

**Waterford
Sports Partnership
Coaching Conference
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Weight training for Sport

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- Traditionally we try to make a player , and after we want to make an athlete out of him.
- We need to make a person an athlete first, and then make a player out of that athlete

Session Objectives

- Understand the basics of weight training
- Know the difference between Free-weights and Resistance machines
- Why we need Power
- Apply the “Principles of training” for an effective programme

Why do we need to do weight training?

To Develop Explosive Power

Maximum Strength and Muscular
Endurance

To correct muscular Weakness and
Imbalance

To Prevent or Rehabilitate injuries and to
improve technique and performance in
virtually every sport.

Reduction of Injury risk

- The strength status of the athlete can play an important role in reducing the risk of injury. Burkett (1970) and Poulmedis(1989) have shown that where there is a strength imbalance in particular between the quadriceps and the hamstrings then there is an increased risk of hamstring strain in team sport players

With regard to hamstring injuries:

Sherry and Best(2004) concluded that a rehab programme consisting of progressive agility and trunk stabilization was more effective than a programme concentrating on isolated hamstring stretching and strengthening in promoting return to sports and preventing injury recurrence in athletes suffering an acute hamstring strain.

- Bompa(2000) states that athletes who do not strength train are 3 times more likely to incur an injury

Rehabilitation following injury

- A general accepted principle is low-resistance and high repetition exercises – such as stationary bike, lifting light sandbags or other weights etc.
- These develop endurance rather than power
- The fatigue that results from low resistance-high repetition is not due so much to overcoming resistance, as to the sheer number of reps

- Strength training involves both the nerve and muscle adaptations
- “Functional training” is based on the premise that if the athlete strengthens the neuromuscular system both statically and dynamically then he or she will be better able to perform a sport skill.

To facilitate greater stability in contact sport

- Sports such as Rugby, G.A.A. and Basketball are examples of an opponent being put off balance.
- Strength training facilitates this capability and also gives the player a greater degree of confidence to withstand an opponent's physical pressure

What are Weight Training Programmes?

- Athletes once followed the same weight training regimen for months
- Cycling of training has proven to give greater results.
- The objective is to continually change the stimulus to achieve continual adaption

Sample 5 - Phase Programme

- 1. Foundation – Hypertrophy
- 2. Strength Phase 1
- 3. Strength Phase 2 – Power
- 4. Peaking
- 5. Maintenance

1. Muscle Growth

- Foundation is developed
 - Sets 3 – 5
 - Reps 8 – 20***
 - Intensity Low
-
- Set – The number of repetitions performed
 - Reps – A repetition is a completed execution of an exercise

2. Strength Phase 1

- Sets 3 – 5
- Reps 2 – 6
- Intensity High

3. Strength Phase 2 - Power

- Sets 3 – 5
- Reps 2 – 3
- Intensity High

4. Peaking

- Sets 1 – 3
- Reps 1 – 3
- Intensity Very High

5. Maintenance Programme

- This stage of the programme is vital for maintaining gains made
- Training effects are quickly lost if training stops

What sort of lifting equipment
should I use

Resistance Machines

or

Free Weights

Resistance Machines

Variable resistance machines are effective tools for building strength and muscle tone but are designed to work the target muscle in isolation, without the assistance of surrounding muscles.

Most machines operate a range of movement through one fulcrum and are therefore one dimensional

Free Weights

Multi-dimensional and allow you not only to target a particular muscle group but to engage other muscles that assist the work

The assisting muscles help stabilise the body, support the limbs and maintain posture during the lift.

Free Weights

Improves your co-ordination by improving the neuromuscular pathways that connect your muscles to the central nervous system

What is Free Weight Training?

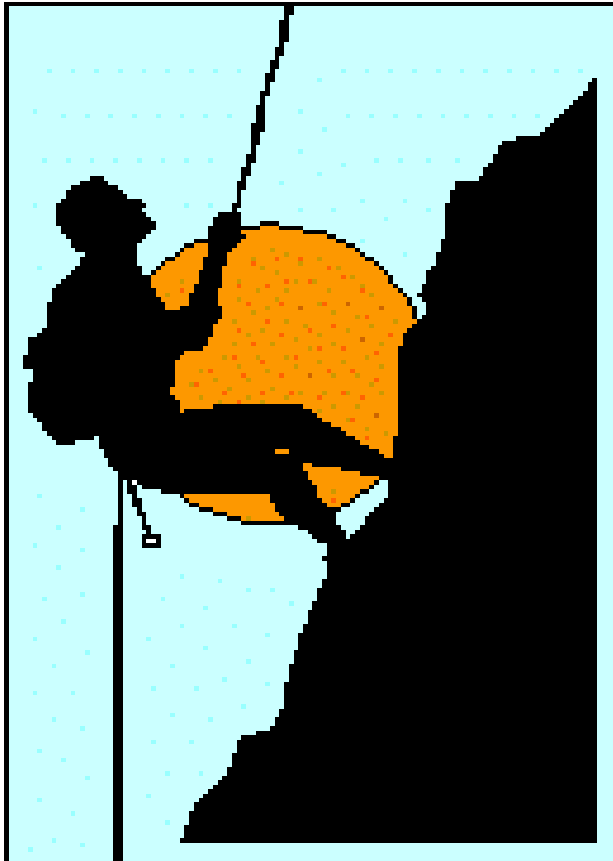
- A natural movement is always a multi-joint movement and has to be stabilised by the centre of the body.
- With a selection of Olympic weightlifting exercises we can combine stabilisation in the centre, training the extremities such as arms, legs

Practical Applications

- If all you've been doing is slow continuous tension movements, be careful.
- It's the white fibres that contract fast that will give you the greatest returns in speed-strength. So never neglect these important fast movements.
- Also remember that all the endless hours of running, cycling and other similar endurance activities will rob you of the ability to achieve your maximum power objectives

For example

- A person may have a lot of strength at bench press but not able to do the shot put well.
- *Why?*
- He doesn't have speed of movement, that combined with with strength, generates the necessary power for the long throw.
- *Strength in itself does not guarantee high performance*



Rock climbers do a lot
of work at a slow rate;
their power is small.

Power

- This is the most important ingredient in many sports.
- It is an athlete's or player's ability to rapidly develop strength.
- It is a product of strength and velocity of muscular contraction

$$\text{Power} = \frac{\text{Work}}{\text{time}}$$

What are Olympic Lifts?
and
Why do we need to use
them?

POWER

- Multi-joint, multi-muscle exercises that allow maximum force generation in minimal time have formed the cornerstone of training exercises for sports performers.

- The snatch the clean, and derivatives of these exercises, are the major resistance training exercises for developing power in sports performers.
- If there is to be an effective transfer of training effect between sports performance and training action, these movements need to facilitate a plyometric response:

What is Strength?

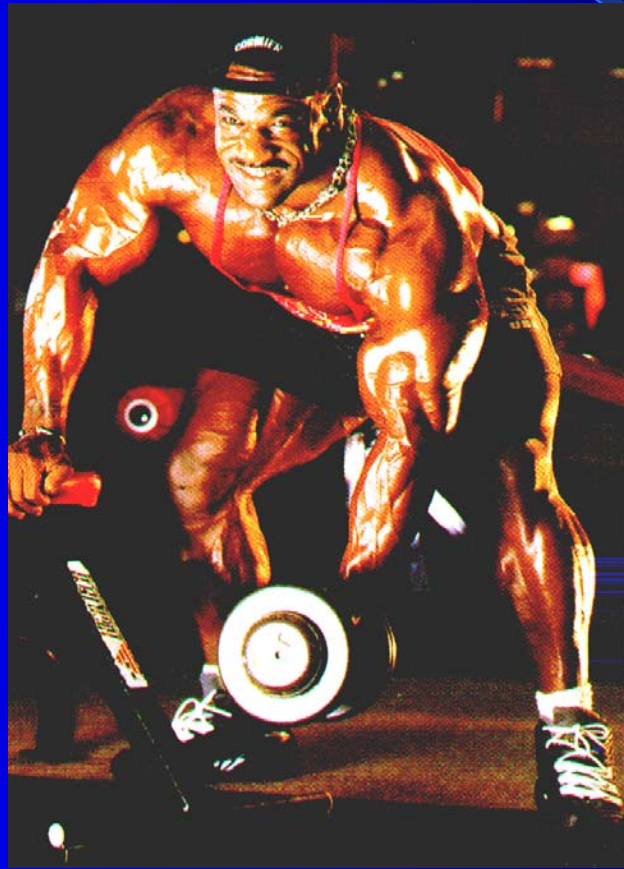
- The most popular definition is:

“The ability to exert a force against a resistance”

Functions of Strength Training

- Increase in bone and connective tissue strength so that:
- Injury risk reduced
- Greater strength and power to effect skilled performance and compete/dominate successfully
- Enhances speed and precision of movement

What type of Strength?



Speed - Strength

- This is how well you apply force with speed
- You may have heard this kind of strength referred to as “Power” ($p=fd/t$)
- There are 2 components of speed-strength
 - 1.Starting strength
 - 2.Explosive strength

Starting Strength

- The ability to instantaneously “turn on” as many muscle fibres as possible.
- In the Gym this is critical in breaking the inertia of the weight being hoisted before ATP is depleted well within 2 seconds during all-out muscle contraction

Explosive strength

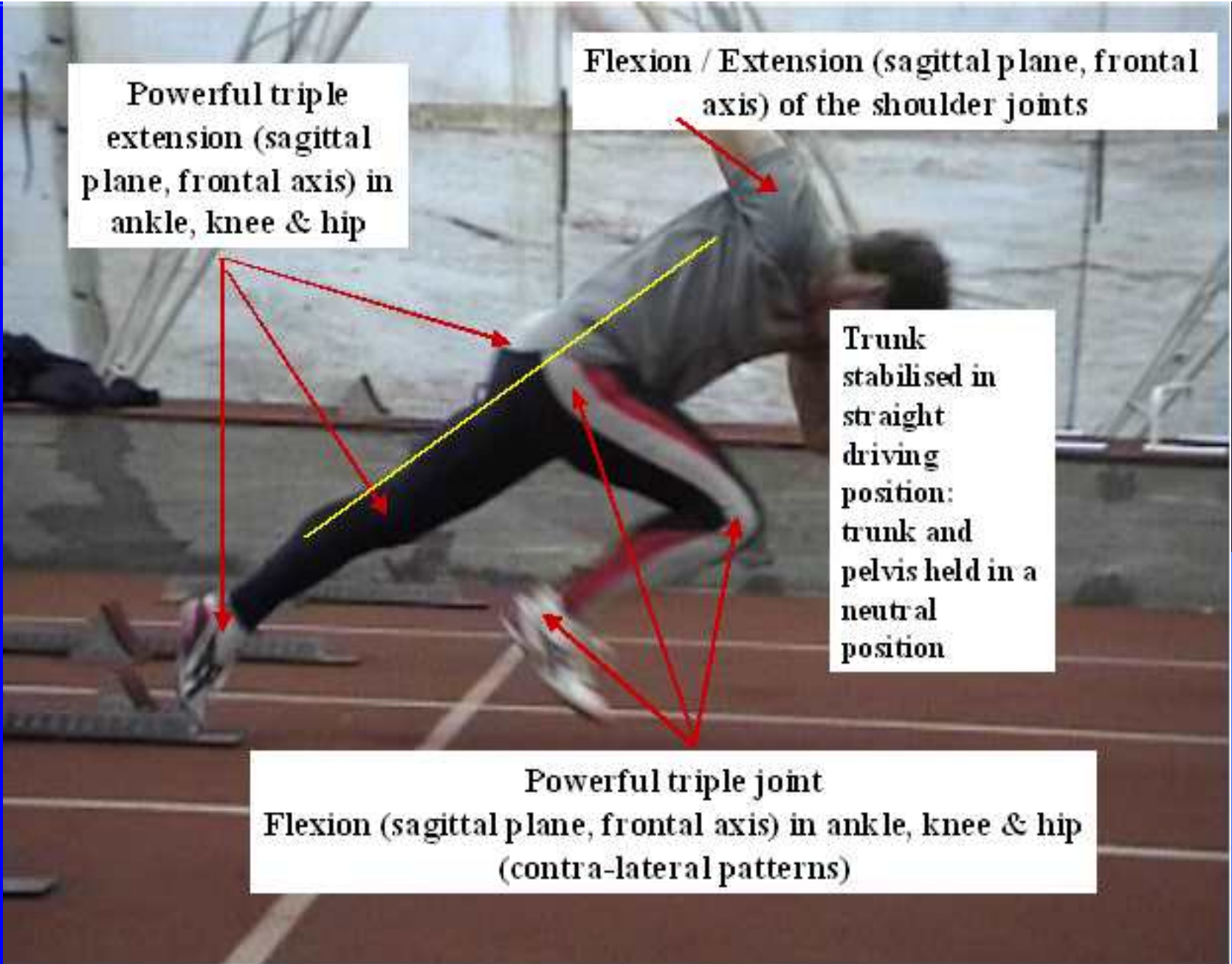
- Once your muscle fibres are turned on, your ability to “KEEP” them turned for a measurable period is referred to as “Explosiveness” (Pushing your opponent off the ball or Sprinting)
- Olympic-style weightlifting is perhaps the best example of maximum explosive strength in action

Powerful triple extension (sagittal plane, frontal axis) in ankle, knee & hip

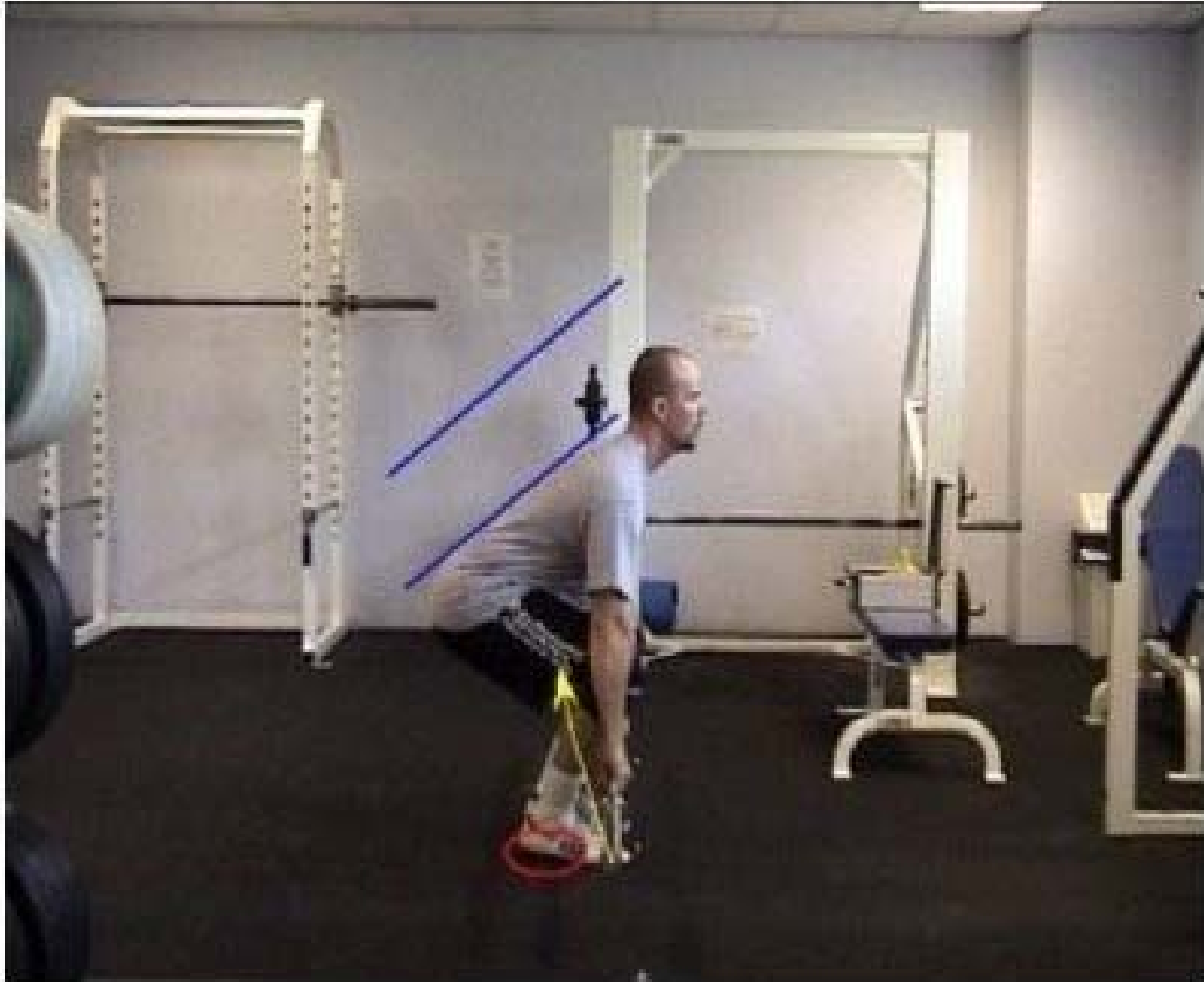
Flexion / Extension (sagittal plane, frontal axis) of the shoulder joints

Trunk stabilised in straight driving position: trunk and pelvis held in a neutral position

Powerful triple joint Flexion (sagittal plane, frontal axis) in ankle, knee & hip (contra-lateral patterns)









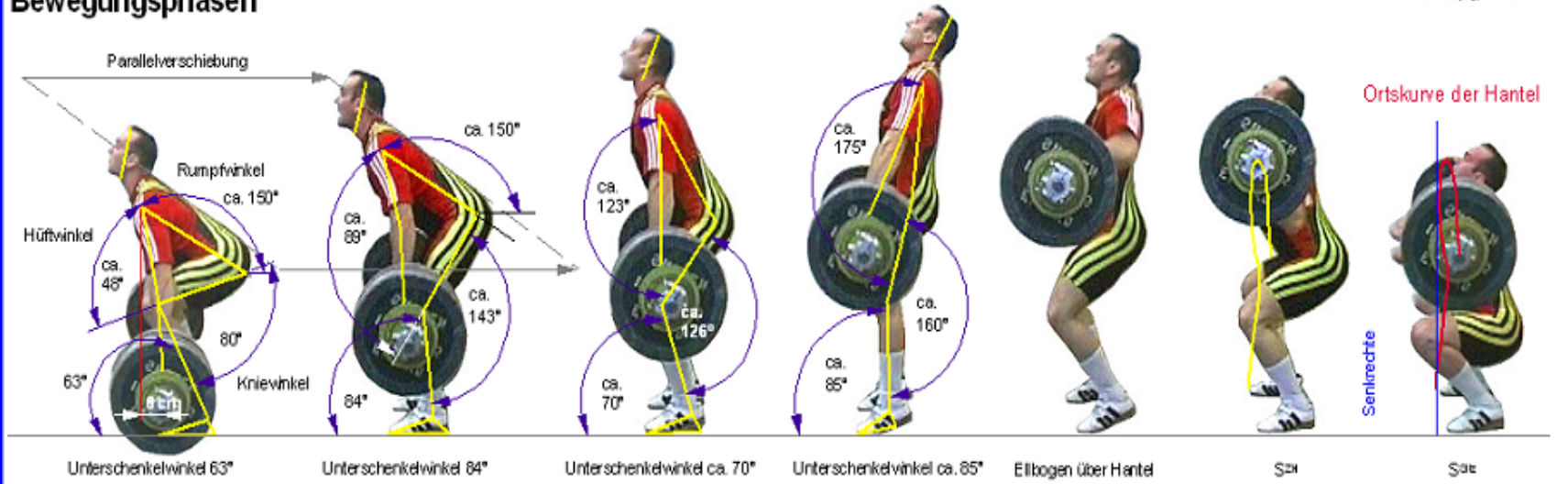


Technikübersicht Umsetzen

OSP - Berlin / BVDC

Video: HT Leipzig, Prof. Dr. Müller

Bewegungsphasen



START

V1

V2

Vmax

UMGRUPPIEREN

SITZPOSITION

Startposition

Zum Erlernen (Optimieren) der Startposition sollte ein dynamischer Auftakt vermieden werden. Die Hantel gleichmäßig beschleunigt abheben. Dies erleichtert eine Parallelverschiebung des Oberkörpers während der Zugsbewegung (Bild: Start bis v1).
 Beim Abheben befindet sich die Schulter ca. 8 cm vor der Hantelstange. Der Rumpfwinkel sollte ca. 150° betragen.

Abheben - START bis V1

Fixieren des Rumpfes und Heben aus den Beinen, um die Rumpfhaltung bis v1 stabil halten zu können. Die Knie- und Hüftwinkel öffnen sich, aber mit der Vorstellung aus den Beinen zu heben. Die Hantel sollte nicht ruckartig, eher etwas ruhiger abgehoben werden.

Kniepassage - V1 bis V2

Fixieren des Kniewinkels bei maximal -14°. Die Knie nicht aktiv unterschieben und Strecken des Rumpfes. Die Kontinuität der Zugsbewegung wird jetzt von der Hüfte übernommen, während die Knie nicht weiter nachgeben. Die Ferse bleibt während der Kniepassage auf dem Boden.

Finaler Zug - V2 bis Vmax

Synchrones Strecken des Rumpfes und der Beine. Die Bewegung erfolgt mit der Vorstellung gleicher Anspannung und die Ferse hebt noch nicht ab. Anschließend Heben des Schultergürtels und der Ferse, aber nur bis zum Zeitpunkt der maximalen Hantelgeschwindigkeit. Die Hüfte wird auf ca. 175° gestreckt und der Kniewinkel sollte im Bereich von 160° liegen. Die Körperstreckung ist nicht so ausgeprägt wie beim Reißen.

Umgruppieren

Zeitgleich mit Vmax erfolgt das Auflösen des Bodenkontakts und das Senken des Körpers unter die Hantel beginnt. Die Zugsbewegung der Arme und das Beugen der Beine unterstützt die Senkbewegung. Der schnelle Wechsel von der Zugsbewegung zur Stützphase wird durch eine aktive Vorwärtsrotation der Unterarme und Ellbogen realisiert. Zum zweckmäßigen Abbremsen wird die Hantel in möglichst hoher Körperhaltung auf die Brust und Schulter aufgelegt. Der Oberkörper geht leicht nach vorn zur Hantel.

Sitzposition

Schnellstmögliches Herstellen des Bodenkontakts. Stabilisieren der Beine, um vor dem Gelenksanschlag bremsend auf die Hantel einwirken zu können. Das Bremskraftmaximum wird vor der tiefsten Hockesitzposition erreicht. Es folgt das Aufstehen aus der Sitzposition.

Question

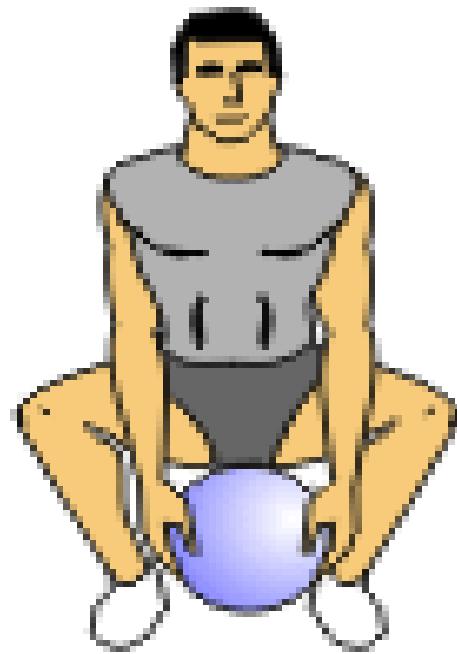
- How does an explosive athlete or player tone up ?

Not by endurance training

- Your % fat should be within 2 to 3% of your competition level at all times
- This means that your nutritional status must be constantly monitored during all stages of your training cycle.
- For its off-season when laziness, easy training and poor dietary habits most often strike.

Methods of Strength Training

- Dependent on:
 - level of player development
 - body weight, med ball, swiss ball, BB & DB technique ... beginner
 - For intermediate as above + Olympic/power lifts + varied intensity
- Facilities, equipment, calendar, supervision, needs, demands, aims...



Designing a Training Programme for your Sport

Conditioning Profile

1. Medical history
2. Training status
3. Nutritional habits
4. Level of ambition
5. Movement analysis
6. Flexibility, imbalances
- Exercise technique

- The most common mistake in sports conditioning today is training a movement pattern before achieving full range of motion and control in that movement.
- Poor technique and inadequate ankle and hip mobility will lead to poor posture and body mechanics. If a mobility problem exists it must be dealt with and rectified before true stability can occur.

“Principles of Training”

- We know that the body changes when we apply a training load to it (adaptation), but it must be a greater load than it is used to (overload) and must be applied to the body part or system we want to train (specificity).

Training Principles

“Focus on the needs of the individual”

Training Principles

- You should become familiar with these principles of training, because they form the cornerstone of all your programme planning.

Weightlifting for Sport

- Athletes and players and need to be trained to work effectively in multiple planes of movement.
- The smart strength athlete who is planning a conversion to weightlifting exercises for sport will do several things.

- Find a good technical coach.
- Weightlifting flexibility assessed
- Work on any areas of deficiency immediately.
- Continue to train on the exercises that made him strong and adapt them to the classic lifts.

Green brown blue blue pink

Green blue red black green

Red brown black pink yellow

green black pink blue pink

black blue green

Proactive Inhibition (P.I)

- Previous Learning is in conflict with
New Learning

How Skill Breaks down.

- ⑩ Incorrect understanding of the movement by the athlete or Coach
- ⑩ Poor physical abilities
- ⑩ Poor co-ordination of movement
- ⑩ Incorrect application of power
- ⑩ Lack of concentration
- ⑩ Inappropriate clothing or footwear
- ⑩ External factors

Questions that must be addressed

- ⑩ Are the basics correct?
- ⑩ Is the direction and movement correct?
- Is the rhythm correct?


Weight training and young participants

- Weight training programmes should not just be scaled down versions of adult training programmes
- Growing bones are sensitive to stress so repetitive load should be avoided
- If coaches are to place young trainers on strength programmes they must ensure:

Young trainers are properly taught
(Skill Development)

Young trainers undertake a well controlled
progressive programme (Planning)

Young trainers are not subject to repetitive
stresses (Injury Prevention)



Conclusion

How do I set up a weight training programme?

- “Practical” can it be done given the development of the person, the facilities and the equipment
- “Personal” does it meet the needs of person in
 - the terms of level of proficiency and
 - physical development
- “Proactive” is there a plan? Does it anticipate possible roadblocks , and provide a solution

Safety in the Gym

- Weight training is safe when properly supervised and controlled
- Is there an experienced coach and a set of rules pertaining to safety
- Is the equipment suitable to your needs
- Is a Functional Movement Assessment available

Programme Design

- To design a weight-training programme for a player or athlete, regardless of the sport it is necessary to prepare training programmes that meet the needs of the individual athlete.

Coaches

Coaches must learn to resist the temptation to teach lifts and increase loads until they are familiar with movement analysis and correct technique

Strength training is but one element of a well-planned and structured training programme.

Journals and sources of information

- The American Academy of Paediatrics

www.aap.org/policy

National Strength and Conditioning Association

www.nsca-lift.org

American College of Sports Medicine

www.acsm.org

American Orthopaedic Society for Sports
Medicine

www.sportsmed.org

Setanta College

setantacollege.com

