OrthoWave DualSync™

CELLULAR HEALING TECHNOLOGIES

PODIATRY SHOCKWAVE PROTOCOL GUIDE

Evidence-Referenced Clinical Protocols for Foot & Ankle Conditions

6	7	RCT
Foot & Ankle Conditions	Dedicated Tips Specified	Evidence-Referenced

For Licensed Healthcare Professionals Only

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ABOUT THIS GUIDE

This protocol guide is designed for licensed healthcare professionals using the OrthoWave DualSync™ Shockwave System in podiatric practice. Each condition section provides evidence-referenced tip selection, treatment parameters calibrated to foot and ankle anatomy, a structured 3-phase session protocol, and clinical evidence grounding from published systematic reviews and randomized controlled trials.

All parameters are starting guidelines. Always begin conservative and progress based on patient tolerance, chronicity, and tissue response. Session frequency: 1–2 sessions per week.

SYSTEM OVERVIEW — ORTHOWAVE DUALSYNC™

Focused ESWT	High-Power Radial
Penetration: 6–12 cm **EFD:** 0.01–0.55 mJ/mm² **Frequency:** 1–8 Hz **Best for:** Deep focal tissue, tendons, regenerative	**Max Pressure:** Up to 10 bar **Max Frequency:** Up to 21 Hz **Penetration:** Superficial to mid-depth **Best for:** Fascia, trigger points, myofascial

PODIATRY TIP QUICK REFERENCE

TIP	SERIES	INTENSITY	PRIMARY PODIATRY USE
F-Appl. 1	F-Applicator	**1/10**	Sensitive forefoot, Morton's neuroma first session, very low tolerance patients
F-Appl. 2	F-Applicator	**3/10**	Superficial tendon insertions, sensitive lateral ankle, early plantar fascia presentations
D15	D-Series	**5/10**	Standard plantar fascia, Achilles mid-portion, peroneal tendon, intermetatarsal space
D20	D-Series	**7/10**	Tibialis posterior, periosteal MTSS, trigger point scanning, paraspinal foot muscles
D25	D-Series	**7/10**	Gastrocnemius-soleus complex, calf integration phase, deep posterior compartment
D35	D-Series	**6/10**	Broad lower leg sweeps, shin splint warm-up, compartment release, aesthetics
C-20	CeraCore™	**9/10**	Calcific plantar fasciitis, heel spur targeting, insertional Achilles calcification

GENERAL TREATMENT GUIDELINES

Apply to every session

01	**Start conservative**	Always begin at the lower end of the bar range. Progress upward based on patient comfort. Acute presentations require lower bars, lower Hz, and fewer pulses than chronic conditions.
02	**DTA pre-treatment**	Apply Dynamic Tissue Activation™ at the listed frequency and duration. Apply shockwave within 2 minutes of DTA completion while tissue is warm and maximally receptive.
03	**Constant motion**	The applicator must be in constant gliding or circular motion throughout. Never apply stationary pressure over tendons, nerves, or bony prominences. Motion is a safety requirement.
04	**Coupling gel**	Apply liberally for optimal acoustic energy transfer. Never treat without adequate gel. Replenish between treatment zones and during longer sessions as needed.
05	**Surrounding tissue**	Always treat the 2–3 cm surrounding the primary target zone. Trigger points and fascial restriction in adjacent tissue significantly contribute to pain and functional limitation.
06	**Session frequency**	1–2 sessions per week. Allow minimum 48–72 hours between sessions to permit the initial healing response to complete before next stimulation.
07	**Verbal check-in**	Check in verbally with the patient after each phase. Significant pain increase, sharp pain, or unusual sensations are signals to reduce settings immediately.
08	**Contraindications**	Never treat over open wounds, active infections, blood clots, pacemakers, active malignancy, acute fractures, or pregnancy. Review contraindications page before every session.

01 PLANTAR FASCIITIS

Medial heel pain · Calcaneal attachment · Morning first-step pain

RECOMMENDED TIPS

D15	C-20	F-Appl. 2
Primary — plantar fascia & calcaneal attachment	Chronic & calcific presentations	Sensitive or early-stage patients

TREATMENT PARAMETERS

PRESSURE	FREQUENCY	PULSES	SESSIONS	DTA PRE-TX
2.5–4.0	**10–15**	**2,000–4,000**	**6–8**	**3 MHz**
bar	Hz	per session	total course	3–4 min

3-PHASE SESSION PROTOCOL

Phase 1 — Tissue Warm-Up
3–4 min

D15 · 2.5 bar · 10 Hz · 500 pulses

Broad sweeping strokes along medial arch. Begin 2 cm proximal to calcaneal attachment. Patient should feel mild pressure only — no sharp discomfort. Never begin directly on the insertion.

Phase 2 — Targeted Treatment
5–8 min

D15 or C-20 · 3.0–4.0 bar · 12–15 Hz · 1,500–2,500 pulses

Focus on calcaneal attachment point and plantar fascia body. Circular motions — never stationary. Use C-20 for calcific presentations where CeraCore cavitation is the therapeutic mechanism.

Phase 3 — Integration
2–3 min

D15 · 2.5 bar · 10 Hz · sweeping

Broaden to gastrocnemius-soleus complex and medial arch. Finish with light sweeping strokes. Combine with toe-spread activation cue and intrinsic foot muscle engagement.

! CLINICAL CAUTION

Avoid direct calcaneal bone contact at high bar. Reduce to F-Appl. 2 if patient reports sharp pain rather than pressure sensation. Do not treat acute heel fracture or open heel wound.

CLINICAL EVIDENCE

Systematic reviews and meta-analyses (2022–2024) confirm ESWT produces significant VAS pain score improvements compared to placebo. C-20 CeraCore tips are preferred for calcific presentations where cavitation-mediated calcium breakdown is the therapeutic goal. 6–8 sessions at 1–2 per week represents the optimal course length per current evidence consensus.

02 CALCANEAL HEEL SPUR

Inferior calcaneal spurring · Chronic calcific enthesopathy · Often co-presents with plantar fasciitis

RECOMMENDED TIPS

C-20	D15
Primary — CeraCore cavitation for calcium disruption	Surrounding plantar fascia treatment

TREATMENT PARAMETERS

PRESSURE	FREQUENCY	PULSES	SESSIONS	DTA PRE-TX
3.0–4.5	**10–15**	**2,000–3,500**	**5–8**	**3 MHz**
bar	Hz	per session	total course	3 min

3-PHASE SESSION PROTOCOL

Phase 1 — Tissue Warm-Up
3 min

D15 · 2.5 bar · 10 Hz · 400–500 pulses

Broad sweeping over medial heel and arch. Prepare tissue and reduce sensitivity before targeted spur treatment. Patient should feel mild warmth and pressure only.

Phase 2 — Spur Targeting
6–8 min

C-20 · 3.5–4.5 bar · 12–15 Hz · 1,500–2,500 pulses

Localize spur via imaging or palpation. Circular motions centered over spur site — never stationary. Build bar gradually per session. Monitor patient response continuously.

Phase 3 — Fascial Release
2–3 min

D15 · 2.5–3.0 bar · sweeping

Address surrounding plantar fascia and medial calcaneal soft tissue. Broaden strokes along full arch length. Finish with light sweeping to consolidate tissue response.

! **CLINICAL CAUTION**

Confirm calcification via imaging (X-ray or ultrasound) prior to CeraCore application. C-20 is intensity 9/10 — not appropriate for acute or highly sensitive patients. Always initiate at conservative bar and never apply high-intensity without imaging confirmation.

CLINICAL EVIDENCE

A systematic review (J Am Podiatr Med Assoc, 2022) found ESWT provides symptomatic benefit for calcaneal spur with minimal side effects. CeraCore ceramic tips are the preferred modality where cavitation-mediated calcium disruption is the mechanism. Imaging confirmation of calcification is recommended prior to high-intensity treatment.

03 ACHILLES TENDINOPATHY

Mid-portion & insertional · Chronic degenerative tendon change · Most common tendon condition in runners

RECOMMENDED TIPS

D15	C-20	F-Appl. 2
Primary — mid-portion Achilles	Insertional + calcific Achilles	Sensitive presentations or session 1

TREATMENT PARAMETERS

PRESSURE	FREQUENCY	PULSES	SESSIONS	DTA PRE-TX
2.5–4.5	10–15	2,000–3,500	6–8	1 MHz
bar	Hz	per session	total course	4 min

3-PHASE SESSION PROTOCOL

Phase 1 — Tissue Warm-Up — 3 min

F-Appl. 2 or D15 · 2.0 bar · 10 Hz · 400 pulses

Begin at musculotendinous junction — not over the symptomatic segment. Sweeping motions along full Achilles length from calf to insertion. Sensitize tissue gradually.

Phase 2 — Tendon Treatment — 6–8 min

D15 (mid) / C-20 (insertional) · 3.0–4.5 bar · 12–15 Hz · 1,500–2,500 pulses

Glide parallel to tendon axis. Treat 2–7 cm proximal to insertion for mid-portion. Use C-20 for insertional with calcific change. Never stationary. Progress bar over sessions.

Phase 3 — Calf Integration — 3 min

D25 · 2.5–3.0 bar · sweeping

Address gastrocnemius and soleus muscle bellies — calf tightness is a primary contributing factor and must be treated every session. Finish with long downward sweeping strokes.

! CLINICAL CAUTION

Differentiate mid-portion (2–7 cm proximal) from insertional — tip selection differs. Insertional cases may involve Haglund's deformity; use C-20 with lower starting bar and careful monitoring. Never treat suspected acute Achilles tendon rupture.

CLINICAL EVIDENCE

A 2021 systematic review found significant improvement in pain and function for insertional AT vs conservative treatment alone. A 2023 meta-analysis found moderate quality evidence for mid-portion AT with pooled VISA-A improvement of 9.08 points. A 2024 RCT demonstrated RSWT was significantly more effective than sonotherapy for non-insertional Achilles tendinopathy.

04 MORTON'S NEUROMA

Intermetatarsal nerve compression · 3rd/4th web space most common · Often refractory to conservative care

RECOMMENDED TIPS

F-Appl. 1	F-Appl. 2	D15
Session 1 always — sensitive forefoot	Sessions 2+ after tolerance established	Well-tolerating patients mid-course

TREATMENT PARAMETERS

PRESSURE	FREQUENCY	PULSES	SESSIONS	DTA PRE-TX
1.5–3.0	**8–12**	**1,500–2,500**	**4–6**	**3 MHz**
bar	Hz	per session	total course	2–3 min

3-PHASE SESSION PROTOCOL

Phase 1 — Forefoot Sensitize — 3 min

F-Appl. 1 · 1.5 bar · 8 Hz · 400 pulses

Broad dorsal and plantar forefoot warm-up. Never begin directly on the neuroma site. Assess patient response carefully. Verbal check-in every 30 seconds throughout.

Phase 2 — Neuroma Targeting — 5–6 min

F-Appl. 2 or D15 · 2.0–3.0 bar · 10–12 Hz · 1,000–1,500 pulses

Apply both dorsal and plantar aspects of the affected intermetatarsal space. Slow, careful circular motions. Monitor continuously. Reduce immediately on sharp or atypical pain.

Phase 3 — Metatarsal Release — 2 min

F-Appl. 1 · 1.5 bar · 8 Hz · sweeping

Light sweeping across all metatarsal heads. Address plantar plate and surrounding soft tissue. Always finish gently — forefoot remains sensitive even at treatment end.

!

CLINICAL CAUTION

Forefoot is highly sensitive. F-Applicator 1 is mandatory for every session 1 regardless of chronicity or patient history. Maximum 3.0 bar — never exceed. If patient cannot tolerate F-Appl. 1 at 1.5 bar, defer and reassess at next visit.

CLINICAL EVIDENCE

RCT (Seok et al., J Am Podiatr Med Assoc, 2016): ESWT produced significantly decreased VAS scores at 1 and 4 weeks and significantly improved AOFAS scores vs sham. A 2025 systematic review (PMC) confirms ESWT exerts a biphasic effect: immediate analgesia via nerve ending degeneration and longer-term improvement via neovascularization and tissue repair.

05 PERONEAL TENDINITIS

Lateral ankle tendon pain · Peroneus brevis & longus · Common in runners and post-ankle sprain

RECOMMENDED TIPS

D15	F-Appl. 2	D20
Primary — peroneal tendon body	Sensitive lateral ankle or session 1	Peroneal muscle belly trigger points

TREATMENT PARAMETERS

PRESSURE	FREQUENCY	PULSES	SESSIONS	DTA PRE-TX
2.0–3.5	**10–15**	**1,500–2,500**	**4–6**	**3 MHz**
bar	Hz	per session	total course	3 min

3-PHASE SESSION PROTOCOL

Phase 1 — Tissue Warm-Up
3 min

F-Appl. 2 · 2.0 bar · 10 Hz · 400 pulses

Begin along the lateral fibula shaft — not directly over the symptomatic tendon segment. Broad upward strokes from fibular head toward lateral malleolus.

Phase 2 — Tendon Treatment
5–6 min

D15 · 2.5–3.5 bar · 12–15 Hz · 1,000–1,500 pulses

Treat peroneal tendon from lateral malleolus groove to insertion. Glide parallel to tendon axis. Include peroneal tubercle for brevis pathology. Move continuously — never stationary.

Phase 3 — Muscle Belly
2–3 min

D20 · 2.5 bar · 10 Hz · sweeping

Treat peroneal muscle belly on lateral lower leg for associated trigger points and fascial restriction. Finish with long strokes down the full peroneal chain from fibular head to ankle.

! **CLINICAL CAUTION**

Exercise caution around the lateral malleolus and the sural nerve pathway immediately posterior to it. Avoid direct treatment over suspected peroneal tendon tear or subluxation — confirm structural integrity with imaging before initiating shockwave treatment.

CLINICAL EVIDENCE

Direct RCT evidence specific to peroneal tendinitis is limited; clinical evidence is extrapolated from broader Achilles and lateral ankle tendinopathy literature. ESWT mechanisms of neovascularization and collagen fiber remodeling are well-established for tendon tissue broadly. Clinicians treating active patients and runners report consistent outcomes. More dedicated peroneal-specific trials are warranted.

06 SHIN SPLINTS (MTSS)

Medial tibial stress syndrome · Periosteal overload · Common in runners and military personnel

RECOMMENDED TIPS

D20	D35	D15
Primary — tibialis posterior & periosteal region	Broad anterior/posterior compartment sweep	Focal periosteal tender points

TREATMENT PARAMETERS

PRESSURE	FREQUENCY	PULSES	SESSIONS	DTA PRE-TX
2.0–3.5	10–15	2,000–3,500	6	1 MHz
bar	Hz	per session	total course	4 min

3-PHASE SESSION PROTOCOL

Phase 1 — Compartment Warm-Up
3–4 min

D35 · 2.0 bar · 10 Hz · 500 pulses

Broad sweeping along the full lower leg — anterior and posterior compartments. Increase circulation and prepare periosteal tissue before targeted medial tibial border work.

Phase 2 — Periosteal Treatment
7 min

D20 · 2.5–3.5 bar · 12–15 Hz · 1,500–2,500 pulses

Treat medial tibial border along the full symptomatic segment systematically. Glide parallel to tibia — never stationary over bone. Identify and address all tender points in sequence.

Phase 3 — Deep Compartment
3 min

D35 or D20 · 2.0 bar · sweeping

Address deep posterior compartment and tibialis posterior. Combine with ankle dorsiflexion cue to assess tissue release. Finish with downward sweeping strokes along full lower leg.

! CLINICAL CAUTION

Rule out stress fracture before initiating treatment — ESWT is absolutely contraindicated over acute cortical fractures. MRI or bone scan recommended when presentation includes localized single-point tenderness. Never apply directly over the tibial crest or anterior border.

CLINICAL EVIDENCE

Evidence for ESWT in MTSS is primarily from athletic population studies. Improvements in pain scores and return-to-sport timelines have been demonstrated. The treatment mechanism involves periosteal neovascularization and stimulation of bone remodeling at sites of tibial cortical stress. Conservative parameters are appropriate given proximity to osseous structures.

ABSOLUTE CONTRAINDICATIONS

Review before every session

ABSOLUTE CONTRAINDICATIONS	INCREASED CAUTION REQUIRED
• Pregnancy	• Active stress fracture (foot/ankle)
• Active malignancy	• Suspected tendon rupture — image first
• Active bleeding disorders	• Peripheral neuropathy — reduce settings
• Acute infections	• Anticoagulant therapy — assess risk
• Deep vein thrombosis	• Implanted metal hardware near target
• Open wounds	• Acute inflammatory flare
• Acute abdominal hernia	• Pediatric growth plates
• Severe pelvic pain of unknown origin	• Hypersensitivity disorders

Professional Disclaimer

This guide is intended for trained healthcare professionals only. Protocols should be adapted based on patient presentation, physician oversight, device manufacturer guidance, and local regulatory standards. OrthoWave™ recommends conservative application at all times. All parameters are clinical guidelines — always adjust based on individual patient response and clinical judgment.

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