SYNDESMOSIS REPAIR

A Hockey-Specific Return to Ice Roadmap

Criteria-Based Return to Hockey Clinical Guideline

Clinical intent

This document provides a criteria-based framework for rehabilitation and return to hockey following uncomplicated surgical stabilization of an unstable ankle syndesmosis injury. It is written for sports medicine, rehabilitation, athletic training, strength and conditioning, and performance staff managing an elite hockey athlete. Timelines are estimates and should be individualized to injury grade, fixation construct, concomitant pathology, reduction quality, symptoms, and competitive demands.

Important note

There is no published hockey-specific TightRope protocol. This guideline adapts elite athlete syndesmosis literature, suture button/TightRope fixation data, and sport-specific hockey demands. Surgeon-specific restrictions, imaging findings, wound status, and clinical irritability supersede this framework.

Core return-to-hockey decision

Progression should be based on pain, swelling response, syndesmosis irritability, ankle range of motion, strength, neuromuscular control, skating tolerance, objective functional testing, surgeon clearance, and medical/performance staff consensus.

Primary hockey problem

Hockey creates unique demands through rigid skate boot constraint, repetitive dorsiflexion loading, external rotation torque, edge-control demands, acceleration/deceleration, crossovers, puck battle contact, and rapid transitions.

1. Scope, Assumptions, and Decision-Making Framework

Time is a reference point - not clearance

This clinical guideline is intended for an elite hockey athlete after operative stabilization of an unstable syndesmotic ankle injury using a flexible suture-button construct, commonly referred to as an ankle TightRope. The framework may also be useful after other syndesmotic stabilization techniques, but rehabilitation timelines should be modified when screw fixation, fracture fixation, deltoid injury, cartilage injury, malreduction, persistent diastasis, infection, wound complications, or revision surgery are present.

Domain	Clinical implication
Primary tissue concern	Restoration and maintenance of tibiofibular syndesmotic stability while avoiding excessive external rotation, dorsiflexion, and fibular translation stress early after fixation.
Sport-specific concern	Hockey creates unique demands through rigid skate boot constraint, repetitive dorsiflexion loading, external rotation torque, edge-control demands, acceleration/deceleration, crossovers, puck battle contact, and rapid transitions.
Clinical progression model	Protect fixation early, restore gait and ankle mobility, rebuild calf/peroneal capacity, reintroduce running and multidirectional loading, restore skating mechanics, then progress through practice and contact exposure.

2. Evidence Summary: What the Research Tells Us

Elite athlete data adapted to hockey demands

The recent literature supports high rates of return to sport after syndesmosis injury in elite athletes, but it also demonstrates major variability in surgical constructs and rehabilitation protocols. Because no hockey-specific TightRope protocol has been published, this guideline applies the best available elite athlete evidence to the sport-specific demands of ice hockey.

BOLIA ET AL., 2023

Design / population	Systematic review and meta-analysis of 440 elite athletes.
Key findings	Reported a 99% overall return-to-sport rate. Surgically treated athletes, 96% of whom were managed with suture button/TightRope-type fixation, returned at a mean of approximately 50 days compared with 29 days for nonoperative management.
Clinical translation	Strongest recent synthesis for elite athletes. Supports a high probability of successful return while emphasizing that surgically stabilized injuries usually require a longer progression than stable/nonoperative syndesmosis sprains.

HUNT ET AL., 2022

Design / population	ISAKOS global survey of 742 surgeons.
Key findings	Flexible fixation/suture button was the preferred construct in 47.1% of respondents compared with 29.6% favoring screw fixation. The study found substantial variability in rehabilitation and return-to-sport protocols, and 64% of respondents did not alter protocols based on injury severity.
Clinical translation	Highlights the absence of a standardized evidence-based rehabilitation progression and supports an individualized, criteria-based clinical model.

SANDERS ET AL., 2019

Design / population	Level I multicenter randomized controlled trial comparing TightRope and syndesmotic screw fixation.
Key findings	TightRope fixation demonstrated lower malreduction rate (15% vs 39%) and lower reoperation rate (4% vs 30%) compared with screw fixation. Functional outcomes were equivalent by 12 months.
Clinical translation	Supports flexible fixation as a construct that may reduce hardware-related limitations and reoperation risk, while still requiring protection of reduction and clinical symptoms during progression.

D'HOOGHE ET AL., 2020	
Design / population	Retrospective cohort study of 110 professional male football players after surgery for isolated unstable syndesmosis injuries.
Key findings	On-field rehabilitation occurred at 37 +/- 12 days, team training at 72 +/- 28 days, and first match at 103 +/- 28 days. Injury severity, concomitant cartilage injury, and age independently predicted longer recovery.
Clinical translation	Provides detailed professional sport milestone data that can be adapted to hockey. Hockey-specific return should still account for skate boot constraint, edge work, crossovers, deceleration, contact, and position demands.

WRIGHT ET AL., 2004	
Design / population	NHL syndesmosis injury cohort.
Key findings	NHL players with syndesmosis sprains returned at a mean of 45 days with a wide range of 6 to 137 days.
Clinical translation	Highlights the high variability of recovery in hockey and the need to distinguish stable sprains from surgically stabilized unstable injuries.

Evidence synthesis

Elite athletes generally return successfully after syndesmotic injury, but the surgical population is heterogeneous. Suture button fixation may support earlier functional progression than static screw constructs in selected cases, yet there is no validated hockey-specific TightRope protocol. For an NHL athlete, the return-to-play decision should be criteria-based and must integrate imaging/reduction, symptoms, objective strength and performance testing, and repeated on-ice tolerance.

3. Quick-Reference Timeline

Progression is criteria-based

Approx. weeks	Phase	Primary emphasis	Key clinical restriction
0-2	Post-operative protection	Protect fixation, manage wound/edema, maintain proximal fitness	Immobilization/boot; weight bearing per surgeon
2-4	Early mobility and controlled loading	Restore protected ROM, initiate low-level strength, progress WB if cleared	Boot; avoid forced dorsiflexion/external rotation
4-6	Gait normalization and foundational strength	Transition toward shoe/brace, improve calf/peroneal control, begin higher aerobic conditioning	Shoe/brace if gait and symptoms allow
6-8	Linear running and early skating readiness	Begin run progression and controlled skating prerequisites	Straight-line work only if criteria met
7-9	Return to controlled skating	Straight-line skating, edges, controlled acceleration/deceleration	No contact; no chaotic reactive drills initially
8-12	Team training integration	Non-contact to full practice progression; high-speed skating and COD	Monitor next-day swelling and syndesmosis symptoms
10-14+	Competition integration	Controlled contact, game simulation, full performance testing	Clearance by surgeon, rehab, ATC, performance, and coaching staff

4. Hockey-Specific Rehabilitation Considerations

What makes return to ice different

Hockey demand	Clinical implication
Rigid skate boot	May provide perceived stability but can mask deficits. It may also compress incisions, hardware, or soft tissue. Boot comfort does not equal readiness for high-speed skating or contact.
Dorsiflexion and external rotation	Syndesmosis stress is commonly provoked by dorsiflexion and external rotation. Tight turns, crossovers, toe-loaded pushes, pivots, and board battles should be delayed until symptoms and testing support progression.
Edge control	Medial/lateral edge work requires ankle control despite restricted boot motion. Progress edges gradually before tight turns, crossovers, and reactive drills.

Hockey demand	Clinical implication
Contact and puck battles	Contact adds unpredictable torsional loading. Full skating tolerance should precede contact progression. Wall work and net-front battles are late-stage exposures.
Volume management	Return to skate should be progressed by total ice minutes, number of high-intensity efforts, directional complexity, and next-day response.

5. Phase-by-Phase Rehabilitation Progression

Clean criteria-based flow

PHASE 1 | WEEKS 0-2 | POST-OPERATIVE PROTECTION AND TISSUE CALM

Primary clinical objectives	Protect the surgical fixation and soft tissue envelope; manage pain, edema, and wound healing; maintain hip, knee, core, and contralateral limb capacity; prevent deconditioning without stressing the syndesmosis.
Rehabilitation progression	Immobilization or boot per surgeon. Weight-bearing status is surgeon-specific and may range from non-weight bearing to protected partial weight bearing depending on fixation, reduction, fracture involvement, and concomitant pathology. Elevation, compression, cryotherapy, toe mobility, proximal strengthening, hip/core work, and upper-body conditioning are emphasized. Begin gentle ankle AROM only if cleared, avoiding aggressive dorsiflexion and external rotation stress.
Primary loading emphasis	Protection and symptom control. No high syndesmosis load.
Criteria to progress	Incisions are healing appropriately; pain and edema are controlled; athlete can ambulate with prescribed assistive device without compensation; no signs of wound complication or fixation irritation; surgeon clears advancement.
Hold / regress if	Increasing distal tibiofibular pain, wound drainage, erythema, calf pain, neurovascular symptoms, night pain escalation, or loss of reduction concern.

PHASE 2 | WEEKS 2-4 | EARLY MOBILITY AND CONTROLLED WEIGHT BEARING

Primary clinical objectives	Restore protected ankle mobility, begin low-level muscular activation, progress weight bearing if cleared, and maintain cardiovascular fitness without provoking syndesmotic symptoms.
Rehabilitation progression	Progress protected weight bearing in boot as permitted. Continue edema control. Initiate ankle AROM in pain-free ranges, intrinsic foot activation, isometric dorsiflexion/plantarflexion/inversion/eversion, hip and knee strengthening, stationary bike with boot or stiff shoe if tolerated, and pool work when incision status permits. Avoid end-range dorsiflexion, external rotation stress testing, loaded twisting, and aggressive manual mobilization of the distal tibiofibular joint.
Primary loading emphasis	Low-load mobility and isometrics. Progress load before complexity.
Criteria to progress	Pain is stable at rest and with protected loading; swelling does not increase after sessions; gait mechanics in boot are acceptable; ROM is improving without syndesmosis provocation; athlete tolerates basic bike/pool conditioning.
Hold / regress if	Reactive swelling, focal syndesmosis tenderness, pain with external rotation or squeeze-type stress, worsening gait compensation, or inability to tolerate protected weight bearing.

PHASE 3 | WEEKS 4-6 | GAIT RESTORATION, SHOE TRANSITION, AND FOUNDATIONAL STRENGTH

Primary clinical objectives	Normalize gait, transition from boot to supportive shoe/brace when cleared, restore ankle strength, and reintroduce controlled single-leg stability.
Rehabilitation progression	Progress to full weight bearing in boot and then supportive athletic shoe with brace/taping if criteria are met. Add calf raises, seated calf loading, leg press, split squats, step-ups, resisted band inversion/eversion/dorsiflexion/plantarflexion, single-leg balance, bike, elliptical, and pool running. Restore dorsiflexion gradually without forcing end-range or recreating external rotation pain.
Primary loading emphasis	Foundational strength, gait, and balance. Running and skating are not automatic at this stage.
Criteria to progress	Symmetric gait in shoe/brace; minimal swelling; pain <=2/10 during and after training; single-leg balance >30 seconds; 20 controlled bilateral calf raises; no positive symptom response to progressive strengthening.

PHASE 3 | WEEKS 4-6 | GAIT RESTORATION, SHOE TRANSITION, AND FOUNDATIONAL STRENGTH

Hold / regress if	Limp, next-day swelling, pain with dorsiflexion/external rotation, tenderness at the anterior syndesmosis, or altered mechanics during step-down/single-leg stance.

PHASE 4 | WEEKS 6-8 | LINEAR RUNNING PREPARATION AND RETURN-TO-SKATE READINESS

Primary clinical objectives	Prepare the athlete for linear running and early skating by restoring calf/peroneal capacity, sagittal plane control, and low-level elastic tolerance.
Rehabilitation progression	Progress heavy seated and standing calf raises, soleus-biased work, split squats, lateral step-downs, sled push/pull, anti-gravity treadmill or pool running, linear walk-jog progression if cleared, and low-level pogo/line-hop preparation only if symptom-free. On-ice exposure may begin near this window only when walking, strength, ROM, edema, and surgeon clearance support progression.
Primary loading emphasis	Linear loading and skating readiness. Avoid uncontrolled cutting, reactive agility, and contact.
Criteria to progress	Pain-free walking and stairs; no reactive swelling; closed-chain dorsiflexion sufficient for skating posture; 20-25 controlled calf raises; good single-leg squat/step-down mechanics; ability to tolerate linear jog or equivalent without next-day symptoms.
Hold / regress if	Pain with push-off, recurrent swelling, poor deceleration mechanics, focal syndesmosis pain, or inability to control single-leg tasks.

PHASE 5 | WEEKS 7-9 | CONTROLLED RETURN TO SKATING

Primary clinical objectives	Reintroduce the athlete to the ice while controlling intensity, direction, volume, and torsional stress across the syndesmosis.
Rehabilitation progression	Start with straight-line skating, easy laps, submaximal pushes, and controlled stride mechanics. Progress to acceleration/deceleration, wide turns, gentle edge work, and controlled stops. Delay tight turns, aggressive crossovers, chaotic reactive drills, and contact until the athlete demonstrates repeated symptom-free exposures. Initial sessions may be 15-25 minutes with gradual increases based on 24-hour response.
Primary loading emphasis	Skating volume before intensity; straight-line before multiplanar; planned drills before reactive drills.
Criteria to progress	No increased swelling after skating; pain <=2/10 and resolving quickly; full skate boot tolerance without incision/hardware irritation; symmetrical stride quality; adequate calf/peroneal strength; medical staff clearance to increase skating complexity.
Hold / regress if	Next-day swelling, pain during toe-loaded push-off, avoidance of involved-side edge, painful crossover mechanics, or worsening boot pressure symptoms.

PHASE 6 | WEEKS 8-12 | HIGH-SPEED SKATING AND TEAM TRAINING INTEGRATION

Primary clinical objectives	Restore high-speed skating, transition mechanics, repeated sprint ability, and progressive integration into team practice while monitoring cumulative ankle load.
Rehabilitation progression	Progress crossovers, backward skating, tight turns, rapid transitions, acceleration/deceleration, puck handling, small-area movement, and non-contact team drills. Add off-ice multidirectional plyometrics, sprint progressions, resisted lateral shuffles, slideboard intervals, and position-specific conditioning. Gradually increase the number of high-intensity efforts before full practice volume.
Primary loading emphasis	High-speed and multidirectional loading. Non-contact team training precedes full-contact practice.
Criteria to progress	Completion of full high-speed skating session without symptoms; strength and hop metrics trending toward >=90% limb symmetry; no next-day swelling; normal stride mechanics at speed; tolerates non-contact practice with planned recovery.
Hold / regress if	Reactive swelling, asymmetrical edge use, pain during deceleration or crossover, inability to repeat high-intensity efforts, or symptoms during small-area drills.

PHASE 7 | WEEKS 10-14+ | RETURN TO FULL PRACTICE, CONTACT, AND COMPETITION

Primary clinical objectives	Progress from full practice to contact integration, game simulation, and return to competition once objective criteria and repeated tolerance are demonstrated.
Rehabilitation progression	Add controlled contact, board battles, net-front play, puck protection, reaction drills, high-speed transitions under fatigue, and game-like shifts. Continue calf/peroneal strength, hip strength, plyometrics, sprinting, and recovery monitoring. Progress from full practice participation to scrimmage/game simulation, then competition.
Primary loading emphasis	Competition readiness requires repeated tolerance, not a single successful skate or practice.
Criteria to progress	No swelling after full practice; full skating progression complete; sport-specific testing >=90-95% depending on team standards; force plate/hop/agility testing acceptable; athlete confidence restored; surgeon, rehab, athletic training, and performance staff clearance.
Hold / regress if	Painful contact exposure, recurrent swelling, failed repeatability across back-to-back sessions, apprehension, inability to tolerate position-specific demands, or medical concern regarding reduction/fixation.

6. Return-to-Skate Progression

Progress volume before speed and complexity

Stage	Skating emphasis	Example content	Restriction / monitoring point
Stage 1	Straight-line skating	Easy laps, stride mechanics, low-intensity forward skating, 15-25 minutes	No maximal push-off, tight turns, or crossovers
Stage 2	Acceleration / deceleration	Controlled starts, stops, gradual acceleration, deceleration mechanics	Limit abrupt stops and reactive drills initially
Stage 3	Edge control and turns	Wide turns, inside/outside edge work, controlled transitions	Monitor syndesmosis symptoms with dorsiflexion and external rotation
Stage 4	Crossovers and backward skating	Crossovers, backward skating, figure-8 patterns, tighter turns	Progress volume slowly; watch for asymmetrical edge avoidance
Stage 5	Puck and small-area movement	Puck handling, route changes, small-area skating, non-contact drills	No board battles or uncontrolled contact yet
Stage 6	Practice integration	Full skating practice, high-speed transitions, controlled team drills	Contact only after full skating tolerance and objective testing support progression

7. Objective Return-to-Play Criteria

Before unrestricted hockey

Domain	Recommended criterion
Symptoms / irritability	No resting pain; no focal syndesmosis tenderness; pain <=2/10 during late-stage loading and resolves quickly; no next-day swelling after full practice.
Range of motion	Functional dorsiflexion adequate for skating posture, deceleration, and deep knee flexion without compensatory pronation/rotation or syndesmosis symptoms.
Strength	Ankle dorsiflexion, plantarflexion, inversion, eversion, calf endurance, peroneal capacity, and proximal hip strength at least 90% of uninvolved side or team baseline.
Balance / control	Single-leg balance, Y-balance or equivalent, step-down, single-leg squat, and deceleration mechanics without asymmetry or pain.
Power / plyometrics	Hop testing >=90% symmetry at minimum; elite return may target 95% or team normative thresholds. Ability to tolerate repeated elastic loading without reactive symptoms.
Skating performance	Completion of full progression: straight-line skating, acceleration/deceleration, edge work, crossovers, backward skating, small-area movement, non-contact practice, and full practice without symptom response.
Contact readiness	Controlled board battles, puck protection, net-front contact, and reactive transitions tolerated across repeated sessions.
Medical clearance	Surgeon, physician, rehabilitation, athletic training, strength/performance staff, and athlete input integrated into final clearance.

8. Red Flags and Reasons to Hold or Regress

The ankle gets a vote

- Increasing pain during or after activity, particularly pain localized to the anterior syndesmosis or distal tibiofibular joint.
- Reactive swelling later the same day or the following morning after a loading progression.
- Pain or apprehension with dorsiflexion-external rotation, tight turns, crossovers, or deceleration.
- Loss of dorsiflexion, altered gait, reduced push-off, or avoidance of involved-side edge work.
- Incision irritation, hardware irritation from the skate boot, drainage, erythema, or other wound concerns.
- Calf pain, neurovascular symptoms, systemic symptoms, or signs concerning for complication.
- Failure to tolerate repeated exposures despite a single symptom-free session.

9. Suggested Testing Battery

Objective data plus repeated tolerance

Testing category	Measures to consider
Impairment	Ankle ROM, closed-chain dorsiflexion, circumferential edema, palpation, external rotation/squeeze-type symptom testing as clinically appropriate
Strength	Handheld dynamometry or isokinetic testing for ankle planes; seated and standing calf endurance; soleus and gastrocnemius bias testing
Neuromuscular control	Single-leg balance, Y-balance, step-down quality, single-leg squat, landing mechanics
Power / elasticity	Single hop, triple hop, crossover hop, repeated hop, pogo tolerance, reactive hop tasks
Speed / agility	Linear sprint, acceleration/deceleration, change of direction, shuttle or position-specific testing
On-ice	Timed skating, repeated sprint skating, transition drills, crossovers, small-area movement, position-specific skill sequence, contact progression
Recovery response	Pain, swelling, stiffness, gait and confidence 24 hours after loading and after back-to-back sessions

10. Hockey-Specific Clinical Pearls

Practical rules for return to hockey

- Suture button fixation may permit functional progression, but the reduction and the athlete's clinical response remain the priority.
- Skating can feel deceptively safe because the boot limits motion; this should not be interpreted as full readiness for contact, fatigue, or unpredictable torsional load.
- Progress the athlete from volume to intensity to complexity: minutes first, then speed, then direction change, then reactive chaos and contact.
- Tight turns and crossovers are key syndesmosis stress tests in hockey because they combine dorsiflexion, external rotation, and edge demand.
- Return to skate often precedes return to practice by several weeks; return to practice precedes return to competition.
- Back-to-back practice tolerance is more informative than a single successful session.
- Decision-making should integrate objective testing with role, position, game demands, schedule density, playoff context, and athlete confidence.

Key References

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Syndesmosis Repair Return to Hockey Clinical Guideline | Criteria-based progression; surgeon-specific restrictions supersede this framework.