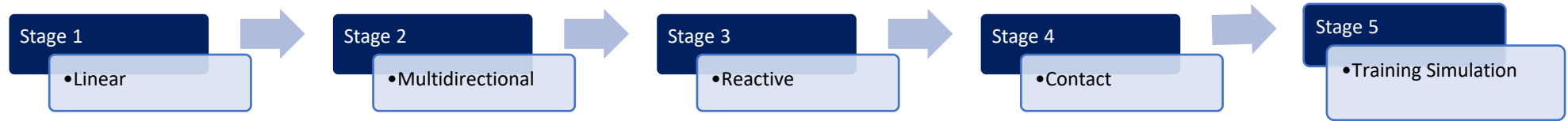


## UNC On-field Rehabilitation: Patient Handout

- On-field rehabilitation is the period when you are transitioning from gym-based rehabilitation back to the competitive team environment. Gym-based strength, conditioning, and movement training continues during this time as well.
- The goal is to reintroduce you to the technical, skillful, and physical demands of your sport.
- On-field rehabilitation is a 5-stage process outlined below.



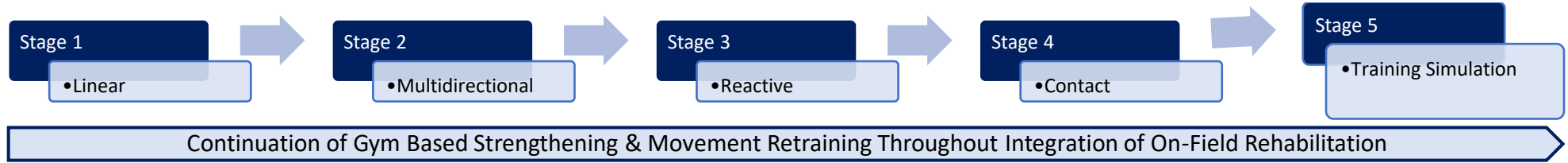
Continuation of Gym Based Strengthening & Movement Retraining Throughout Integration of On-Field Rehabilitation

| Stage 1: Linear   | Stage 2: Multidirectional  | Stage 3: Reactive  | Stage 4: Contact   | Stage 5: Training Simulation   |
|---|--|--|--|--|
| <p><b>Goals of Stage:</b></p> <ul style="list-style-type: none"> <li>• Establish foundation for high speed running</li> <li>• Establish foundation for deceleration and turning</li> <li>• Establish foundation for skill work integration</li> </ul>   | <p><b>Goals of Stage:</b></p> <ul style="list-style-type: none"> <li>• Establish foundation for multidirectional movement</li> <li>• Progress high-speed running</li> <li>• Introduce less controlled tasks</li> </ul>   | <p><b>Goals of Stage:</b></p> <ul style="list-style-type: none"> <li>• Sport technical training</li> <li>• Progression of high speed running distance</li> <li>• Reactive movement training</li> <li>• Intro to short max effort sprinting</li> </ul>  | <p><b>Goals of Stage:</b></p> <ul style="list-style-type: none"> <li>• Sport skill training</li> <li>• Reactive high-speed running</li> <li>• Minimal contact drills with opponent</li> <li>• Progress max effort sprinting</li> </ul>   | <p><b>Goals of Stage:</b></p> <ul style="list-style-type: none"> <li>• Sport simulation</li> <li>• Position specific reconditioning</li> <li>• Technical tasks at game speeds with reactive demands</li> </ul>   |
| <p><b>Specific Entry Criteria</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> No pain or swelling</li> <li><input type="checkbox"/> No reported instability</li> <li><input type="checkbox"/> No positive laxity tests</li> <li><input type="checkbox"/> Knee flexor and extensor strength &gt;80% compared to non-surgical limb</li> <li><input type="checkbox"/> Good movement quality with gym based movement tasks</li> </ul> | <p><b>Specific Entry Criteria</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> No pain or swelling</li> <li><input type="checkbox"/> Satisfactory progression through stage 1 activities</li> <li><input type="checkbox"/> Patient reports confidence with movements and activities</li> <li><input type="checkbox"/> Clinician notes confidence with movements and activities</li> </ul> | <p><b>Specific Entry Criteria</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> No pain or swelling</li> <li><input type="checkbox"/> Knee flexor and extensor strength &gt;90% compared to non-surgical limb</li> <li><input type="checkbox"/> Satisfactory progression through stage 2 activities</li> <li><input type="checkbox"/> Good movement quality with preplanned sport tasks</li> <li><input type="checkbox"/> Patient reports confidence with movements and activities</li> <li><input type="checkbox"/> Clinician notes confidence with movements and activities</li> </ul> | <p><b>Specific Entry Criteria</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> No pain or swelling</li> <li><input type="checkbox"/> Satisfactory progression through stage 3 activities</li> <li><input type="checkbox"/> Patient reports confidence with movements and activities</li> <li><input type="checkbox"/> Clinician notes confidence with movements and activities</li> </ul> | <p><b>Specific Entry Criteria</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> No pain or swelling</li> <li><input type="checkbox"/> Satisfactory progression through stage 4 activities</li> <li><input type="checkbox"/> Patient reports confidence with movements and activities</li> <li><input type="checkbox"/> Clinician notes confidence with movements and activities</li> </ul> |
| <p><b>Example Activities (Video)</b></p> <ul style="list-style-type: none"> <li>• Lunge iso-holds</li> <li>• Falling sprint start to lunge</li> <li>• Single and double limb hops</li> <li>• Touches between feet</li> <li>• High speed running exposure</li> </ul>   | <p><b>Example Activities (Video)</b></p> <ul style="list-style-type: none"> <li>• Curved running</li> <li>• Agility ladder hops</li> <li>• Slow acceleration drills</li> <li>• Slow deceleration drills</li> <li>• Y shallow cutting (slow)</li> <li>• Z lateral shuffle</li> </ul>  | <p><b>Example Activities (Video)</b></p> <ul style="list-style-type: none"> <li>• High-speed change of direction drills</li> <li>• Sprints</li> <li>• High-speed acceleration drills</li> <li>• High-speed deceleration drills</li> <li>• Reactive movements with external focus</li> </ul>  | <p><b>Example Activities (Video)</b></p> <ul style="list-style-type: none"> <li>• High-speed multidirectional reactive movements</li> <li>• Technical drills with player pressure or light contact</li> <li>• Repeat sprint running</li> <li>• Reactive passive drills with change of direction</li> </ul>   | <p><b>Example Activities</b></p> <ul style="list-style-type: none"> <li>• Sport-specific tasks at game speeds with and without contact</li> <li>• Conditioning specific to sport and position</li> </ul>   |

Example videos for warmup drills and movements can be found ([here](#)) and example videos of foundational movements can be found ([here](#)).

## UNC On-field Rehabilitation: Clinician Handout

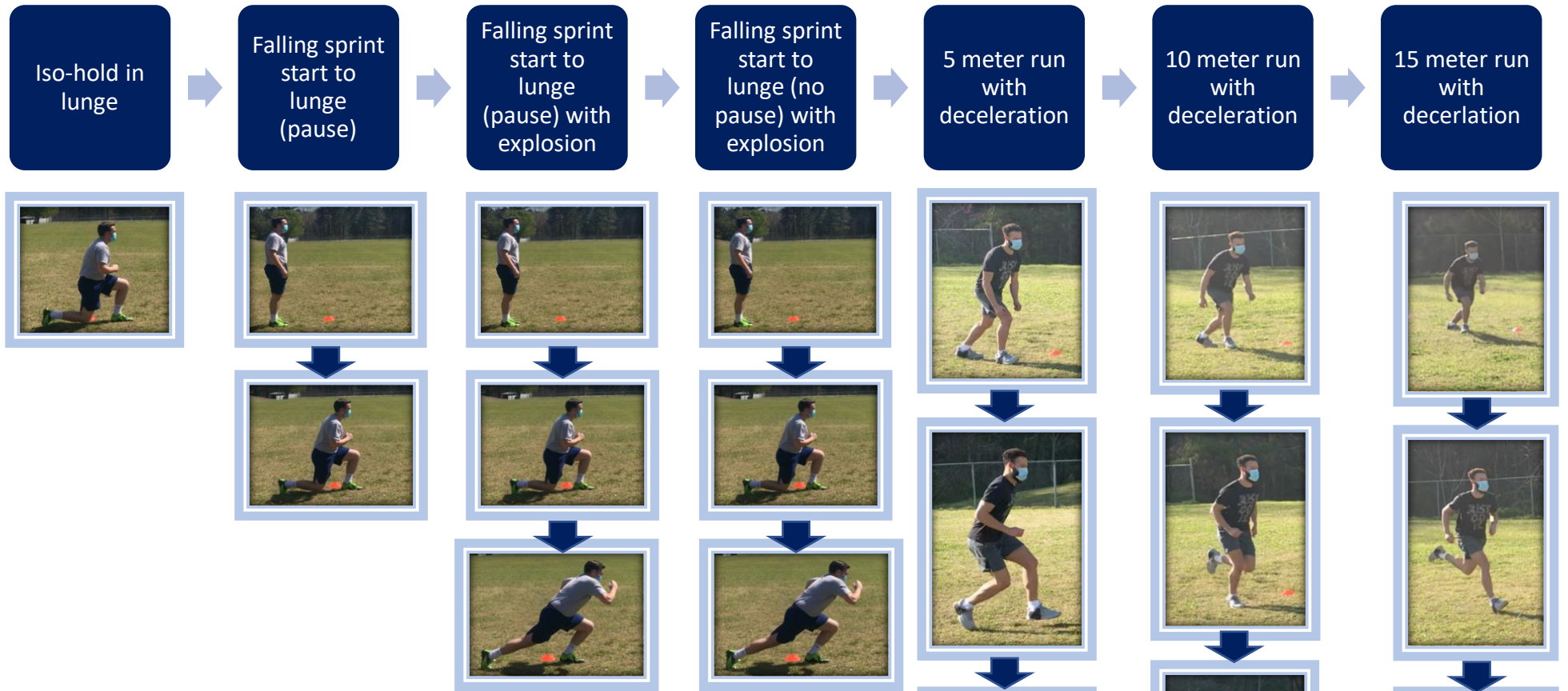
- On-field rehabilitation is the period when the athlete is transitioning from gym-based rehabilitation back to the competitive team environment. Gym-based strength, conditioning, and movement training continues during this time as well.
- The goal is to reintroduce the athlete to the technical, skillful, and physical demands of your sport.



| Stage 1 (2-5 Sessions)   | Stage 2 (3-5 Sessions)   | Stage 3 (3-5 Sessions)  | Stage 4 (4-6 Sessions)   | Stage 5 (4-6 Sessions)   |
|--|--|---|--|--|
| <p><b>Goals of Stage:</b></p> <ul style="list-style-type: none"> <li>• Establish foundation for high speed running (&lt;55% max speed)</li> <li>• Establish foundation for deceleration and turning capacity (&lt;55% max speed)</li> <li>• Establish foundation for skill work integration</li> </ul>   | <p><b>Goals of Stage:</b></p> <ul style="list-style-type: none"> <li>• Establish foundation for multidirectional movement</li> <li>• Progress high-speed running (≤70% max speed)</li> <li>• Introduce less controlled tasks</li> </ul>  | <p><b>Goals of Stage:</b></p> <ul style="list-style-type: none"> <li>• Sport technical training</li> <li>• Progression of high speed running distance (60-80% max speed)</li> <li>• Reactive movement training</li> <li>• Intro to short max effort sprinting</li> </ul>  | <p><b>Goals of Stage:</b></p> <ul style="list-style-type: none"> <li>• Sport skill training</li> <li>• Reactive high-speed running (&gt;75% max speed)</li> <li>• Minimal contact drills with opponent</li> <li>• Progress max effort sprinting</li> </ul>   | <p><b>Goals of Stage:</b></p> <ul style="list-style-type: none"> <li>• Sport simulation</li> <li>• Position specific reconditioning</li> <li>• Technical tasks at game speeds with reactive demands</li> </ul>   |
| <p><b>Specific Entry Criteria</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> No pain or swelling</li> <li><input type="checkbox"/> No reported instability</li> <li><input type="checkbox"/> No positive laxity tests</li> <li><input type="checkbox"/> Hamstring and quadriceps LSI ≥ 80%</li> <li><input type="checkbox"/> Good movement quality with gym based movement tasks</li> </ul> | <p><b>Specific Entry Criteria</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> No pain or swelling</li> <li><input type="checkbox"/> Satisfactory progression through stage 1 activities</li> <li><input type="checkbox"/> Patient reports confidence with movements and activities</li> <li><input type="checkbox"/> Clinician notes confidence with movements and activities</li> </ul> | <p><b>Specific Entry Criteria</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> No pain or swelling</li> <li><input type="checkbox"/> Hamstring and quadriceps LSI ≥ 90%</li> <li><input type="checkbox"/> Satisfactory progression through stage 2 activities</li> <li><input type="checkbox"/> Good movement quality with preplanned sport tasks</li> <li><input type="checkbox"/> Patient reports confidence with movements and activities</li> <li><input type="checkbox"/> Clinician notes confidence with movements and activities</li> </ul> | <p><b>Specific Entry Criteria</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> No pain or swelling</li> <li><input type="checkbox"/> Satisfactory progression through stage 3 activities</li> <li><input type="checkbox"/> Patient reports confidence with movements and activities</li> <li><input type="checkbox"/> Clinician notes confidence with movements and activities</li> </ul> | <p><b>Specific Entry Criteria</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> No pain or swelling</li> <li><input type="checkbox"/> Satisfactory progression through stage 4 activities</li> <li><input type="checkbox"/> Patient reports confidence with movements and activities</li> <li><input type="checkbox"/> Clinician notes confidence with movements and activities</li> </ul> |
| <p><b>Example Activities (Video)</b></p> <ul style="list-style-type: none"> <li>• Lunge iso-holds</li> <li>• Falling sprint start to lunge</li> <li>• Single and double limb hops</li> <li>• Touches between feet</li> <li>• High speed running exposure</li> </ul>  | <p><b>Example Activities (Video)</b></p> <ul style="list-style-type: none"> <li>• Curved running</li> <li>• Agility ladder hops</li> <li>• Slow acceleration drills</li> <li>• Slow deceleration drills</li> <li>• Y shallow cutting (slow)</li> <li>• Z lateral shuffle</li> </ul>  | <p><b>Example Activities (Video)</b></p> <ul style="list-style-type: none"> <li>• High-speed change of direction drills</li> <li>• Sprints</li> <li>• High-speed acceleration drills</li> <li>• High-speed deceleration drills</li> <li>• Reactive movements with external focus</li> </ul>   | <p><b>Example Activities (Video)</b></p> <ul style="list-style-type: none"> <li>• High-speed multidirectional reactive movements</li> <li>• Technical drills with player pressure or light contact</li> <li>• Repeat sprint running</li> <li>• Reactive passive drills with change of direction</li> </ul>   | <p><b>Example Activities</b></p> <ul style="list-style-type: none"> <li>• Sport-specific tasks at game speeds with and without contact</li> <li>• Conditioning specific to sport and position</li> </ul>   |

Example videos for warmup drills and movements can be found ([here](#)) and example videos of foundational movements can be found ([here](#)).

## Simple Linear Deceleration Progression: Clinician Handout



### **Key Points for Linear Deceleration Progression**

- Progressively using increasing distances between cones increases acceleration distance, peak speed attained, and the stopping distance required to complete the task.
- Breaking strategies begin at greater distances from the final cone with increased peak speeds (see images to right).
- Different strategies can be seen with increased distances and peak speeds such as increased steps performed within braking strategy and changes in torso and lower extremity positioning.
- Estimated % of maximal speed attainable for different conditions are:
  - 5 meters: 55%
  - 10 meters: 70%
  - 15 meters: 85%
  - 20 meters: 90%

## References for Handouts

Buckthorpe M, Della Villa F, Della Villa S, Roi GS. On-field Rehabilitation Part 2: A 5-Stage Program for the Soccer Player Focused on Linear Movements, Multidirectional Movements, Soccer-Specific Skills, Soccer-Specific Movements, and Modified Practice. *J Orthop Sports Phys Ther.* 2019;49(8):570-575. doi:[10.2519/jospt.2019.8952](https://doi.org/10.2519/jospt.2019.8952)

Taberner M, Allen T, Cohen DD. Progressing rehabilitation after injury: consider the 'control-chaos continuum.' *Br J Sports Med.* 2019;53(18):1132-1136. doi:[10.1136/bjsports-2018-100157](https://doi.org/10.1136/bjsports-2018-100157)

Graham-Smith P, Rumpf M, Jones P. ASSESSMENT OF DECELERATION ABILITY AND RELATIONSHIP TO APPROACH SPEED AND ECCENTRIC STRENGTH. *New Zealand.* Published online 2018:7.