two position is meant to teach the initial movement of the legs, torso, and arms are simultaneous.

2.7.8.3 Pause Three

The body's position in this pause drill has the legs at the one-quarter slide, the torso almost perpendicular, and the arms bent with the hands over the knees. In pause three, the athlete's legs are bent and sitting at about a quarter slide. The torso is almost perpendicular with a neutral spine. The arms are bent, and elbows about ninety degrees to allow the oar handle and hands to be over the knees. In the cyclical rowing stroke, the legs, torso, and arms move out of the finish together. Following the pause, the athletes should accelerate towards the catch as in the regular, continuous stroke.

2.7.8.4 Pause Four

In the Pause Four position, the athlete is at half slide, knees about ninety degrees, with the torso pivoted forward to about eighty percent of its swing movement. The arms are slightly bent with the oar handle and hands over the footstops. The blade is above the water high enough to be able to square and move down to the water on the catch approach.

2.7.8.5 Pause Five

Pause five, the athlete is at three-quarter slide, with the torso at the catch angle and the arms straight. Following pause five, the athlete completes movement on the slide to achieve the full reach position.

2.7.8.6 Beat Pause

This drill is a pause rowing drill that includes a short one-beat (half-second) pause in the finish position of the stroke. This drill is typically done continuously for 30 to 60 seconds.

2.7.8.7 Stationary Recovery Progression

This drill starts with the athletes sitting at the finish position with blades square and buried in the water. The coxswain or bow will call 3-2-1-tap, and the crew will tap

down and hold their blades in the air (squared or feathered, pause one) with the boat balanced for as long as possible. Once the boat tips, the crew returns to buried blades, sets the boat up and repeats. The outcome is the simultaneous movement of the release as well as the posture of the crew and the balance of the boat.

The next step is on the call from the stationary blades square and buried at the finish; the crew will tap down and move to the pause two position. Again the drill emphasizes simulations movement, posture, and balance. Once the crew becomes proficient with timing and balance, they can move on to the next part. The drill progresses from the tap down to pauses three, four, and five.

The final step is to complete the entire recovery from tap down with dynamic movement to planting the blades in the water, stationary in the catch position. The movements must be dynamic, accelerating the footstops towards the seat while working on timing and balance.

When proficient at this drill, it can be continued by reversing the movements from the catch to the finish position with buried blades.

2.7.8.8 Offset Handle Grip

This drill involves holding the oar handle offset or further to one side to exaggerate the discomfort and increase the difficulty of balancing the boat. In sweep rowing, the outside hand can be placed 10cm from the end of the oar, and the inside hand can be placed an extra 15cm down the handle (towards the blade). In sculling, one hand can be in the regular position and the other 15cm from the end of the oar.

This is a very awkward rowing position for the athlete. The athlete will compensate for the position by engaging the core, upper body and arm muscles to a greater extent. Both drive and recovery will be affected dramatically in this offset balance drill.

This drill should not extend more than 20 strokes. Stop the crew/athlete and startup immediately with the proper grip and posture. The athlete will experience a heightened

sense of balance from an increased comfort level. The athlete should make a conscious effort to feel the balance and relaxation.

2.7.8.9 Cut the Cake

In this drill, the athlete moves from the finish position to the pause three position (with dynamic recovery movements) back to the finish position without stopping. This drill is typically included every third or fifth stroke of continuous full-stroke rowing. The drill emphasizes the move out of the finish position, which should be monitored for posture, simultaneous movement of legs, torso and arm, and balance.

2.7.8.10 Hand Position Drills

The grip and hand positions are critical for good rowing technique. Grip drills have been reviewed earlier in this chapter; however, ensuring the grip and hand positions are not ignored during recovery drills. Flat wrist drills that emphasize relaxing the forearms and carrying the sculling oar handles under the fingers are helpful, but coaches should remember at racing intensity, wrists are bent during the recovery until moving into the catch.

2.7.8.11 Sculling Left Hand Away

Typically, in sculling, coaches prefer that the left hand leads away from the finish position with the right hand at a similar level and closely behind. To support this movement, use this drill.

The drill starts with the athlete pausing in the pause one position. From the pause one position, only the left arm moves away from the body until the arm is straight, with the torso and right arm still in the finish position. Once the left arm is straight, the recovery begins with the right arm and torso moving to catch up with the left arm.

2.7.8.12 Eyes Closed

Rowing at a low rate with eyes closed allows the athlete to sense the flow of the shell between strokes. The goal for the athlete is to make their body feel weightless as they accelerate on the slide. As the crew moves together, the athletes should work to pull themselves on the slide but hold a neutral position as the shell moves under them.

2.7.8.13 Accelerated Recovery 0 to 100

This drill requires the rower(s) to emphasize the acceleration of the recovery. The rowers start very slow out of the finish and exaggerate the acceleration, zero speed at the finish 100 percent (as fast as possible) into the next catch. This drill should only be done between five and ten strokes before returning to controlled rowing.

2.7.8.14 Accelerated Recovery Half Slide

Rowing at steady state (rate 18~20), the crew then goes to half slide, and the rate comes up (24~26) for ten strokes. Next ten strokes, the crew drops the pressure but increases the rate. After the second ten at half slide, the crew lengthens to full strokes in three and rows at full pressure and race rate.

- 1) Steady state (18~20spm)
- 2) Ten strokes at half slide (24~26spm)
- 3) Ten strokes drop the pressure and increase the rate (30~32spm)
- 4) Full strokes and build in three to full pressure and race rate for a hard ten.
- 5) Back to steady state

2.7.8.15 Air Strokes Accelerated Recovery

Rowing at steady state (rate 18~20), the crew does an 'air stroke,' with the blade feathered above the water on the drive phase moving slowly. This is followed by an accelerated recovery focusing on accelerating the boat. The air stroke is performed every fifth stroke three times.

2.7.8.16 Two-Speed Recovery

While rowing, move very slowly from the finish position to the pause two position. Micro pause in the pause two position, followed by exaggerated acceleration into the next catch.

2.7.8.17 Recovery Only (moving the boat)

With the boat stationary, the athlete/crew will start from the finish position and execute the recovery, accelerating the footstops towards the seat while keeping the blades off the water. The athlete/crew will slowly return to the catch position with the boat balanced and blades feathered off the water. Once at the finish position, the athlete/crew will again execute the recovery, accelerating the footstops to the seat and again move back to the finish position with feathered blades and a balanced boat. This should be repeated ten times and the goal is to see how far the crew can move the boat using only the recovery.

2.7.8.18 Body Start First Drill

These body awareness drills help the athlete when there is a movement delay (torso, legs, hands) from the finish position. The legs, torso and hands move together out of the finish position but at different speeds.

Torso First. Rowing at a low rate with a short pause at the finish position. From the finish position, the hands stay at the body, and the legs stay straight. The torso starts the recovery by pivoting forward a small amount (ten degrees) while the hand stays at the body and legs straight. Once the torso begins the recovery (noticeably), the hands and legs join in. This drill emphasizes the torso movement out of the finish at the beginning of the recovery.

Legs First. Rowing at a low rate with a short pause at the finish position. From the finish position, the hands stay at the body and the torso at the finish angle. The legs start the recovery by moving the slide and lifting the knees a few inches while the hand stays at the body and the torso at the layback angle. Once the legs start and the knees raise on

the recovery, the hands and torso legs join in on the recovery. This drill will emphasize the leg movement out of the finish at the beginning of the recovery.

Hands First. This drill can also be completed with the hands starting first but is typically not needed, as the hands generally start first due to early development coaching.

These drills are typically only completed for a short time (10 strokes) and provide the athlete with a new sense of movement control.

2.7.9 Focus Drills

This section provides a variety of drills that address several aspects of physiological skills and the ability to focus on rowing technique.

2.7.9.1 Eyes Closed

This simple drill requires the athlete to close their eyes and focus on the feeling of the movement.

2.7.9.2 Stroke Pyramid Drill

The pyramid of strokes drill. This drill involves the sequential change from full stroke, 3/4, 1/2, 1/4, swing, pick, swing, 1/4, 1/2, 3/4, full stroke. It is most easily done by allowing the coxie or coach to call the next stroke early.

2.7.9.3 Three-Part Breathing

Breathing skills allow enhanced air intake and the opportunity to improve relaxation skills in the boat. The NCCP Level 3 Theory Manual 1983 outlined the three-part breathing drill. This technique allowed relaxed focus.

2.7.10 Start Drills

The start of the race typically includes several shorter strokes that keep the blade in the middle of the stroke position where it is more effective.

2.7.10.1 Start Progression Drills

Progression drills typically start with one stroke, the first. The first stroke can be completed at $\frac{1}{2}$ power and half speed $\frac{1}{2}$ speed. Once the crew is together, the progression may go to $\frac{1}{2}$ power at $\frac{3}{4}$ speed or $\frac{3}{4}$ power $\frac{3}{4}$ speed. The progression will increase with power and speed and then progress to two stroke, three, and so on.

2.7.10.2 Quarter Stroke Starts

Starts at excessively high rates;\Pause one body position drills are

2.7.10.3 Running Starts

This drill involves rowing at a low rate with half pressure and then doing a start half, three quarters and full and full pressure and full speed. You can build up to a regular start.

2.7.10.4 Over Rate Starts

Starts at excessively high rates.

2.7.10.5 Starts on Square

Starts on the square allow the athletes to develop a quick clean release. This drill also promotes low hands on the recovery and a quick catch.

2.7.11 Timing Drills

Crew timing is critical for maximum performance, and coaches must constantly work to achieve and maintain the blades and body movement timing. Changing rowing technique or rigging can change major timing errors, but the crew should constantly perfect good timing.

2.7.11.1 Water Slap Drill

While rowing at practice rates. On the recovery, the crew will raise their hands and slap the blade together as the hands cross over the footstops.