



LANDESKRANKENHAUS SALZBURG  
**UNIVERSITÄTSKLINIKUM**  
DER PARACELTUS MEDIZINISCHEN PRIVATUNIVERSITÄT



UNIVERSITÄTSKLINIK FÜR  
PHYSIKALISCHE MEDIZIN UND REHABILITATION

VORSTAND: PRIM. UNIV.-PROF. DDR. Mag. Anton WICKER

# Prevention of Training and Competition Overloads of Young Athletes in Alpine Skiing

Herfert J, MD

**S.I.T.E.M.S.H**

INTERNATIONAL SOCIETY FOR SKIING TRAUMATOLOGY AND WINTER SPORTS MEDICINE

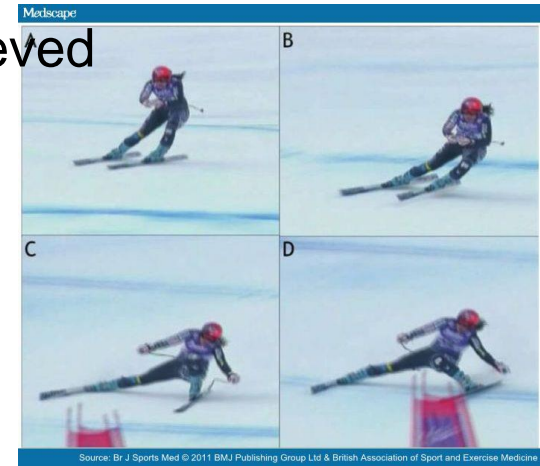
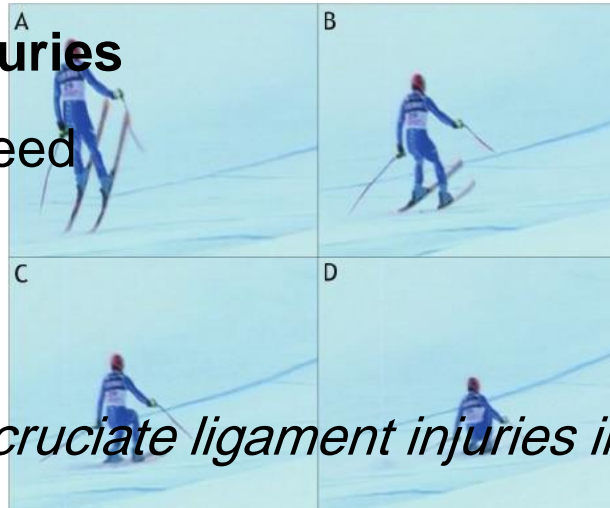


S.I.T.E.M.S.H



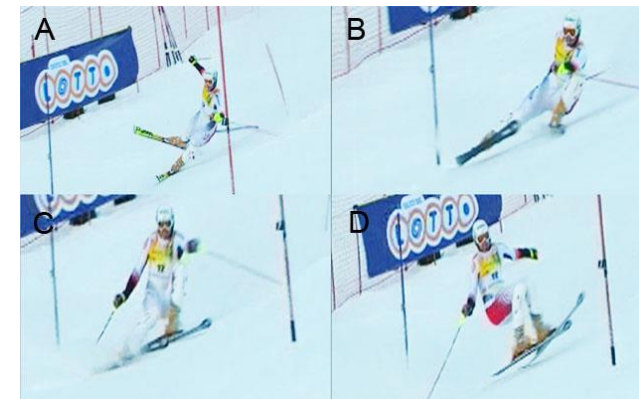
*Florens et al (2009): Injuries among male and female World Cup alpine skiers*

- injury risk in competitive alpine skiing is higher than believed
- **most injuries are knee injuries**
- injury rate increases with speed



*Hewett et al (2006): Anterior cruciate ligament injuries in female athletes*

- **Female athletes have higher risk for ACLR.**





FIS Ski World Cup

**34** wins, **77** podiums

Season titles

**4** Overall 2012/2013/2014/2015

**2** GS 2012/2015

**3** SL 2013/2014/2015

World Championships

**4** G, **2** S

Olympic Games

**1** S

**1 # of metatarsal bone**



## Some facts

### Incidence of ACL Rupture

10 - 14 years	3,1% male
	7,6% female
15 - 18 years	10,4% male
	26,2% female

Austrian Girls National Ski Team: **53,8%** of girls -> ACL Rupture



***Traumatic and overuse injuries among elite adolescent alpine skiers:  
A two-year retrospective analysis (C. Hildebrandt, C. Raschner; 2012)***

**89 athletes**

**235 injuries**

**15-19 years**

**135 traumatic injuries**

**100 overuse injuries**

**Male**

**risk for traumatic injury: 67%**

**risk for overuse injury: 56%**

**Female**

**risk for traumatic injury: 67%**

**risk for overuse injury: 60%**



British Journal of Sports Medicine

## The Relationship Between ACL Injuries and Physical Fitness in Young Competitive Ski Racers

A 10-year Longitudinal Study

Christian Raschner, Hans-Peter Platzer, Carson Patterson, Inge Werner, Reinhard Huber, Carolin Hildebrandt

Br J Sports Med. 2012;46(15):1065-1071.

**This study contributes to the current knowledge of physical fitness as a modifiable ACL injury risk factor by identifying one main risk factor in young ski racers:**  
**core strength deficit.....**

Further risk factors  
Ligament dominance  
Quadriceps dominance  
Leg dominance

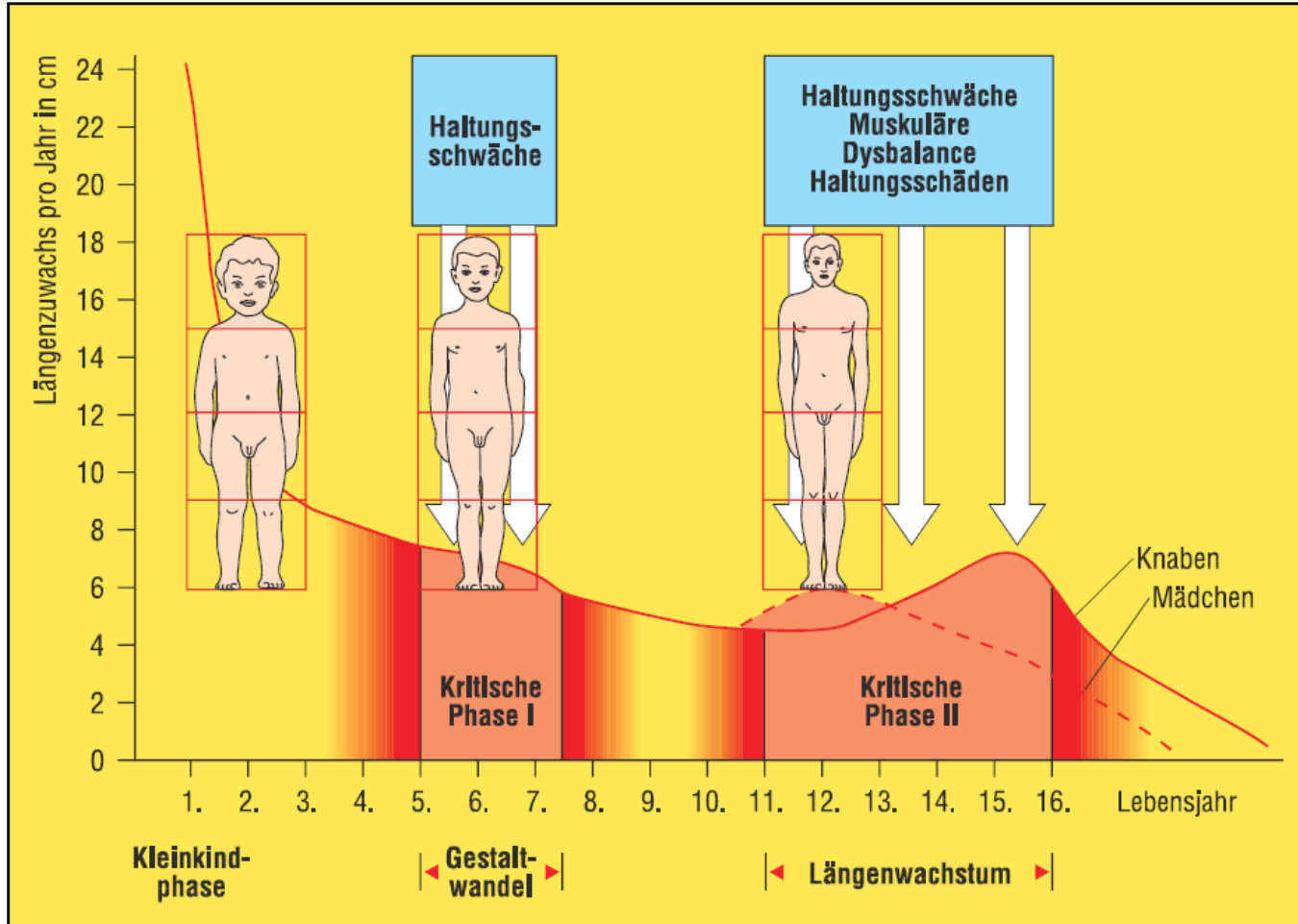
Sportmotorische Tests von 1996-2006

Sprungkoordination	Sprungkraft	Isometrische Maximalkraft des Rumpfes	Isometrische Max.kraft Beine
Linienlauf	Coopertest	Kraftausdauer	

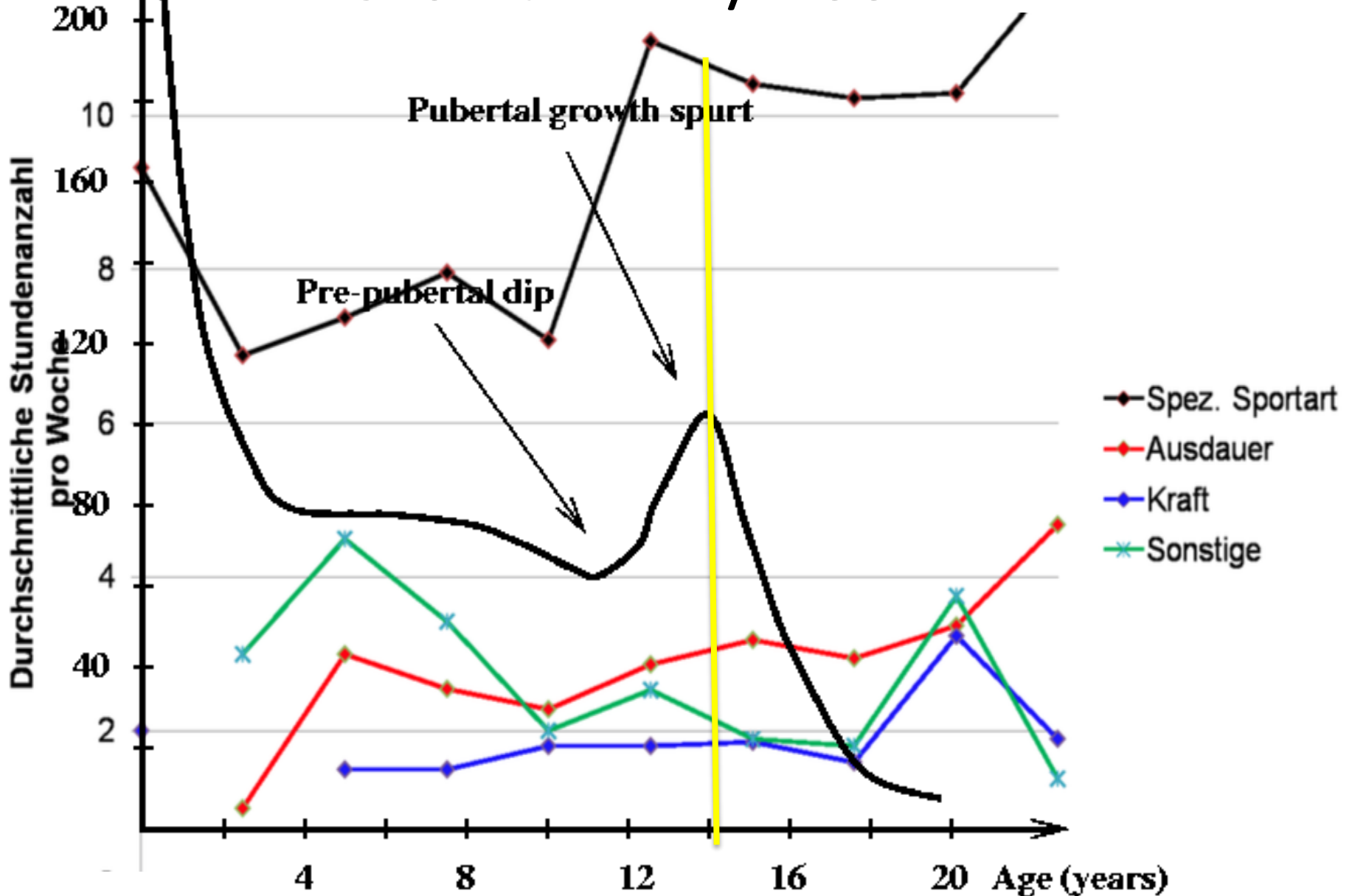
- Vorkommen von ACL – Verletzungen aufgezeichnet
- 370 SkirennfahrerInnen (♀ 175, ♂ 195) aus Schule mit skisportlichem Schwerpunkt, Alter: 14-19 Jahre

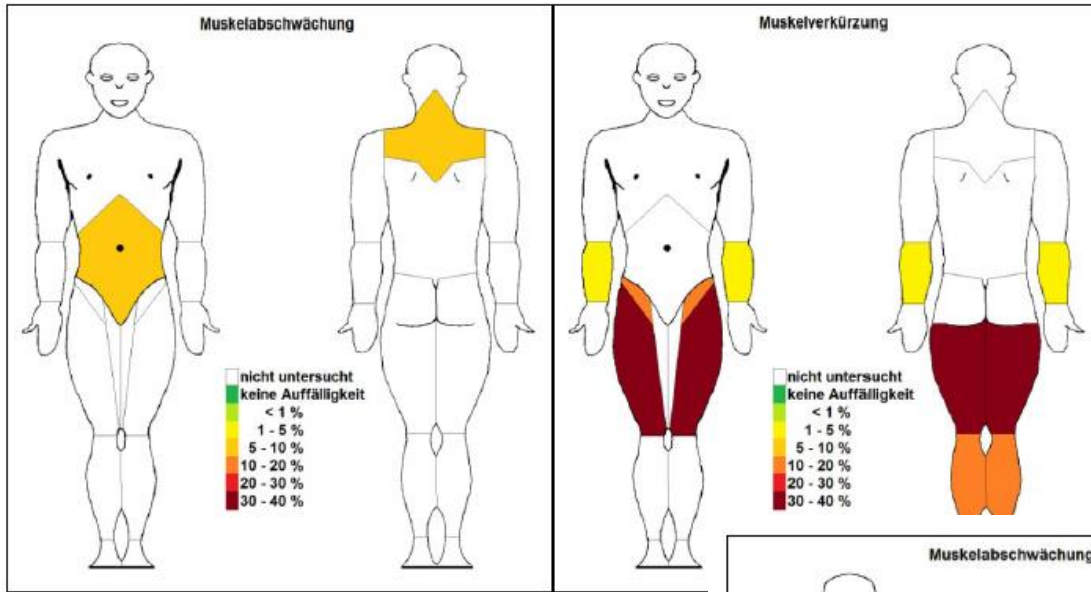


- Development of children - growth



# Growth – TT/week





Quadriceps dominance

Abbildung 26: Muskelabschwächung und Muskelverkürzung

Core strenght deficite

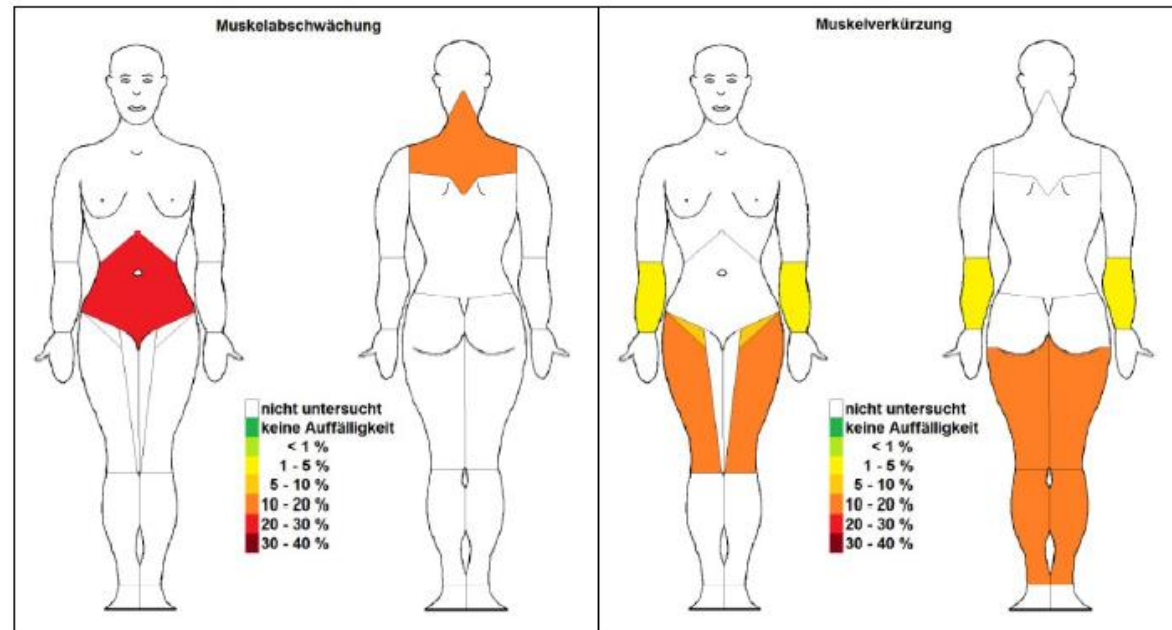
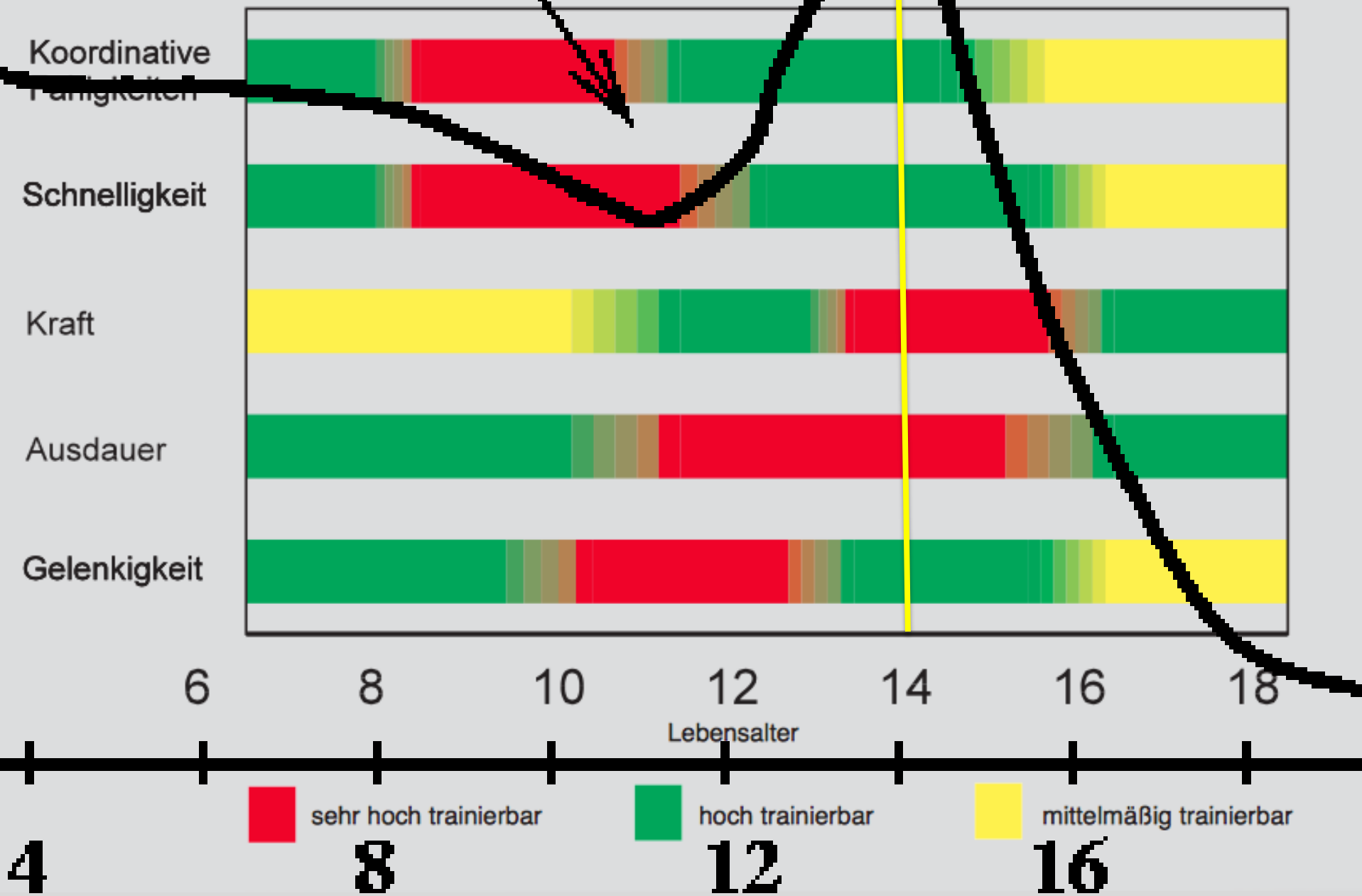


Abbildung 27: Muskelabschwächung und Muskelverkürzung Mädchen



# Knee: Mb Osgood Schlatter

and Morbus Sinding Larsen Johannson (Patellaspitzenyndrom)

10 – 16 years, peak 14 years

Therapy:

**Rest**

**Reduce intensity of training**

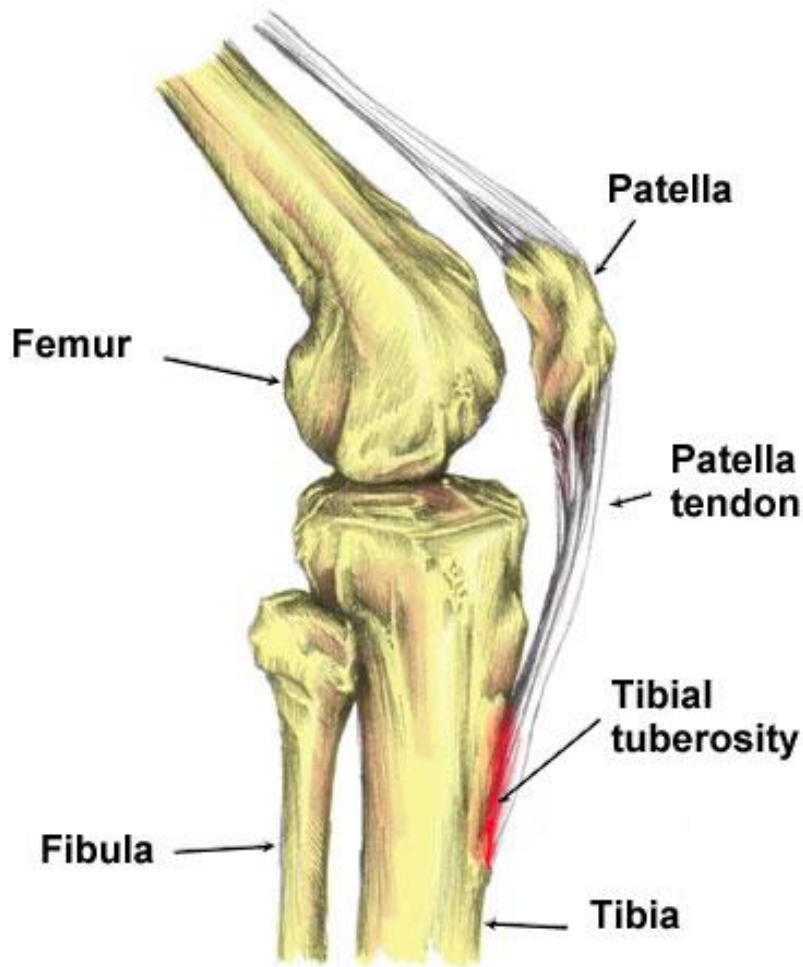
Stretching

Concentric and eccentric strength training for the lower extremities

Endurance training

Sensomotoric training

Isokinetic testing and training



# Heel: Haglund Heel, Mb Sever

10 – 14 years, peak 12 years

Therapy:

**Rest**

**Reduce intensity of training**

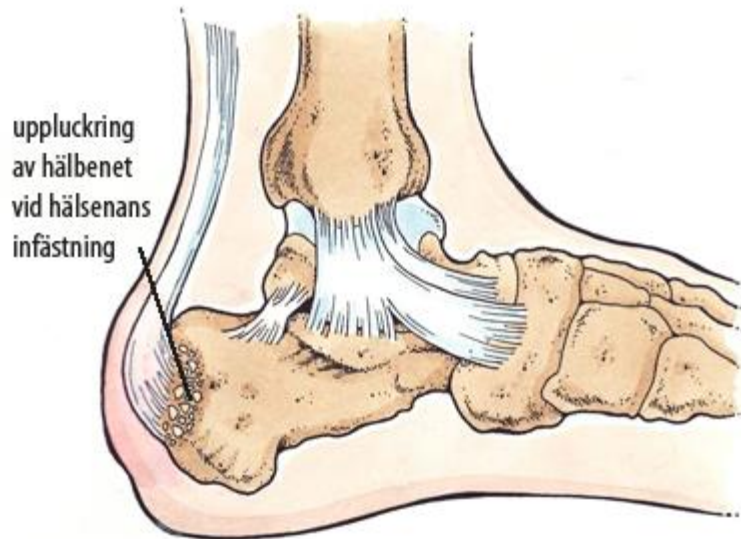
Stretching

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Isokinetic testing and training





American Academy  
of Pediatrics



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CLINICAL REPORT

## Overuse Injuries, Overtraining, and Burnout in Child and Adolescent Athletes

Joel S. Brenner, MD, MPH, and the Council on Sports Medicine and Fitness

PEDIATRICS Volume 119, Number 6, June 2007

Guidance for the Clinician in Rendering  
Pediatric Care



## GUIDANCE FOR THE CLINICIAN

1. Encourage athletes to strive to have at least **1 to 2 days off per week** from competitive athletics, sport-specific training, and competitive practice (scrimmage) to allow them **to recover both physically and psychologically**.
2. Advise athletes that the weekly training time, number of repetitions, or total distance should **not increase by more than 10% each week** (eg, increase total running mileage by 2 miles if currently running a total of 20 miles per week).
3. Encourage the athlete to take **at least 2 to 3 months** away from a specific sport during the year.
4. Emphasize that the focus of sports participation should be on **fun, skill acquisition, safety, and sportsmanship**.



5. Encourage the athlete to participate on **only 1 team during a season**. If the athlete is also a member of a traveling or select team, then that participation time should be incorporated into the aforementioned guidelines.
  
6. If the athlete complains of **nonspecific muscle or joint problems, fatigue, or poor academic performance**, be alert for possible burnout. Questions pertaining to sport motivation may be appropriate.
  
7. Advocate for the development of a medical advisory board for weekend athletic tournaments to educate athletes about heat or cold illness, overparticipation, associated overuse injuries, and/or burnout.



8. Encourage the development of educational opportunities for athletes, parents, and coaches to provide information about appropriate nutrition and fluids, sport safety, and the avoidance of overtraining to achieve optimal performance and good health.
  
9. Convey a special caution to parents with younger athletes who participate in multigame tournaments in short periods of time.



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