How to Condition Pitchers for Velocity, Not Just Endurance

13 and up | Drills | Coach Nick & the YSC Coaching Team

Last spring I watched a 15-year-old with a legitimately live arm jog foul pole to foul pole for twenty minutes after his bullpen, because that's what his previous travel coach had him do every throwing day. He was a good kid and a hard worker, and he was quietly training himself to be slower. By the time he picked a ball back up, the thing that actually makes him throw hard — his ability to produce force fast — was gone for the day. We had the conversation that afternoon, and over the next two months we swapped those miles for a different kind of work. His command held, his arm felt better, and he stopped gassing out in the fourth.

The short answer: condition pitchers the way pitching actually works — short, maximal bursts with long rest, not long slow miles. Pitching is a roughly one-second, all-out effort repeated every 15 to 20 seconds. Build the qualities that support that (lower-body power, repeatable mechanics, and recovery between pitches) with sprints, jumps, med-ball throws, and strength work. Use true endurance work sparingly, as recovery and general fitness — not as your main conditioning tool. Long-distance running doesn't make a pitcher throw harder, and done in high volume on throwing days it can blunt the power he's trying to build.

What the research actually says (and what it doesn't)

The internet is full of "STOP running poles — it KILLS your velocity" videos, and the truth is more useful than the hot take. The strongest argument for cutting the long miles is specificity: pitching is a fast-twitch, high-power movement, and the stretch-shortening cycle your body uses to snap the arm through release matters most in explosive efforts. Sprint and plyometric training train the nervous system to recruit muscle fibers quickly; a slow 20-minute jog trains the opposite.

But be honest about the evidence, because your players' parents will Google it. One often-cited 2008 study (Rhea and colleagues) found that a sprint-trained group gained lower-body power while a distance-running group *lost* power — yet that distance group didn't actually throw slower. So "distance running kills velocity" overstates it. The accurate, defensible statement is this: **sprint- and power-based conditioning is far more specific to what a pitcher needs, and high-volume aerobic running does nothing to build velocity while competing for the recovery you'd rather spend on power work.** That's enough reason to change how you condition. You don't need to pretend a mile jog is poison.

The velocity framework we lean on (drawn from the work groups like Tread Athletics have published after training thousands of pitchers) comes down to four factors: **strength, mechanics, intent, and timing.** Notice that "aerobic base" isn't one of them. Conditioning's job is to support those four — not to replace them.

"Conditioning" should mean the right energy system

Here's the gap almost every running-based program misses, and it's the whole point of this article. Coaches hear "conditioning" and picture lungs and distance. But the energy system pitching uses is the **alactic (phosphagen) system** — the one that powers maximal efforts of a few seconds, then needs 15 to 60 seconds to recharge. That's exactly the rhythm of an inning: explode, reset, explode again.

So conditioning a pitcher well means training *repeat power* — the ability to produce a near-maximal effort, recover briefly, and do it again without the quality falling off. That is a completely different stimulus than steady-state running, and it's trainable with short sprints and jumps on full rest. If you want the on-field version, this pairs naturally with our work on speed training for youth baseball players and the strength base we lay out in our youth baseball strength and conditioning program for ages 12–15.

A weekly conditioning block that builds velocity

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Below is the conditioning block we run with high-school-age pitchers, layered around their throwing, not on top of it. Keep every rep crisp — the moment speed or mechanics decay, the set is over. Quality is the entire game here.

Day A — Short Sprint Repeats (12 min) 6–8 × 10-to-20-yard sprints at 100% effort, with a full 45–60 seconds of walk-back rest between each. This trains the exact alactic burst-and-recover pattern an inning demands. Coaching cue: "Every rep is a max rep — if it's not fast, you're done."

Day A — Med-Ball Rotational Throws (8 min) 4 sets of 5 throws per side into a wall, driving from the ground up through the hips and trunk — the same sequence that creates pitch velocity. Rest 30–45 seconds between sets. A medicine ball at theranchsports.com is the one piece of gear I'd buy first for this. Coaching cue: "Push the ground away, then let the hips throw the ball — the arm is just along for the ride."

Day B — Jump + Bound Circuit (10 min) 3 rounds of: 5 broad jumps, 5 lateral bounds per leg, 5 pogo hops — all for height/distance, not for time. Walk and fully reset between movements. This builds the elastic, fast-twitch quality the stretch-shortening cycle relies on. Coaching cue: "Land quiet, explode loud."

Day B — Sled or Hill Pushes (8 min) 5 × 15-yard heavy pushes with full recovery (60+ seconds). Pure lower-body force production with no eccentric arm stress. If you don't have a sled, a 10-yard uphill sprint works. Coaching cue: "Slow is fine — violent is the goal. Drive, don't jog."

Recovery Day — Easy Tempo Flush (10 min) Light, relaxed movement — a slow jog, bike, or 6–8 build-up strides at 70% — the day after a start to move blood and flush soreness. This is the ONLY place steady, low-intensity cardio earns a spot. Coaching cue: "This should feel like a warm-up that never gets hard."

That tempo flush is the honest answer to "do pitchers need any endurance?" They need enough general fitness to recover between outings and hold mechanics late in a game — and short tempo work, plus the strength base, covers it. What they don't need is 30 minutes of poles that eat into power training. If you want a deeper look at managing arm workload itself, pair this with our long toss program for youth pitchers.

The endurance pitchers actually need

Let's name it clearly, because this is where coaches overcorrect in both directions. The endurance that matters for a pitcher isn't aerobic base — it's **mechanical endurance**: holding the same clean delivery on pitch 75 as on pitch 5. You build that with smart pitch counts, strong trunk and lower-body conditioning, and repeat-power work that keeps late-game effort from collapsing into a slow, arm-only throw. Short sprint repeats and med-ball work build that far better than distance miles, because they train the body to produce power *when it's already tired* — which is the actual challenge of the sixth inning.

Under 13? This is athletic development, not a velocity program

If you coach younger kids, don't turn this into a velocity chase. For athletes under about 12, the best "conditioning" is broad athleticism: sprinting, jumping, crawling, climbing, playing other sports. Build the engine first. The specific repeat-power conditioning above assumes a pitcher who already moves well and has some training age. Rushing a 10-year-old into structured velocity conditioning is how you get a sore arm and a bored kid. Multi-sport movement now creates more velocity ceiling at 16 than any pole-running or specialized program ever will.

Mistakes we see every season

The most common one is conditioning *after* a bullpen with long runs — you've just trained the arm for power and then spent the next half hour training the opposite quality on fatigued legs. The second is treating rest as optional: when a pitcher turns sprint repeats into a gasping circuit with 10 seconds between reps, he's no longer training power — he's training mediocrity at speed.

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And the third is volume creep, where a "conditioning day" quietly grows into an hour. Short, violent, fully rested, and done. If a rep isn't fast, the workout is over.

One last note on gear: most of this needs almost nothing — a field, a med ball, and maybe a sled. If you're outfitting a program, theranchsports.com runs 10% off with no sales tax, which is a real difference on team-quantity orders. Keep the equipment list short and the intent high.

Condition the pitcher for the sport he actually plays — one-second efforts, over and over, with recovery in between — and the velocity work you're already doing finally has a foundation to stand on. For more on where this fits in a full development plan, start at our baseball coaching hub.

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