Technique is More Than What You See

One of the most commonly discussed topics in sport performance is sport-specific movement patterns, or technique. But are we accounting for all the factors that shape those movement patterns?

When we discuss technique we often talk about what we see – body position, sequencing, posture or if the movement matches our perceived ideal. Do you consider your coaching instruction in addition to the athlete's physical capacities or the environment that impact those movements?

As coaches we tend to think that movement quality is largely based on what we say, the cues we give or what drills we introduce into our program. The truth is our instruction may have less impact on an athlete's movements than we would like to think.

Constraints and Movement

Newell's Theory of Constraints (1985) examines the interaction between types of constraints that affect human movement and is shaped by three constraint types.

1) **Individual Constraints -** the athlete – height, weight, strength, injury history, coordination, mobility, cognitive capacity
2) Environmental Constraints - weather, playing surface, temperature, terrain, visibility
3) **Task Constraints -**sport specific, rules, equipment, objectives and task comprehension

Coaching interventions most often target the TASK constraint, focusing on what an athlete should be doing or what the movement should "look like". While this is important and has some influence on performance, it is only addressing one part of the overall system. In reality all three constraint types interact consistently. This often leads to the athlete's technique being the most efficient movement pattern within the physical or cognitive limits of the individual at that time, which is not necessarily the most efficient or effective movement pattern for optimal performance.

This highlights a critical coaching question - Is the athlete physically capable of performing the movement being asked for in training and in competition? For example, I have noticed that many swimmers coming into triathlon lack sufficient hip mobility (extension, flexion and control) to achieve effective hip angles for running. This doesn't mean the athlete can't run, however, this mobility constraint will limit long term run performance. Addressing mobility and strength constraints before increasing run volume may be a more effective long term strategy.

Angles, Levers and Muscle Function

A very useful principal guiding movement mechanics is: **"The angle of a lever dictates muscle function".** Put another way – joint angles will determine which muscles can contribute effectively to a movement

- Shoulder angle as the hand enters the water influences propulsion in swimming
- Ankle angle affects force application throughout the pedal stroke
- Hip angle dictates muscle engagement and efficiency in running

By observing joint angles rather than basic movement patterns, coaches can better identify any underlying constraints and then choose a more appropriate intervention.

Creating Conditions to Develop Better Technique

Athletic performance involves a complex interplay of unseen internal processes and visual physical actions. Movement is the combination of physiological and neurological functions. When working on technique it is worth stepping back and think about a broader range of issues:

- What are the athletes, physical capacities/limitations?
- Are there environmental factors shaping movement behaviour?
- Am I designing coaching interventions to align with the athlete's current capabilities?

We can also consider introducing some reflective questions when working with athletes on technical adaptations:

- What is the most limiting constraint affecting this athlete's movement ability right now?
- Are my coaching cues providing a solution that the athlete is physically capable of achieving?
- Would changing the task or environment provide a better result in this movement pattern?

Rather than forcing a predetermined technical model from the onset it may be more effective to create the conditions that allow sustainable changes to emerge. Ultimately, improving technique is less about providing the perfect instruction and more about understanding the athlete's constraints, respecting their capacity and guiding their adaptation.

Thanks for reading

Greg Kealey
Provincial Coach - Triathlon Ontario