ATHLETIKTRAINING IM JUGENDBASKETBALL

Leistungssteigerung und Verletzungsprävention

BASKETBALL PERFORMANCE SYMPOSIUM

Felix Sempf (M.A., Sportwissenschaften)

INHALT

1. Grundlagen
2. Präventionsstrategien
3. Athletiktraining BBT Göttingen

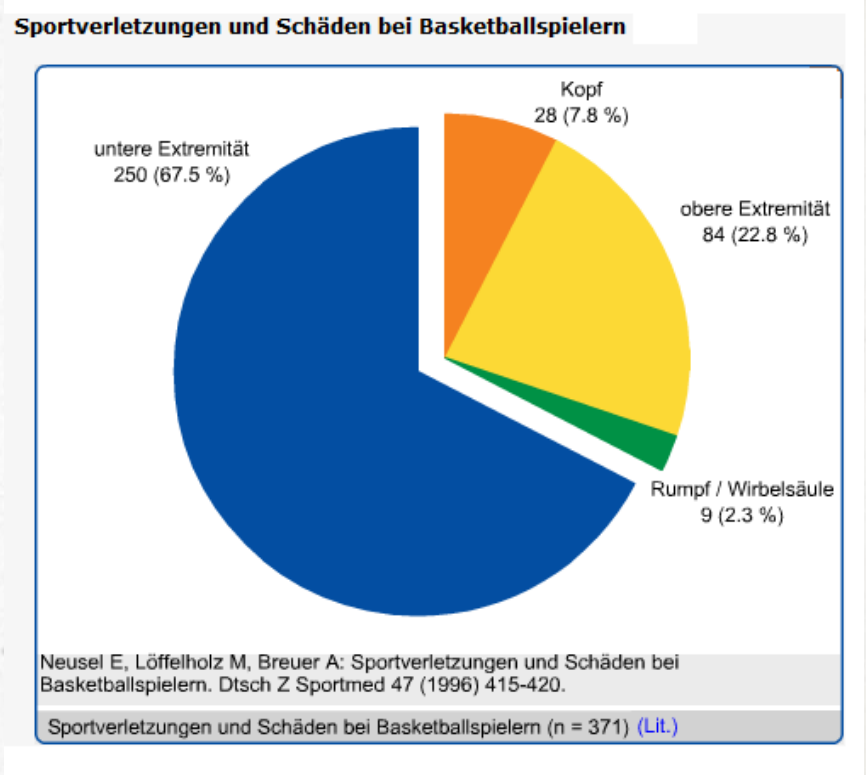
1. GRUNDLAGEN - ANFORDERUNGSPROFIL BASKETBALL

- Physiologische Wirbelsäulenstatik, Beinachsen und Fußformen
- Gute Stütz- und Haltemuskulatur, speziell Rumpfmuskulatur
- Ausdauer, Ermüdungsresistenz
- Spielspezifische (anaerobe) Ausdauer
- Große Beweglichkeit & Agilität
- Hohes Maß an Schnell- und Sprungkraft

(Weineck & Haas, 1999; Neumann, 2001; Brockmann, 2004; Fort-Vanmeerhaeghe et al., 2016)

VERLETZUNGEN IM BASKETBALLSPORT

- häufigste Verletzungen an den unteren Extremitäten, insbesondere Supinationstraumen (Pfeifer et al., 1992)
- Leistungsbezogene Basketballspieler sind einem erhöhten Verletzungsrisiko ausgesetzt und verletzen sich im Schnitt zwei mal pro Saison (VBG Sportreport, 2016)



ALLGEMEINE RISIKOFAKTOREN FÜR SPORTVERLETZUNGEN

- Unzureichender Zustand der Fußmuskulatur
- Mangelnde Kraftfähigkeiten (Quadrizeps, der ischiocruralen Muskulatur, Adduktoren und Abduktoren)
- Mangelnde Hüftextensionsfähigkeit & Rumpfstabilität
- Eingeschränkte Sprunggelenksbeweglichkeit
- Dynamischer Valgus
- Mangelnde Balancefähigkeit
- Schlechte Landemechanismen
- Asymmetrien

(Gabbe et al., 2004; Bell et al., 2008; Myer et al., 2008; Renstrom et al., 2008; Sigward et al., 2008; Noyes & Barber, 2012; Amraee et al., 2015; Myer et al., 2015)

2. PRÄVENTIONSSTRATEGIEN

Editor's choice
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The effectiveness of exercise interventions to prevent sports injuries: a systematic review and meta-analysis of randomised controlled trials

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► Additional material is published online only. To view please visit the journal online (http://dx.doi.org/10.1136/bjsports-2013-092538).

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ABSTRACT

Background Physical activity is important in both prevention and treatment of many common diseases, but sports injuries can pose serious problems.

Objective To determine whether physical activity exercises can reduce sports injuries and perform stratified analyses of strength training, stretching, proprioception and combinations of these, and provide separate acute and overuse injury estimates.

Material and methods PubMed, EMBASE, Web of Science and SPORTDiscus were searched and yielded 3462 results. Two independent authors selected relevant randomised, controlled trials and quality assessments were conducted by all authors of this paper using the Cochrane collaboration domain-based quality assessment tool. Twelve studies that neglected to account for clustering effects were adjusted. Quantitative analyses were performed in STATA V.12 and sensitivity analysed by intention-to-treat. Heterogeneity (I^2) and publication bias (Harbord's small-study effects) were formally tested.

Results 25 trials, including 26 610 participants with 3464 injuries, were analysed. The overall effect estimate on injury prevention was heterogeneous. Stratified exposure analyses proved no beneficial effect for stretching (RR 0.963 (0.846–1.095)), whereas studies with multiple exposures (RR 0.655 (0.520–0.826)), proprioception training (RR 0.550 (0.347–0.869)), and strength training (RR 0.315 (0.207–0.480)) showed a tendency towards increasing effect. Both acute injuries (RR 0.647 (0.502–0.836)) and overuse injuries (RR 0.527 (0.373–0.746)) could be reduced by physical activity programmes. Intention-to-treat sensitivity analyses consistently revealed even more robust effect estimates.

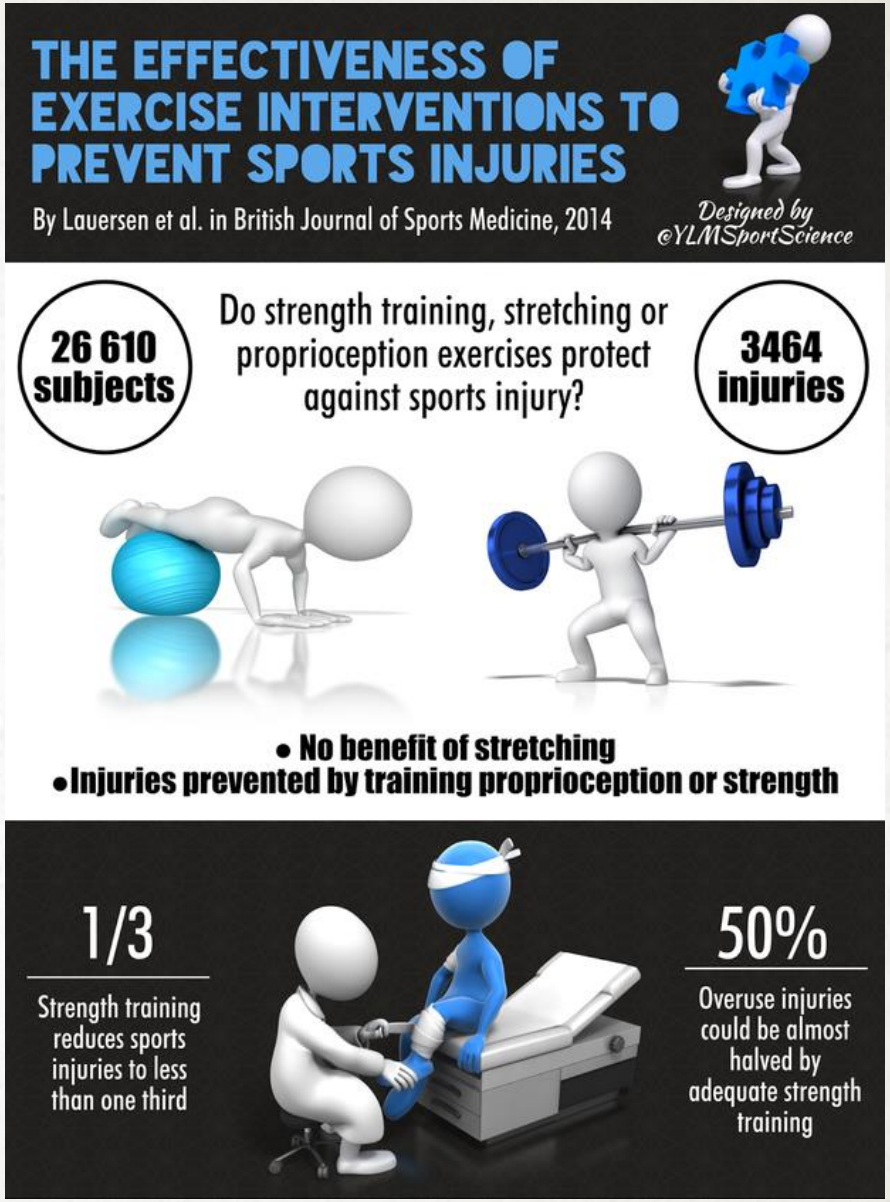
Conclusions Despite a few outlying studies, consistently favourable estimates were obtained for all injury prevention measures except for stretching. Strength training reduced sports injuries to less than 1/3 and overuse injuries could be almost halved.

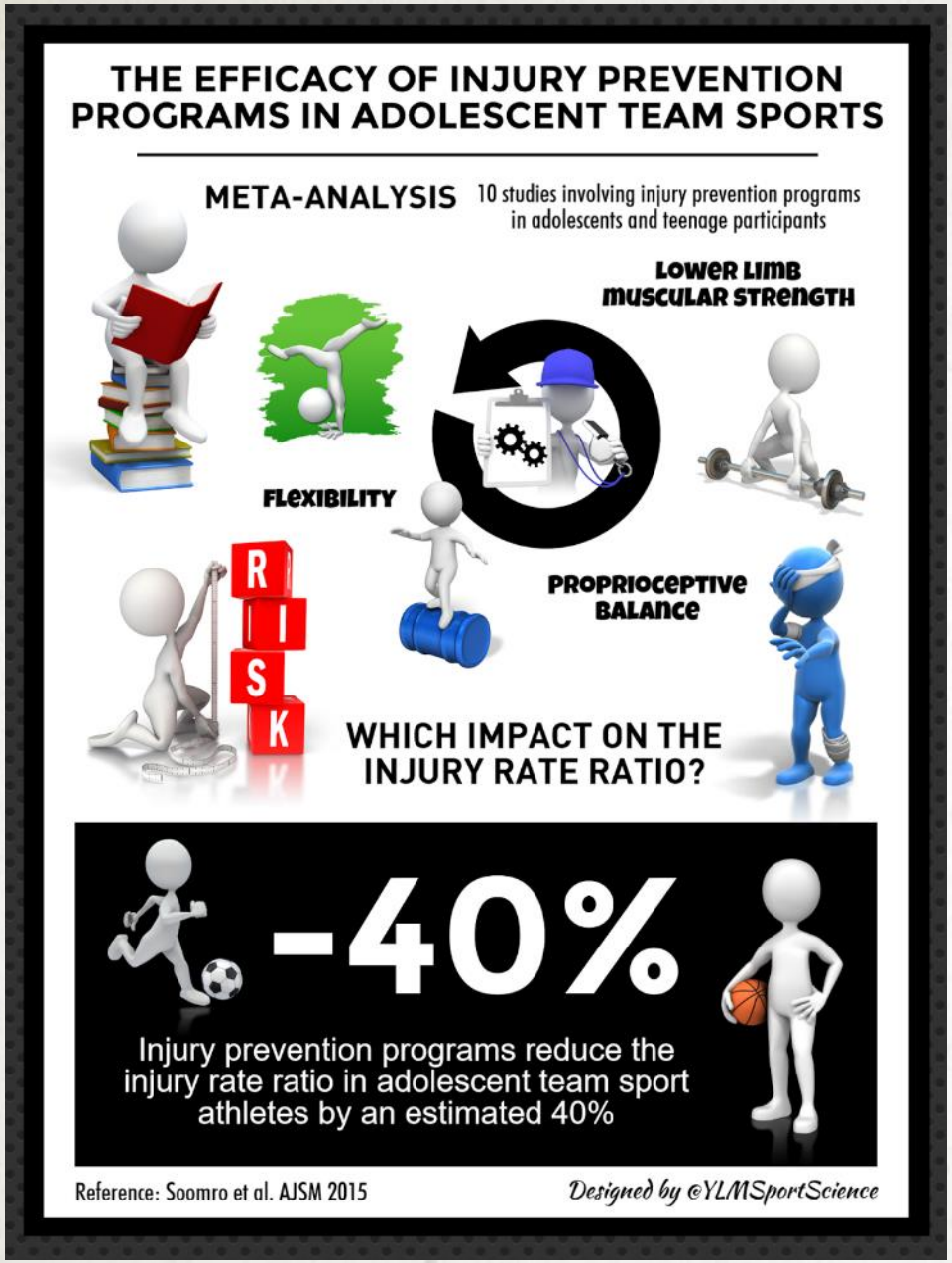
INTRODUCTION

Increasing evidence exists, for all age groups, that physical activity is important in both prevention and treatment of some of the most sizable conditions of time-consuming and expensive, both for the society and for the individual.[8–10] However, sports injury prevention by different kinds of strength training, proprioception exercises, stretching activities, and combinations of these, is accessible to essentially everyone and requires limited medical staff assistance. This adds several interesting aspects regarding the potential dispersion, applicability, and compliance to these programmes.

Most studies on musculoskeletal injuries have focused on one particular intervention, injury type/location, sport or studied other relatively narrowly defined research questions. This applies to most reviews and meta-analyses as well.[11–18] However, Parkkari *et al*[19] described 16 controlled trials in a narrative review. Central concepts of sports injury prevention such as extrinsic (including exposures, environment, equipment) and intrinsic (including physical characteristics, fitness, ability, age, gender, psychology) risk factors and the 'sequence of prevention' model of van Mechelen[20] were summarised. Aaltonen *et al*[21] presented an overview of all sports injury prevention measures, but as in the literature up until their search in January 2006, the focus of this review was primarily on extrinsic risk factors.[22] Recently, and with less restrictive exclusion criteria, Schiff *et al*[23] covered the same topic with additional studies. Aaltonen *et al* and Schiff *et al* were unable to obtain full quantification of intervention effect estimates. Steffen *et al*[24] presented a narrative review of acute sports injury prevention written by field experts for each location of injury, but an examination and quantification of specific training exposures and a differentiation of acute and overuse outcome effect estimates is still lacking.

This review and meta-analysis will broaden the scope of previous reviews and meta-analyses on sports injury prevention and focus on the preventive effect of several different forms of physical activity programmes and complement the existing summative literature on extrinsic risk factor reduction. Valuable summary literature exists for both neuromuscular proprioception[14 15] and stretching exercises.[17 18] However, aggregation of effect estimates and com-





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The Efficacy of Injury Prevention Programs in Adolescent Team Sports: A Meta-analysis.

Soomro N[1], Sanders R[1], Hackett D[1], Hubka T[1], Ebrahimi S[1], Freeston J[1], Cobley S[2].

Author information

Abstract

BACKGROUND: Intensive sport participation in childhood and adolescence is an established cause of acute and overuse injury. Interventions and programs designed to prevent such injuries are important in reducing individual and societal costs associated with treatment and recovery. Likewise, they help to maintain the accrual of positive outcomes from participation, such as cardiovascular health and skill development. To date, several studies have individually tested the effectiveness of injury prevention programs (IPPs).

PURPOSE: To determine the overall efficacy of structured multifaceted IPPs containing a combination of warm-up, neuromuscular strength, or proprioception training, targeting injury reduction rates according to risk exposure time in adolescent team sport contexts.

STUDY DESIGN: Systematic review and meta-analysis.

METHODS: With established inclusion criteria, studies were searched in the following databases: Cochrane Central Register of Controlled Trials, MEDLINE, SPORTDiscus, Web of Science, EMBASE, CINAHL, and AusSportMed. The keyword search terms (including derivations) included the following: adolescents, sports, athletic injuries, prevention/warm-up programs. Eligible studies were then pooled for meta-analysis with an invariance random-effects model, with injury rate ratio (IRR) as the primary outcome. Heterogeneity among studies and publication bias were tested, and subgroup analysis examined heterogeneity sources.

RESULTS: Across 10 studies, including 9 randomized controlled trials, a pooled overall point estimate yielded an IRR of 0.60 (95% CI = 0.48-0.75; a 40% reduction) while accounting for hours of risk exposure. Publication bias assessment suggested an 8% reduction in the estimate (IRR = 0.68, 95% CI = 0.54-0.84), and the prediction interval intimated that any study estimate could still fall between 0.33 and 1.48. Subgroup analyses identified no significant moderators, although possible influences may have been masked because of data constraints.

CONCLUSION: Compared with normative practices or control, IPPs significantly reduced IRRs in adolescent team sport contexts. The underlying explanations for IPP efficacy remain to be accurately identified, although they potentially relate to IPP content and improvements in muscular strength, proprioceptive balance, and flexibility.

CLINICAL RELEVANCE: Clinical practitioners (eg, orthopaedics, physical therapists) and sports practitioners (eg, strength and conditioners, coaches) can respectively recommend and implement IPPs similar to those examined to help reduce injury rates in adolescent team sports contexts

Herman et al. BMC Medicine 2012, 10:75
http://www.biomedcentral.com/1741-7015/10/75

BMC Medicine

Advances in Sports Nutrition, Exercise and Medicine

RESEARCH ARTICLE Open Access

The effectiveness of neuromuscular warm-up strategies, that require no additional equipment, for preventing lower limb injuries during sports participation: a systematic review

Katherine Herman, Christian Barton, Peter Malliaras and Dylan Morrissey*

Abstract

Background: Lower limb injuries in sport are increasingly prevalent and responsible for large economic as well as personal burdens. In this review we seek to determine which easily implemented functional neuromuscular warm-up strategies are effective in preventing lower limb injuries during sports participation and in which sporting groups they are effective.

Methods: Seven electronic databases were searched from inception to January 2012 for studies investigating neuromuscular warm-up strategies and injury prevention. The quality of each included study was evaluated using a modified version of the van Tulder scale. Data were extracted from each study and used to calculate the risk of injury following application of each evaluated strategy.

Results: Nine studies were identified including six randomized controlled trials (RCT) and three controlled clinical trials (CCT). Heterogeneity in study design and warm-up strategies prevented pooling of results. Two studies investigated male and female participants, while the remaining seven investigated women only. Risk Ratio (RR) statistics indicated 'The 11+' prevention strategy significantly reduces overall (RR 0.67, confidence interval (CI) 0.54 to 0.84) and overuse (RR 0.45, CI 0.28 to 0.71) lower limb injuries as well as knee (RR 0.48, CI 0.32 to 0.72) injuries among young amateur female footballers. The 'Knee Injury Prevention Program' (KIPP) significantly reduced the risk of noncontact lower limb (RR 0.5, CI 0.33 to 0.76) and overuse (RR 0.44, CI 0.22 to 0.86) injuries in young amateur female football and basketball players. The 'Prevent Injury and Enhance Performance' (PEP) strategy reduces the incidence of anterior cruciate ligament (ACL) injuries (RR 0.18, CI 0.08 to 0.42). The 'HarmoKnee' programme reduces the risk of knee injuries (RR 0.22, CI 0.06 to 0.76) in teenage female footballers. The 'Anterior Knee Pain Prevention Training Programme' (AKP PTP) significantly reduces the incidence of anterior knee pain (RR 0.27, CI 0.14 to 0.54) in military recruits.

Conclusions: Effective implementation of practical neuromuscular warm-up strategies can reduce lower extremity injury incidence in young, amateur, female athletes and male and female military recruits. This is typically a warm-up strategy that includes stretching, strengthening, balance exercises, sports-specific agility drills and landing techniques applied consistently for longer than three consecutive months. In order to optimize these strategies, the mechanisms for their effectiveness require further evaluation.

Keywords: neuromuscular training, lower limb, injuries, prevention

- Dynamic stretching
- Kräftigung
- Aktivierung
- Balance Exercise
- Sports specific Drills
- Landing techniques

(konstant über 3 Monate)

Efficacy of the FIFA 11+ Warm-Up Programme in Male Youth Football: A Cluster Randomised Controlled Trial

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Abstract

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The FIFA 11+ is a structured warm-up programme specially designed to prevent injuries among football players from age 14 years and above. However, studies to prove its efficacy are generally few and it is yet to be tested in male youth footballers and among African players. The purpose of the study was to examine the efficacy of the FIFA 11+ programme in reducing the risk of injuries among male youth football players of the Lagos Junior League. A cluster randomised controlled trial was conducted. All the 20 teams (414 players aged 14 -19 years) in the Premier League division were block-randomised into either an intervention (INT) or a control (CON) group. The INT group performed the FIFA 11+ exercises as warm-up during training sessions and the CON group performed usual warm-up. Participating teams were prospectively followed through an entire league season of 6 months in which they were visited every week to assess injured players for time-loss injuries in both groups. The primary outcomes were any injury to the players, injuries by type of exposure and injuries specific to the lower extremities. The secondary outcomes were injuries reported by body location, aetiology, mechanism and severity. In total, 130 injuries were recorded affecting 104 (25%) of the 416 players. Team and player compliance with the INT was 60% and 74% respectively. Based on the primary outcome measures of the study, the FIFA 11+ programme significantly reduced the overall rate of injury in the INT group by 41% [RR = 0.59 (95% CI: 0.40 – 0.86; p = 0.006)] and all lower extremity injuries by 48% [RR = 0.52 (95% CI: 0.34 – 0.82; p = 0.004)]. However, the rate of injury reduction based on secondary outcomes mostly did not reach the level of statistical significance. The FIFA 11+ programme is effective in reducing the rates of injuries in male youth football players.

Key points

- The FIFA 11+ has only been tested in randomised controlled trials conducted on female youth football players; this study reports its efficacy in male youth football for the first time
- The FIFA 11+ programme significantly reduced the overall rate of injuries and lower extremity injuries in male youth football players
- Youth football administrators in Africa and other parts of the world should pursue the implementation of the FIFA 11+ in order to minimize the incidence of injuries among players

Prevention of Football Injuries

Donald T Kirkendall, PhD,* Astrid Junge, PhD, and Jiri Dvorak, MD

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Abstract

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Purpose

Every sport has a unique profile of injury and risk of injury. In recent years, there have been numerous attempts at conducting injury prevention trials for specific injuries or for injuries within specific sports to provide evidence useful to the sports medicine and sport community. Football has been a focus of a number of randomized injury prevention trials.

Methods

MEDLINE was searched with the first order keywords of "injury prevention" and "sport". This list was restricted to "clinical trial" or "randomized controlled trial" which had been conducted on children and adults whose goal was preventing common football injuries. Our objective was to find studies with an exercise-based training program, thus projects that used mechanical interventions were excluded.

Results

A structured, generalized warm-up has been shown to be effective at preventing common injuries in football, reducing injuries by about one-third.

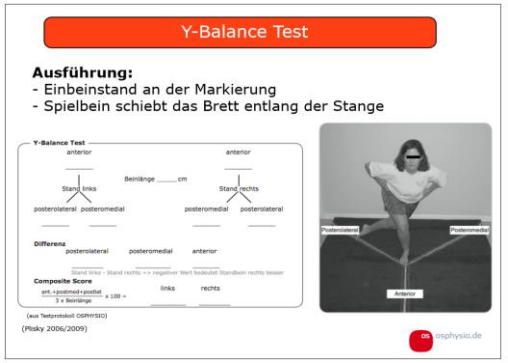
Conclusion

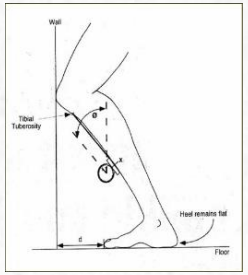
The huge participation numbers in the worldwide family of football would suggest that any reduction in injury should have a public health impact. Professionals in sports medicine need to promote injury prevention programs that have been shown to be effective.

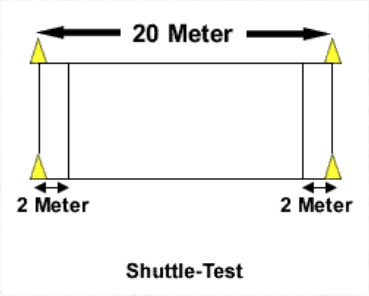
3. ATHLETIKTRAINING BBT GÖTTINGEN

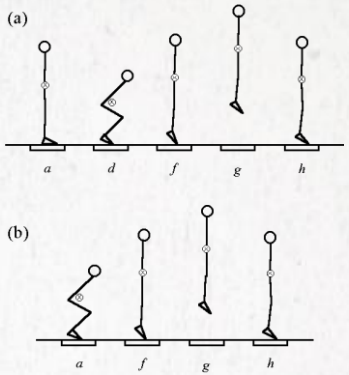
- Leistungsdiagnostik
- Trainingsinhalte und -aufbau
- Ergebnisse

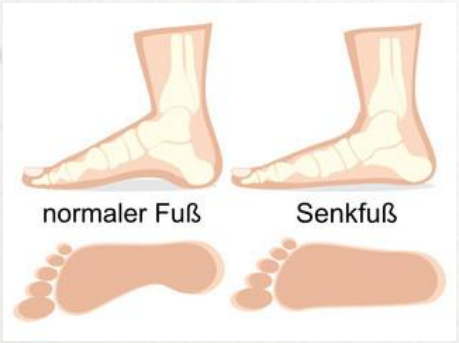
LEISTUNGSDIAGNOSTIK

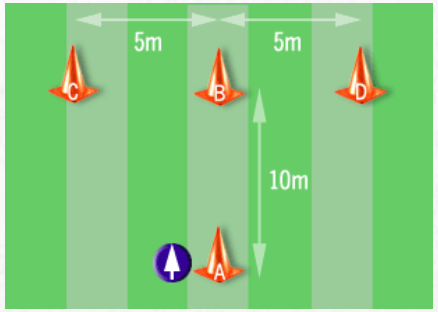




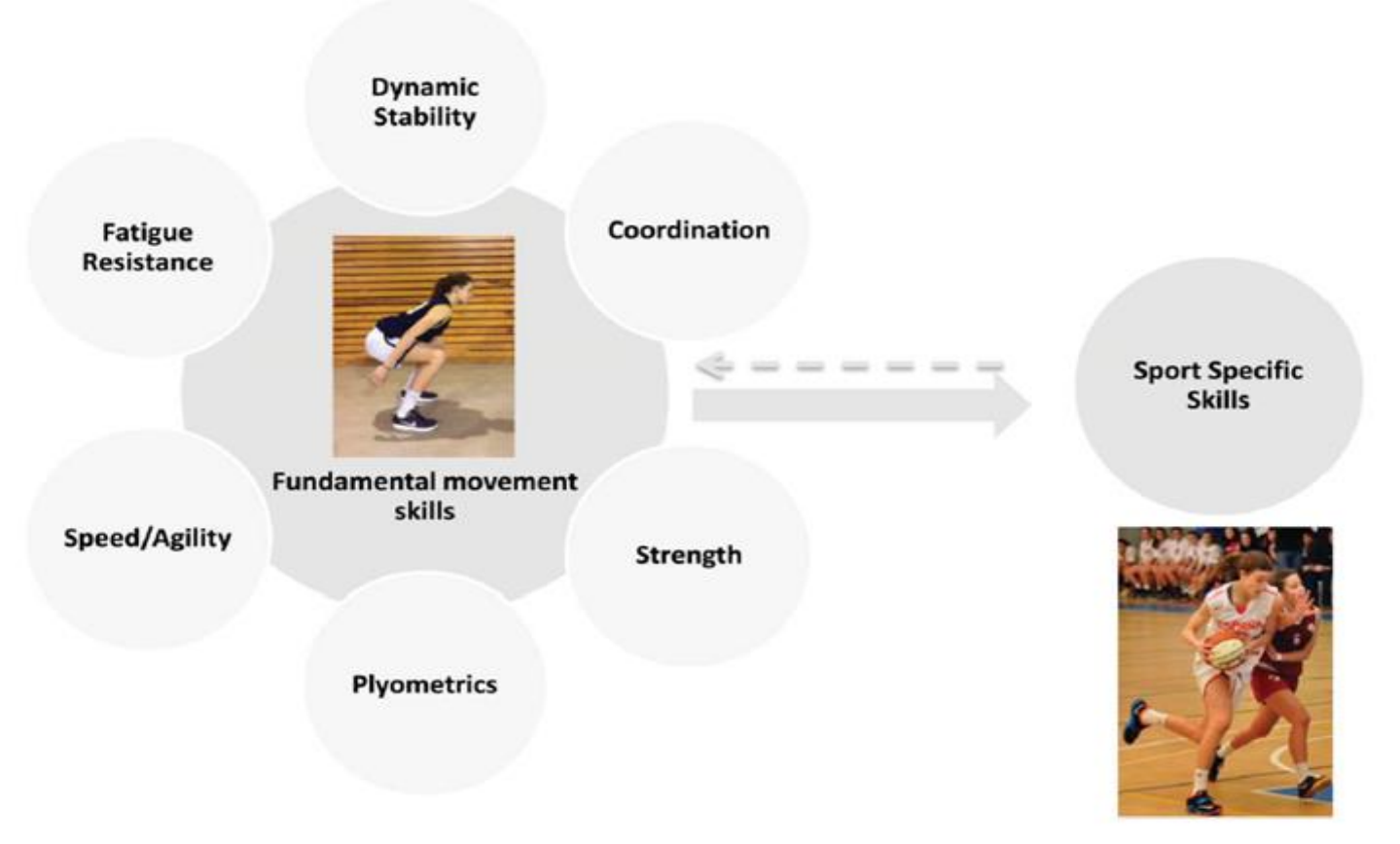








TRAININGSINHALTE



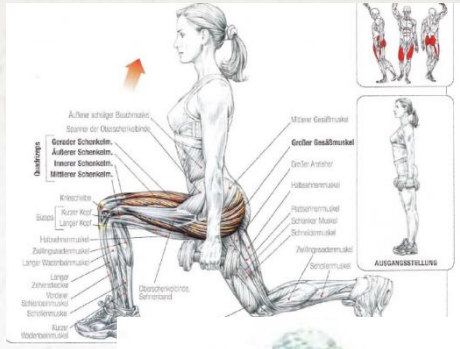
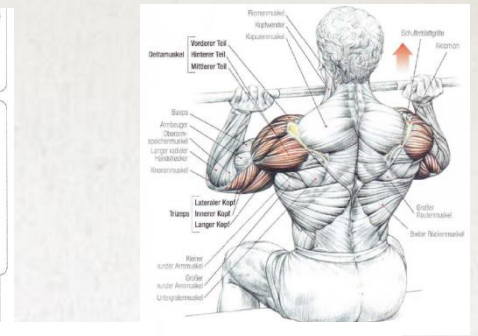
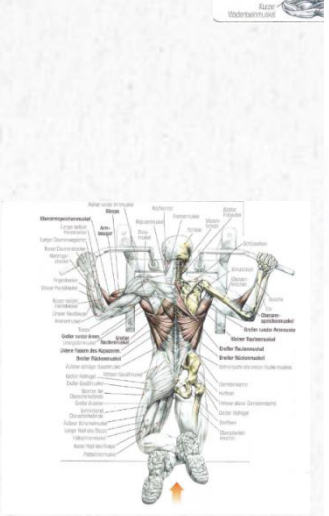
Quelle: Fort-Vanmeerhaeghe et al., (2016): Integrative Neuromuscular Training in Youth Athletes. Part II: Strategies to Prevent Injuries and Improve Performance

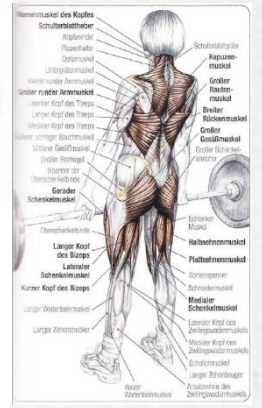
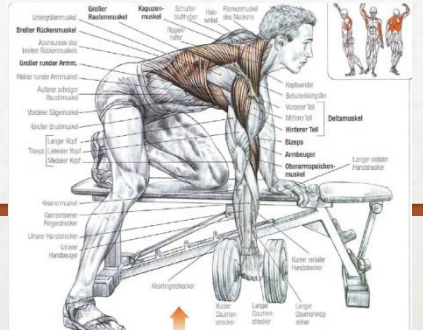
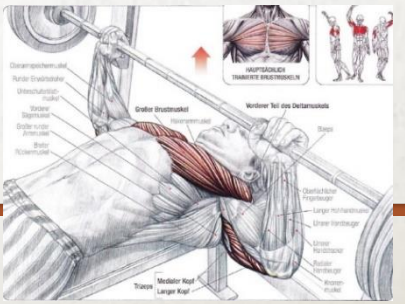
TRAININGSAUFBAU

1. Mobilität / Stabilität
2. Schwachpunkte
3. Auf den Füßen (Control)
4. Laufdrills, Sprints / Antritt
5. “Kraft”
6. Ausdauer

5. KRAFT

- Grundlegende Bewegungsmuster
- Push/ Pull System
- Ganzkörper
- “Assistance Exercise”

STRENGTH STANDARTS – HIGH SCHOOL (DAN JOHN)

- 100% BW Bench
- 5x Pullup
- 100 to 150% Bodyweight deadlift
- 75% x BW Front/ Zercher Squat
- 100% BW Farmer’s Walk

(PRE)SEASON SCHWERPUNKTE

1. Stability
2. Hypertrophy
3. Strength
4. Power

Inseason

1. STABILITY / KRAFTAUSDAUER

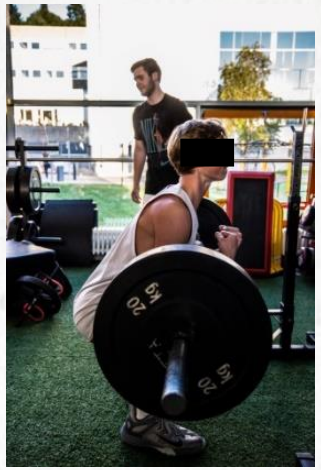
- Wiedereinstiegsphase
- Integration neuer Spieler (6+)
- Bewegungslernen, Technikschulung der Grundübungen
- Kraftausdauer & Rumpfstabilität
- Ausgleich von Dysbalancen

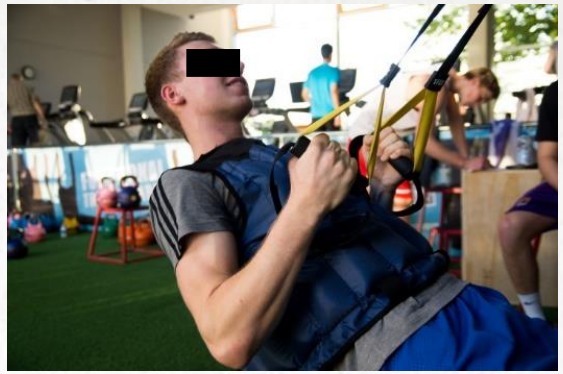
- High Reps (15-10), moderate Intensität, moderater Umfang
- Unilateraler Charakter

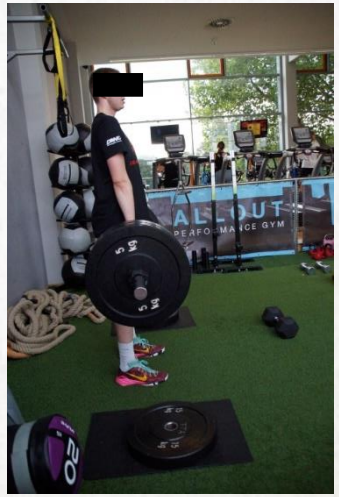
2. HYPERTROPHY

- Bodyarmor
- Bilateral + Unilateral

- Volumen
- Intensität

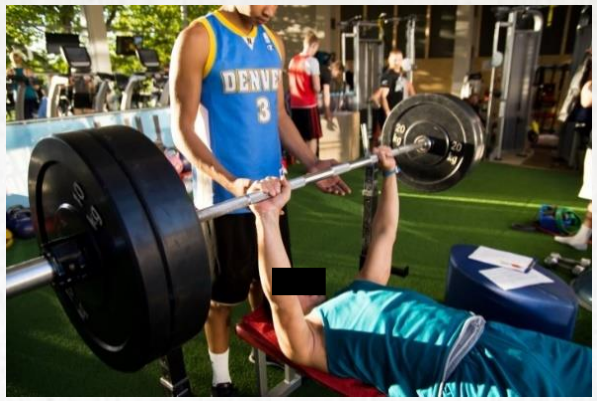






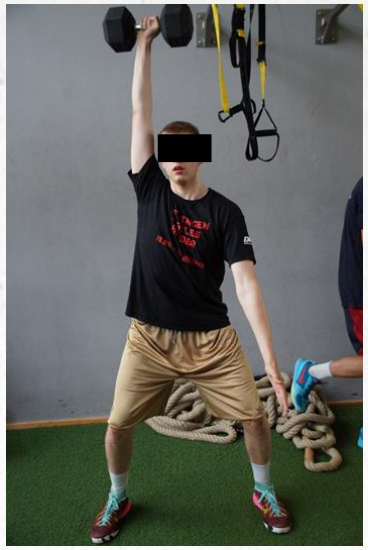
3. STRENGTH

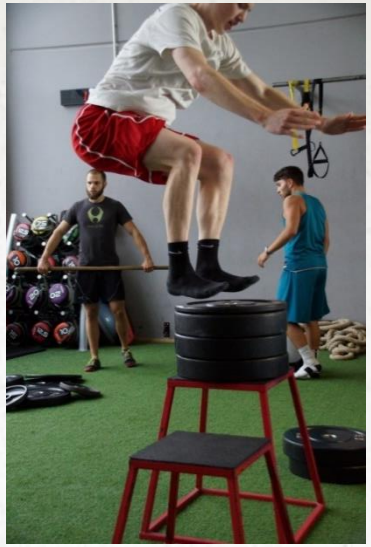
- “Maximal Volitional Contraction”
- Bilateral + Unilateral
- Volumen ↓
- Intensität ↑



4. POWER

- “Spritzigkeit”, Explosivität
- Intensität ↓
- Tempo + Wdh. ↑
- 1 Unterkörper Druck- oder Zugmuster, 1 Oberkörper Zugmuster, 1 Oberkörper Druckmuster





INSEASON

4 Rules for In-Season Strength Training

- Train Light and Fast
- Focus on Recovery
- Address Dings Before They Become Injuries
- Don’t Be Reluctant to Call It a Day

*3 Sätze						
"Alive and well" (well-rested and prepared to train): Full volume						
"Alive" (either well-rested or prepared to train): Minus one set						
"Dead" (neither well-rested nor prepared to train): Minus two sets						

Volumen & Intensität

„Kraft“

1. Unterkörpermuster
2. Ziehen
3. Drücken
4. Sprünge
5. Core
6. Schwachpunkte/ Ausgleich

VIELEN DANK FÜR DIE AUFMERKSAMKEIT!

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