My overall approach to rehabilitation is restoration of range of motion, strength, function, and sport specific conditioning. Failure to do so results in chronic ankle dysfunction, an anomaly affecting some 20% to 50% of lateral ankle sprain patients. Chronic ankle dysfunction is characterized by pain, inflammation, and loss of motion and may produce long-term disability and function. It can lead to increased treatment costs and time loss for patients.

Various complicated mechanical and neuromuscular factors seem to be involved in chronic ankle instability. The two hypothesized causes of chronic ankle instability are mechanical instability and functional instability. Mechanical instability is defined as ankle movement beyond the physiologic limit of the ankle’s range of motion. The term “laxity” is often used synonymously with mechanical instability. Functional instability is defined as the subjective feeling of ankle instability or recurrent, symptomatic ankle sprains (or both) due to proprioceptive and neuromuscular deficits. Nussbaum correlated severity of syndesmosis injury via time loss with the extent of pain extending proximally in the interosseous membrane. Syndesmosis injuries produce ankle instability with medial traction forces and external rotation torque to the tibia.

Verhagen et al attempted to modify the athletes’ intrinsic susceptibility to ankle sprain through an ongoing motor learning program. What was effective but only for those with a history of prior ankle injury. This suggests that parameters affected by the training program, whether proprioception, muscle strength, or motor learning patterns, may only be deficient after injury and may not be causes of primary ankle sprain. To prevent injury, scientists must first correctly identify a predisposing factor, devise an effective intervention to modify it, implement the intervention with adequate compliance, and study the outcome of the intervention with a method that is sensitive enough to detect potentially small but clinically significant reductions in injury rate.

To prevent injuries, the use of proprioceptive balance board program is an effective treatment for the prevention of ankle sprain recurrences. The importance of conditioning in injury prevention was reported Osborne as muscle onset latency decreases in specific ankle muscle groups after ankle disk training in previously injured ankles. Experimental and controls demonstrated a significant change, and thus raises the question of proprioceptive cross-training effect. Both plyometric and dynamic stabilization/balance exercises should be included in an injury-prevention program. It is suggested deficits in running speed, cardiorespiratory endurance, balance, dorsiflexion strength, coordination, muscle reaction, and dorsiflexion range of motion at the ankle are associated with the risk of ankle inversion sprains in male subjects.

Strengthening exercise must be completed to restore all involved muscles. Clinicians must remember to train the muscles in concentric and eccentric modes of function. Many tests and training devices center around concentric (shortening) contractions while the eccentric contraction are the deceleration and lengthening action which are so related to sporting activity.
Extrinsic risk factors were also investigated prospectively and included bracing and taping, shoe type, and the duration and intensity of competition and player position.\textsuperscript{13} Specific means to prevent sprains by bracing and taping has been studied extensively. Athletic tape was used with success;\textsuperscript{14-30} while orthotic devices were also reported.\textsuperscript{30-39} Several authors reported athletic taping and bracing as effective in injury reduction. Sitler et al\textsuperscript{40} performed comprehensive prospective studies of the effect of bracing on reducing ankle sprains among collegiate basketball athletes and determined the incidence of ankle sprains was lower in athletes with a history of ankle sprains who wore a brace.

Orthotic devices increase the ankle torque counteracting the inversion movement. Prevention of inversion movement by preloading and maintaining the ankle in proper position with optimal contact between the articular surfaces.\textsuperscript{41} Ankle braces have been shown to be effective at preventing some types of ankle sprains\textsuperscript{34, 40, 42-44} and do not effect athletic performance.\textsuperscript{45, 46} Some authors reported affected basketball-related performance among females.\textsuperscript{47} Prophylactic use of a double-upright ankle brace in volleyball athletes significantly reduced the ankle injury rate compared to a NCAA control group.\textsuperscript{6}

Many authors have reported the effectiveness of ankle taping in controlling motion\textsuperscript{21, 25, 27, 48-50} and providing protection to the ankle.\textsuperscript{18, 23, 25, 27, 42, 48-56} Though not reported to enhance functioning, several studies\textsuperscript{48, 53, 54} found ankle taping not a deterrent to performance. These findings are of value to provide clinicians a means to improve performance parameters. The use of elastic tape maintains pressure throughout the workout period, and thus affords more support to the involved structures. Additionally, using elastic tape and its compressive properties can enhance dynamic balance and subsequent performance. Taping the ankle decreases the ability to detect movement in the inversion-eversion plane in participants with recurrent ankle sprains.\textsuperscript{57} Thus, taping is effective in reducing the incidence of ankle sprains and should be used as an adjunct to reduce the likelihood of reinjury.