Infographic. Progressing rehabilitation after injury: consider the 'control-chaos continuum'

Matt Taberner ,[1] Tom Allen,[2] Daniel Dylan Cohen[3]

Return to sport (RTS) is a dynamic process, during which practitioners must balance the risk that early reintegration to training/match-play increases reinjury risk with the benefit to the team of having key players available.[1] Medical and performance staff must work together to formulate a plan considering the individual, the specifics of the injury, tissue healing time and potential risk factors for reinjury.

A key element of this plan is the management and prescription of external running loads using global positioning systems (GPS) to return players to previous levels of chronic load prior to injury, relatively quickly and safely.[2 3] Alongside the quantitative elements of load, practitioners should also consider the qualitative nature of movement in competition that is, highly variable, spontaneous and unanticipated movements ('chaos'), reflecting the unpredictable nature of sport. During the early stages of rehabilitation, however, control should be maintained using appropriate constraints to control movement variability. By balancing control parameters and dynamic movement, the practitioner can influence physical performance outcomes by implementing appropriate task and environmental constraints throughout the RTS process.[4] We therefore suggest a framework designed to provide a base for the practitioner to use progressing from high control to high chaos, interlinking GPS metrics while incorporating greater perceptual and reactive neurocognitive challenges to simulate competition demands.[5]

The 'control-chaos continuum' is embodied by five key phases which can be adapted to both long-term and short-term injuries using condensed or extended phases—particularly as progression is criteria based, not time dependent. These five keys phases are as follows.

1. High control: return to running, with high control over running speeds/loads and low musculoskeletal impact forces, building player confidence.
2. Moderate control: introduce change of direction with the ball, reduce control (somewhat controlled chaos) and progress high-speed running (HSR) load.
3. Control>chaos: introduce sport-specific weekly structure to overload game-specific demands reflecting a transition from control to chaos (inclusion of movements with unpredicted actions, within limits).
4. Increase HSR under moderate chaos (unpredicted movements, minimal limitations), with the addition of pass and move and specific pattern of play drills.

5. Return the player to preinjury weekly training demands and include drills designed to test worst-case scenarios (high speed/high chaos).

While we have found this framework helpful in football, we hope it may add value to practitioners working across other sports including rugby, basketball, Australian rules football, hockey and American football.

[1]Performance Department, Everton Football Club, Liverpool, UK
[2]Arsenal Performance and Research Team, Arsenal Football Club, London, UK
[3]Faculty of Health Sciences, University of Santander, Bucaramanga, Colombia

Correspondence to Matt Taberner, Performance Department, Everton Football Club, Liverpool, UK; matt.taberner@evertonfc.com

Collaborators Yann Le Meur.

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ORCID iD
Matt Taberner http://orcid.org/0000-0003-3465-833X

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