Developing Swimmers
For Lifelong Success

Memo To:	TAC Community
From:	Derek Wall Executive Director
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At the Triangle Aquatic Center, our mission is simple but ambitious: **Developing Swimmers for Lifelong Success.**

Whether you're 8 or 80, a competitive age-grouper, a masters swimmer, a triathlete, or a lap swimmer working toward your first open water race – your development is our passion.

In recent months, this memo series has explored why movement quality comes first, how skill is built through consistent deliberate practice, and how fueling and recovery support athletes through the demands of competition. Each of those topics connects to a single framework that shapes every training decision we make - from how our instructors teach children to float, to how our staff supports professional-level athletes competing on the world stage.

That framework is called Long-Term Athlete Development, or LTAD. Understanding it will help you understand how our coaches and instructors work - and why.

What is LTAD?

Long-Term Athlete Development is a structured approach to building athletes in stages, where each stage has a specific purpose and a specific window in which it is most effective. Developed by sport scientist Istvan Balyi and widely adopted across competitive swimming and dozens of other sports worldwide, the framework is not a single philosophy - it is a map. Our coaches and instructors use it as the primary guide for every developmental decision, at every level of the program.

The stages are built around the biology of human development: the windows when certain motor skills, movement patterns, and physiological systems are most responsive to training.

One important note before going further: the age ranges in the LTAD model are guidelines, not rules. Every athlete develops on their own timeline. Biological age (how physically mature an athlete is) often differs meaningfully from chronological age, especially during adolescence. Two 13-year-olds on the same team may be years apart in biological development. Our coaches and instructors are trained to recognize where each athlete actually is in their development and to build practice structures / consider group placement accordingly. The table below reflects typical windows, not prescriptions.

- **FUNdamentals (Ages 6–9):** The ABCs - Agility, Balance, and Coordination. Movement literacy before structured training. Economy begins here. This is the beginning of learning how to move well in the water, and how to move water well.

- **Learn to Train (Ages 9–12):** Building the technical "chassis." Stroke mechanics and efficient movement patterns are established. This is where the movement economy foundation is laid. This stage is crucial in continuing the development of swimmers who "move with the water" as opposed to swimmers who work against it.

- **Train to Train (Ages 12–16):** The Engine Building phase. Aerobic capacity is developed on top of the technical foundation. Economy and volume grow together. The most critical window in the model.

- **Train to Compete & Perform (Ages 16+):** Optimization and specialization. Economy is refined under race-specific conditions. Applies equally to a 17-year-old chasing Olympic Trials cuts and a 42-year-old in their first open water 5K. Improvement at this stage is earned through economy, not biology.

The sequence matters as much as the stages themselves. Each phase builds on the one before it. A strong aerobic engine loaded onto a weak technical foundation produces a limited swimmer. High training volume applied before movement patterns are established produces injured, burned-out, or stagnant athletes. The map has a sequence - and it cannot be skipped without consequences.

Why the Sequence Should not be Rushed

The "old school" approach to distance swimming is to pile on massive volume early. This can produce higher scores at age-group meets - but does so at a steep price: increased injury risk, stunted technical development, and mental burnout before an athlete reaches high school.

What decades of research - in running, cycling, and swimming - has shown is that movement economy, the measure of how efficiently an athlete moves at a given speed, is the most durable predictor of long-term performance. And economy is best built early, during the FUNdamentals and Learn to Train stages, when movement patterns are most pliable and most easily shaped. Our coaches and instructors prioritize this sequence because it is what the science demands.

Build economy first, and volume later becomes a multiplier. Pile volume onto a technically deficient athlete and you get a tired, inefficient, and injured swimmer.

At TAC, our coaches and instructors are developing swimmers for life - not athletes built to peak at 15 and break down at 19. If a training group does not score as many points in the 1650 today, it is because our coaches are ensuring that when that athlete is 18, 22, or 36, they have the mechanical foundation to handle elite-level training loads without breaking down. For most athletes, this phase is not optional. Skipping it is a gamble with consequences that rarely show up on the scoreboard until it is too late.

The physical consequences of overtraining a young athlete are visible and measurable. The mental health consequences are often neither... hidden behind results, rankings, and early success... until they are not.

Individual Development and the Role of Coaches

Because every athlete moves through these stages on their own timeline, our system is not applying a single template to an age group. Coaches and instructors are continuously assessing where each individual athlete is - technically, physically, and mentally - and building their practice structures and seasonal plans around that athlete's actual readiness, not their age on a birth certificate.

At TAC, this shows up directly in how our track structure and training groups are determined. Across every age group, multiple groups and tracks are maintained. Placement is based on a combination of factors: training history, attendance consistency, current skillset, performance history, and readiness to handle increased load. Times matter - but they are one input among many.

An athlete's times might suggest one group while their technique foundation, availability, or developmental stage points toward a different environment - one where they will get more out of every session, build more durable skills, and stay healthy. The right group is the one where an athlete can do their best work right now. That is always the goal our coaches and instructors are working toward.

Coaching Philosophies within the LTAD Framework

One thing our members may notice, and that we consider a genuine strength of the program, is that our coaches do not all sound the same.

TAC does not mandate a single coaching philosophy or prescribe specific seasonal training plans to our staff. What the organization does require is that every coach operates within the LTAD framework - the developmental sequence is the common foundation. How each coach moves athletes through that sequence, however, is where individual coaching expertise, athlete-coach dynamics, and seasonal approach come into play.

Our coaches share notes on swimmers, exchange ideas continuously, and collaborate on decisions that affect athletes across groups. But each brings their own lens to practice design and seasonal planning. That variety is intentional - and it is good for athletes.

The body adapts to training demands placed on it. When those demands stay exactly the same for too long, adaptation slows and progress can stall. Introducing fresh challenges - new patterns of volume, intensity, or emphasis - keeps the body responding. This is one of the core reasons that great coaching has never been one-size-fits-all, and why a staff of coaches with distinct approaches, all working within the same developmental framework, produces better long-term results than a program where every athlete gets the same plan/approach/philosophy every season.

The LTAD framework is what keeps all of this coherent. Every coach at every level is asking the same questions: Is this athlete ready for more load? Has the technical foundation been established? What does this athlete actually need right now? The framework provides the shared language. What makes our program exceptional is that within those guardrails, our coaches bring distinct voices - and that breadth of perspective is something athletes benefit from directly.

Taper Through the LTAD Lens

Taper - the structured reduction in training load before a major competition - is one of the most misunderstood parts of athletic preparation, and one of the most common sources of questions from families. We will address it in much greater depth in a future communication, but the LTAD framework is the right starting point for understanding why taper looks different for different athletes.

In the early stages of development (FUNdamentals and Learn to Train) taper is largely irrelevant. Young athletes in these stages are not carrying the chronic training load that makes a taper necessary or productive. Their preparation for competition is mostly about rest, routine, and confidence.

As athletes move into the Train to Train stage, taper begins to matter. The body is now absorbing meaningful training stress, and reducing load before competition allows accumulated fatigue to clear while fitness remains. A general approach - reducing volume while maintaining intensity over 10–14 days - works well for **most** athletes at this stage, and our coaches incorporate this into their seasonal planning accordingly.

In the Train to Compete & Perform stage, as training load & muscle development are increased, taper becomes more individual. Every athlete responds differently to reduced load - some sharpen quickly, others need more time; some stay mentally engaged with less, others get restless and need short sharp efforts to feel ready. The most important thing an athlete can do is communicate honestly with their coach throughout the process. The coach provides the structure and the intent, based on years of experience and thousands of data points. The athlete provides the feedback. That dialogue is what allows our coaches to make adjustments that can help over time.

A few things are consistent across all stages and all athletes, regardless of which coach or practice structure an athlete is working within:

- **Intensity does not drop with volume.** Race-pace work continues through taper. The neuromuscular system needs that stimulus to stay primed.
- **Dryland and strength work do not disappear.** As pool volume drops, maintaining movement patterns and neuromuscular firing becomes even more critical.
- **Fueling becomes more important, not less.** The nervous system's demands do not drop just because yardage does. Consistent carbohydrate and hydration support through taper directly affects how well an athlete expresses their training on race day.
- **Feeling "off" during taper is normal.** The brain is accustomed to frequent training stimulation. When that drops, athletes often feel restless, flat, or less sharp - even while they are actually becoming more prepared.

We plan to go much deeper on taper in a dedicated communication. For now, the key takeaway is this: taper is not one-size-fits-all, and the more developed the athlete, the more individualized it should be.

The Long Game: Patient Development and Lasting Results

One of the most consistent patterns in competitive swimming - and in endurance sport broadly - is that athletes who develop steadily and sequentially tend to keep improving long after athletes who develop quickly early have leveled off. The tortoise and the hare story turns out to be a pretty accurate description of how many athletic careers actually unfold.

Athletes who develop extraordinarily quickly between ages 12–15 often do so because puberty is doing a lot of the work. Testosterone, growth hormone, and rapid increases in lung capacity can produce dramatic time drops that have more to do with biology than training. There is nothing wrong with that - it is exciting to watch. But it can create a misleading picture of where an athlete actually is in their development. (HINT: Athletes that are developing early need to ensure that technique and learning to work hard are not forgotten as time drops accelerate. Athletes who are "late bloomers" should take comfort in the fact that they are still on track – focus on skill development and trusting the process.)

By 16 or 17, that biological tailwind has largely equalized across the field. Many athletes in the pool have been well-coached and are physically mature. The athletes who continue improving in that environment are the ones with something that cannot be rushed: a technically sound foundation, efficient movement patterns, and an aerobic engine built gradually over years of smart training. That is economy, and it is what our coaches and instructors are building toward, at every age and stage.

This is why the LTAD sequence prioritizes technical development and movement quality early, and why our coaches resist the temptation to load volume onto young athletes before that foundation is in place. The athletes who benefit most from high training loads are the ones who are structurally ready for them. Building that readiness takes time. And the athletes who arrive at 17 - 20 with it tend to have swimming careers that look very different from those who peaked early and ran out of room to grow.

If you ever have questions about where your athlete is in this sequence, or about a training or grouping decision that has been made, your coach is the right starting point. These conversations are always welcome - and they are almost always more reassuring than families expect.

For Masters Swimmers, Lap Swimmers, and Triathletes

The LTAD framework carries an equally important message for adult athletes: **it is never too late to rebuild economy.**

Many adult swimmers who plateau do so not because of fitness limitations, but because technique inefficiencies that were manageable at 25 become genuine limiters at 45. If your times have stalled, a conversation with your coach about returning to movement fundamentals may be the highest-return training decision you make this season.

For masters athletes specifically: after age 35, the body naturally loses 3–8% of muscle mass per decade without resistance training. The neuromuscular efficiency that produces movement economy erodes with it. The Train to Compete & Perform stage does not have an upper age limit. It simply requires a different kind of intentionality as the decades accumulate - and our coaches and instructors build their practice structures and seasonal plans with that in mind.

The same individual variation that applies to younger athletes applies here too. Adult athletes come to the pool at every stage of their own development - some with decades of competitive history, some starting from scratch at 50. Our coaches and instructors meet each athlete where they are and build from there.

The Big Picture

Long-term development is not a constraint on ambition. It is the foundation of it.

Athletes who develop in sequence - movement literacy first, technical chassis next, engine on top - arrive at the Train to Compete & Perform stage with something that cannot be shortcut: a body that moves efficiently, durably, and well under fatigue. That is what separates athletes who continue improving into their 20s, 30s, and beyond from those who peak early and plateau.

At TAC, this is not theory. It is the structure behind every training group, every practice design, and every seasonal plan our coaches and instructors build - including every conversation a coach has with an athlete about what to prioritize and when.

This is a conversation our coaches and staff welcome. If you have questions or topics you'd like addressed in future communications, we invite you to share them with us here.

Thank you for being part of that journey with us.

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