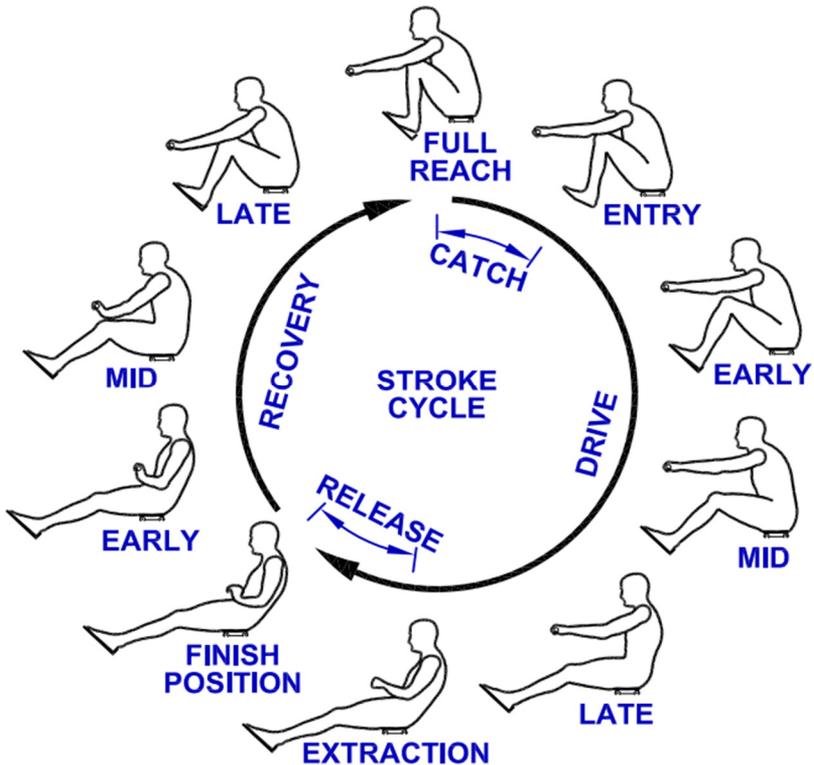


2.11 COACHING TECHNIQUE *by: Mike Purcer*

Coaching technique requires a focus on the movement of the rower and oar. Often, when coaching rowing technique and looking at the crew and the entire stroke cycle, the coach may find it difficult to identify errors. Identifying errors requires focus, and this section breaks down specific movements into different parts. Figure 2.11a Stroke Cycle shows various phases and positions of the athlete during the stroke.

Figure 2.11a Stroke Cycle



The stroke cycle can be divided into the drive and recovery phases. The recovery phase has the athlete moving from the finish position to full reach at the catch. In

the drive phase, athletes move from full reach at the catch to the finish position as they pull on the oar handle. The drive is further divided into the catch (entry), drive (power application), and release. The power application is often subdivided into early-, mid-, and late-drive parts. Dividing the stroke into phases allows the identification of the unique movements of each part of the rowing technique.

Coaches can cycle through each phase of the stroke, examining individual body and oar movements. One method for detecting technique errors is to observe parts of the stroke in a sequence of body and oar movements. The coach will not watch the athlete's entire movement but will focus on a specific part of multiple strokes. Starting from the footstops, the coach looks at the lower legs, then the knees and leg movement; this is followed by the lower back and torso. The observation continues systematically to the upper back, shoulders, and head. The next observation is to look at the arms, elbows, wrists, and hands. Finally, the coach watches the oar movements, specifically the blade path and rotation. This sequence of observations is referred to as coaching from the boat to the blade. Focusing systematically on individual movements across multiple strokes allows for better error detection. This sequence is often reversed, and the coach systematically observes, starting with the blade and working back into the boat.

Rowing technique, error detection, and correction are coaching skills. **Once the coach detects an error, they should not immediately tell the athlete; instead, they should analyze which movements are causing the error.** For example, an error might be that the athlete lunges forward with their upper body at the catch. The cause of the error is not at the catch but in the torso preparation (swing forward) earlier in the recovery. Another example is an athlete who 'skys' the blade at the catch. The cause of the error may be improper blade height off the water during the recovery. Communicating the error is less effective than explaining the cause and how the movement can be improved to correct it.

Other errors may be the result of poor rigging or footstop placement. Errors such as the blade washing out or digging on the drive may be the result of improper oarlock height or blade pitch. Body or arm position errors at the release may be caused by improper footstop position or hand spacing on the oar handle.

Sometimes, the technique movement is correct, but the timing or speed of the movement does not correspond to the desired performance, which results in an error in that part of the stroke. The speed of the movement is critical, and faster is not always the answer. The coordination of the moving parts and the speed are vital to ensure effective movements on the drive and recovery.

Most coaching is done at practice rates with slower speeds and lower power applications than when racing. Technique movements are related to the speed of the muscle contraction and the force applied. Therefore, errors that were not detected during training may appear at racing rates. Coaches must confirm good technique and efficiency at racing rates on a regular basis. Video of the crew at racing speeds allows the coach more time to analyze errors and identify opportunities for improved rowing technique. Racing speed errors may be difficult to correct at lower speeds and intensities. These high-rate movement errors must be corrected to maximize the crew's racing performance.

2.11.1 Movement

An understanding of the terminology used herein provides clarity to the intended meaning. Coaches must communicate in terms that allow other coaches and athletes a clear understanding.

Technique relates to the specific movements of the body and oar/blade that are fundamental to the athlete's method of applying power on the oar handle during the drive phase, and how their body mass is used to promote rhythm on the recovery.

For example, technique relates to how the legs, torso and arms synchronize through the drive. One technique is to drive the legs first before the body (torso) swings back, with the final part using the arms to finish the stroke. A different technique is to engage the legs, torso swing and arms together at the same time and finish together. As the power application from the two different methods would differ, they are two distinct techniques.

Another example would be the distinction in the proportion of leg and torso movements. A technique using very little forward-and-back torso swing, with maximum knee joint compression, would provide a specific power application from the muscle groups. Contrast this leg's dominant technique with one that emphasizes the torso reaching forward and lying back at the finish, with much less leg/knee compression. These two distinct leg/torso combinations would be different techniques, as the power application would be unique.

Style relates to movements that are insignificant to how the athlete applies power on the oar handle during the drive and do not affect the rhythm of the recovery. For example, the blade height above the water's surface on the recovery or the point at which the blade begins to square is a difference in style.

A second example of style may be that some crews are taught to lean their torso and tilt their shoulders toward their rigger during the drive, while other crews remain perpendicular as they pull on the oar handle. The difference in body position would not affect the application of power on the drive and would only be a variation in style.

Although coaches are committed to their individual, detailed movements for how they want their athletes to row, it may be only a difference in rowing style, not technique.

Simultaneous movements happen at the same time. For example, during the blade entry, the hands and arms lift the oar handle vertically while the legs push to move the blade horizontally to match the speed of the boat and allow a quick and clean blade entry.

Sequential movements occur in a series, one after another. For example, during the extraction, the oar handle is pushed downward to start moving the blade out of the water on the square, followed by a wrist turn to feather the blade. These two movements happen in sequence, one after the other.

2.11.2 Communicating to Rowers

Motivating athletes is a combination of providing a goal and praising accomplishments. This statement is very true for technical change. The coach's instructions must be to identify the change (goal) instead of the fault (error). The opportunity for improved performance is the change; the focus must be on the goal.

Coaches must be thoughtful when communicating verbal instructions to athletes requiring technique improvements. For example, while the crew is rowing, short, focused statements to communicate changes are needed, and more explanatory statements may be effective when the crew is stationary. Extended or excessively repeated verbal instructions to one athlete may prove frustrating to the athlete who cannot make the change. Over-coaching is ineffective, and coaches must limit their continued focus on one athlete. Changes needed by one athlete may be voiced as general instructions to the entire crew.

Communicating the change required to address the root cause of the fault is an opportunity to improve performance.

2.11.3 Grip, Posture, Balance

Before technique movement can be discussed and developed, the initial focus of a coach must be on the athlete's grip, posture and balance. These skills are critical for new learners but must also be reviewed regularly.

The grip on the oar handle is the first step in supporting good rowing technique. Coaches must address the spacing of the hands and how the hands and fingers grasp the handle to pull, feather and carry the oar. The spacing of the

hands on the oar handle should be similar to the athlete's shoulder width. When sitting in the finish position, the hands (on the oar handle) should be at an equal distance from the body's centreline, which is a function of the position of the footstops.

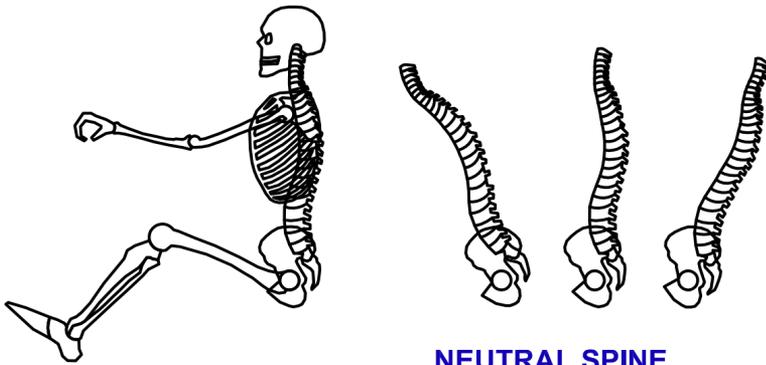
The sculling grip requires the hands to be at the end of the oar handles, typically with the thumbs over the butt. When the sculling blades are square, the wrists are flat, and the oar handles are held in the fingers under the first knuckle, not the palms. During the release, the wrists are turned down to feather the blades and then relaxed as the oar handles are rolled under their fingers to carry the blades on the feather. Similar to sweep rowing, the wrists rotate up to square the blades in preparation for the catch.

The sweep rowing grip requires the inside hand to work, much like the sculling hand and wrist when squaring and feathering the blades. The outside hand holds the end of the oar handle in the fingers under the first knuckle, and the wrist is kept flat, parallel to the water during the drive and recovery.

Posture. The posture of the athlete sitting on the slide includes the back and head positions. Posture is often discussed as a neutral spine that is not straight but in a natural position, Figure 2.11.3a.

Figure 2.11.3a

Neutral Spine



NEUTRAL SPINE

The upper back, from the mid back to the shoulders, is often used to increase reach as the shoulders stretch forward toward the catch. During the drive, the shoulders and upper back pull, straightening the upper spine. This aids the engagement of the latismus muscles to support the arm pull in the late drive. An important aspect of the rowing technique is the position and alignment of the lower back, which must remain in a neutral position and not flex or collapse during the stroke.

Balance is a skill that must be learned and practised constantly. Time learning to sit comfortably on the seat and balance the boat in various positions of the stroke cycle is well spent. Crew boats add the extra dynamic to balance, and the coach must watch for athletes sitting straight over the centre of the boat through the drive and the recovery.

2.11.4 Entry

The entry, also referred to as the catch, is the movement from full reach to when the blade is buried, including connecting with pressure on the blade. As with many parts of the stroke, preparation in the preceding phase allows for a more effective movement. Figure 2.11.4a Coaching Entry breaks down the catch into individual movements of the part of the body and oar to allow coaches a detailed review.

Figure 2.11.4a Coaching Entry

Phase	Skill Ref.	Skill Objective	Coaching Recommendations
CATCH	Blade	Three parts of the catch: 1. Blade approach: path down to water and rotation to square, and should touch water when the athlete achieves full reach. 2. Blade entry, placement, and minimum time required to bury. No splash.	1. Watch the blade square before it touches the water. 1. The timing of how fast it squares is style. 1. Watch the trailing edge of the blade. It must move down toward the water as it squares on its' approach to full reach.

Phase	Skill Ref.	Skill Objective	Coaching Recommendations
	Blade	3. Blade connection. Horizontal force on the blade when buried. Exact blade depth is style, but it must be fully buried.	2. Look for a quick and clean vertical entry movement. 3. Blade at full bury moves horizontally to pressure.
	Oars	The shaft of the oars at the catch is at a similar angle for the entire crew. The oar shaft moves horizontally when the blade is buried.	Check all the oars are at a similar catch angle for the crew. Watch; the amount of oar shaft in water is a cue to blade depth.
CATCH	Grip	Oar handle in fingers. Hands at proper spacing.	Look for the oar handle in the athlete's fingers. Watch hand movements upward on approach.
	Wrists	Inside wrist only squares sweep blade. Wrists flat on pull.	Watch the wrists rotate up to square the blade, NOT lowering hands to square.
CATCH	Arms	Straight and reaching on approach.	Look for the inside arm straight as possible (sweep rowing)
	Elbows	Straight and hanging on to connect,	Check sculling arms are spread wide at catch.
	Shoulders	Sweep: shoulders rotated toward handle while level and reaching.	Look at the shoulder rotation in sweep rowing is from the lower back. Watch for good posture and reach in the shoulders.
	Trunk	Strong lower back position. Trunk maintains catch angle through entry. Rotation of shoulders through lower back twist.	Check the trunk is at the full-reach angle before catch. Watch torso maintains forward catch angle during approach, blade entry and connection.
	Seat	Seat-blade timing critical, blade touches water as seat reverses	Watch for excess slide movement (>5") to bury blade. Use video analysis of blade-seat timing.
	Legs	Good knee compression at full reach.	Watch the shoulders do not lift or arms bend.

Phase	Skill Ref.	Skill Objective	Coaching Recommendations
		Only the legs initiate the horizontal connection	Look for quick movement of legs at entry.
CATCH	Shins	Knees below shoulders. Shins perpendicular at full reach.	Watch shins should not go past perpendicular. Review footstop height or angle if needed.
	Boat		
	Timing	Timing of the crew's blade entry is critical	Watch all blades enter the water at the same exact time.
Catch Notes: See Section 2.8 Drills for specific drills.			
1) Catch requires the ideal approach with perfect blade placement.			
2) Catch movements are consistent at race speed.			

The catch is the transition between recovery and power application stages, which requires quickness and crew timing. It may be the easiest part of the stroke to improve speed, since it is a technical, complex movement. Effective catches provide extended stroke length and the opportunity to apply power earlier. Slow vertical movements with the oar handle will extend entry time, reduce effective stroke length, and severely limit boat speed.

2.11.5 Power Application

The power application stage of the drive begins when the blade connects at the entry. This phase continues until the extraction point, when the blade starts to release from the water. This power application stage of the stroke can be further divided into three parts:

1. **Early Drive** – blade entry to knees past ninety degrees.
2. **Mid Drive** – from knees at ninety degrees to legs approaching full extension.
3. **Late Drive** – is the last part of the power application stage, which uses predominantly arm movement with the blade in the water and force on the oarlock.

The effectiveness of the power application depends on the athlete's ability to coordinate the muscles involved and apply effective force between the oar handle and the

footstops. It also depends on the bladework as the blade acts as a fulcrum anchored in the water, while the athlete uses the oar as a lever to pry and apply force to the oarlock to accelerate the boat. Poor bladework or improper rigging will reduce the force applied to the oarlock as the blade slips through the water. Bladework is critical and is further discussed in Section 2.3 Bladework.

Figure 2.11.5a Drive Technique shows different body positions during the drive.

Figure 2.11.5a. Drive Technique

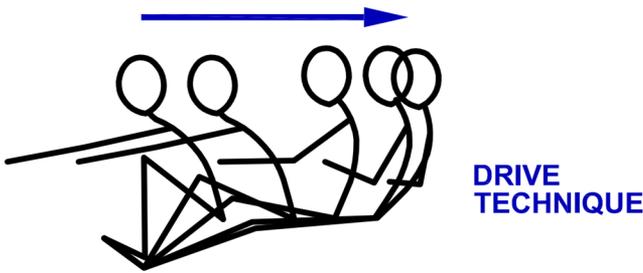


Figure 2.11.5b Coaching Power Application breaks down the power application phase into parts and provides coaching tips.

Figure 2.11.5a Coaching Power Application

Phase	Skill Ref.	Skill Objective	Coaching Recommendations
POWER APPLICATION	Blade	Consistent blade depth throughout the drive phase. Good blade connection, Blade Slip	Watch for consistent blade depth on the drive. Look at oar shaft to help confirm blade depth. The blade should be just below the surface of the water between entry and release.
	Oars	Horizontal pull on the oar handle. Stroke position is important for effectiveness.	In crew boats, oar shafts stay about parallel through the drive. Look for the oar shaft bend that reflects the pulling force.

POWER APPLICATION	Grip	Fingers gripping the oar handle	Watch for the grip on the oar handle in fingers.
	Hands	Good connection with hands	Consider
	Wrists	(sculling) hands level, one hand leads	Look for flat wrists throughout the drive.
	Arms Forearm	Good arm hang (1 st half) Horizontal pull to finish Strong finish acceleration Elbow draws past the body at the finish	Watch for the 'hang' on the oar handle in the early/mid-drive. Consider oar handles closer to the body coming into release. Watch for arms to finish late-drive
	Shoulder	Good arms to lats hang early in the first half of the drive. Good transition pulling back to support arms last half	Look for good reach (from the shoulders) in the early drive. Look for good posture in mid-drive. Late Drive: Watch for shoulders to rotate back as lat muscles finish the drive.
POWER APPLICATION	Torso	Early Drive: holds torso angle to half slide. Strong posture Mid Drive: actively engage torso pivoting from hips. Late Drive: torso finishes pull in late drive.	Watch that the torso holds the catch angle until the knees pass through ninety degrees. Watch that the lower back does not collapse during the drive, specifically the late drive.
	Seat	The athlete's weight moves from the front to the back of the seat	Early Drive: Watch for the seat and oar handle moving together in the early drive
	Legs	Legs dominate 1 st half of the drive. The knee joint opens quickly, and the legs continue. Continuous acceleration in getting the legs down.	1. Watch in the early drive that only the legs engage to move the oar handle. 2. Watch knees continue to drive legs down through the mid-drive without stalling. 3. Look for legs that are down in the late drive.
	Sequence	Legs extend first, then the body, and the arms finish. The sequence includes a smooth transition. Push-Pull-Draw	Watch the Late Drive for the shoulders to rotate back as the lat muscles finish the drive.

Accel.	Power application increases throughout the drive.	Watch for back-end acceleration and good send.
Drive Notes:		
<ol style="list-style-type: none"> 1) Sequential application for legs first, transition to torso through mid-drive and arms pulling in late drive. 2) Sculling emphasizes a back-end power application, building pressure through the drive. 		

The power application phase is the opportunity to accelerate the hull while moving the athlete's body weight toward the bow of the boat.

2.11.6 Release

The release begins when the blade is extracted from the water and ends when the blade is fully feathered, and the athlete is in the finish position. The legs relax, and the torso is in the layback finish position throughout the release.

There are style variations of the blade movements during the release, ranging from starting the feather underwater and rotating the blade out of the water in the air cavity formed behind the blade during the last part of the drive. Another example is not feathering until the blade is clear and well above the water's surface. As these variations do not affect power application or boat speed on the recovery, they are only considered style differences. Style variations with torso movement during the release include no movement, holding it in the finish layback position, or starting the shoulders forward (sternward) as the arms and hands extract and feather the blade.

Figure 2.11.6a Coaching Release is a systematic review of the release.

Figure 2.11.6a Coaching Release

Phase	Skill Ref.	Skill Objective	Coaching Recommendations
	Blade	Blade remains buried until the hands are close to the body.	Watch the blade, squared, and vertical movement from water.

Phase	Skill Ref.	Skill Objective	Coaching Recommendations
		Clean and quick release out square and quickly feathers. Wash (m)	Look for a clean release with no splash or drag from the blade. Watch for a quick rotation to square.
RELEASE	Oars	Quick transition to feather	Watch for the oar finish angle similar for the crew?
	Hands	Hands are close to the body when they move vertically to begin release.	Look at the hands being pulled horizontally, keeping the blade in the water until the release begins.
	Wrists	Sweep: The outside wrist stays flat, and only the inside wrist flexes to feather the blade.	Look closely at the wrists; the outside wrist stays flat while the inside wrist feathers the blade.
	Grip	Good connection with hands. Sculling wrists flex.	Watch: the hands should be very close to the body before the vertical movement starts.
	Arms	Forearms level and parallel to the water surface. Reduce pressure. Tap-down from elbows	Watch the boat speed analysis to see how late the drive is effective due to the oar stroke position being too far to stern.
	Shoulders	Shoulders back connecting lats and arms Square to boat	Look at shoulder position: shoulders back and level.
RELEASE	Torso	Torso is in the finish position layback at the start of the release. Good posture in the layback position. Not leaning. An interesting style variation is starting to pivot the torso forward during the release.	Watch that the torso does not continue to pull back during the release. Look for good back posture without lower back collapse. Watch from the stern that athletes do not lean out of the boat.
	Seat	Seat at backstops	Check the seat does not move through the release.

Phase	Skill Ref.	Skill Objective	Coaching Recommendations
	Legs	Legs relax during the release to transition from pushing to pulling on footstops.	Look for relaxed, straight legs at the beginning of the release.
RELEASE	Boat	The boat is stable	Look for balance by watching from the stern of the boat.
	Timing	Release blade timing is critical at the extraction and feather.	Watch from the stern to ensure all blades begin the extraction and feather together.
	Release Notes: 1) Quick, clean blade release is key. 2) Force on footstops and oar handle(s) not part of the release. 3) The timing of the release is critical for crew boats.		

Release errors should be identified and take precedence to correct as they will affect the recovery balance and timing. The release is an opportunity to bring the crew together and not lost on coaches who teach a micro-pause at the finish.

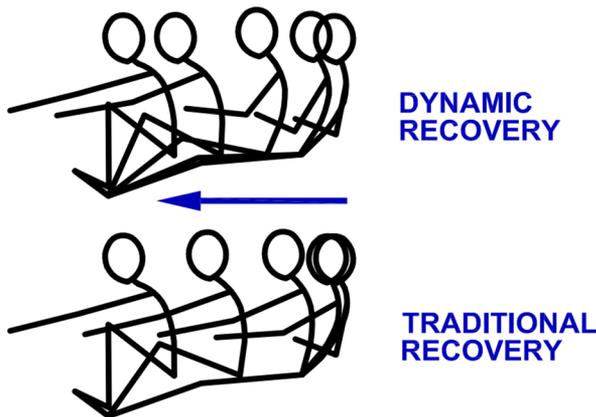
2.11.7 Recovery

The recovery begins when the athlete moves from the finish position and continues until they move to full reach at the catch. The speed and coordination of the movements of the hands, torso swing and slide have been debated over the last twenty years.

Before the year 2000, most crews practiced at low rates with traditional recovery technique, moving their hands quickly away from their bodies, followed by torso pivoting and a slow, controlled slide forward. Since 2000, many coaches have adopted a more dynamic recovery technique, with athletes simultaneously moving their hands, torsos and seats. During low-rate practices, dynamic recovery involving legs, torso, arms movements and late drive acceleration begin the recovery with slower-moving hands from the finish position.

Dynamic recovery is similar to the coordinated muscle movements that occur at racing rates but are much slower at practice speeds. Figure 2.11.7a Recovery Styles shows Traditional sequential recovery movements of arms, body, and legs in sequential order. The figure contrasts traditional with the dynamic (simultaneous) movements used in racing. Many coaches believe that the traditional movements support the racing movements, but no data support this.

Figure 2.11.7a Recovery Styles



The two practice recovery techniques are very popular; however, videos of racing crews always show that dynamic recovery is used in racing. Figure 2.11.7b Coaching Dynamic Recovery reviews specific movements in the parts of the recovery phase.

Figure 2.11.7b Coaching Dynamic Recovery

Phase	Skill Ref.	Skill Objective	Coaching Recommendations
RECOVER	Blade	Clear and above water. High enough above water that the trailing edge moves down to the water on approach to the catch.	Watch the blade above the water's surface and not touching it. The height of the blade above the water is a matter of style.

Phase	Skill Ref.	Skill Objective	Coaching Recommendations
	Oars	Carried in a horizontal line	Watch the oars are at the same height above water on recovery.
	Hands	Relaxed. In sculling, the left hand leads away as the right hand follows and is slightly lower.	Watch for the hands moving horizontally on the recovery. Check the hands rise on the approach to catch.
	Wrists Grip	Inside wrist (sweep) bent down to maintain blade feather. Both wrists (sculling) bent when oars are feathered. On approach to catch forearms rise to left wrists and square the blade(s). <u>In Practice</u> fingers and grips are relaxed	Watch in the late recovery, the wrists rise to square the blade. Look at the position of the bent wrist. It should look comfortable, not over-flexed and not flat. Watch (sweep) that the outside wrist is flat and the inside wrist squares the blade.
RECOVERY	Arms	Move hands/handle horizontally. Arms straight on approach to catch. <u>In practice</u> the hands start slow to allow acceleration throughout the recovery.	Consider dynamic recovery, moving hands/arms, torso and legs together in a combined, relaxed, flowing movement. Watch the Dynamic Recovery video on Purcerverance.
	Shoulder	Pivot with the torso Support arm reaching forward	Look for relaxed shoulders that are level and appear low.
	Torso	Pivot from the hips Straight lower back Achieves catch angle before full reach	Watch for good posture. The torso must move with the arms and legs out of the finish position. The torso should not move independently.
	Seat	Athlete weight transitions form back to the front of the seat	Watch that the seat does not stop at the finish but just changes direction.
	Legs	Legs initiate the recovery, starting with the feet pulling up on the laces of	Check the legs immediately engage from the finish (<u>starting at low rates</u>).

Phase	Skill Ref.	Skill Objective	Coaching Recommendations
RECOVERY		the shoes with the top of the feet to engage the tibialis anterior muscle, which is located on the outside of the shin bone.	
	Knee Feet	This is the main muscle used to lift the front of the foot upwards.	Watch the simultaneous feet pull up on the laces while hamstrings engage to begin knee flexion supported by gracilis, sartorius gastrocnemius's plantar is and popliteus muscles.
	sequence	The body, arms, and legs move simultaneously to the finish. Hands over knees, elbows are bent and trunk perp. <u>In Practices</u> at low rates, movements start slow with constant acceleration towards the next catch	Watch the legs, torso and arms move simultaneously during the recovery. Check at practice rates: the legs connect (sometimes unnoticeable) as the hands and torso move slowly out from the finish position.
	Boat	Balanced Accelerating	Watch for a long surge of the boat forward, which represents late recovery acceleration.
Recovery Notes:			
1) a more relaxed dynamic recovery is recommended at low rates. 2) athletes must learn to maximize acceleration time over as much of the recovery as possible to promote peak boat speed just before the catch.			

During the recovery, the athletes pull their footsteps toward their bodies, increasing the boat's speed. At racing speeds, the boat moves much faster and farther than during the drive phase. Athletes must learn to utilize their body weight to move effectively and maximize the boat's movement at low practice rates.

2.11.8 Rhythm

Rhythm in rowing is the continuous repeated stroke cycle pattern with an ideal balance between effective power application and dynamic recovery movements that maximize hull speed.

Figure 2.11.8a Coaching Rhythm

Phase	Skill Ref.	Skill Objective	Coaching Recommendations include drills
Rhythm	Drive	Legs, trunk, and arms movements are sequential.	Watch for sequential legs, then torso, and then arms movements with effective overlaps.
	Recovery	Legs, body, and arms, movements with a slow start at low rates in practice, including constant acceleration toward full reach	Check recovery matches the rhythm of the drive, not too fast and not too slow. Watch rhythm is a result of movement on the recovery that supports continued boat acceleration.
<p>Rhythm Notes:</p> <ol style="list-style-type: none"> 1) Rhythm requires effective crew timing of body and blade movements. 2) Requires effective catch and release timing. 			

Coaching rhythm requires the coach to identify the movements in the recovery-drive cycle that promote boat speed, both at high and lower practice rates.

2.11.9 Speed

Speed is a skill, and rowers must be able to row effectively at high rates. Learning to row efficiently in a crew at high rates requires practice. Rowing at high rates engages muscles and energy systems differently than during lower-rate sessions. Speedwork can be incorporated into most practices but should be kept at very low volumes to sustain the training effect on the targeted muscle energy systems. For example, a few ten-stroke

pieces at a high rate will not alter the targeted training effect of a low-intensity workout.

Coaching technical speed is an ongoing process that starts at the beginning of the season. Technical speed is the ability to effectively row at very high rates (top speed). It is the athlete's skills taking the catch, applying power on the drive, with precision blade extraction and effective movements on the recovery. During recovery, the boat reaches its highest speed and requires effective movements that utilize the athlete's mass. Technique speed requires the ability to transition from drive to recovery and back to drive quickly. Practicing speed on a regular basis is key to the crew's ability to row at higher rates effectively in racing.

Speed is the goal and should never be sacrificed for the aesthetic value of the rowing technique. Coaches should clearly understand which biomechanical movements apply power on the drive and recovery, and promote boat speed, and which movements improve the crew's look. Boat speed and technical skill are not synonymous. There are crews that row well and go slow, and crews that appear technically deficient but are fast.

2.11.10 Practice v. Racing

The vast majority of coaching takes place in practice at low rates. At higher rates, coaches should use video to identify opportunities to improve. Understanding the difference between muscle contractile speed during racing and practice is key to converting practice technique to racing efficiency.

The time for one complete stroke cycle during racing and practice is different, and the proportions of drive to recovery are even more so. The stroke cycle at 38 strokes per minute covers 1.58 seconds while rowing at 20 spm takes 3.00 seconds. Figure 2.11.10a shows data collected between 2017 and 2023 for boat classes in eights, pairs and singles. The data collected at racing rates represents

the average rate, full drive time (entry, power application and release), and recovery time.

A crew's drive phase intensity during low-rate practices can vary from gentle rowing to exerting full pressure. The total drive phase time could be from fifteen to forty percent longer than at race pace. Figure 2.11.10a Stroke Cycle Racing and Practice shows practice drive times at 130 percent of race data. The chart provides the percentage of the stroke cycle for both the drive and recovery phases to illustrate differences in proportions. It also highlights that recovery times are significantly longer, typically about two and a half times longer than during race conditions.

Figure 2.11.10a Stroke Cycle Racing and Practice

Boat Class	Stroke Rate	DRIVE*		RECOVERY**	
		Time (seconds)	Percent of Stroke Cycle	Time (seconds)	Percent of Stroke Cycle
W8+	37.9	0.84	53.2%	0.74	46.8%
	20.0	1.09	36.3%	1.91	63.7%
M8+	39.2	0.80	52.3%	73.0	47.7%
	20.0	1.04	34.7%	1.96	65.3%
W2-	36.2	0.92	55.4%	0.74	44.6%
	20.0	1.20	40.0%	1.80	60.0%
M2-	38.3	0.86	54.8%	0.71	45.2%
	20.0	1.12	37.3%	1.88	62.7%
W1x	36.0	0.91s	54.5%	0.76s	45.5%
	20.0	1.18	39.3%	1.82	60.7%
M1x	36.0	0.91	54.5%	0.76	45.5%
	20.0	1.18	39.3%	1.82	60.7%

* DRIVE full reach to finish (includes catch and release)

** RECOVERY – finish position to full reach

Stroke Rate 20.0, DRIVE Time is 130% of race times.

The biomechanical movements of the rowing stroke should be similar for both racing and practice, with the main

difference being the speed of muscle contractions. During practices, especially on the recovery, body movements at much slower speeds should be synchronized to match the faster movements of racing. Some coaches modify the movement speeds of various parts of the recovery to highlight specific skills or alter the flow, aiming to enhance technique. A detailed analysis of the required movements and speeds should be thoroughly reviewed for a complete understanding before coaching adjustments are made.

2.11.11 Coaching Process

Coaching rowing requires patience and a systematic review of the small individual movements from parts of the body and the oar. Coaching technique is the skill of observation, analysis, planning and communication. The ability to systematically identify an error and analyze the related cause.

1. Identification of technique error (opportunity).
2. Analysis of the cause of the error.
3. Determination of the error correction pathway.
 - a. Athlete's understanding of the change.
 - b. Video review of error and required change.
 - c. Coaching using all or targeted learning strategies.
 - d. Drills
4. Communication of the change to the athlete.
 - a. Identify the change opportunity.
 - b. Analyze and describe the cause.
 - c. Explain the required changes to the athlete(s).
 - d. Visual cues are examples of movement.
 - i. Video of error and example.
 - ii. Video of preferred movement.
 - iii. Visual examples (other athletes).
 - e. Supporting discussion with athletes on how change will improve performance.
5. Coaching to support technical change.
 - a. Coaching using all learning styles

- i. Auditory description.
 - ii. Visual example.
 - iii. Tactile opportunities (drills), (stroke breakdown).
 - b. Whole-part-whole & new-old-new.
 - c. Drills to support the movement.
 - d. Utilize erg or other tools to support change.
6. Review and movement on a regular basis to ensure error correction is permanent. Motor patterns are not easily changed and must be monitored regularly.

Whole-Part-Whole. The whole-part-whole coaching process involves allowing the athlete to experience the entire movement first. The movement is then broken into a part that the coach wants to emphasize. This is followed by the complete movement, which integrates the emphasized part.

New-Old-New. This process involves communicating a clear understanding of the change to the athlete and allowing them to experience it. Once they have become proficient with the change, let them experience the old (fault) movement for no more than ten strokes. Then, have the athletes row with the new movement for ten strokes. Stop the crew and ask the athlete to discuss the differences in how the two movements feel.

The relationship between different rowing techniques and boat speed is uncertain, and any technique performed well by a good crew can win races. Most coaches are firmly committed to their preferred rowing technique and believe it will translate to the best boat speed. It is not lost on the author that we coach aesthetics and not boat speed.