

What makes a winning water polo shot?

Written by Jonathan Freeston, Lecturer, University of Sydney

Medal games in water polo are notoriously close affairs, which are often decided by a single shot. The average margin in gold medal games across the last four Olympics is 3.5 goals in men's competition and 1.5 goals in women's competition.

With goals such a valuable commodity, what does it take to produce a winning water polo shot? Three things go a long way to deciding water polo medallists.

1) Getting out of the water

Throwing velocity is critical to the success of a water polo shot; it gives goalkeepers and defenders less time to block. Olympic-level shot velocities exceed 60km per hour for women and 90km per hour for men.

To achieve these high speeds, elite players are incredibly good at getting their body above the water. Indeed, [research shows](#) the greatest determinant of throwing velocity is a player's ability to get out of the water.

Throwing is all about rotation, and rotating against the resistance of water is slow and difficult work. Players who are able to get more of their body out of the water face less resistance to hip and shoulder rotation, allowing more energy to be transferred into the throwing arm and ball.

2) Threading the needle

Beating an Olympic-level goalkeeper is no easy feat. Goalkeepers have quick reaction times, can get much of their body out of the water and have long arms capable of covering much of the goal. As a result, there are really only five areas of the goal that are likely to lead to a successful shot: the four corners and the counter-intuitive, top-middle target.

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Hitting any of these five targets makes life difficult for a goalkeeper. The corner targets are hard to reach, while the top-middle target exploits the time needed for the goalkeeper to lift their arms out of the water and above the head.

Hitting these small targets (20cm by 20cm) requires incredible precision. The smallest of errors (say of five centimetres) is often the difference between a successful and a saved shot. Remarkably, elite players can hit these targets [as often as 60% of the time](#) .

If all that's not hard enough, these shots are taken under enormous defensive pressure. A successful shot not only needs to beat the goalkeeper, but opposition players as well. Like a wall in soccer, defensive players effectively block sections of the goal, reducing the options available to the shooter.

To combat this, shooters will often implement the baulk technique. This involves faking shots at goal until a shooting lane opens up in the defensive structure, or the goalkeeper makes a false move.

3) A slice of luck!

Finally, successful shots often require a bit of luck. Players often utilise the skip shot, whereby they intentionally bounce the ball off the water's surface. The uneven surface creates natural variance in the trajectory of the ball, presenting an unpredictable challenge for the goalkeeper.

While not an exact science, this is a skilful art that elite players practise regularly to great effect.

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