

Sports & Activity-Specific Prescribing

Adapting Orthotic Prescriptions for Sport, Load, and Footwear Demands

Orthotic prescriptions for active and sporting patients must account for sport-specific footwear constraints, loading patterns, biomechanical demands, and performance considerations. A prescription optimised for everyday footwear may be ineffective or impractical in a sport-specific context. This reference covers key adaptations by activity type.

1 General Principles for Active Patients

Aspect	Detail
Footwear is the primary constraint	Sport-specific footwear (running shoes, football boots, cycling shoes, court shoes) differs significantly in volume, rigidity, and geometry. Always assess the sport-specific shoe, not just everyday footwear.
Load magnitudes in sport	Running generates GRFs of 2–3× bodyweight; jumping/landing 5–8×; cutting sports generate high transient lateral loads. Shell rigidity and top cover durability must be matched to sport-specific load magnitudes.
Bilateral symmetry	Sports orthotics should be prescribed bilaterally even when only one limb is symptomatic — asymmetric correction alters proximal kinetic chain mechanics and may create contralateral overload.
Minimalism vs maximum control	In high-performance sport, a thinner, lighter device that maintains 70% of the required correction may outperform a full-control device the patient won't wear or that doesn't fit the boot. Evidence supports even modest orthotic correction for load redistribution in sport.
Transition and load management	Introducing orthotics during active training must be managed carefully — abrupt load redistribution in a high-volume training block can cause new tissue stress. Advise a 2-week wear-in before returning to full sport-specific use.

2 Sport-by-Sport Prescribing Reference

Sport / Activity	Footwear Constraints	Shell Recommendation	Key Modifications	Top Cover / Material
Running (road)	Standard running shoe; usually deep with removable insole; good compatibility	Semi-rigid polypropylene or TPU 3D-printed	Rearfoot post per assessment; met dome if metatarsalgia; heel raise if equinus	Poron Vive or XRD sulcus length; durability priority
Running (trail)	Stiffer sole; less volume than road; some have removable insole	Semi-rigid, may need to be thinner	As per road running; lateral flange if ankle instability on uneven terrain	Poron Vive sulcus; durable top cover
Football / rugby	Very low volume boot; no removable insole usually; stud pattern limits forefoot design	2mm EVA or thin semi-rigid; sulcus length only	Minimal — rearfoot post only if essential; met dome where possible; no flanges	Thin PPT or Poron; sulcus length essential
Cycling	Extremely low volume; rigid carbon/nylon sole; no removable insole	1.5–2mm carbon fibre or thin rigid	Forefoot wedging only (cleat position); metatarsalgia offloading; no rearfoot posts possible	Thin Poron or microfibre; forefoot only
Court sports (tennis, badminton, squash)	Good volume; lateral stability built in; removable insole usually present	Semi-rigid; lateral flange useful	Rearfoot post per assessment; lateral flange for ankle instability; met dome if forefoot pain	Poron Vive sulcus; lateral wear durability
Swimming / pool	Aquatic footwear (flip flops, pool shoes) — essentially incompatible	N/A for pool; address dry-land footwear	Address in training/everyday footwear instead	N/A
Hiking / walking	Good volume; stiff midsole; excellent compatibility; usually removable insole	Semi-rigid to rigid; full length	Full orthotic prescription as per assessment; cushioning priority for long distance	Poron full length; Plastazote top for comfort
Gym / weightlifting	Flat-soled lifting shoe or trainer; moderate volume	Semi-rigid; avoid excessive heel raise for lifting-specific use	Rearfoot and forefoot as per assessment; note: heel raise contraindicated for Olympic lifting	PPT or Poron sulcus
Dance / gymnastics	Minimal footwear or barefoot; effectively incompatible with standard orthosis	Specialist dance orthoses (Harlequin-style) or taping only	Strapping and taping as primary intervention; orthosis in practice/everyday footwear	N/A for performance
Skiing / snowboarding	Ski boot is a custom shell — built-in footbed space	Custom ski footbed (2mm thermoformable); forefoot canting	Forefoot valgus/varus canting for alignment; heel wedge for equinus compensation	Thermoformable EVA; thin Poron

3 Running-Specific Considerations (Extended)

Running is the most common sporting presentation — the following considerations supplement the sport-by-sport reference above.

Aspect	Detail
Running gait vs walking gait	Running has no double support phase; GRFs are higher and loading rate is faster. Midfoot/forefoot strike patterns are common in faster runners. Orthotic prescription must account for actual strike pattern — a heel-strike focused device may be inappropriate for a midfoot striker.
Cadence and orthotic effect	Higher cadence (>170 steps/min) reduces individual step loading and may reduce the need for high-control orthoses. Gait retraining and cadence modification can complement or reduce orthotic prescription requirements.
Shoe drop and heel raise	Running shoes already have 4–12mm heel drop. Prescribing a heel raise inside a high-drop shoe may produce excessive total heel elevation — account for existing shoe drop when prescribing intrinsic heel raises.
Rotation and mileage	Running orthotics should be rotated across at least 2 pairs of shoes and replaced when top cover or posting shows wear — typically every 500–800 miles of running use. Advise patients on replacement schedule.
Return-to-run protocol	When prescribing for a running injury, co-ordinate orthotic issue with a structured return-to-run programme — orthotics alone without load management have poor evidence for injury prevention.

4 Load Management & Orthotic Timing

INTRODUCE DURING LOW-LOAD PERIODS

Ideally, prescribe orthotics at the start of a reduced training block or rest period — not at peak training load. Orthotic adaptation requires 2–4 weeks; introducing mid-season in a high-volume block risks new injury.

SPORT-SPECIFIC FOOTWEAR ASSESSMENT IS MANDATORY

Assessing only the patient's casual shoes and prescribing for sport is a common error. Always assess the specific sporting footwear — volume, heel counter, removability, and stud/cleat pattern.

PERFORMANCE VS CLINICAL GOALS

Some high-level athletes will accept reduced clinical correction in exchange for performance gains (lighter, thinner device). Document shared decision-making when prescribing below the clinically indicated control level.

BILATERAL PRESCRIPTION

Always prescribe and fit bilaterally for sporting use, even if the complaint is unilateral. Unilateral correction in sport alters proximal mechanics and can create new problems.

Sport-specific prescribing requires understanding the sport as well as the patient. When in doubt, a conservative, thin, bilaterally-matched device that the patient will actually wear in their sporting footwear will outperform a clinically 'optimal' device that doesn't fit the boot.