Achilles Tendinopathy

Mid-Substance | No Tear | Return to Running

55 years old | Tendon Width: 8mm (^ 60%) | Pathology: Mid-Substance | Baseline: Pain-free walking

Clinical Overview

Mid-substance Achilles tendinopathy (AT) is characterised by intratendinous degeneration, neovascularisation, and disrupted collagen architecture without macroscopic tearing. An 8 mm anteroposterior diameter represents a 60% increase above the accepted normal of ~5 mm, consistent with moderate tendinosis. This program applies a **load-progression model** grounded in current evidence (Cook & Purdam continuum; Malliaras et al. 2023), prioritising tendon capacity before reintroducing running-specific stress.

Goal	Progressive return to running over 12–16 weeks via structured tendon loading
Framework	Isometric → Isotonic (heavy slow resistance) → Energy storage → Running reintegration
Pain rule	≤ 3/10 NRS during exercise; ≤ 24-hr symptom flare; morning stiffness resolving within 20 min
Imaging note	Tendon width is a structural, not functional, indicator. Ultrasound changes may lag clinical recovery by months. Progression is symptom- and load-tolerance–guided, not imaging-guided.
Red flags	Sudden sharp pain, palpable gap, inability to perform single-leg calf raise → cease exercise, review

Phase 1 — Pain Modulation & Isometric Loading (Weeks 1–3)

Goal: Reduce tendon irritability, establish tolerance to load, and address calf flexibility without provocation. Isometric contractions provide immediate analgesic benefit and gentle tendon stimulus without the energy-storage demands that aggravate reactive tendinopathy.

Exercise Prescription

Exercise	Sets x Reps / Duration	Load / Tempo	Key Cue
Isometric calf press – wall lean (bent knee)	5 x 45 sec	Moderate – bodyweight	Heel stays grounded; feal load in mid-calf
Isometric calf press – wall lean (straight knee)	5 x 45 sec	Moderate – bodyweight	Hold steady; no bouncing
Seated soleus isometric (weight on knee)	5 x 45 sec hold	Body weight or 5-10kg	Pain ≤ 3/10; sustain full duration
Towel calf stretch (non-provocative range)	3 x 30 sec each	Gentle tension only	Stop short of pain; achilles not loaded
Hip & glute activation (clamshells, bridges)	3 x 15	Bodyweight	Pelvic control; lumbo-pelvic stability

Frequency	Daily isometrics (pain-permitting); glute/hip work 5 days/week
Avoid	Plyometrics, running, sudden changes of direction, barefoot walking on hard surfaces
Footwear	Supportive trainer with 8–12 mm heel drop at all times; 2 mm heel raise in shoes if morning pain present
Cross-training	Pool running, cycling (if pain-free) to maintain aerobic fitness
Advance when	Morning stiffness < 5 min; isometrics pain-free at 5 × 45 sec; walking fully pain-free

Phase 2 – Heavy Slow Resistance (HSR) Loading (Weeks 4-8)

Goal: Stimulate collagen synthesis and tendon stiffness through high-load, slow-velocity contractions. HSR training (Beyeret al.) produces equivalent clinical outcomes to eccentric-only protocols with superior patient adherence. Target: 3–4

Exercise Prescription

Exercise	Sets x Reps / Duration	Load / Tempo	Key Cue
Double-leg heel raise on flat surface	4x 8-12	3:3 tempo; add weight (vest / pack) once full ROM reps are achieved	Pause at top for 1 second
Single-leg heel raise – concentric up, bilateral down	4 × 8 each side	Bodyweight → add load; 3 sec up (single leg), 3 sec down (both legs)	Maintain control throughout
Single-leg heel raise on step (limited range if needed)	3–4 × 8–10	Bodyweight → calf raise machine as tolerated	Controlled descent; 3 sec eccentric
Leg press calf raise (seated)	4 × 6–8	~80% 1RM; slow tempo	Avoid end-range dorsiflexion if painful
Romanian deadlift	3 × 10	Moderate load	Posterior chain focus; hip hinge pattern
Single-leg balance on foam	3 × 30 sec each side	Unstable surface; progress eyes open → eyes closed	Maintain balance and alignment

Frequency	HSR exercises 3 days/week (non-consecutive); isometrics retained on rest days if needed
Progression	Increase load when 3 sets of 12 reps achieved with ≤ 3/10 pain; target 6–8 RM by week 8
Cross-training	Continue pool running / cycling; add brisk walking if pain-free
Monitor	Log morning stiffness, 24-hr soreness, and session pain score each session
Advance when	Single-leg heel raise × 3 sets × 15 reps pain-free; no morning stiffness; comfortable fast walking

Phase 3 — Energy Storage & Return-to-Running Prep (Weeks 9-12)

Goal: Progressively introduce elastic energy storage—the key mechanical demand of running—through controlled low-level plyometric tasks and fast-cadence calf work. Running imposes 6–8× body weight on the Achilles; this phase bridges the gap between slow heavy loading and dynamic impact.

Exercise Prescription

Exercise	Sets x Reps / Duration	Load / Tempo	Key Cue
Double-leg pogo hops (mini, soft landing)	3 × 10–15 sec	Bodyweight; small amplitude	Quiet landing; spring from ankle
Single-leg pogo hops (progress from double)	3 × 8–10 each	Bodyweight	Introduce week 10–11 only if tolerating
Fast-cadence double-leg calf raise (1:1 tempo)	3 × 20	Bodyweight	Explosive up; controlled down
Skipping – low intensity	3 × 30 sec	Flat surface; low impact	Gradual; monitor 24-hr response
Treadmill walking → fast walking (6 km/h)	10–15 min continuous	Incline 0%	Assess Achilles response before run progression
Single-leg squat & hip control	3 × 8–10	Bodyweight → light load	Knee tracks over toe; pelvis level

Frequency	Plyometric work 2× per week; strength maintenance 2× per week; at least 1 day rest between sessions
Footwear	Running shoe with good heel-toe offset (8–10 mm); consider HOKA Clifton or Brooks Ghost for cushioning
Advance when	Double-leg pogos pain-free × 3 sets; 10 min fast walking pain-free; no next-day soreness
If flare-up	Return to Phase 2 HSR for 1 week; reassess loading volume

Phase 4 — Run-Walk Reintegration (Weeks 13-16)

Goal: Graduated reintroduction of running volume using an interval model. Running is introduced on flat surfaces at easy conversational pace (~60–65% HRmax). Strength maintenance continues throughout.

Run-Walk Progression Protocol

Week	Session Structure	Total Run Time	Frequency / Week	Notes
13	Run 1 min / Walk 2 min x 6	6min	3	Flat surface; easy pace; stop if > 3/10
13-14	Run 2 min / Walk 2 min x 6	12 min	3	Assess 24-hr response before progressing
14	Run 3 min / Walk 1 min x 5	15 min	3	Increase run block only if fully asymptomatic
15	Run 5 min / Walk 1 min x 4	20 min	3	Monitor Achilles load; pace remains easy
16	Continuous easy run 20-25 min	20-25 min	3-4	Milestone: first continuous run

Strength Maintenance During Run Reintegration

Exercise	Sets x Reps / Duration	Load / Tempo	Key Cue
Single-leg heel raise on step	3 x 15 (loaded)	Continue progressive load	Maintain tendon stiffness
Leg press calf raise	2 x 10 heavy	~ 80% 1RM	2x per week; not on run day
Hip / glute circuit	2 rounds of 3 exercises	Moderate	Gluteal control for running mechanics

Do not progress running	If morning stiffness > 10 min, pain > 3/10, or next-day soreness persists > 24 hrs
Footwear (running)	Neutral or mild stability shoe; 8–10 mm heel drop; replace if > 600 km worn
Running surface	Favour flat paths, grass, or treadmill; avoid camber, hills, track during initial weeks
Speed	Easy conversational pace only; no speed work or intervals until 6 weeks of continuous running

Ongoing Maintenance & Prevention

Achilles tendinopathy has a significant recurrence rate. Ongoing loading is protective—tendon capacity diminishes with detraining.

Run-Walk Progression Protocol

Heel raises (loaded)	2–3× per week — lifelong tendon maintenance
Running load	10% weekly volume increase maximum; reduce by 20–30% after race or hard block
Footwear	Replace training shoes every 500–700 km; maintain adequate heel drop
Warm-up	5 min brisk walk before all runs; gentle calf activation (not static stretch pre-run)
Monitoring	If morning stiffness returns > 2 consecutive days: reduce run load by 30%, reinstate isometrics

Adjunct Therapies & Considerations

GTN patches	0.125 mg/hr patch; evidence for pain reduction in chronic AT; discuss with prescribing doctor; skin reaction common
ESWT	Extracorporeal shockwave therapy: 3–5 sessions; consider if inadequate progress by week 8
PRP injection	May be considered if HSR loading plateau after 12 weeks; evidence remains moderate
Heel raise (in-shoe)	2–5 mm temporary offloading strategy in early painful stages; wean by Phase 3
NSAIDs	Short-term use acceptable for acute pain flares; avoid long-term (may impair tendon remodelling)
Night splint	Consider if significant morning stiffness persists > 4 weeks despite treatment
Running gait review	Assess for overstriding, excessive pronation, hip drop; refer to running physio / biomechanics review

Outcome Milestones

Exercise	Target
Week 3	Isometrics pain-free (£ 2/10); morning stiffness resolving within 5 min
Week 6	Single-leg heel raise × 3 sets × 8 with added load, pain-free
Week 8	Double-leg pogo hops tolerated; pain-free fast walking 20 min
Week 10	Single-leg pogos introduced without next-day flare; skipping tolerated
Week 13	First run-walk session completed without provocation
Week 16	Continuous 20–25 min easy run completed; VISA-A score > 80/100
Week 20+	Gradual return to full training load at athlete's preferred pace / terrain

Clinical Disclaimer

This rehabilitation program is designed for a specific clinical presentation and should be implemented under the supervision of a qualified sports medicine physician or physiotherapist. Individual progression may vary. If symptoms worsen, or new symptoms arise, cease the program and seek prompt clinical review. Document prepared by Sydney Sportsmed Specialists.