

Zurück zum Sprung nach Verletzungen an der unteren Extremität

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Paradigmenwechsel

Rehabilitation and Return to Sport Testing After Anterior Cruciate Ligament Reconstruction: Where Are We in 2022?

Alli Gokeler, Ph.D., P.T., Bart Dingenen, Ph.D., P.T., and Timothy E. Hewett, Ph.D.

Muscle Strength

Hop Tests

Movement Quality Assessment

Psychological factors



Nomenklatur der Sprünge

Physical Therapy in Sport 36 (2019) 5–6



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Physical Therapy in Sport

journal homepage: www.elsevier.com/ptsp



Letter to the Editor

Clarity in applying and reporting on functional tests in therapeutic settings



Jump



Bound



Hop

Nomenklatur der Sprünge

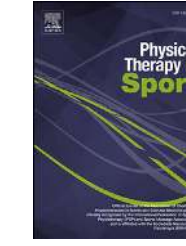
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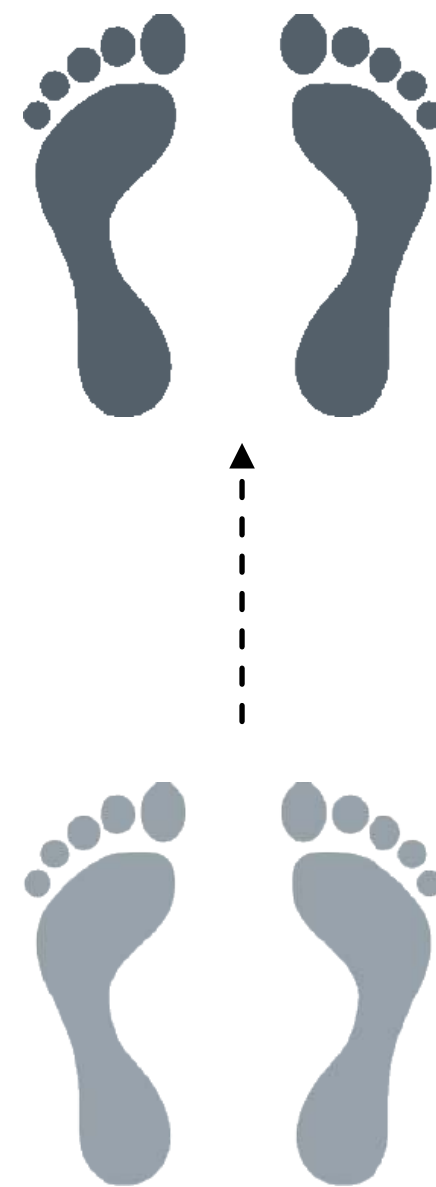


Letter to the Editor

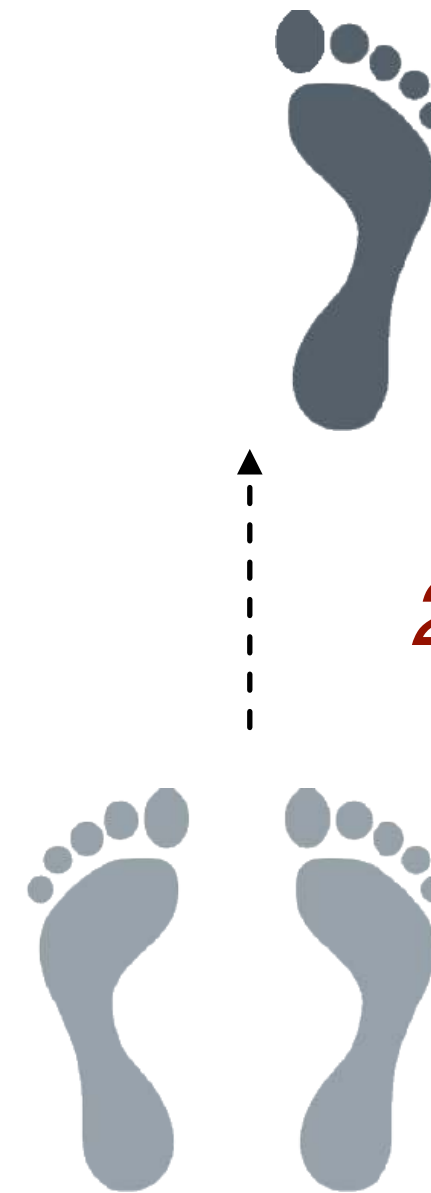
Clarity in applying and reporting on functional tests in therapeutic settings



Modifikationen

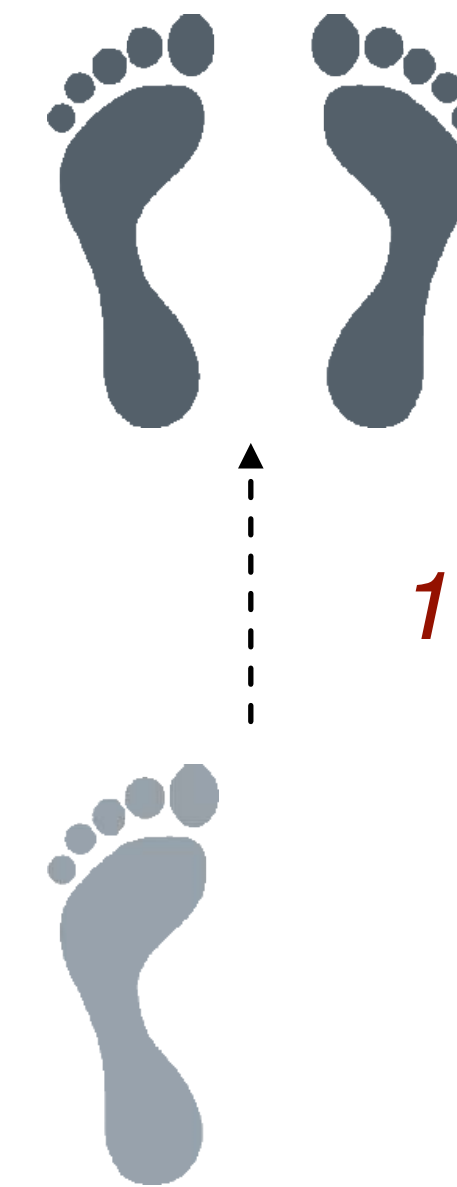


Jump



2 auf 1

Landekontrolle



1 auf 2

Landesicherheit



Better reporting standards are needed to enhance the quality of hop testing in the setting of ACL return to sport decisions: a narrative review

Paul Read ^{1,2} Sean Mc Auliffe ³ Mathew G Wilson ^{1,4}
Gregory D Myer ^{5,6,7}

„Substantial variation exists in RTS hop test administration, scoring and interpretation. Authors often failed to report important details of methods such as warm up activities, randomisation, number of trials, rest periods and landing requirements.“

Table 1 Studies cited in the 2019 systematic review of RTS outcomes following ACL reconstruction⁶

Study	Tests included	Testing order	Warm up activities	Familiarisation session	# Practice trials	# Trials on each limb	Limb order	Best or mean score	Rest period	Hand placement	Landing requirements	Point of measurement	Checks for systematic bias	Studies cited for procedures
Beischer <i>et al</i> ⁸	Isometric quad strength, isokinetics, vertical hop, single hop, side hop	Controlled as stated	10 mins exercise bike	Not stated	3-5	3	Not stated	Best	3 mins between trials for side hops, other tests not stated	Not stated	Not stated	Not stated	Yes	Gustavsson <i>et al</i> ²⁵
Di Stasi <i>et al</i> ⁹	Quadriceps strength Index, single hop, triple-hop, cross-over hop, timed hop	Order not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Fitzgerald <i>et al</i> ²³
Ebert <i>et al</i> ¹⁰	Single hop, timed hop, triple-hop, cross-over hop	Controlled as stated	6 mins walk test, optional unstandardised stretching	Not stated	2-3	2-4, test dependent	Uninvolved then involved	Mean	Based on patient readiness	Not stated	Controlled landing	Not stated	Not stated	Reid <i>et al</i> ²⁴
Fältström <i>et al</i> ¹¹	Star excursion balance, single hop, 5 jump test, side hop, drop jump, tuck jump	Controlled as stated	5-10 mins run, 10 squats, toe raises, 1 min skipping	Not stated	A few	3	Uninvolved then involved	Best	3 mins between tests, between trials not stated	Not stated	Not stated	Not stated	Yes	Gustavsson <i>et al</i> ²⁵ ; Neeter <i>et al</i> ²⁵
Gokeler <i>et al</i> ¹²	Drop jump, single hop, triple hop, side hop, isokinetics	Controlled as stated	10 mins exercise bike	Not stated	3	Not stated	Not stated	Not stated	30s between trials; 3-5 mins between tests	Not stated	Not stated	Not stated	Not stated	Gustavsson <i>et al</i> ²⁵ ; Noyes <i>et al</i> ²²
Graziano <i>et al</i> ¹³	Isokinetics, single hop and subjective movement test battery	Order not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Not stated	None
Grindem <i>et al</i> ¹	Isokinetics, single hop, triple-hop, cross-over hop, timed hop	Controlled as stated	Not stated	Not stated	1	2	Uninvolved then involved	Not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Logerstedt <i>et al</i> ¹⁵ ; Grindem <i>et al</i> ⁴
Krych <i>et al</i> ¹⁴	Isokinetic, vertical jump, single hop, triple-hop	Order not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Jarvela <i>et al</i> ²⁷ ; Petschnig <i>et al</i> ²³ ; Reid <i>et al</i> ⁴
Kyritsis <i>et al</i> ²	Isokinetics, single hop, triple-hop, cross-over hop, agility T-Test	Controlled for hops, order not stated for other tests	Not stated	Not stated	Not stated	3	Not stated	Not stated	Not stated	Not stated	Land without losing balance	Not stated	Not stated	Hopper <i>et al</i> ²⁶ ; Reid <i>et al</i> ⁴ ; Ross <i>et al</i> ²⁵
Logerstedt <i>et al</i> ¹⁵	Isokinetics, single hop, cross-over hop, triple-hop, timed Hop, IKDC	Controlled as stated	Not stated	Not stated	1-2	2	Uninvolved then involved	Mean	Not stated	Not stated	Landing was stable	Heel	Not stated	Noyes <i>et al</i> ²²
Luo <i>et al</i> ¹⁶	Isokinetics, vertical jump, single hop, triple-hop	Order not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Petschnig <i>et al</i> ²³
Nawasreh <i>et al</i> ³	Isometric quad strength, single hop, triple-hop, cross-over hop, timed Hop*	Order not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Nawasreh <i>et al</i> ²¹ ; Noyes <i>et al</i> ²²
Sousa <i>et al</i> ¹⁷	Isokinetic, vertical jump, single hop, triple-hop	Order not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Not stated	Jarvela <i>et al</i> ²⁷ ; Petschnig <i>et al</i> ²³
Thoméé <i>et al</i> ¹⁸	Vertical jump, single hop, side hop	Controlled as stated	10 mins exercise bike	Not stated	3-5	3	Uninvolved then involved	Best	3 mins between side hops only	Not stated	Not stated	Not stated	Yes	Gustavsson <i>et al</i> ²⁵
Toole <i>et al</i> ⁵	Isokinetics, single hop, triple hop, cross-over hop, timed Hop, IKDC	Controlled as stated	Not stated	Not stated	1	2	Randomised	Mean	Not stated	Not stated	Not stated	Not stated	Not stated	Noyes <i>et al</i> ²²

Continued

Wundheilung
(van Berg 1999,
de Morree 2001)

Entzündungs-
phase
0–5 Tage

Proliferations-
phase
6–21 Tage

Konsolidierungsphase
Organisations-, Umbau-
und Reifungsphase
21–60 Tage

Remodulierungsphase
300–500 Tage

Rehabilitationsstufen
(mod. nach Radlinger 1998)

Stufe 1: Aktivierung, Bahnung, Wiederaufbau der physiologischen Innervations- und Bewegungsmuster, Sensomotorik

Stufe 2: Lokales Kraftausdauertraining

Stufe 3: Wiederaufbau Muskelmasse

Stufe 4: Steigerung der neuromuskulären Kraftqualitäten

Stufe 5: Entwicklung vielfältiger und situations(un)abhängiger Kraftqualitäten (sportart- und alltagsspezifisches Training)

Funktionsorientierte
Übungsauswahl
(Keller 2016)

Level I: Balance Squat, Y-Balance Test

Level II: Balance Front Hop, Front Hop Test

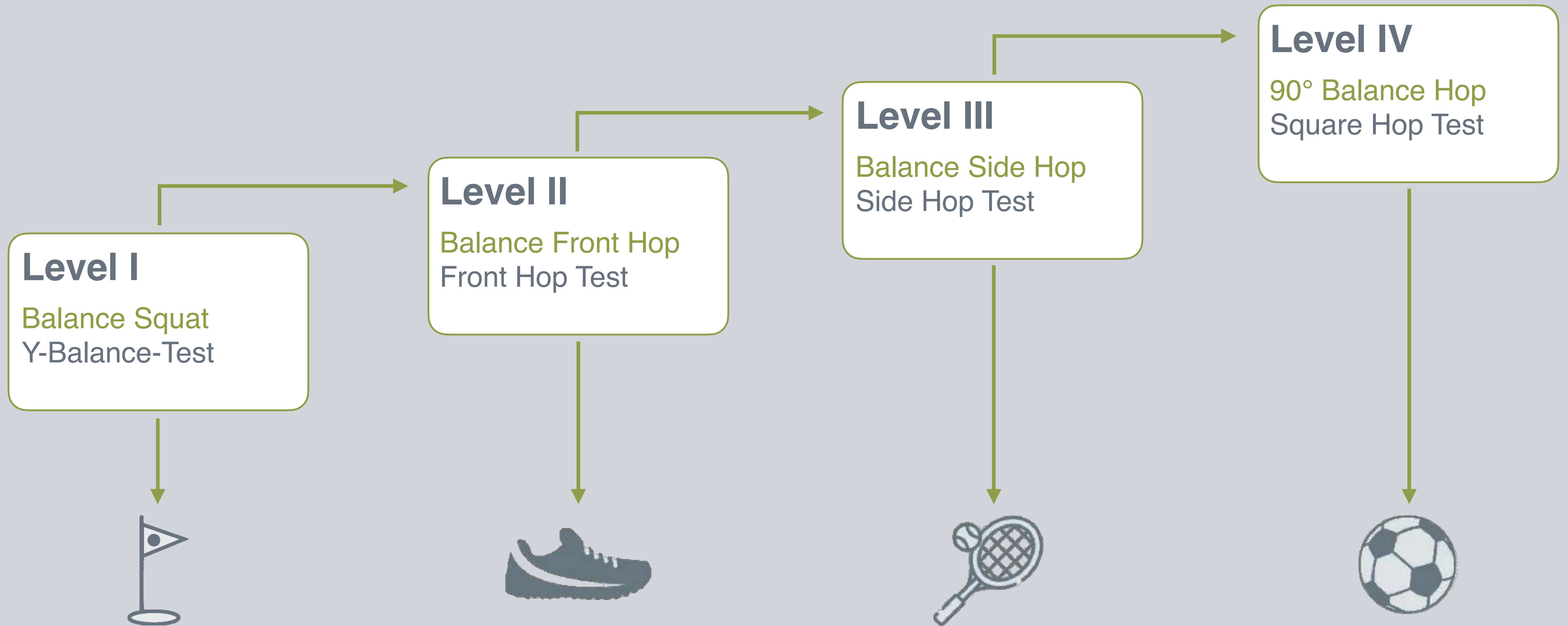
Level III: Balance Side Hop, Side Hop Test

Level IV: 90°Balance Hop, Square Hop Test

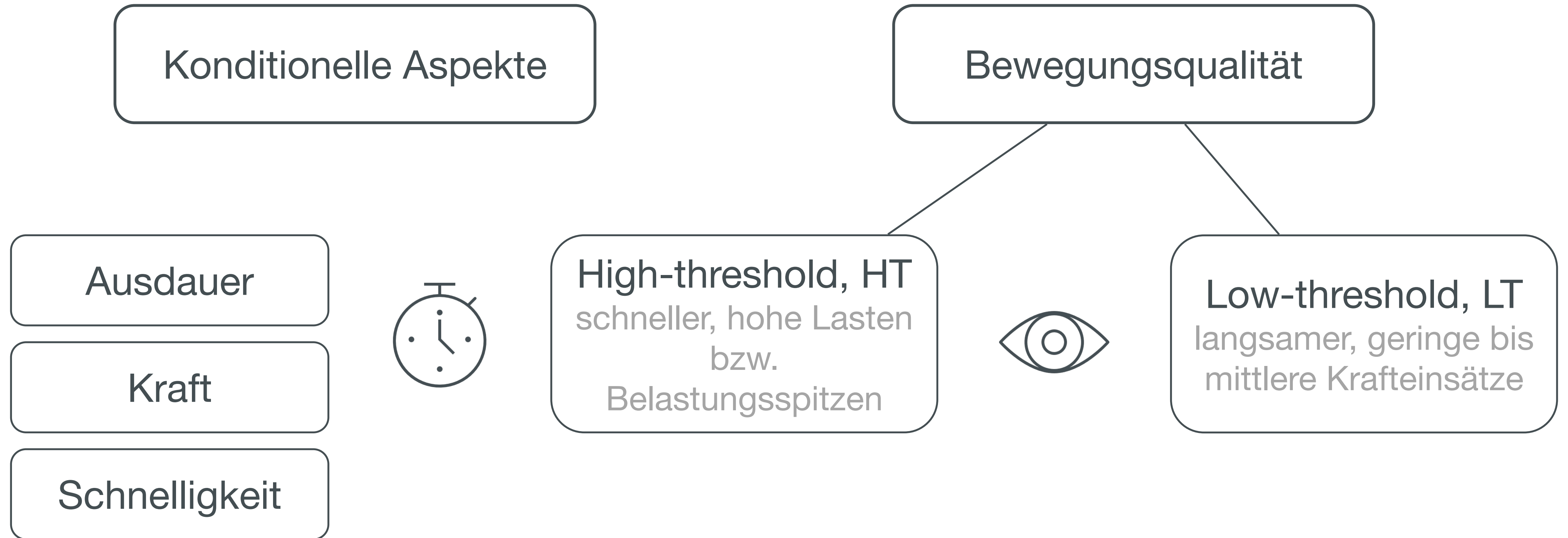
Zeit



Return to Activity Algorithmus (RTAA[®]) Untere Extremität



Grundlegende Gedanken

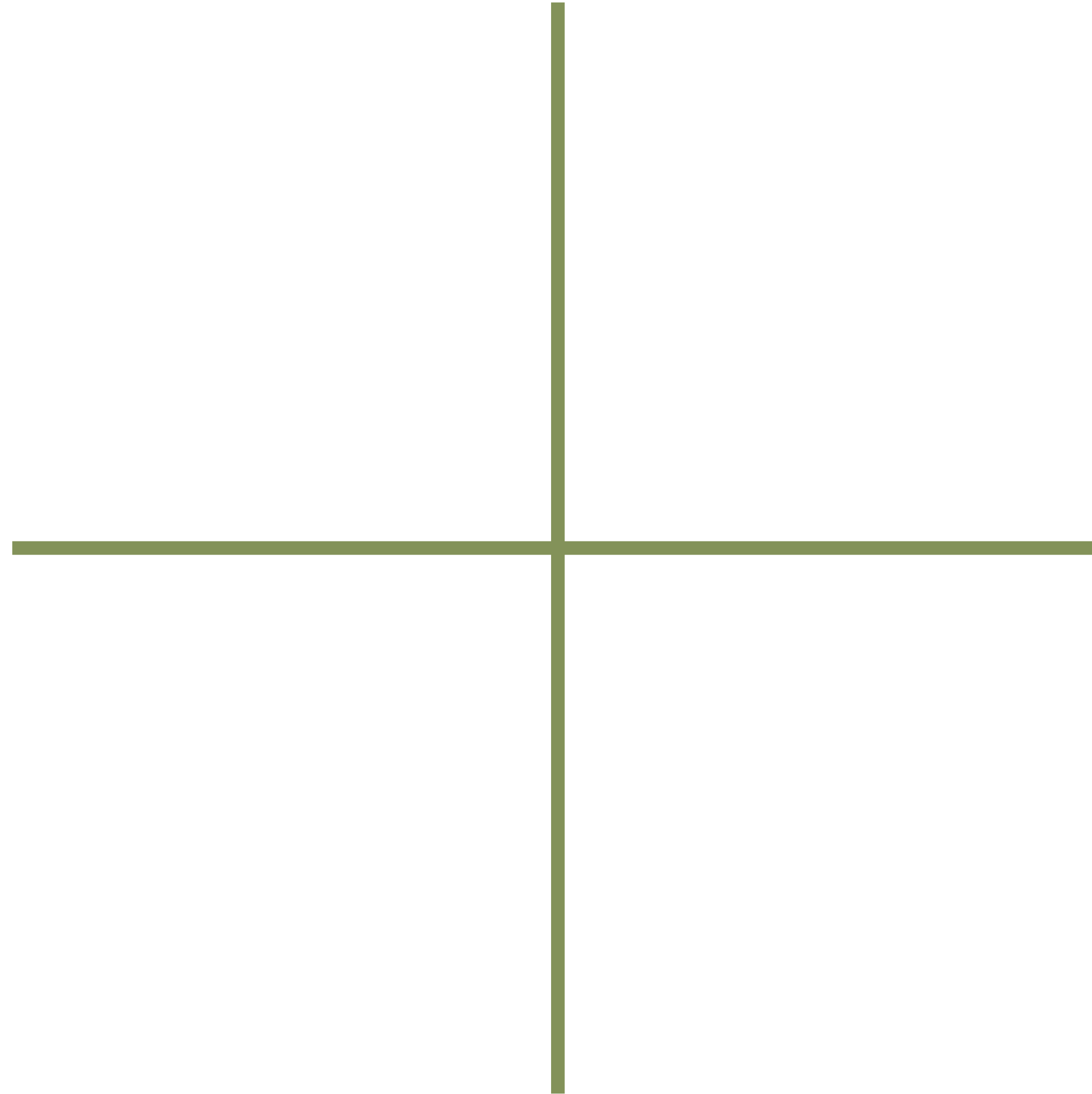


Chaos

Control

Low Threshold

High Threshold



Kontrollverlust des Kniegelenks

Tests zur Beurteilung der Bewegungsqualität nach ligamentären Verletzungen des Kniegelenks: eine systematische Übersichtsarbeit

Judging movement quality in patients who sustained a knee ligament injury: a systematic review

Autoren
Matthias Keller¹, Frank Diemer², Eduard Kurz^{1,3}

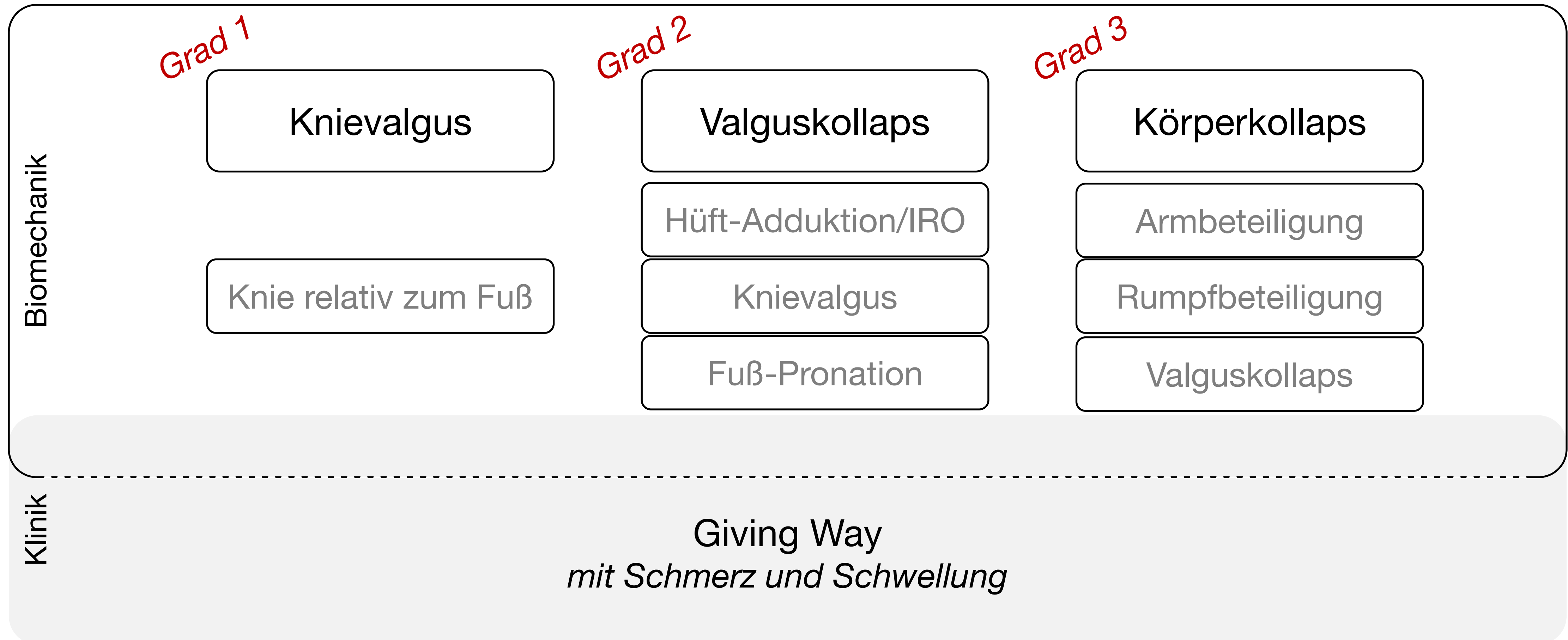
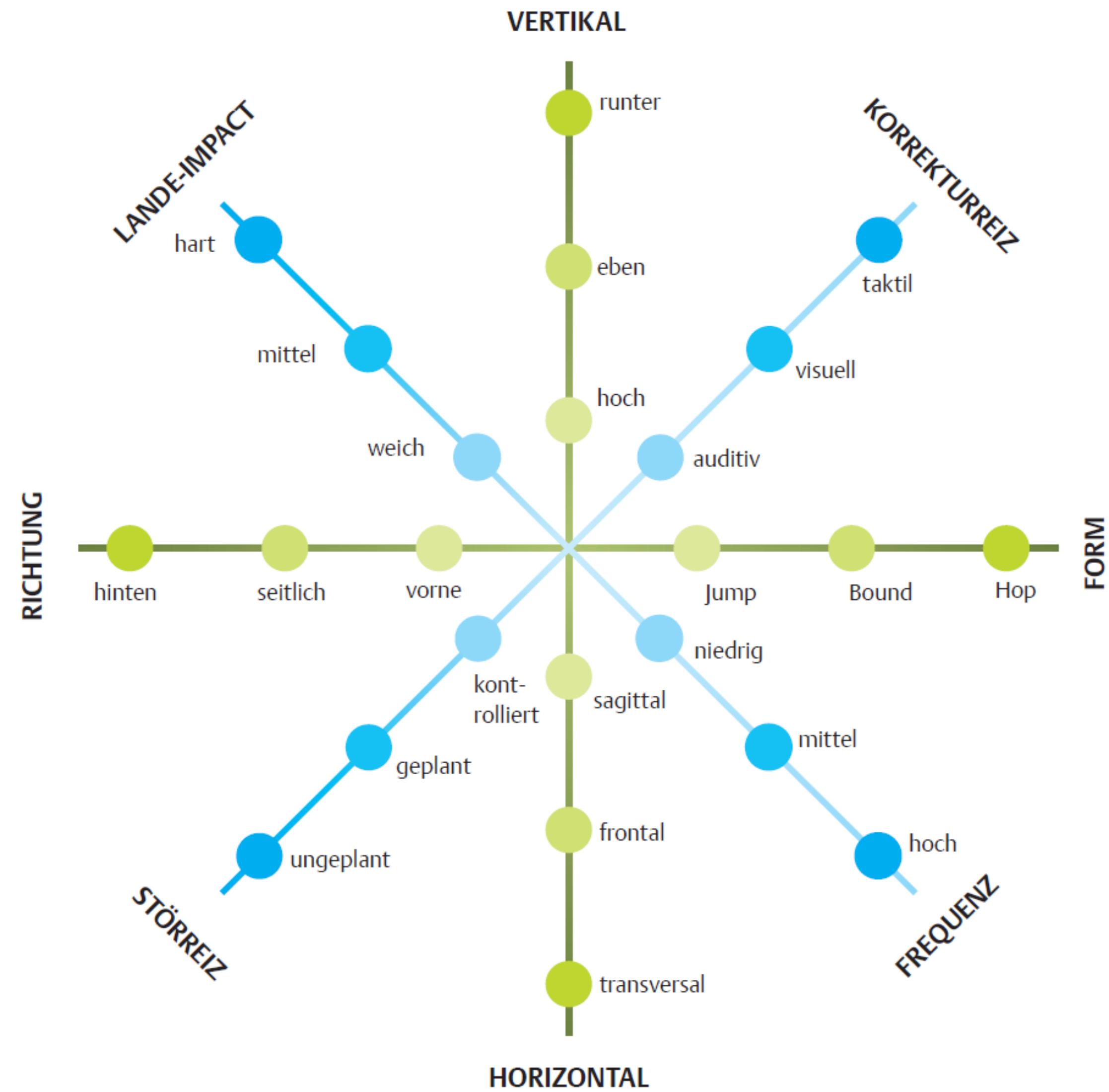




Abb.: OSINSTITUT

Die Sprungmatrix

Sprungmatrix (4x4)

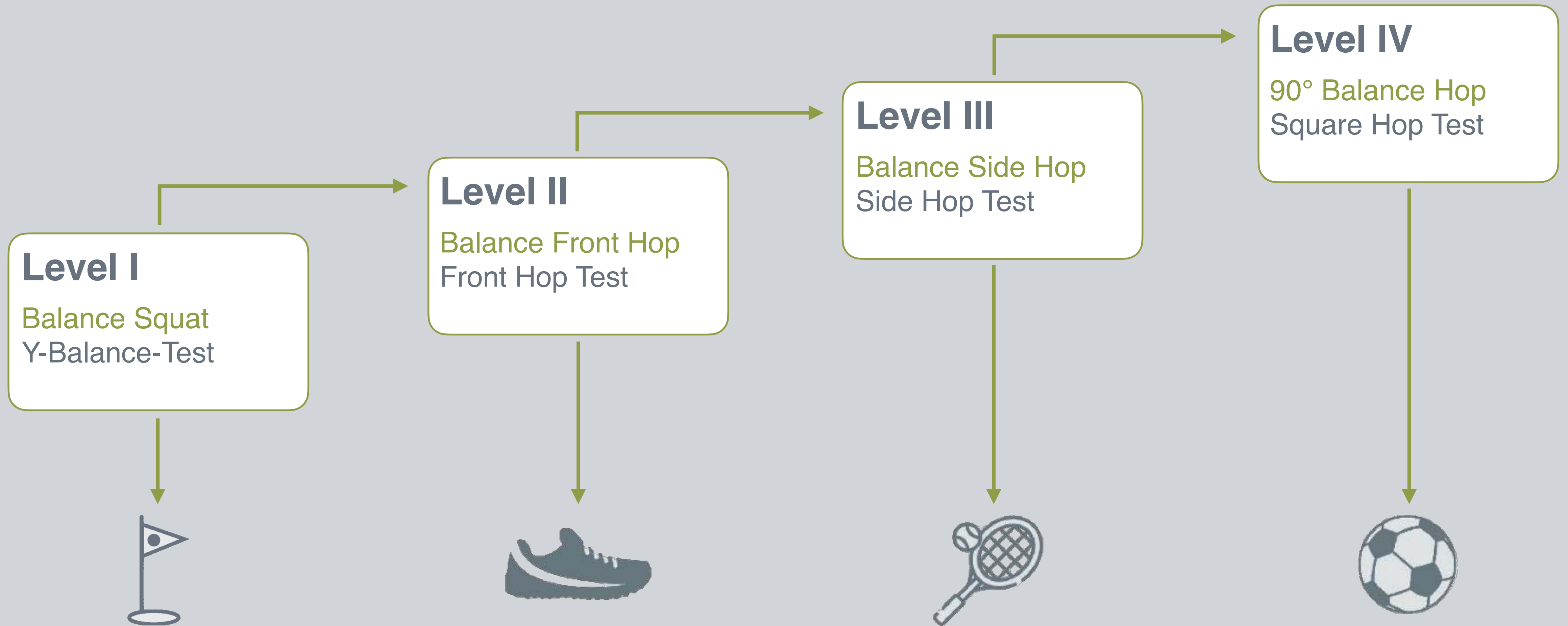


Sprungmatrix (4x4)





Return to Activity Algorithmus (RTAA[®]) Untere Extremität



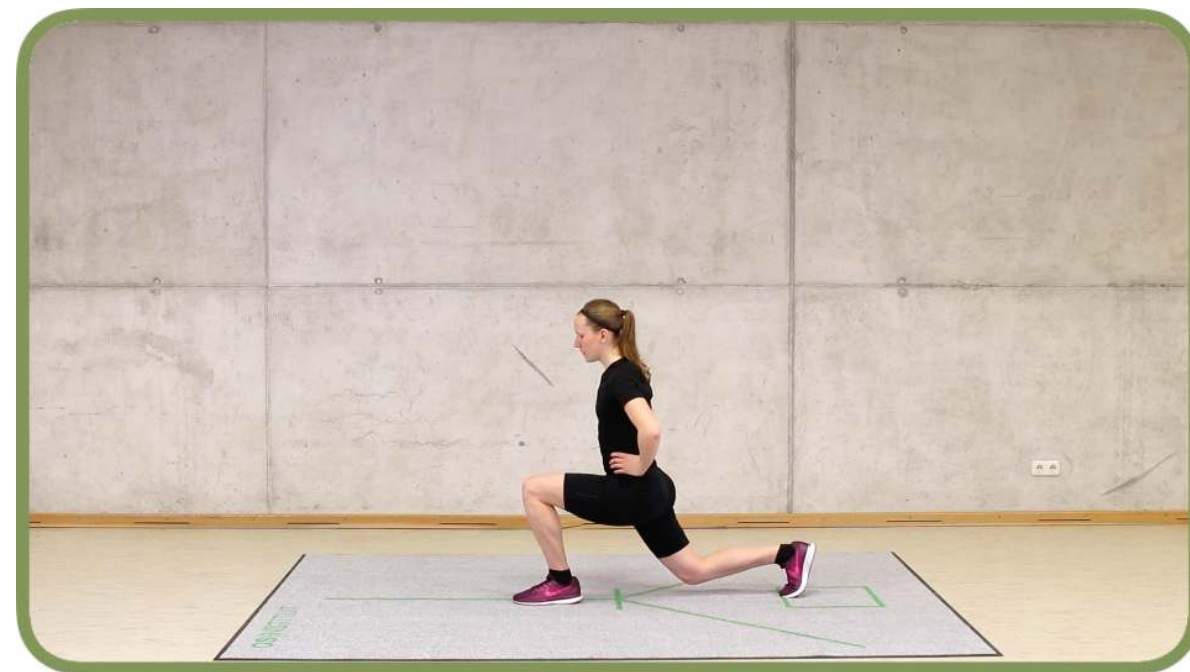
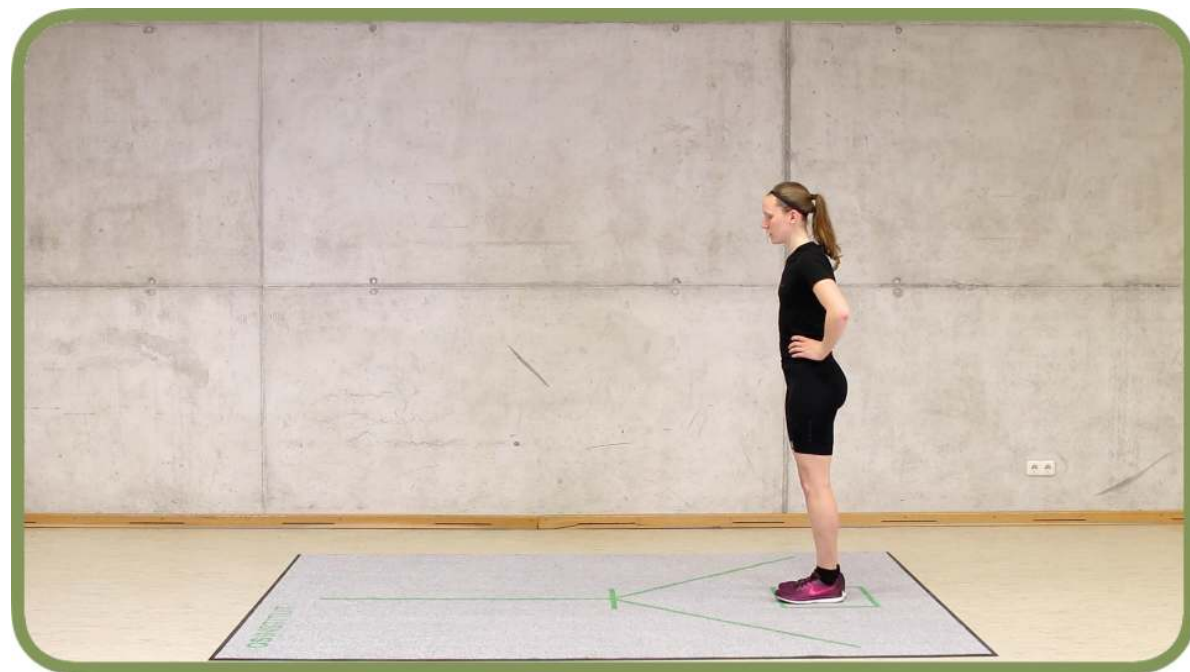
Rehab Exercises – Level II - Impact Progression/Sagittal Plane



Wall Drill



Forward Lunge



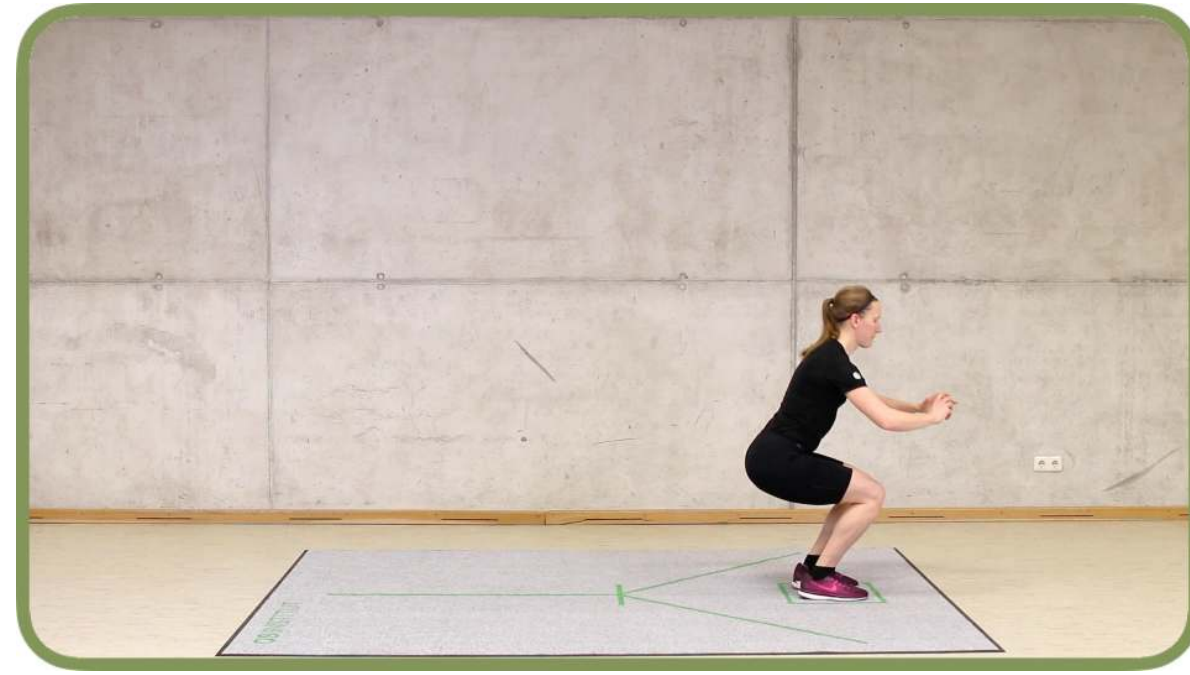
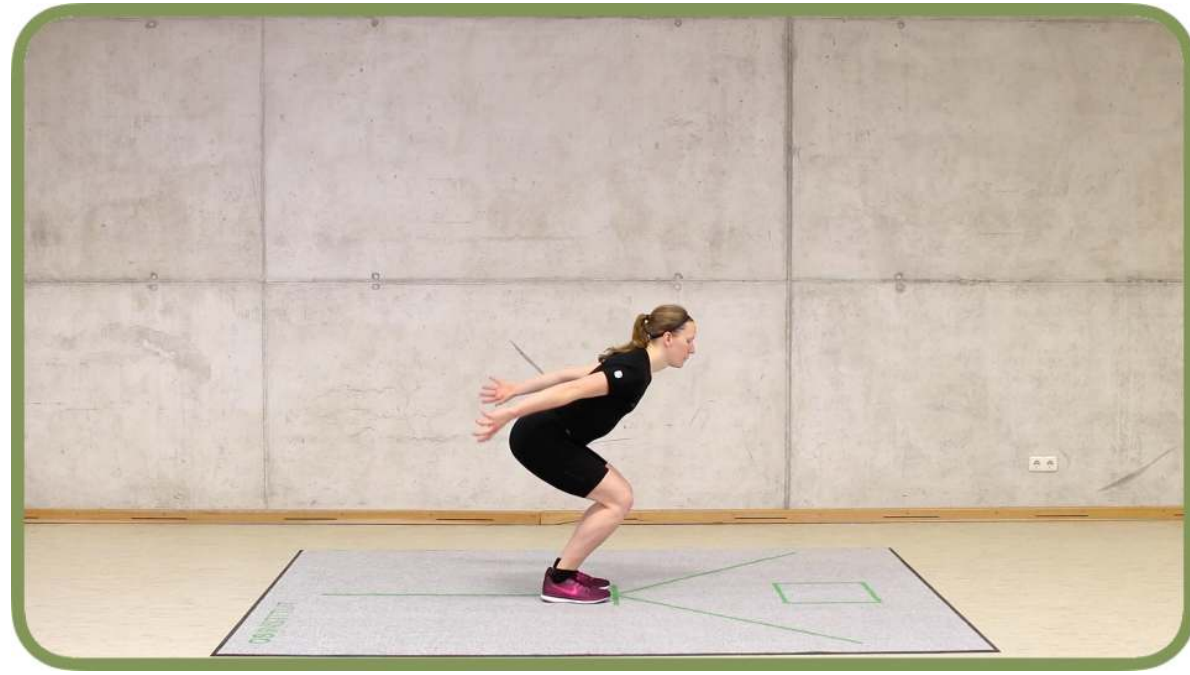
Drop Squat



Rehab Exercises – Level II - Sprungformen/ Sagittalebene



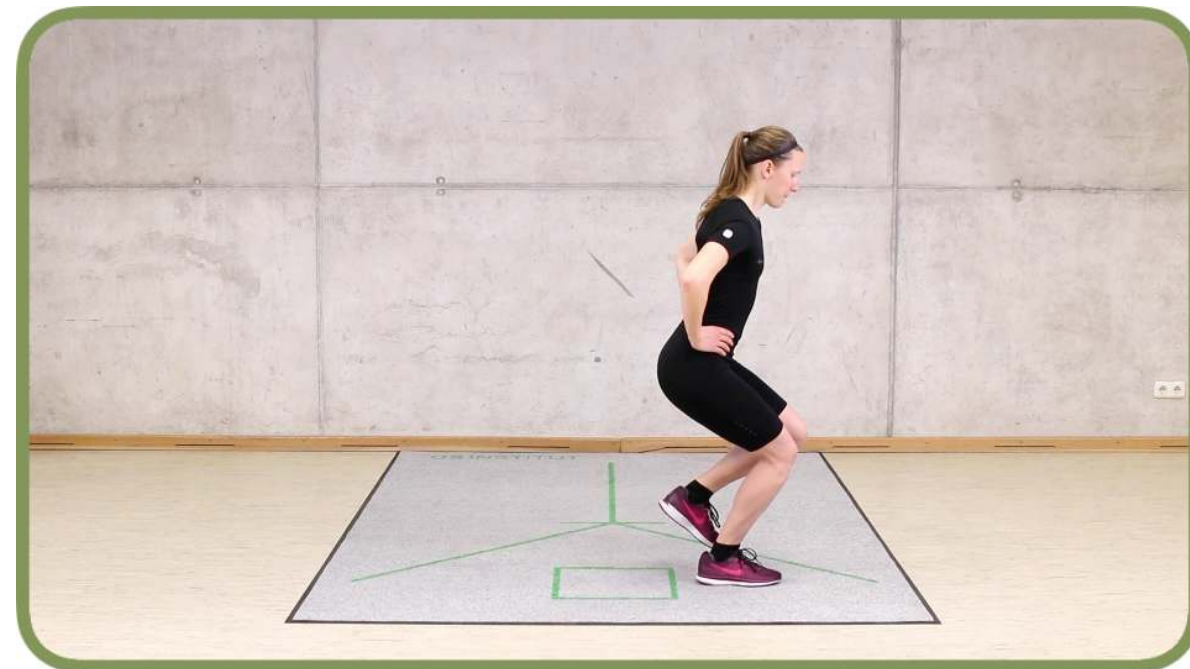
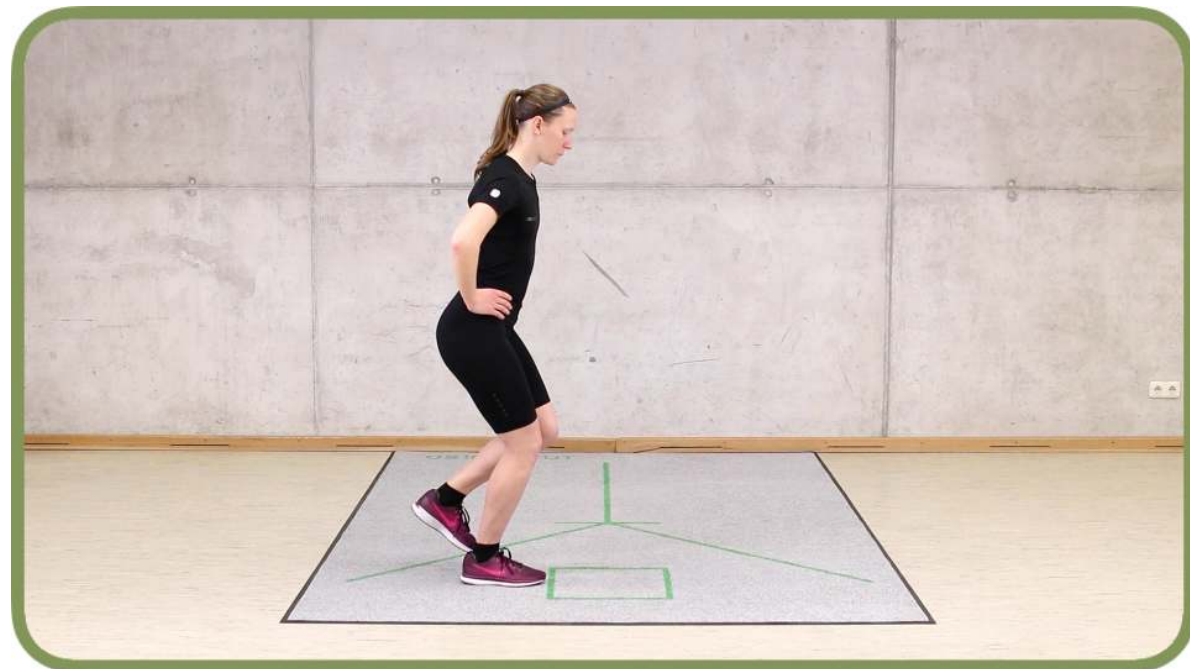
Front Jump



Front Bound



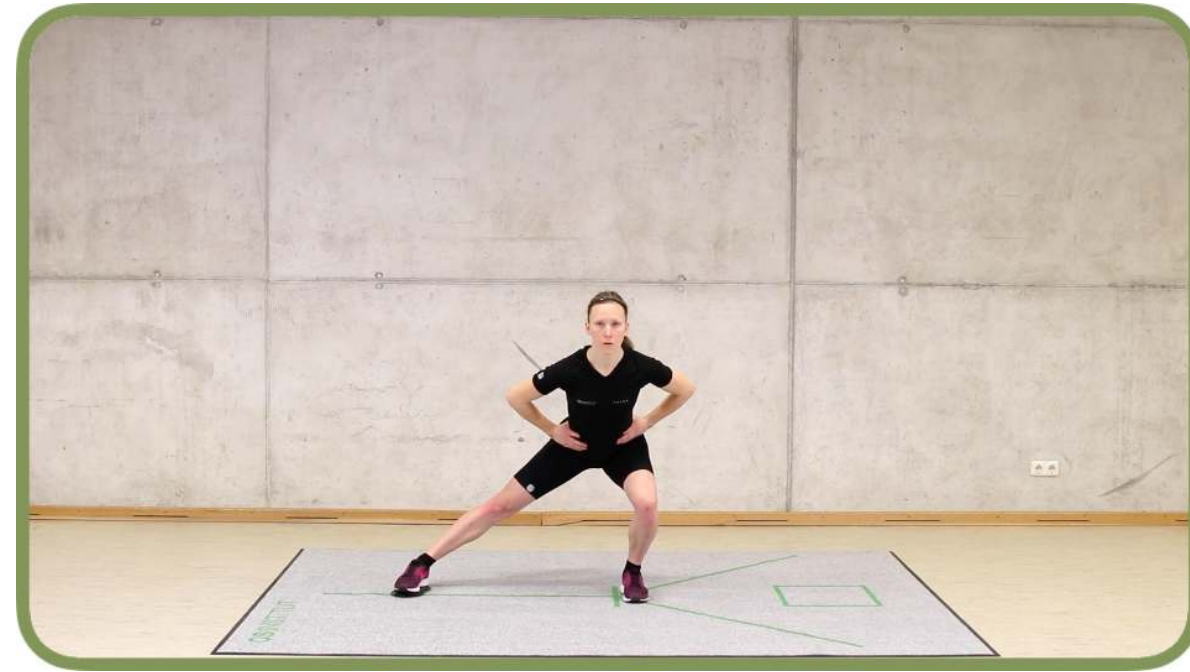
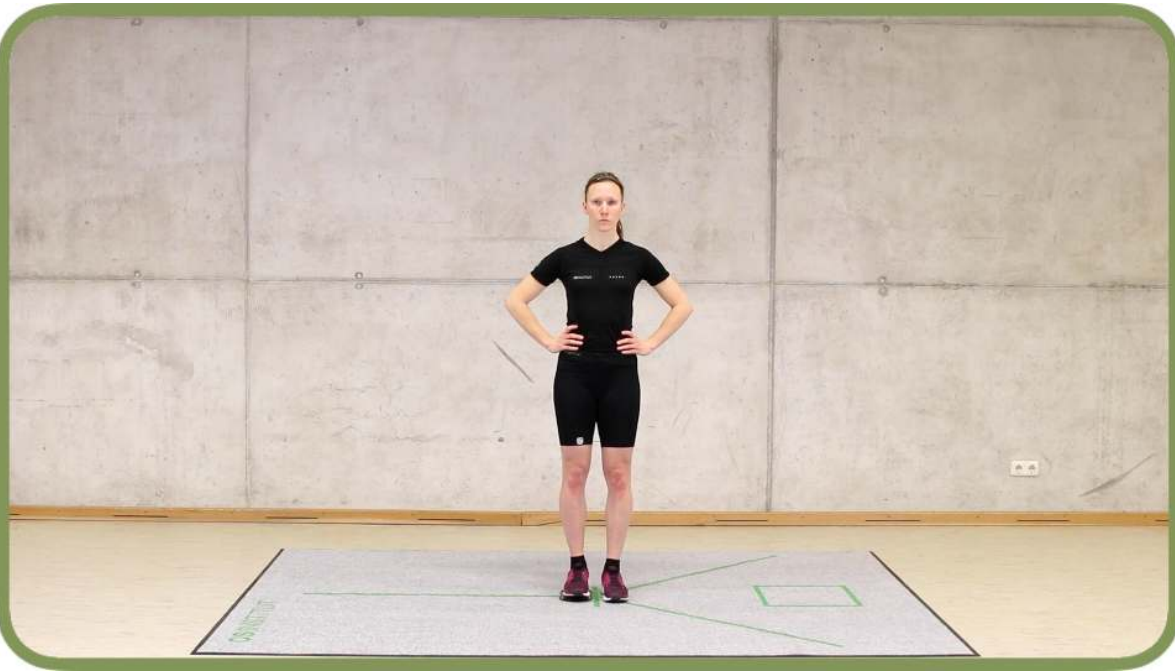
Front Hop



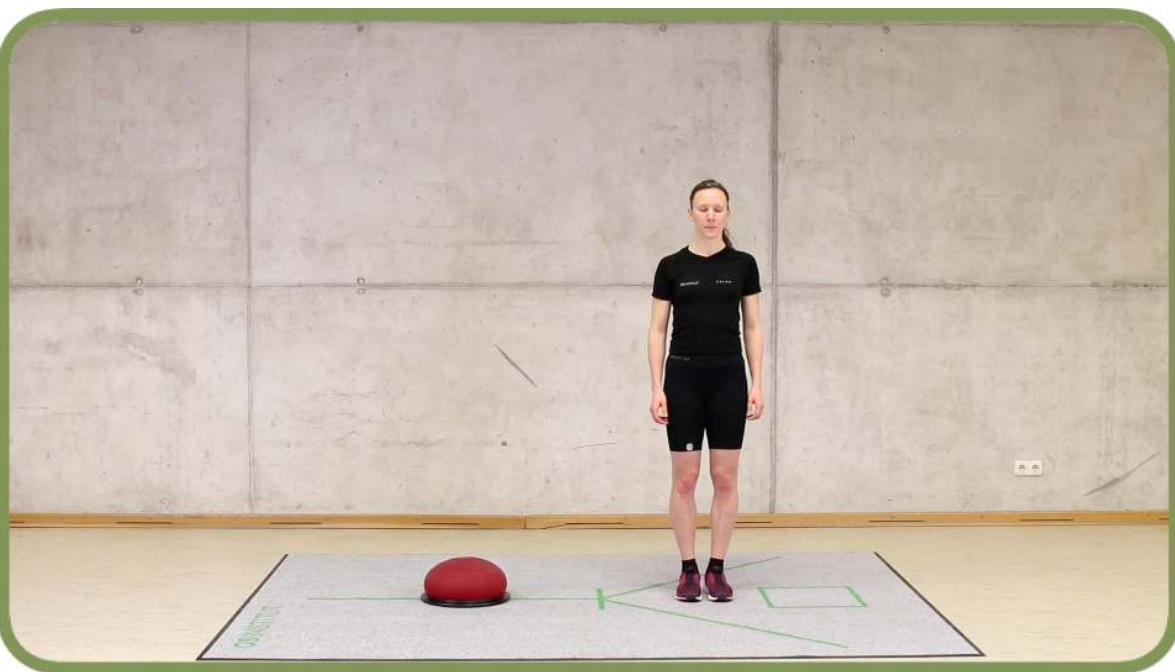
Rehab Exercises – Level III - Impact Progression/ Frontal Plane



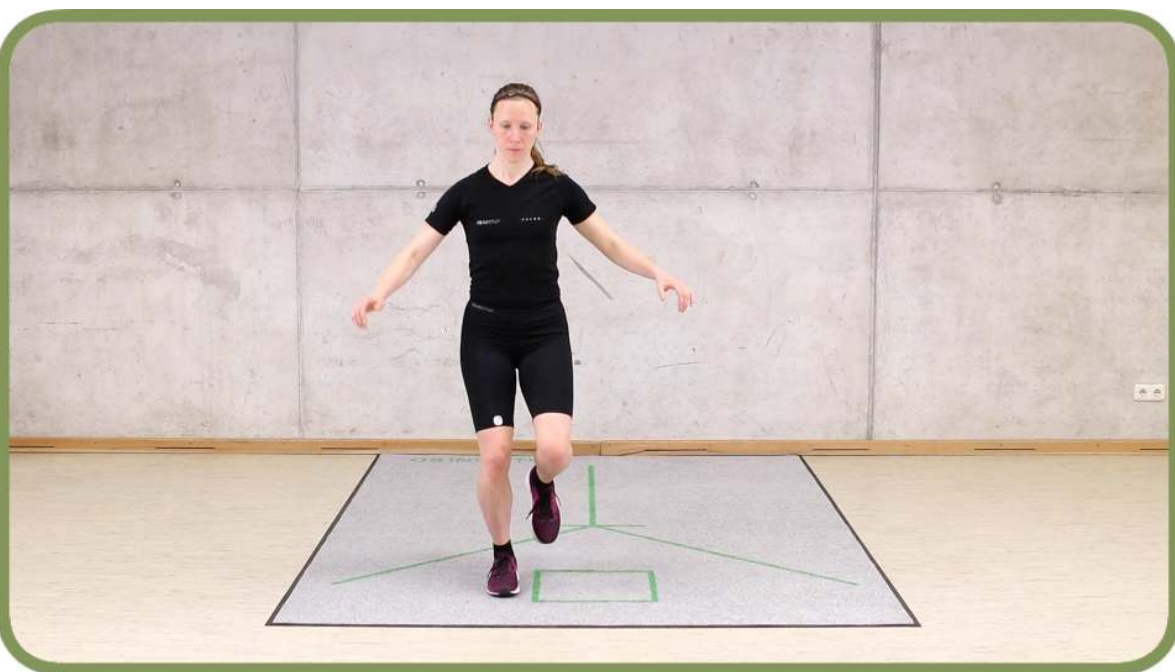
Sliding Side Lunge



Plyo Side Lunge



Plyo Side Bounds and Stick



Rehab Exercises – Level VI - Multidirektional



4 Directions Heel Down Drill



4 Directions Lunges Drill



5 Dot Drill

