



Correction of Errors in Rowing Technique



FISA Development Program

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Introduction:

As mentioned in the title page of this material we call it a “draft”, and not necessary a definitive production of “Correction of Errors in Rowing Technique”. The topic has been used as educational material for the participants in the FISA Coaching Academy to teach awareness of technical errors, and how to analyse and correct the different errors that are common in our sport.

We will only highlight one point of importance for active coaching; errors can be sorted out in two groups:

- 1) Errors that limit the rowers efficiency*
- 2) Errors that disturb the boat velocity*

As a test for yourself try to classify the different errors described in to one of those groups.

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Identification and Correction of Errors

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General Considerations

- It is more beneficial to teach proper technique from the beginning than to later correct technique.
- It is important to ensure that the boat is properly adjusted.
- It is necessary to first observe and analyze the action of the blade and boat for a demonstration of the effect of improper technique.
- Next, it is necessary to examine the relative body movements of the athlete to determine the possible causes.

- Determine whether the relative body movement causing the problem is at the point of the demonstrated error or in the preceding phase of the stroke cycle.
- Determine the method to correct the error.
- Explain clearly to the athlete the effect, cause and correction of the error.
- Demonstrate the correct body movement.
- Since beginners may have difficulties correlating the errors to the actual movements of the body, it is better to only show them the correct execution of the movement rather than showing them the incorrect movement.
- Concentrate on one corrected body movement at a time. This is particularly important for beginners.
- Short and frequent training sessions for technique improvement are better than using long and infrequent sessions.
- Since increasing the effective force applied through the oar must be accompanied by an improvement in technique, it is necessary to work continuously on technique correction particularly during periods of increasing training loads.
- Select and use exercises for technique improvement carefully to ensure the maximum benefits.
- Remember, it is important to acquire a good sense of balance and rhythm during the period of learning technique to ensure that the athletes develop the correct perception of the proper rowing technique.

Sweep Rowing Technique

Errors of the Oar

Errors	Technical Explanation	Causes	Drills and things to look for	Points to Teach
1. The blade is "washing out" at the finish.	The blade leaves the water during the last part of the stroke. Watch from the bow and from the stern.	♦The outside hand does not pull high enough at the finish.	♦Stop in the finish position to show the athlete the exact position of the handle at the correct height and with the correct blade depth. ♦Pull high in the finish with the outside hand with the elbow high and slightly back. ♦Row only with the outside arm. ♦Row with square blades.	♦Pull high with the outside hand and elbow. ♦Check to make sure the blade is still buried before the extraction.
		♦Leaning out opposite the oar at the finish.	♦Keep the body over the center of the boat at the finish.	
		♦There is too much pitch.	♦Check the pitch and adjust, if necessary.	
		♦Oarlock is too high.	♦Check the height and adjust, if necessary.	
2. Turning the blade under water during the drive.	Water rises up the shaft of the oar before and during the extraction.	♦The inside hand begins to turn and feather the blade before the extraction.	♦Row with the blade square, lowering it at the finish with the outside hand. ♦Row with the blade square using the outside arm only. ♦Row feathering with the inside hand. ♦Row normally while concentrating on the finish sequence. ♦Row normally controlling the outside lateral pressure.	♦Do not hold the hands too close or too far apart. ♦The inside hand turns the blade to feather. ♦The outside hand lowers the handle while still squared, checking that the wrist is still flat before the inside hand feathers the oar. ♦For the second exercise, make sure the boat is level. ♦For the first and second exercises, concentrate on the outside hand. ♦For exercise three, concentrate on the inside hand. ♦For exercises four and five, concentrate on both hands.

Errors	Technical Explanation	Causes	Drills and things to look for	Points to Teach
3. Dirty or "splashy" finish.	The water masses and pushes on the convex side of the blade.	♦Not enough pressure, thus no whirlpools at the finish.	♦Accelerate the stroke beginning from the entry increasing the pressure to the extraction.	♦Follow the stroke cycle closely by taking easy strokes. Check the puddles and the fluidity of the drive to see if there is enough strength to release cleanly. Stay well back with the shoulders in the finish.
		♦The rigging is too long in the finish.	♦Move the foot stretchers toward the stern and check that the end of the handle allows for correct movement by the outside arm.	
		♦The extraction of the blade is too slow.	♦Row only with the arms.	
		♦The riggers are too low.	♦Check the height of the pull through and adjust, if necessary.	
4. Pulling the collar out of the oarlock during the extraction.	If the foot stretchers are too far to the bow or the rigging is too long in the finish then the athlete tends to pull the oar to the outside in the extraction.	This can be because:	♦Move the foot stretchers toward the stern in a way that between the end of the tracks at the bow and the perpendicular point from the pin there are 65 cm at maximum. With shorter athletes this measurement becomes smaller.	♦Look for the athlete to keep a slight amount of pressure toward the oarlock.
		♦The outside wrist bends above the grip.		
		♦The outside elbow is dropping.		
		♦The outside shoulder drops.		
5. The handle of the oar crosses to the inside of the body at the finish.	The outside wrist lowers itself and turns inside the end of the handle. Check that the handle does not turn to the inside of the profile with the body. Check with the rower stopped at the finish.	♦The inboard setting on the oar is too short.	♦Check that the inboard of the oar is 30 to 31 cm more than the spread of the boat.	
		♦The rigger is too low. There is a tendency to lean to the outside to facilitate the extraction.	♦Check the height of the oarlock.	
		♦The rowers lean to the outside to correct the balance.	♦Look for errors by the crew.	

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Errors	Technical Explanation	Causes	Drills and things to look for	Points to Teach
6. The blade rises or "skies" at the entry.	The blade rises from the water's surface as it approaches the entry.	♦The hands drop while approaching the entry.	♦Row with square blades. ♦Row normally squaring the blade when the hands pass over the knees in the recovery. ♦Row lightly at a low stroke rate with a pause in the recovery at 3/4 slide.	♦Develop the awareness of the hands and their effect on the blade in each stroke phase. ♦Become conscious of the position of the blade relative to the water. ♦Check that during the exercise before and after the pause the rower doesn't change the level of the recovery.
		♦The head lowers itself below the chest level and curls up above the feet at the entry.	♦Take single strokes reminding the rower to focus on one point above the stern. ♦Row with no pressure at a low stroke rate keeping the head in line with the spinal cord.	
		♦The riggers are too low.	♦Check the height of the riggers and adjust, if necessary.	
7. Slow entry.	The blade takes too long to immerse itself in the water and gather pressure. Check the difference between the time on the recovery and on the drive.	♦The outside hand moves too slowly at the entry. ♦Lack of coordination between the arms and the legs in the timing of the recovery. ♦The speed of the slide in the recovery is too fast or is done with flexed arms.	♦The recovery/entry drill: begin with the exact progression of movements and stop immediately after the blade enters the water.	♦Check during the recovery for correct and homogeneous succession of movements: extension of the arms and forward lean with the back then slide on the seat.
8. Bow splash by the blade at the entry.	Check the entry of the blade in the water.	♦A slow entry of the blade in the water.		♦Have a firm upper body at the entry.
		♦Incorrect entry of the blade e.g. the blade goes down in the water then forward.		
		♦Not enough pitch.	♦Check the pitch (more pitch for beginners).	
		♦Unsure of when to enter.	♦Teach the correct sequence.	
		♦Shooting the slide.	♦Row only with the legs keeping the body and the arms firm in the entry position.	
9. The blade goes too deep at the entry.	The blade enters the water up to the shaft, spraying up towards the bow.	♦The blade is not completely prepared. ♦Not enough pitch. ♦The stroke sequence is in error at the entry.	♦Row normally with full body preparation and speed with the outside hand. ♦Check the pitch and adjust, if necessary.	♦Pull on the same plane as the water's surface.

Errors	Technical Explanation	Causes	Drills and things to look for	Points to Teach
10. The stroke is at two speeds.	Check the speed of the oar during the stroke.	♦Poor coordination among the arms, back and legs.	♦Row slowly and correctly for a few strokes.	♦Make the rower sensitive to the constant movement on the slide on the recovery and the increasing pressure during the drive. ♦Use a lighter load for beginners.
		♦The load is too heavy (Not capable of accelerating the stroke).	♦Check the oar and the rigging to select the correct gearing for the capacity of the rower.	
11. The blade touches the water during the recovery.	Observe the blade during the recovery.	♦Not enough downward pressure by the outside hand during the recovery.	♦From a stop, make the oar balance with the hands. ♦Row with only the outside hand.	♦Check to see that the blade is not lowered and that it does not touch the water. ♦Look to isolate the individual with this error; don't tell the whole crew. ♦It is common for juniors to use boats built for heavyweight seniors.

Errors of the Hands

It is very important to identify the role of each hand in the sequence of movements of the hands.

Errors	Technical Explanation	Causes	Drills and things to look for	Points to Teach
1. Hands too close together.	Between one hand and the other there should be about the space of two hands.	♦The rower was incorrectly taught how to hold the oar.	♦Practical demonstration ♦Show the correct way to hold the handle.	♦The outside hand should be placed on the end of the oar. ♦Use tape or string to mark the position of the inside hand.
		♦The inboard is too short.	♦Check that the inboard is approximately 30-31 cm longer than the spread.	
		♦Foot stretchers are too close together.	♦Check and readjust the foot stretchers, if necessary.	
2. Hands are too far apart.		♦The rower was taught incorrectly how to hold the oar.	♦Practical demonstration.	
		♦Inboard is too long.	♦Don't set the inboard length to be more than 30-31 cm greater than the spread.	
		♦Foot stretchers are too far apart.	♦Check the width and readjust, if necessary.	

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Errors	Technical Explanation	Causes	Drills and things to look for	Points to Teach
3. The outside hand bends around the end of the handle.	The elbow angles down at the finish.	♦The inboard is too short.	♦While sitting at the finish, check the position of the handle with respect to the body. Watch exercises relative to errors of the blade numbers 3 and 4. Row normally.	♦Pull the elbows behind the plane of the body and not so far that they are sticking out.
		♦The foot stretchers are too close together.	♦Check and readjust the foot stretchers, if necessary.	
		♦Bending outside of the rigger in the finish because of insecurity in the set.	♦At the finish, keep pressure against the oarlock. Pull correctly on the oar in line with the length of the boat.	
		♦Pulling too hard with the outside shoulder.	♦Complete the pull-through correctly with the arms and not exaggerated shoulders.	
4. Feathering or turning the oar with the outside hand during the extraction.	Watch the blade and the outside wrist while the blade leaves the water.	♦The rower was taught incorrectly how to execute the release.	♦Stop the boat with the rowers sitting at the finish. Have them raise and lower the blade in and out of the water while squared.	♦The outside hand is responsible for controlling the entry and the extraction of the blade and not to feather or square.
			♦Row with the blade squared (without feathering).	♦The outside wrist should remain straight and flat.
5. Squaring (preparing the blade) with the outside hand.	The outside wrist rotates up before the entry. Check the tension of the forearm.	♦The outside hand squeezes the handle and rotates it.	♦With the boat still, oars flat above the water in equilibrium, square and feather the oars with the inside hand. The oar rotates within the outside hand. The outside hand serves only to balance the boat at this point.	♦The outside hand stays loose to permit the oar to turn inside it, while the inside hand turns the handle. The outside wrist remains flat.
6. Arms bent during the drive.	Watch the arms immediately after the entry.	♦Not enough pitch.	♦Check the pitch and increase it, if necessary.	♦Pay particular attention to the extension of the outside arm because it must extend further, and therefore it must travel at a greater velocity.
		♦Insufficient use of the legs.	♦Row only with the legs, with the upper body and the arms, fixed in the entry position. 2. Row long distances continuing to relax the arms.	
		♦Recovery is performed with the arms bent.	♦Extend the arms immediately after the push down and away with the hands. ♦Emphasize length at the entry.	
		♦Tension and squeezing the handle at the entry.	♦Carry the handle at the entry with the fingers relaxed.	

Errors	Technical Explanation	Causes	Drills and things to look for	Points to Teach
7. Inside arm tense at the entry and during the drive.	Watch with care.	♦Not enough rotation of the shoulders to follow the arc described by the handle. ♦Inside shoulder raised.	♦Row at an easy pace, without pressure.	♦The shoulders must remain parallel to the handle. The legs and the back move along the axis of the boat, but the shoulders must follow the arc of the handle and therefore rotate above the torso.
8. The handle is too thin. The hands squeeze the handle.	Check for tension in the forearms and of the knuckles.	♦An insufficient sense of balance in the boat.	♦See "Errors of the Boat." ♦Wiggling the fingers or "Play the piano" during the recovery.	♦Encourage the relaxation of the grip in both hands. Note: The little finger of the outside hand must remain above the end of the handle and together with the other fingers.
9. Thumb(s) on top of the handle.	Watch carefully for the thumbs on the handle.	♦The rower was taught incorrectly.	♦Demonstrate how to hold the thumbs correctly. ♦The thumb of the outside hand must stay below to help maintain complete control of the oar.	♦Both thumbs must stay under the handle. The thumb of the inside hand must stay below the handle to retain the grip needed to feather and square the oar.

Errors of the Body

Errors	Technical Explanation	Causes	Drills and things to look for	Points to Teach
1. "Shooting the slide" or lack of connection between the leg drive with the upper body drive.	Put yourself beside and focus your attention on the movement of the body with respect to the seat.	♦Extra forward reach with the upper body in the last part of the recovery.	♦Check the height of the foot stretchers and adjust, if necessary.	
		♦Lack of coordination between the legs and the body.	♦Row with acceleration concentrating on the isometric tension of the body at the beginning of the leg drive.	
		♦The back is not strong enough to handle the drive of the legs.	♦Exercises appropriate to improve the strength and coordination of the back. ♦Row only with the legs, with the back and arms fixed in the entry position.	
		♦Too much load on the oar for the body to handle.	♦Check the inboard and spread (especially for young people).	

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Errors	Technical Explanation	Causes	Drills and things to look for	Points to Teach
2. Falling toward the opposite side of the rigger at the entry.	Check from behind that the outside shoulder drops and moves outward with respect to the center of the boat. The inside shoulder rises. Also, the inside arm is not bent.	♦The athlete feels insecure to follow the handle. ♦Lack of balance in the boat.	♦Row only with the outside arm. ♦Row easily with the shoulders parallel to the handle.	♦Rowing only with the outside arm holding the inside hand behind the lower back.
3. Extra reach at the entry - the upper body droops at the entry.	Check the position of the body at the entry.	♦Foot stretchers are too low. ♦Tendency to over-reach at the entry. ♦Insufficient preparation of the arms and back before starting to slide	♦Check the height of the foot stretchers and adjust, if necessary. ♦Do the 2 stop drill. Row with a stop at the extension of the arms and a stop when the back is angled forward (the position when the arms and the back are ready for the entry). ♦The same 2 stop drill will help here also.	♦Maintain the correct position with the back at the entry. Correctly prepare the arms and back before sliding forward during the recovery.
4. At the finish, the upper body leans on the handle or the shoulders "fall" over the handle.	Look to see if the upper body is pulled forward over the handle.	♦The pull of the arms begins too soon before the shoulders pass the vertical. ♦Problems with the finish.	♦Use the weight of the upper body to augment the power of the drive in the water, particularly pulling well back with the outside shoulder. ♦Row with the blade square.	♦Check that the shoulders stay well behind the handle during the extraction of the blade. Check that the hands and arms extend out well before the upper body leans forward during the recovery. Double check the drive as it approaches the finish. The center of gravity must stay behind the seat. Check that the oar is pulled in toward the body and not the opposite.
5. Upper body hanging out over the gunwale at the finish.	See "Errors of the Hands" No. 5.	♦Foot stretchers are too far towards the bow.	♦Row checking on the rotation of the upper body.	

Errors	Technical Explanation	Causes	Drills and things to look for	Points to Teach
6. Lying back too far at the finish.	Look at the shoulders with respect to the seat and the position of the spinal column.	♦Lack of coordination between the upper body and the arms in the transmission of the upper body on the blade. Closing the pull-through of the arms too late with respect to the finish of the action of the upper body.	♦Row easily at a low stroke rate. ♦Check the complete movement	♦During the second part of the drive, maintain the action of the upper body behind the oar with the immediate transmission on the oar.
		♦Rigging is too low.	♦Check the height of the riggers.	
8. Uneven drive with the legs.	The outside leg pushes and finishes before the inside leg. The knee rises at the finish. Can cause the boat to be down to the side opposite of the rower making the error.		♦Row at an easy pace, emphasizing equal pressure on the foot stretchers, particularly at the beginning of the drive.	♦Check the perception of an equal drive of the legs during a stroke.
9. Lack of slide control during the recovery.	Check the speed of the sliding seat during the recovery.	♦Loss of the correct sequence (hands, body, slide) after the extraction.	♦Row at a low stroke rate. ♦Row single strokes taking time to ensure a correct sequence of movements.	♦The run of the boat must be disturbed as little as possible.
		♦Traveling too fast on the slide.	♦Row at a low stroke rate checking that the upper body is assuming the correct position at the finish and during the first part of the drive.	

Errors of the Crew

- With the awareness that the lack of rhythm and balance in the boat can provoke individuals to make new errors, the coach can appreciate the value of beginning with correct instruction of beginners in a single scull.
- The beginner in a single must learn the correct technique while receiving the response of the boat directly. Learning in a crew boat with other beginners creates many more problems because the responses of the boat are cancelled or modified by the other rowers in the boat.
- In a crew boat the process of learning the technique is much slower and it increases the risk of acquiring movements that compensate for other errors.
- In theory, the technique must be learned individually, and only when an athlete is sufficiently experienced is it practical to row with others. When, in a crew boat, every pair of rowers can row at full slide feathering, then the crew can train like a complete unit. At this point, the attention of the coach must be devoted to the rhythm and the balance, and particularly to the timing of the finish.
- The exercises that allow for a "stop" at a precise point in the stroke cycle permits us to check that all of the rowers in a crew find the correct position at the same time.

Conclusions (List of Drills)

Follow this list of drills utilized with the technical benefit correlated to every benefit if used with correct instruction. The requirement is to teach and have the rower learn the best technique.

- Describe the movement with clear, simple and concise terminology.
- Demonstrate with gestures to the rowers what must to be repeated.

Exercise	Technical Benefits	Possible Problems Derived From Abuse
1. Rowing with a square blade	• quick extraction • powerful finish • prevents lowering the wrists • aids balance and self-confidence	• squeezing the handle during the recovery • it can be boring training
2. Single strokes	• controls the balance • allows you to clearly see the course of the boat • it takes time to prepare the movement on the recovery • check the height of the hands ~ aids in balance and self-confidence	• lose the rhythm of the stroke cycle • more difficult to balance
3. Row with the eyes closed	• helps to perceive the exact sensation of rhythm and time • helps to relax and facilitate balance • the athlete can fix the imagination for developing a particular technique, for example the control of the position of the blade at the entry	
4. Rowing at 1/4, 1/2, and 3/4 slide	• quick entry • acceleration of the power applied by the legs that increase proportionally with the slide • awareness of the length and the opportunity to row with strokes sufficiently long • conducive to learning the correct technique from the start	• lack of precision in the speed of the slide at the entry • can accustom the upper body to raising at the entry
5. Stop at the finish	• awareness of the position and height of the hands at the finish • distance of the hands from the body at the finish • power in the finish observing the puddles or whirlpools that race away	• encourages feathering under water • discourages a harmonious release
6. Row at a low stroke rate (16-18 strokes per minute) for brief periods	• perception of the acceleration of the power application • perception of the course of the boat in the drive and in the recovery • check on the correct recovery.	• strokes at a resistance twice the normal • stiffening of the muscles

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Exercise	Technical Benefits	Possible Problems Derived From Abuse
7. Row with only the outside arm (with square blades). The inside hand is held behind the lower back.	· identifies the role of the outside hand in controlling the blade and the balance · corrects the tendency to raise the blade too high before the entry · stimulates the rotation of the upper body · improves the movement at the entry	· can provoke too firm a grip on the handle and a stiffening of the arms · can cause balance and rhythm problems
8. "Playing the piano"	· discourages an excessively tight grip · stimulates rotation of the upper body · improves the movement at the entry	· can encourage a grip that is too loose · lose the identification of the role of each hand
9. Row with no slide and without the back (arms only) at a high stroke rate	· speed of movement of the hands in the entry and the finish	· shortens the entry · loss of the coordination between the movement speed of the hands and that of the upper body
10. Row with no slide using the back and arms	· correct the succession of movement of the hands and upper body in the finish	· the blade can rise too high above the water · taking the entry raising the shoulders · breaking off the rhythm

Note: In these exercises it is useful to alternate the fixed blade and feathering. In all the cases, it is important to emphasize experimenting - on the part of the coach and the rower - of the concentration perceived motor learning for the exact execution of exercises toward the objective.

Sculling Technique

Errors of the Oar

1. The most errors in sculling are found in the action of the blade and it is in this aspect of the movement that the coach must concentrate most of his or her attention.
2. We will list the common errors, their causes and how to correct them.

Errors	Technical Explanation	Causes	Drills and things to look for	Points to Teach
1. The blade is "washing out" at the finish.	The blade leaves the water during the last part of the stroke. Watch from the bow and from the stern.	♦The pull through is not high enough in the finish (the hands pull through below the rib cage). ♦The elbows finish the pull through lower than the wrists. ♦Too much pitch. ♦Oarlocks are too high.	♦On light pressure, watch closely that the blades carry the full pressure and the handles follow through to the ribs. Progressively increase the pressure of the stroke. ♦Row only with the arms, upper body firm in the finish position, stopping every three strokes, for an instant, with the elbows in the correct finish position. ♦Check the pitch. ♦Check the height.	♦Pull the handles in high. ♦Keep the blade buried. ♦Finish the drive with the wrists at the same level. ♦Check the level of the boat at the release. ♦Ask the rower to memorize the exact position of the moment of the pause.
2. Turning of the blade under water.	Water rises up the shafts of the sculls during the extraction.	♦The sequence of movements of the wrists in the extraction is incorrect. ♦The grip on the sculls is too tight.	♦Row with square blades ♦The last part of the drive is ineffective if the hands are over gripping and the wrists are rolled up or squeezing too hard.	
3. Dirty or "splashy" finish.	The water masses and pushes on the convex side of the blade.	♦Not enough pressure, thus no whirlpools at the finish. ♦The extraction of the blade is too slow. ♦The rigging is too long.	♦Accelerate the stroke beginning from the entry increasing the pressure to the extraction. ♦Row only with the arms. ♦Move the foot stretchers toward the stem and check that the ends of the handles contact the ribs at the release.	♦Follow the stroke cycle closely by taking easy strokes. Check the puddles and the fluidity of the drive to see if there is enough strength to release cleanly. Stay well back with the shoulders in the finish.
4. A blade comes out before the other.	Watch the action of both the blades from the bow and from the stern. The boat drops toward the side of the scull that is last out of the water.	♦The crossover of the grips is staggered. ♦The pull through is not level. ♦One hand drops before the other. ♦The riggers are not set at the correct heights.	♦Row normally while checking that the crossover of the hands during the recovery and during the drive - the right hand should be below the left hand at the perpendicular to the rigger. ♦Row without pressure at a low stroke rate. ♦Row without pressure at a low stroke rate. ♦Check the height of the riggers.	♦End the pull through and begin the recovery with the hands at the same levels. ♦Check that the boat is moving in a straight line. ♦Emphasize the correct movement of the hands in the push down and turn at the finish. ♦Be sure that there is the correct amount of pressure between the hands and the feet.

Errors	Technical Explanation	Causes	Drills and things to look for	Points to Teach
5. The blades rise at the entry.	The blades rise from the water's surface as they approach the entry.	♦The hands drop while approaching the entry.	♦Row lightly at a low stroke rate with a pause in the recovery at 3/4 slide.	♦Check that during the exercise before and after the pause doesn't change the level of the recovery. Raise the hands at the moment of the entry. ♦Learn to perceive, before the entry, where the blades are relative to the water. ♦Observe the sculls during the drive and look for the position of the blade relative to the water ♦Develop the concept of the hands and of the blade in the phase. ♦Become conscious of the position of the blade relative to the water.
		♦The hands hold the sculls too tightly.	♦Train the fingers while moving toward the stern. ♦"Play the piano" with the fingers.	
		♦The head lowers itself below the chest that it curls up above the feet at the entry.	♦Take single strokes reminding the rower to focus on one point above the stern. ♦Row with no pressure at a low stroke rate keeping the head in line with the spinal cord.	
		♦The riggers are too low.	♦Check the height of the riggers.	
6. Slow entry.	The blade takes too long to immerse itself in the water and gather pressure. Check the difference between the time on the recovery and on the drive.	♦The hands move too slowly at the attack. ♦Lack of coordination between the arms and the legs in the timing of the recovery. ♦The speed of the slide in the recovery is too fast and/or the arms are flexed.	♦The recovery/entry drill: begin with the exact progression of movements and stop immediately after the blade enters the water.	♦Check during the recovery for correct and homogeneous succession of movements: extension of the arms - forward lean with the back - slide on the seat.
7. Bow splash by the blades at the entry.	Check the entry of the blades into the water.	♦A slow entry of the blades into the water.		♦Set the upper body in the recovery and keep it firm at the entry.
		♦Incorrect entry of the blade (e.g., down then forward).		
		♦Not enough pitch.	♦Check the pitch (more pitch for beginners).	
		♦Unsure of when to enter.	♦Teach the correct sequence.	
		♦Shooting the slide.	♦Row only with the legs with the body and the arms firm in the entry position.	

Errors	Technical Explanation	Causes	Drills and things to look for	Points to Teach
8. One blade enters the water before the other.	Watch the action of both the blades from the bow and also from the stern. The boat drops toward the side of the scull that enters the water first.	♦One hand rises at the entry before the other.	♦Row easily at a low stroke rate.	♦Check to see that the boat is balanced.
		♦The shoulders are not at an equal height at the entry.	♦The recovery/entry drill: begin with the exact progression of movements and stop immediately after the blade enters the water.	
		♦The riggers are not set at the correct heights.	♦Check the height of the riggers.	
9. The blades go too deep at the entry.	The blades enter spraying towards the bow at the entry.	♦The blades are not completely prepared.	♦Row normally with a full preparation and speed with the outside hand.	♦Pull on the handles at the same plane as the water's surface.
		♦Not enough pitch.	♦Check the pitch.	
		♦The stroke sequence is in error at the entry.		
10. The blades touch the water during the recovery.	Look at the blades.	♦Not enough downward push by the hands.	♦From a stop, make the sculls balance with the hands. ♦Row with only the outside hand.	♦Check to see that a blade is not lowered and touches the water. ♦Check the size of the boat because it is common for children to use boats built for adults.

Errors of the Hands

Errors	Technical Explanation	Causes	Drills and things to look for	Points to Teach
1. The handles finish the pull through at the sides of the rower.	Check the positions of the wrists that they drop and rise too much.	♦The foot stretchers are placed too far toward the bow.	♦Check the position of the foot stretchers in respect to the position of the hands in the finish.	♦Treat the movement of the second part of the drive.
		♦The push of the legs is not complete in the finish.		
		♦The inboard on the sculls is not enough.	♦Check at the crossover of the handles that there is approximately 18-22 cm.	
2. The wrists bend at the finish.	Watch the finish very closely.	♦Not allowing the handles of the sculls to be rotated by the fingers.	♦Exercises to rotate the handles with the fingers. ♦Conclude the finish well with the fingers forward. ♦Row with square blades.	♦It can be caused by turning the sculls while still in the water. ♦Emphasize the importance of continuing the movement of rotation in the release.
		♦The rigging is set too long which renders the extraction difficult.	♦Check that the foot stretchers are not too close together. ♦Check that the inboard is set correctly.	
3. The wrists are bent during the recovery.	Observe by looking very closely.	♦Wrists were bent in the finish.	♦As above.	
		♦The load of the inboard and span is too heavy for the rower.	♦Check the correctness of the inboard and the span.	
4. Grip on the oar is too tight.	Look at the tension in the forearms.	♦Gripping the handle with the palm of the hand.	♦Try the exercise "playing the piano." ♦Teach the correct position rowing easily with the blades squared.	♦Relax the hold on the handle, especially during the recovery. ♦Lateral contact with the thumb and hand hooked around the handle.
		♦Tension in the forearm.	♦Row holding with the fingers.	
		♦The pitch is not correct.	♦Check and adjust the pitch, if necessary.	
5. Elbows that bend too soon causing the rower to grasp onto the grips.	Observe immediately after the entry; look individually at each elbow.	♦Not enough pitch on the sculls.	♦Check and increase the pitch, if necessary.	♦Sensitize the rower to the correct succession of the intervention of the three motors of the drive: the legs, the back and the arms.
		♦Insufficient use of the legs at the beginning of the drive and the back during the pull through.	♦Row easily for long distances maintaining the arms relaxed.	
		♦Recovery with the arms bent.	♦Begin the recovery from the finish position by first extending the arms straight forward.	
		♦Tension squeezing the handles during the recovery.	♦Arrive at the entry during the recovery with the fingers extended and relaxed.	

Errors of the Body

Errors	Technical Explanation	Causes	Drills and things to look for	Points to Teach
1. "Shooting the slide."	Put yourself beside and focus your attention on the movement of the body with respect to the seat.	♦Extra forward reach with the upper body in the last part of the recovery.	♦Check the height of the foot stretchers.	
		♦Lack of coordination between the legs and the body.	♦Row with acceleration concentrating on the isometric tension of the body in the first part of the stroke at the beginning of the leg drive.	
		♦The back is not strong enough with respect to the drive of the legs.	♦Exercises appropriate to improve the strength and coordination of the back. ♦Row only with the legs, with the back and arms in the entry position.	
		♦Too much load on the oar and rigger.	♦Check the inboard and spread (especially for young people).	
2. Uneven drive with the legs.	Check that both the knees go down at the same time during the drive.	♦Unequal pull with the arms or push with the legs.	♦Row at an easy pace emphasizing equal pressure on the foot stretchers.	♦Carefully check for equal distribution of pressure on the foot stretchers, equal push of the legs, equal drive with the back and the arms.
3. Lying back too far at the finish.	Look for the shoulders with respect to the seat and at the position of the vertebrae column.	♦Lack of coordination between the upper body and the arms in the transmission of the upper body on the blade. Close the pull-through of the arms too late with respect to the finish of the action of the upper body.	♦Row easily at a low stroke rate. ♦Check the complete movement.	♦During the second part of the drive, maintain the action of the upper body behind the oars with the immediate transmission on the oars themselves. ♦Don't lie back too far at the finish.
		♦Attempting to lengthen the stroke beyond the relevant sector.	♦Row single strokes stopping at the finish to perceive the correct position (don't use this exercise too much).	
4. The upper Body leans over the handles or the shoulders "fall" over the handles at the finish.	Look to see if the upper body is pulling forward over the handles of vice versa.	♦The pull of the arms begins too soon before the shoulders pass the vertical.	♦Use the weight of the upper body to augment the power of the drive in the water. ♦Row with the blades squared.	♦Check that the shoulders stay well behind the handles during the extraction of the blades. ♦Check that the hands and arms extend out well before the upper body leans forward on the recovery. ♦Double-check the drive when approaching the finish. The center of gravity must stay behind the seat.

Errors	Technical Explanation	Causes	Drills and things to look for	Points to Teach
5. Extra reach at the entry - the upper body falls forward at the entry.	Check the position of the upper body at the entry.	♦Foot stretchers too low.	♦Check the height of the foot stretchers.	
		♦Tendency to over-reach at the entry.	♦Do the 2 stop drill. Row with a stop at the extension of the arms and a stop when the arms are extended and the back is forward (ready for the entry) and then complete the slide.	♦Maintain the correct position with the back at the entry.
		♦Insufficient preparation of the arms and back before starting to slide forward on the seat.	♦The same 2 stop drill will help here also.	♦Correctly prepare the arms and back before sliding forward into the recovery.
6. Lack of control of the slide during the recovery.	Check the speed of the sliding seat in the recovery.	♦Loss of the correct sequence (hands, body, slide) during the recovery.	♦Row at a low stroke rate.	♦The run of the boat must be disturbed as little as possible.
		♦Traveling too fast on the slide.	♦Row single strokes taking time to insure a correct sequence of movements.	
		♦Unable to accelerate the drive.	♦Row at a low stroke rate, checking that the correct position of the upper body is assumed at the finish and during the first part of the stroke.	

Conclusions

Follow the list of exercises/drills utilized with the technical benefit correlated to every drill if used with correct instruction. The requirement to teach and learn the best technique.

- Describe the movement with clear, simple and concise terminology.
- Demonstrate with gestures to the rowers that which tend to be repeated.

Errors of the Crew

- The awareness that the lack of rhythm and of balance of the boat can cause errors adapted to individuals makes the coach appreciate the value of a correct instruction of the beginners in a single.
- The beginner in a single must learn the technique receiving the response directly from the boat. Learning in a crew boat with other beginners creates many more problems because the responses of the boat are cancelled or modified by the other rowers in the boat.
- In a crew boat the process of learning the technique is much slower and it increases the risk of acquiring movements that compensate for other errors.
- In theory, the technique must be learned individually, and only when an athlete is sufficiently experienced is it practical to row with others. When in a crew boat every pair of rowers can row at full slide feathering, then the crew can train like a complete unit. At this point, the attention of the coach must be devoted to the rhythm and the balance, in particular to the timing of the finish.
- The exercises that allow for the "stop" at a precise point in the stroke cycle permit us to check that all of the rowers in a crew find the correct position at the same time.

List of Drills:

Exercise	Technical Benefits	Possible Problems Derived From Abuse
1. Rowing with square blades	· quick extraction · powerful finish · prevents lowering the wrists · adds balance and self-confidence	· squeeze the handles too tight during the recovery · boring training
2. Row with the seat fixed	· opening of the back and the shoulders at the entry · sensitization of the release and the start of the recovery with the hands if used with the movement of the body · control of the sculls with the hands and the forearms · improvement in balance and increase in confidence	
3. Rowing at 1/4, 1/2, and 3/4 slide	· quick entry · acceleration of the power applied by the legs that increase proportionally with the slide · awareness of the length and the opportunity to row with strokes sufficiently long · propaedeutic for learning the technique of the start	· lack of precision in the speed of the slide in the attack · can accustom and enter raising the upper body
4. Stop at the finish	· awareness of the position and height of the hands at the finish · distance of the hands at the finish · power in the finish observing the puddles or whirlpools that race away	· encourage feathering under water · discourages a harmonious release
5. Row with thumbs off	· relaxes the grip · little tension on the forearms · builds confidence · lateral control	
6. Single strokes	· controls the balance · allows you to clearly see the course of the boat · it takes time to prepare the movement of the recovery · check the height of the hands · balance and self-confidence	· lose the rhythm of the stroke cycle · more difficult to balance
7. Row at a low stroke rate (16-18 strokes per minute) for brief periods	· perception of the acceleration of the power application · perception of the course of the boat in the drive and in the recovery · check on the correct recovery to follow	· strokes at two times to cause a bigger resistance · stiffening of the muscles
8. Row with the eyes closed	· helps to perceive the exact sensation of rhythm and time · helps to relax and facilitate balance · the athlete can fix the imagine for developing a particular technique, for example the control of the position of the blade at the entry	

Note: In these exercises it is useful to alternate squared blades and feathering. In all the cases, it is important to emphasize experimenting - on the part of the coach and the rower - of the concentration perceived motion for the exact execution of the exercises in function of the objective.