Resource Section

F. Technique, Drill's, Flexibility

Swim Technique

The picture on the right provides you with a step by step diagram of proper swimming mechanics. Take a good look at the diagram and apply each phase to your own stoke mechanics. Picture how your hands, fingers, wrists, elbows, shoulders, head, back, butt, hips, knees, ankles, feet, and toes move through the freestyle motion. If you think about the proper position of each of these body parts when performing the following drills, your swimming will become more efficient, and you will become faster.

- 1 arm swim (develops enhanced kinesthetic awareness and strength of each arm)
- 3 point touch (butt, hip, shoulder)
- sculling (3 types – develops strength in swimming muscles important to pull phase of front crawl)
  - both arms fully extended; arms bent sculling in front of head; arms bent, sculling at chest
- kick (develops balance, leg strength)
  - front; back; left side; right side; roll side to side
- butt touch (extends finish phase of stroke)
- finger drag (relaxes arm in recover phase)
- palm slap (helps extend stroke length)
- hand cocking (improves catch phase of stroke)
- catch up (improves pull and finish phase)
- paddles (develop strength and power)
- flippers (develop strength, power, technique)
- fist swimming (kinesthetic awareness of forearm)
- broken stroke (improves balance, recover phase)
- slow motion swimming (muscle memory)
- arms only (strength, power, pull & finish phase)
- Butterfy (Power, strength)
  - 1 arm
  - left, right, both, repeat
  - arms only
  - dolphin dives
  - slow motion
- Back (enhances balance, develops power and strength of accessory muscles used in freestyle)
  - arms only
  - broken stroke
  - 1 arm
  - extra roll (show your stripes)
  - slow motion
- Breast (develops power and strength of accessory muscles used in freestyle)
  - Breast with fly kick
  - Arms only
  - 2 pull one kick
  - extra long glide
  - broken stroke (pull, pause, kick, pause, glide, pause, repeat)

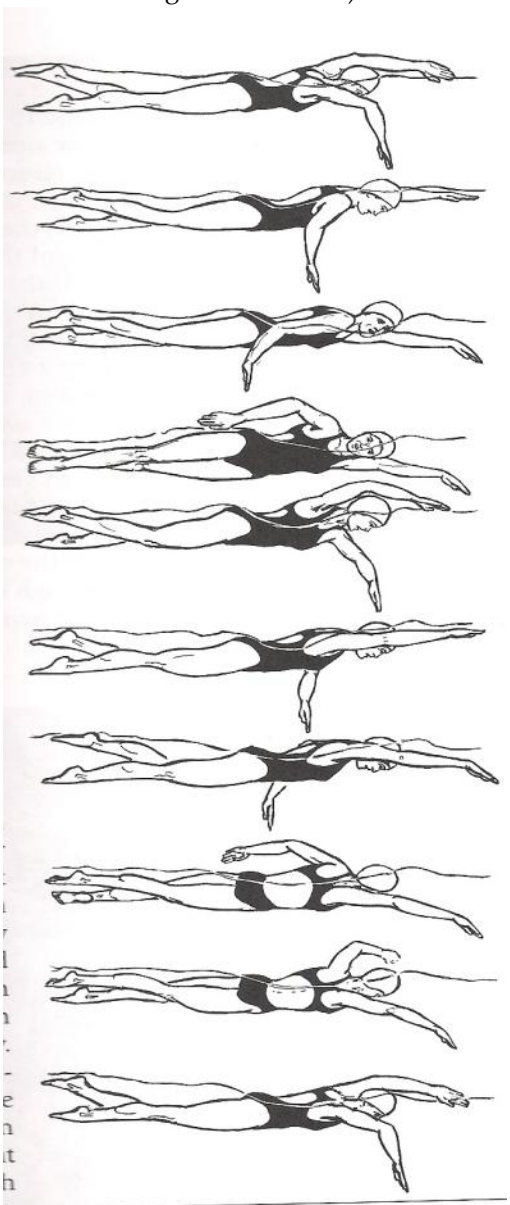


Figure 2.3 Proper freestyle mechanics.
Reprinted, by permission, from Cecil M. Colwin, 2002, *Bre through swimming* (Champaign, IL: Human Kinetics), 51.

Bike Technique

Good cycling form will provide lower drag, faster speed and less energy. The pictures on the right demonstrate good cycling form. The first picture illustrates the importance of flattening the back. The flatter the back the less turbulent the airflow will be as it goes over the body. It also provides a better activation of the muscles contributing to the pedal stroke.

The second picture demonstrates the importance of keeping your elbows in. You can see from this picture that when your elbows are out and your head is up, there is a hole or opening for air to travel into the chest. This will cause a great deal of aerodynamic drag. This hole or opening that is caused by keeping the arms wide and head up is like facing the opening of a cup into the wind and "scooping" the air. You body will go much more efficiently through the air if the air passes around you, rather than into you. If you were to turn the cup around so the opening is facing away from the wind, or the bottom of the cup is now into the wind, there will be no "scooping" and air will flow aerodynamically around the cup instead of into the cup.

By lowering your head and bringing your elbows in, your are performing a technique known in cycling as "closing the cup". Picture two shows what it looks like to bring your elbows in, and picture three shows what is looks like to bring your head down and completing the "closing of the cup". Airflow will now be directed around you instead of into you.

The fourth picture shows a side view of a cyclist in proper aero position, with flat back, cup closed, proper arm extension and head position. The legs should have a 25 to 30 degree bend at the knees when fully extended, according to scientific studies.

The following are some drills to help develop performance and technique.

- Standing core riding
  - Heavy gears, slow rpm
  - Light gears, fast rpm
- Seated core riding
  - Heavy gears, slow rpm
  - Light gears, fast rpm
- Isolated leg spinning
  - Descending speed or resistance
  - Ascending speed or resistance
  - Pyramid sets
  - Sectors (sets of ascending then descending)
- Long sets of high rpm (90-120)
- Single and double leg accelerations

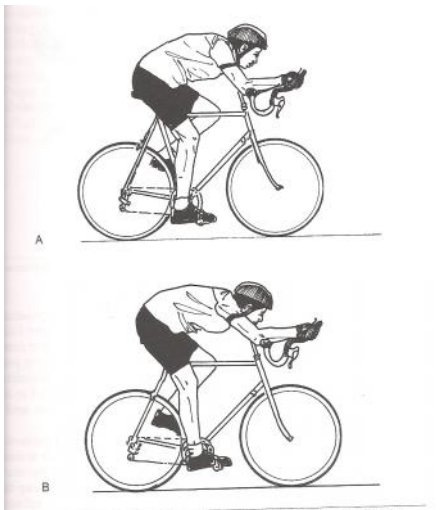


Figure 9.13 To change from riding with a rounded back (a) to a flat back (b), rotate your pelvis forward on the saddle.

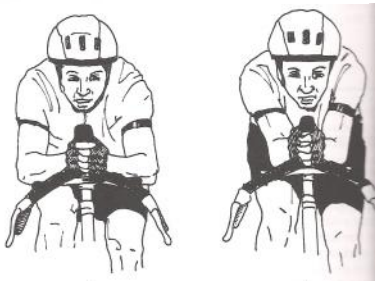


Figure 9.12 Closing the cup.

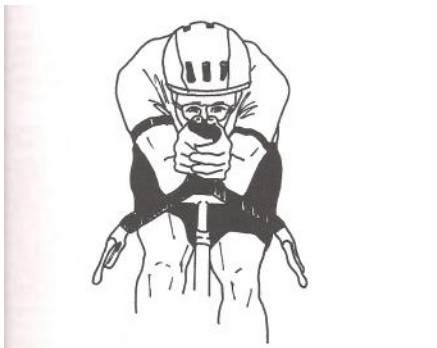


Figure 9.15 A frontal view of an aerodynamic and biomechanically comfortable riding position.


Figure 9.14 Lower your chin to fill the gap between your shoulders and arms further close the cup.

Running Technique

Just like proper form is important in swimming and biking, it is also important in running, as you have probably guessed. An efficient runner can run longer and faster with less energy, but because it is the last of the three sports in a triathlon race, it is probably the most important sport to have good form. Most triathletes say it is the run that wins the race. On the other hand, if you are an efficient swimmer and biker, you will have lots of energy for the run. If you have energy left for the run, and you are an efficient runner, imagine how fast your race could be? Practice makes perfect, so the more time you spend running, the more your muscles will adapt to becoming physiologically efficient. Your stride length and turnover will increase, power in you step will increase, your flight phase will increase, biochemically your muscles will adapt to provide you with increased stores of chemical energy (ie glucose), develop more hemoglobin which will deliver more O_2 to working muscles, and be able to deal with lactic acid better (improved buffering system). All these adaptations will lead you to be a faster runner. Physical training causes a great deal of these adaptations, but so does working on form to help you become a more efficient runner. The following drills can help develop this efficiency:

- Ideal stride rate around 90rpm.
- Dynamic ankle development (ankle strength, flexibility and proprioceptive coordination)
  - Walk on heels, pulling toes toward shins; walk on balls of beet (standing tall); walk on outer sides of feet; walk on inner sides of feet
- Improve hip extension and flexion through flexibility training.
- March to claw (enhances proprioceptive stabilization when performing toe-off phase)
  - Stand with left leg on pillow, raise right thigh (march position), contract abs and hold for 5 seconds, flex left knee 2-3 inches, rapidly lower right foot, "clawing" or brushing over floor with ball of foot, quickly return to march position for 10 reps, then switch sides.
- Single leg hop (balance and strength in hip, quads, foot and shin)
  - Place right thigh in march position (parallel with floor), lower and touch right toes and ball of foot to ground, then rapidly swing right thigh upward toward chest height. The left foot will come off floor when done correctly. Repeat 5-10 times per leg.
- Heel kick up (foot dynamics training, arm coordination and posture)
  - Begin jogging lightly, bring heel(s) up to buttocks. Rapidly get off the foot, working the arms in coordination with each heel lift. Try including single-legged kick-ups, performed by rapidly bringing right heel repeatedly to the butt.
- High knee form acceleration (improve form mechanics, body balance, stride rate, arm carriage, posture and stride length)
  - Begin running, gradually increase the tempo, raise knees and thighs to a higher level every 10 sec, hand should reach chest level and return to hip level during each gait cycle, maintain posture throughout acceleration interval (10-40 sec), follow with light relaxed running.
- Single leg plyo jump (develops hip flexor, glute, and quad strength and stability)
  - At bottom of grassy slope, step forward onto slope with left foot (right foot slightly flexed behind you), squat down onto loft leg 2-4 inches, thrust up on left foot, landing up slope, continue up slope for 3-5 reps with left leg, then do same with right.
- Alternate leg bound (drill for proprioception, hip flexor, quad and foot strength)
  - Begin - left foot in front of right, push off right leg, energetically bringing thigh and knee forward and upward, return to starting position, switch leg positions, repeat.
- Alternate leg box step (foot, hip and calve coordination and strength development)
  - Stand facing 12-18 inch high step box against a wall or stairs, place right foot and about 20% of weight on box, quickly switch feet and continue alternating them for 30 seconds, rest and repeat.

Flexibility

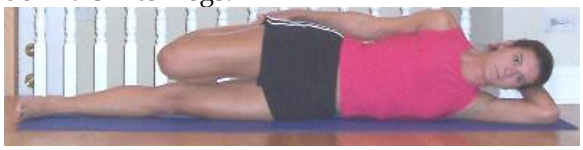
Hip/Glute Stretch
Cross left foot over right knee. Clasp hands behind right thigh and gently pull the leg in towards you, keeping upper body relaxed. Switch Legs

Inner Thigh Stretch

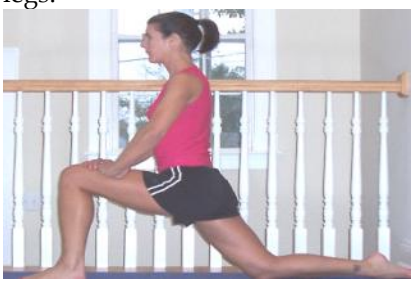
Sit on floor with feet pressed together. Keeping abs in, lean forward until you feel a gentle stretch in your inner thighs.

Knee to Chest
From above position, straighten one leg and pull the other knee into your chest until you feel a stretch in your hip. Switch legs.

Quad Stretch
Lie down on your side using elbow for balance. Using other arm, slowly pull your foot towards your glutes, keeping both knees together and bent knee pointing down. Switch legs.



Lunge Stretch
In lunge position, rest back knee on the floor, with front knee at 90 degree angle, abs in. Gently press forward until you feel a stretch in the front of the leg/hip. Switch legs.



Chest Stretch

Place flat palm of right arm against a wall. Slowly rotate forward until you feel the stretch in your chest. Hold the stretch for 10-30 seconds. Stretch the other side.

The "Spinal Twist"

While seated, extend the left leg in front of you. Bend your right leg, placing your right foot on the outside of the left knee. Extend your right arm behind you to support your body. Place the left arm on the outside of the right leg. Slightly twist the torso using your left arm until you feel the stretch in your side. Hold for 10-30 seconds. Stretch the other side.

Hamstring Stretch

While seated, extend your left leg in front of you. Bend your right leg, placing the bottom of your foot on the inside of the left knee. Place your right hand on top of your left hand. While keeping the lower back straightened, reach toward your left foot. Hold this for 10-30 seconds. During this stretch, keep the foot of the straight leg upright with the ankle and toes relaxed. Repeat for the right leg.

Calf Stretch

While standing, place your left foot near the wall. Bend forearms and rest them against the wall. Keeping the right foot flat on the floor, move right leg back until you feel the stretch in the calf muscle. Hold an easy stretch for 10-30 seconds. Do not bounce. Stretch the other leg.

Shoulder Stretch

Extend your left arm in front of your body. Using the left wrist, place the right wrist underneath and pull inward toward your body, while keeping the left arm extended. Hold for 10-30 seconds. Stretch the other side.

Forearm Stretch

Extend your right arm. Using your left hand, pull your finger tips back toward your body until you feel the stretch in your forearm. Hold the stretch for 10-30 seconds. Repeat using the other arm.

Triceps Stretch

Bend the right arm while placing your fingers in the middle of the back. Using the left arm, pull your right elbow backward until you feel the stretch in the back of your arm. Hold it for 10-30 seconds. Stretch the other side.

This resource section was developed to help you find ways to improve your triathlon training and racing. A great deal of information has been presented here for your reading enjoyment, and to help you develop a training schedule that will suit your own particular needs. Every athlete is very different in their individual training needs, which make it very difficult to make a general training plan for everybody as a whole. This training plan was developed to give you the resources to create a plan according to your individual training needs.

If there are any questions that I can answer, or tips that I can provide, feel free to contact me, Jon Tracy, MSc (Exercise Physiologist). My email is jono3of6@hotmail.com.
Enjoy the program, and have fun training in the winter, and racing in the summer.

"Tri a Tri, Attempt an Olympic, Submit to Ironman" – Jon Tracy