**Backstroke Technique Checklist**
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**Body Position**
- The body must roll from side to side – significant body roll can lessen form drag and improve speed
- The body is in the position of maximum sideways roll as the arm is starting to pull down from above the head; as the arm pulls the body rolls away from the pulling arm
  - the roll of the body toward the pulling arm brings the powerful shoulder muscles, notably latissimus dorsi and teres major, into an optimal position to apply force to the arm at the shoulder joint
- Number of strokes is important – in theory, the fewer strokes taken the lower the total resistance that must be overcome

Body rolls significantly throughout stroke with both arms. This allows a large reach with the arm, and reduces form drag.

**Head**
- Should be very, very still to reduce wave drag and frontal resistance
- Water should just cover the ears
- Head and eyes are slightly inclined to face backwards
- Shorter the event, the higher the head; the longer the race the farther back the head (higher head position allows the legs a deeper and more propulsive kick, lower position is more streamlined).
- Should remain in the middle of the shoulders and stay in line with the rest of the body to prevent an excessive sideways movement of the body
- Bobbing the head will throw off the entry position of the hand – difficult to compensate for this error later in the stroke (swimmers use the distance between the eye and the arm to help place the hand in the correct position in reference to the shoulder for entry).

**Breathing**
- Cannot breath at will as breathing affects buoyancy and thus the stroke
- Best breathing: in on one hand entry and out on the opposite (suggest breath in on the dominant hand entry as it may be more effective in aiding power)
• Inhale through the mouth and exhale through the mouth and nose to prevent panting (breathing quick and shallow)

**Kicking**

• Positioned deeper in the water than in the freestyle; leg kick is quite deep with maximum knee angle close to 115°
• Legs should not break the surface of the water during kick- kick is an underwater skill
• Should use a 6 beat kick to maintain body position and aid in propulsion; 6 leg kicks for every arm cycle
• Kicking is very important in the backstroke
• Propulsive force of the kick is on the upbeat; feet are plantarflexed and toes are pointed toward the back of the pool during the entire kick
• Knees bent for upbeat and extended for the down beat

![Knee approaches 115-degrees of flexion, while remaining under water throughout the kick. Foot is plantarflexed during kick.](image)

Fig. 1: The complete pull of the backstroke from entry led by the little finger to the exit led by the thumb.

**The arm pull**

• Enter water just outside the shoulder lines – arm should be straight at entry
• At entry the shoulder is laterally rotated and the forearm is supinated to position the hands facing outward- this allows the hand to slice down into the water at entry
• Little finger should enter first with ulnar deviation of the wrist (bends the wrist so the fingers enter before the rest of the arm)
  • -hand should enter a split-second before the other arm has completed its stroke – to ensure continuous propulsion
• Hand knifes down through the water (wide and deep and elbow toward the bottom)
• Elbow begins to bend as the arm starts to pull
• Medial rotation of the humerus is the movement that backstroker should emphasize for the first half of the pull (as the elbow is flexing)
• Deep hand is critical on this “catch” action
• Elbow should be close to 90-degrees when it’s under the shoulder – then peak flexion occurs when the hand is almost at the surface of the water – opposite of the shoulder, but doesn’t break surface due to the trunk roll
• When elbow is in the same transverse plane as the shoulder, the forearm is about 15-deg above the horizontal
• Up and over in an arc that is wide of the body (reason why this is a less efficient stroke than the front crawl)
• As hand reaches the limits of its reach (wide of the body), the hand is accelerated up, across and out past the hip (palm of hand faces the feet during the acceleration)
• Second half of the pull, the shoulder adducts as the medial rotation continues to occur and the elbow extends
• Downward push causes the body to rotate about its longitudinal axis away from the pushing hand
• Finish the push about 1.2-2ft below the surface of the water
• Hand should be palm down at this point
• Hands should be at a 40-deg angle in relation to the pull pattern, thus creating more propulsion due to the effect of lift than if they pushed straight backward and obtained propulsion due to the effect of drag (/ 40 degrees)
• Length of stroke = entry above the shoulder, exit past the hips
• Width = entry just outside the shoulder line, then the hands sweeps wide (and deep) and then sweeps inward once again to the hip.
• Hand acceleration is from the wide-and-deep catch position through the over-the-top extension.
• Second acceleration occurs as the hand finishes the stroke past the hip

Left elbow is flexed to 90-degrees as it passes under the shoulder. As arm extends, the shoulder is adducted. Stroke finishes 1-2 feet under the surface as the other hand enters. Recovery of this arm is initiated through body roll.

**Recovery**
• Thumbs exit water first
• Gradual acceleration through this phase
• Hips should remain high in the water to prevent excess resistance
• Hand should not delay at the hips but be removed immediately without any pause
• Hand should exit water with either the thumb first or with the palm down and the wrist flexed
• Recovery shoulder rolls up and out as opposite arm begins catch
• Recovery shoulder rolls inward, clearing the water on a clean shoulder lift
• Arm should be 90-degrees at the shoulder with the surface of the water at mid-recovery (shoulder, elbow, wrist and fingers all aligned) – shoulder will be very close to chin as the head should not move
• Recovery should remain in the sagittal plane only (any deviation from this line will result in a lateral reaction in the body)
• ie. if the arm is swung wide in a low, flat, circular movement, there will be a reaction of the legs in the opposite direction
• Recovery arm accelerates slightly past the shoulder in order to enter the water before the pull arm finishes (argued by Councilman who says there should be no overlap between the arm pulls)

Tired swimmers – usually lose the depth dimension of the stroke

Recovery occurs in sagittal plane, reducing lateral movement which would increase drag. Recovering arm moves upward and inward during recovery, entering before other arm finished the pull.