

# **METODI SCIENTIFICI PER LO SVILUPPO DELLA FORZA, RESISTENZA, VELOCITÀ E POTENZA NEGLI SPORT INDIVIDUALI E DI SQUADRA.**

**Un approccio sistematico ai protocolli di allenamento.**

**Perugia 1/12/2013**



# COME COLMARE IL “GAP”

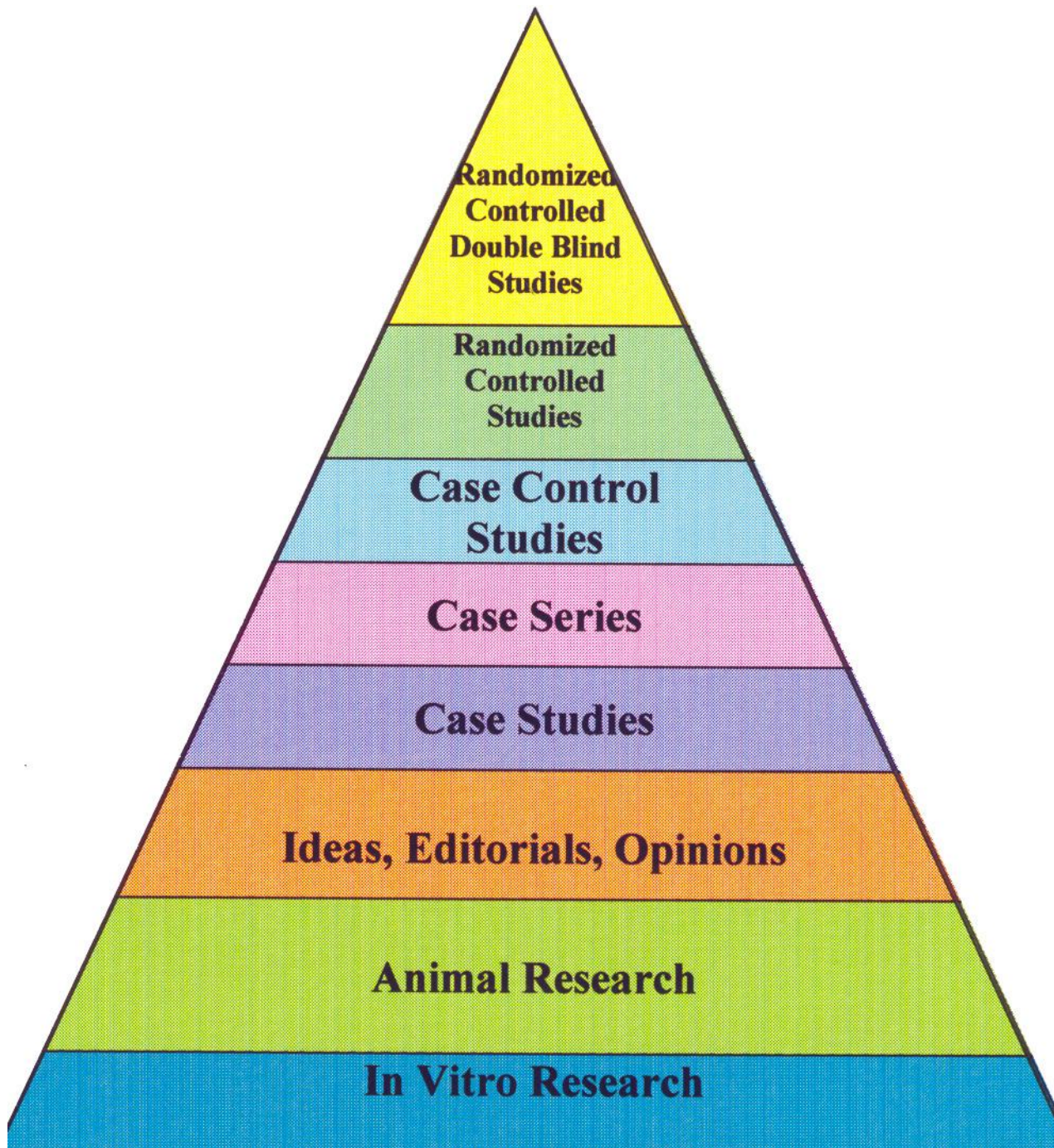
## TRA LA RICERCA E LA PRATICA?



La contrarietà del  
pensatore 1915

- Il paradigma EBM si sta facendo strada anche nel mondo sportivo
- L'applicazione del paradigma alle Scienze Motorie ha bisogno di strumenti operativi
- I database bibliografici ci offrono strumenti prima non disponibili





# LA PREPARAZIONE FISICA

- Cosa è?
- Quando iniziarla?
- Come farla?
- Quanta farne?
- Con quali sovraccarichi/tipologia di esercizi?
- Come preparare un atleta?
- Come preparare una squadra?



## COSA È?

- Un insieme di stimoli esogeni diretti a stimolare principalmente:
- L'apparato muscolare
- L'apparato scheletrico
- Il sistema nervoso
- L'apparato cardiovascolare
- L'apparato respiratorio
- Il sistema endocrino



## QUANDO INIZIARLA?

- Dopo i 16 anni?
- Dopo la pubertà?
- A 14 per i maschi a 13 per le femmine?
- Già da bambini?



## COME FARLA?

- Con allenamento a carico naturale?
- Con esercitazioni ludiche?
- Giocando la disciplina scelta?
- Con allenamenti a bassa intensità?
- Con allenamenti di resistenza?
- Con allenamento di alta intensità?
- ... oppure?





# ECCO UNO DEI TANTI STUDI...

- The Elite Young Athlete

## High-intensity and Resistance Training and Elite Young Athletes

### Abstract:

Although in the past resistance and high-intensity exercise training among young children was the subject of numerous controversies, it is now well-documented that this training mode is a safe and effective means of developing maximal strength, maximal power output and athletic performance in youth, provided that exercises are performed with appropriate supervision and

- At present, there is no scientific evidence to support the view that high-intensity and/or resistance training might hinder growth and maturation in young children. Pre-pubertal growth is not adversely affected by sport at a competitive level and anthropometric factors are of importance for choice of sport in children. However, coaches, teachers and parents should be aware that unsupervised high-intensity and resistance training programmes involving maximal loads or too frequently repeated resistance exercises increase the risk of injury. Resistance training alone is an effective additional means of developing athletic performance throughout planned youth sports training programmes. Strategies for enhancing the effectiveness and safety of youth resistance and high-intensity exercise training are discussed in this chapter.





## ... ANCHE A LIVELLO PEDIATRICO

- Pediatric Resistance Training: Benefits, Concerns, and Program Design Considerations
- Faigenbaum, Avery D.1; Myer, Gregory (American college of Sports Medicine)
- **Abstract**
- A growing number of children and adolescents are involved in resistance training in schools, fitness centers, and sports training facilities. In addition to increasing muscular strength and power, regular participation in a pediatric resistance training program may have a favorable influence on body composition, bone health, and reduction of sports-related injuries. Resistance training targeted to improve low fitness levels, poor trunk strength, and deficits in movement mechanics can offer observable health and fitness benefits to young athletes. However, pediatric resistance training programs need to be well-designed and supervised by qualified professionals who understand the physical and psychosocial uniqueness of children and adolescents. The sensible integration of different training methods along with the periodic manipulation of programs design variables over time will keep the training stimulus effective, challenging, and enjoyable for the participants.



# QUANTA FARNE?

- 1 ora 3 volte a settimana
- 1 ora 5 volte a settimana
- 1 ore 2 volte a settimana
- 30 minuti 3 volte a settimana
- 30 minuti 5 volte a settimana
- 30 minuti 2 volte a settimana
- 1 ora tutti i giorni
- 30 minuti tutti i giorni
- Di più? Di meno?



# NATIONAL STRENGTH AND CONDITIONING ASSOCIATION

- Youth Resistance Training: Updated Position Statement Paper

Journal of Strength & Conditioning Research: August 2009 - Volume 23

Current recommendations suggest that school-aged youth should participate daily in 60 minutes or more of moderate to vigorous physical activity that is developmentally appropriate and enjoyable and involves a variety of activities (219). Not only is regular physical activity essential for normal growth and development, but also a physically active lifestyle during the pediatric years may help to reduce the risk of developing some chronic diseases later in life (196). In addition to aerobic activities such as swimming and bicycling, research increasingly indicates that resistance training can offer unique benefits for children and adolescents when appropriately prescribed and supervised (28,66,111,139,147,234). The qualified acceptance of youth resistance training by medical, fitness, and sport organizations is becoming universal (5,6,8,12,18,33,104,167,192,215).



# CON QUALI SOVRACCARICHI/TIPOLOGIA DI ESERCIZI?

- Lavoro isometrico?
- Lavoro a carico naturale?
- Lavoro di sollevamento pesi?



# RESISTANCE EXERCISE AND STRONG HEALTHY CHILDREN: SAFE WHEN DONE RIGHT!

Applied Physiology, Nutrition, and Metabolism, 2008.

## ○ Abstract

- Weight lifting in children and youth is often viewed as a potentially harmful activity that could result in damage to bones, connective tissue, and muscle. Reviews, such as the one appearing in this issue of the journal, show that the balance of evidence indicates that weight lifting in pediatric populations is safe. Importantly, weight lifting, when performed in a safe and age-appropriate manner, is very beneficial on a number of health fronts, including strength and balance, self-esteem, and reducing cardiovascular risks. This is an understudied area that is still lacking in key areas of research to establish efficacy, dose–response relationships, and other health benefits.



# PASSIAMO ORA AD ATLETI ADULTI E PROFESSIONISTI

- Quali caratteristiche allenereste principalmente in uno sport di resistenza come i 5km?
- E nel calcio?
- E nel basket?
- E nella pallanuoto?
- E nel volley?
- E nel tennis?
  
- Scrivete 2 aspetti che secondo voi sono rilevanti sugli altri... li rivaluteremo a fine lezione



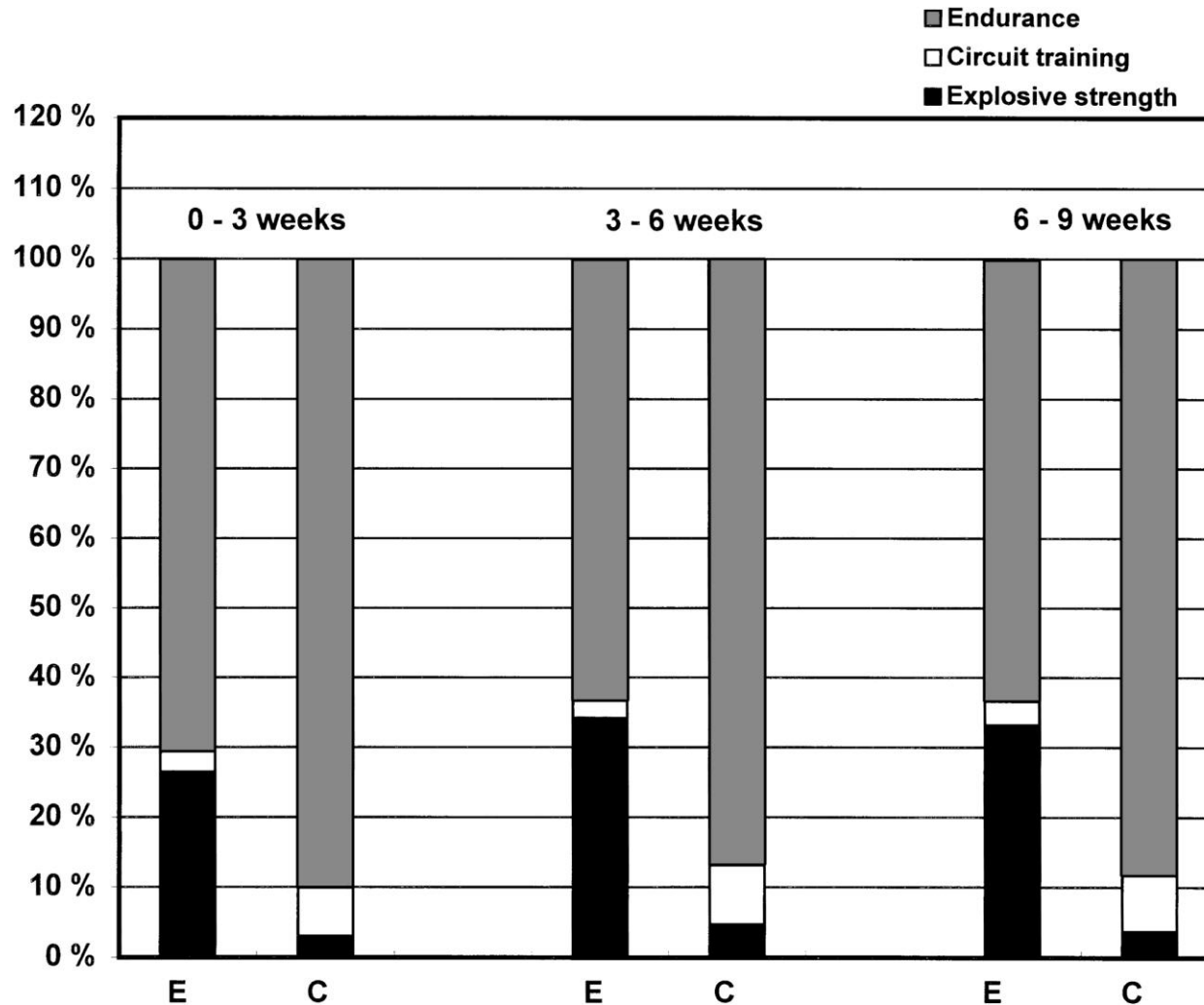
# QUALE CARATTERISTICA ALLENERESTE PER MIGLIORARE LA CORSA SUI 5KM?

- **L'allenamento di forza esplosiva migliora il tempo di corsa sui 5km ottimizzando l'economia della corsa e la potenza muscolare.**
- In conclusion, simultaneous explosive-strength training, including sprinting and endurance training, produced a significant improvement in the 5-km running performance by well-trained endurance athletes without changes in  $\dot{V}O_{2\max}$  or other aerobic power variables. This improvement is suggested to be due to improved neuromuscular characteristics that were transferred into improved muscle power and Running Economy.





**Relative volumes of different training modes in experimental (E) and control (C) groups during course of 9-wk simultaneous explosive-type strength and endurance training.**



Paavolainen L et al. J Appl Physiol 1999;86:1527-1533

Journal of Applied Physiology



# IL LAVORO PLIOMETRICO: EFFETTI SULLA PERFORMANCE E GLI INFORTUNI

- - movimenti di adduzione ed abduzione all'articolazione del ginocchio, maggiori nelle donne rispetto agli uomini e questo è un fattore di rischio su cui lavorare
- Forze di impatto a terra minori ed aumento dei picchi di forza dei femorali.
- tra i vari esercizi da proporre per l'allineamento dell'asse corporeo, c'è la pliometria.
- the plyometric group demonstrated adductor muscle preactivation significantly earlier and with greater amplitude than the control group.
- J Athl Train. 2004 Jan-Mar; 39(1): 24-31. [Am J Sports Med.](#) 1996 Nov-Dec;24(6):765-73.



| Week | Exercises*   |
|------|--|
| 1    | Wall touches (3 × 30 s)<br>Split squat jumps (2 × 40)<br>Lateral cone jumps (2 × 30)<br>Cone hops with 180° turn (4 cones × 10)                              |
| 2    | Wall touches (4 × 30 s)<br>Split squat jumps (2 × 50)<br>Lateral cone jumps (2 × 40)<br>Cone hops with 180° turn (4 cones × 20)                              |
| 3    | Wall touches (5 × 30 s)<br>Split squat jumps (2 × 60)<br>Lateral cone jumps (2 × 50)<br>Cone hops with 180° turn (4 cones × 30)                              |
| 4    | Wall touches (5 × 30 s)<br>Split squat jumps (2 × 60)<br>Lateral cone jumps (2 × 50)<br>Cone hops with 180° turn (4 cones × 30)<br>Drop jumps: 45.72 cm (20) |
| 5    | Wall touches (5 × 30 s)<br>Split squat jumps (2 × 60)<br>Lateral cone jumps (2 × 50)<br>Cone hops with 180° turn (4 cones × 30)<br>Drop jump: 45.72 cm (30)  |
| 6    | Wall touches (6 × 30 s)<br>Split squat jumps (2 × 70)<br>Lateral cone jumps (2 × 60)<br>Cone hops with 180° turn (4 cones × 40)<br>Drop jump 45.72 cm (40)   |

\*30 s between sets and 2 min between exercises.



# ALLENAMENTO AD ALTA RESISTENZA ED ALTA INTENSITÀ?

- **HEAVY RESISTANCE AND HIGH-INTENSITY TRAINING improved THROWING VELOCITY, STRENGTH, JUMPING AND MAXIMAL SPRINT SWIM PERFORMANCE**
- Specific strength and high-intensity training in male WP players for 18 weeks produced a positive effect on performance qualities highly specific to WP. Therefore, we propose modifications to current training methodology for WP players to include strength and high-intensity training for WP athletes. 20-m maximal sprint swim, maximal dynamic strength (1RM) for upper (bench press (BP) and lower (full squat (FS) body, countermovement jump and throwing velocity were measured before and after training. Training program included upper and lower body strength and high-intensity exercises (bench-press, full-squat, military-press, pull-ups, CMJ loaded, abs).



# ALTERNATIVE AL LAVORO DI FORZA?

- Sebbene il lavoro di forza sia una metodologia di allenamento primaria, l'allenamento combinato di resistenza all'agilità e sprint ripetuti hanno mantenuto livelli di forza durante la stagione di calcio femminile.
- linear single sprint speed, vertical jump, repeated sprint ability (RSA), and aerobic capacity.
- [J Strength Cond Res.](#) 2013 Nov;27(11):2966-72.



# GLI EFFETTI DELL'ALLENAMENTO DI FORZA SULLA RESISTENZE IN ATLETI TOP DI GARE DI DURATA

- L'effetto dell'allenamento combinato di Forza e Resistenza su capacità aerobica, gare di resistenza e sviluppo di forza massima, è ancora non totalmente chiaro.
  - La referenza a cui faccio riferimento descrive l'effetto di Forza e Resistenza sulle performance di endurance sia brevi che lunghe su soggetti moderatamente allenati ed atleti professionisti.
  - It is concluded that strength training can lead to enhanced long-term (>30 min) and short-term (<15 min) endurance capacity both in well-trained individuals and highly trained top-level endurance athletes, especially with the use of high-volume, heavy-resistance strength training protocols.
- 
- [Scand J Med Sci Sports](#). 2010 Oct;20 Suppl 2:39-47.



# L'ALLENAMENTO DELLA FORZA: DOES IT REALLY HELP SPORTS PERFORMANCE?

- SI
- There is sufficient evidence for strength training programs to continue to be an integral part of athletic preparation in team sports.





# ESEMPIO DI ALLENAMENTO DI FORZA PER LO SVILUPPO DELLA FORZA E DEL SALTO

- 8 serie
  - 3-5 RM
  - 2 volte alla settimana
  - 12 settimane
  - 1 esercizio principale per gli arti inferiori
  - 2 esercizi principali per gli arti superiori
- 
- [European Journal of Applied Physiology](#)
  - June 2012, Volume 112, [Issue 6](#), pp 2341-2352



# SVILUPPIAMO LA FORZA MASSIMA. MEGLIO 6 RM O 12?

- **METHOD:**

- A single-blind, randomized controlled trial was used in the study. Sixty-two healthy physical therapy students, with age (mean [+standard deviation]) 23 (+2.6) years, weight 67.4 (+11.7) kg and height 171.7 (+8.4) cm, of both genders who were recreationally active, but not training systematically, volunteered to participate in the study. They were randomized into two groups (group 1: 24 women and 8 men; group 2: 23 women and 7 men) by a block randomization procedure that ensured equal gender distribution

- **INTERVENTIONS:**

- Group *1 did three sets of 6RM* of each exercise, and group *2 did three sets of 12RM*. Both groups performed the *exercises twice per week for 8 weeks with 3 minutes rest between sets and exercises*. Primary outcomes were maximum strength defined as one-repetition maximum squat (1RMSq) for lower-body strength and bench press (1RMBp) for upper-body strength. Secondary outcomes were body weight.

- **RESULTS:**

- Both groups increased strength significantly ( $p < 0.001$ ) in 1RMSq (6RM 13.6%, 12RM 13.5%) and 1RMBp (6RM 9.2%, 12RM 8.4%). There was no significant difference in the change between the two groups, no change in body weight.

- **CONCLUSION:**

- Both 6RM and 12RM training protocols improve maximum strength in recreationally active healthy young adults, with no significant difference between the protocols.

- [Physiother Res Int.](#) 2012 Sep;17(3):179-86Source



# L'ALLENAMENTO DELLA FORZA QUANTE SERIE?

- Panca piana – Panca inclinata – Croci –
- Bicipiti con bilanciere – bicipiti con manubri – bicipiti a martello con manubri
- Shoulder press con bilanciere (dietro la testa) - alzate laterali – tirate al mento con bilanciere
- Totale 9 esercizi (petto+bicipiti+spalle)
- 3 allenamenti a settimana x 8 settimane
- Quante serie da 6 RM per esercizio proporreste?
- **(Gruppo da 1 serie)** 6 repetitions × 1 set × 9 exercises × 3 days per week × 8 weeks = 24 sessions and a total of **1,296** repetitions, and **(gruppo da 3 serie)** 6 repetitions × 3 sets × 9 exercises × 3 days per week × 8 weeks = 24 sessions and a total of **3,888** repetitions.
- The initial 6RM load was calculated as 85% of the 1RM load.



## UNA. SOLAMENTE UNA

- One set of high intensity resistance training was as effective as three sets for increasing the strength of muscle groups in the upper body. The one set protocol also produced significantly greater decreases in adiposity.
- Può sembrare un paradosso, ma il gruppo di lavoro con una serie soltanto rispetto al gruppo con 3 serie, ha prodotto gli stessi incrementi di forza ed un calo maggiore di % grasso.



# AGILITÀ: COSA È? COME DEFINIRLA E COME ALLENARLA?

- At present, no agreement on a precise definition of agility within the sports science community exists. The term is applied to a broad range of sport contexts, but with such great inconsistency, it further complicates our understanding of what trainable components may enhance agility. A new definition of agility is proposed: **“a rapid whole-body movement with change of velocity or direction in response to a stimulus”**. Agility has relationships with trainable physical qualities such as **strength, power and technique**, as well as **cognitive components such as visual-scanning techniques, visual-scanning speed and anticipation**.



# LA PLIOMETRIA SVILUPPA AGILITÀ

- The plyometric training group performed in a six week plyometric training program and the control group did not perform any plyometric training techniques. A plyometric training group had quicker posttest times compared to the control group for the agility tests. A significant group effect  $F_{2,26} = 7.81, p = 0.002$  was found for the Force Plate test. The plyometric training group reduced time on the ground on the posttest compared to the control group. **The results of this study show that plyometric training can be an effective training technique to improve an athlete's agility.**

- Journal of Sports Science and Medicine (2006) 5, 459-46



and efficiency due to plyometrics may increase lower extremity injuries, and were not involve

**Table 2.** Plyometric 6-week training protocol.

| Training Week | Training Volume (foot contacts) | Plyometric Drill                          | Sets X Reps | Training Intensity |
|---------------|---------------------------------|---|-------------|--------------------|
| Week 1        | 90                              | Side to side ankle hops                   | 2 X 15      | Low                |
|               |                                 | Standing jump and reach                   | 2 X 15      | Low                |
|               |                                 | Front cone hops                           | 5 X 6       | Low                |
| Week 2        | 120                             | Side to side ankle hops                   | 2 X 15      | Low                |
|               |                                 | Standing long jump                        | 5 X 6       | Low                |
|               |                                 | Lateral jump over barrier                 | 2 X 15      | Medium             |
|               |                                 | Double leg hops                           | 5 X 6       | Medium             |
| Week 3        | 120                             | Side to side ankle hops                   | 2 X 12      | Low                |
|               |                                 | Standing long jump                        | 4 X 6       | Low                |
|               |                                 | Lateral jump over barrier                 | 2 X 12      | Medium             |
|               |                                 | Double leg hops                           | 3 X 8       | Medium             |
|               |                                 | Lateral cone hops                         | 2 X 12      | Medium             |
| Week 4        | 140                             | Diagonal cone hops                        | 4 X 8       | Low                |
|               |                                 | Standing long jump with lateral sprint    | 4 X 8       | Medium             |
|               |                                 | Lateral cone hops                         | 2 X 12      | Medium             |
|               |                                 | Single leg bounding                       | 4 X 7       | High               |
|               |                                 | Lateral jump single leg                   | 4 X 6       | High               |
| Week 5        | 140                             | Diagonal cone hops                        | 2 X 7       | Low                |
|               |                                 | Standing long jump with lateral sprint    | 4 X 7       | Medium             |
|               |                                 | Lateral cone hops                         | 4 X 7       | Medium             |
|               |                                 | Cone hops with 180 degree turn            | 4 X 7       | Medium             |
|               |                                 | Single leg bounding                       | 4 X 7       | High               |
| Week 6        | 120                             | Lateral jump single leg                   | 2 X 7       | High               |
|               |                                 | Diagonal cone hops                        | 2 X 12      | Low                |
|               |                                 | Hexagon drill                             | 2 X 12      | Low                |
|               |                                 | Cone hops with change of direction sprint | 4 X 6       | Medium             |
|               |                                 | Double leg hops                           | 3 X 8       | Medium             |



# RESISTENZA E FORZA NEI GIOCATORI DI CALCIO. COME SVILUPPARLE?

- Interval training?
- Che frequenza cardiaca?
- Quanti minuti?
  
- Carichi alti o bassi? Ripetizioni tante o poche?
- Lavoro concentrico o eccentrico?



## ECCO DEI RIFERIMENTI NUMERICI

- Endurance interval training using an intensity at **90-95%** of maximal heart rate in **3- to 8-minute** bouts have proved to be effective in the development of endurance, and for performance improvements in soccer play. **Strength training using high loads, few repetitions and *maximal mobilisation of force in the concentric mode* have proved to be effective in the development of strength and related parameters.** The new developments in physical training have important implications for the success of soccer players. The challenge both for coaches and players is to act upon the new developments and change existing training practice.



## ED ANCORA...

- The specific aerobic training consisted of interval training, four times 4 min at 90 –95% of maximal heart rate, with a 3-min jog in between, twice per week for 8 wk. Players were monitored by video during two matches, one before and one after training.
- Enhanced aerobic endurance in soccer players improved soccer performance by increasing the distance covered, enhancing work intensity, and increasing the number of sprints and involvements with the ball during a match.
- MEDICINE & SCIENCE IN SPORTS & EXERCISE by the American College of Sports Medicine



## POWER ENDURANCE (INTERMITTENT HIGH INTENSITY EXERCISE), GENERAL ENDURANCE OR REGULAR BASKETBALL TRAINING?

- All training modalities were able to maintain initial values of speed and power, however, the anaerobic capacity and skill increased only in the players from the power endurance group. Therefore, the power endurance training (intermittent high intensity exercise) may be more beneficial to prepare junior players according to the game cardiovascular and metabolic specific determinant.
- Journal of Sports Science and Medicine (2006) 5, 163-170



# FEMORALI? LAVORO CONCENTRICO O ECCENTRICO? (CHE ESERCIZIO SCEGLIERESTE?)

- **PURPOSE:**

- To compare the effects of a 10-week training program with two different exercises -- traditional hamstring curl (HC) and Nordic hamstrings (NH), a partner exercise focusing the eccentric phase -- on muscle strength among male soccer players.

- **METHODS:**

- Subjects were 21 well-trained players who were randomized to NH training (n = 11) or HC training (n = 10). The programs were similar, with a gradual increase in the number of repetitions from two sets of six reps to three sets of eight to 12 reps over 4 weeks, and then increasing load during the final 6 weeks of training.

- **RESULTS:**

- In the NH group, there was an 11% increase in eccentric hamstring torque measured at 60 degrees s(-1), as well as a 7% increase in isometric hamstring strength at 90 degrees, 60 degrees and 30 degrees of knee flexion. Since there was no effect on concentric quadriceps strength, there was a significant increase in the hamstrings:quadriceps ratio from 0.89 +/- 0.12 to 0.98 +/- 0.17 (11%) in the NH group. No changes were observed in the HC group.

- **CONCLUSION:**

- NH training for 10 weeks more effectively develops maximal eccentric hamstring strength in well-trained soccer players than a comparable program based on traditional HC.



# RISCALDAMENTO LUNGO O BREVE? INTENSO O LEGGERO?

- Twenty male rugby union players were tested to determine the acute effect of a **resistance training warm-up** on subsequent 20-m sprint performance. The study consisted of a repeated measures design with two experimental conditions. During the control (C) condition, the participants performed a 20-m sprint, rested for 10min, and then repeated the 20-m sprint. During the experimental (E) condition, the second sprint was preceded by five repetitions of a back-squat with a load equal to each participant's five repetition maximum (5RM). Sprint times were recorded using New Test digital recording equipment. The results showed a mean improvement of 0.098s ( $p < 0.0001$ ) when the second sprint was preceded by the back squats. This amounted to a 3.3% improvement on the precondition time. During the control condition, no improvement was observed between the first and second sprint. The improved sprint times observed during the E condition probably were due to a temporary increase in the efficiency of neuromuscular activation following the performance of heavy-load back squats. (serie di pesi nel riscaldamento?)



# CORRELAZIONI TRA LA FORZA MASSIMA NELLO SQUAT, LO SPRINT E L'ALTEZZA DI SALTO NEI GIOCATORI DI CALCIO

- Che tipologia di lavoro nello squat?
- Maximal strength in half squats determined the sprint performance in these elite soccer players. Strong correlations are evident in all aspects of 0–30 m sprints as well as the 10 m shuttle run test and jumping height. The players with a high level of strength in this team had used a training regimen with *few repetitions, high loads, and emphasis on maximal mobilisation of force in the concentric part of the half squat.*





# MIGLIORARE IL TEMPO SUI 3 KM?

## PLIOMETRIA...

- Previous research has reported that plyometric training improves running economy (RE) and ultimately distance-running performance, although the exact mechanism by which this occurs remains unclear. This study examined whether changes in running performance resulting from plyometric training were related to alterations in lower leg musculotendinous stiffness (MTS). Subjects were randomly split into an experimental (E) group which completed 6 weeks of plyometric training in conjunction with their normal running training, and a control (C) group which trained as normal. Following the training period, the E group significantly improved 3-km performance (2.7%) and RE at each of the tested velocities, while no changes in  $\dot{V}O_{2\max}$  or  $Th_{1a}$  were recorded. CMJ height, 5BT, and MTS also increased significantly. No significant changes were observed in any measures for the C group. ***The results clearly demonstrated that a 6-week plyometric programme led to improvements in 3-km running performance.*** It is postulated that the increase in MTS resulted in improved RE. We speculate that the improved RE led to changes in 3-km running performance, as there were no corresponding alterations in  $\dot{V}O_{2\max}$  or  $Th_{1a}$ .

- Eur J Appl Physiol. 2003 Mar;89(1):1-7.



# ALLENAMENTO BALISTICO?

- 16 pallavolisti sono stati divisi in 2 gruppi randomizzati. Tutti i soggetti hanno fatto l'usuale lavoro pre-season ed il lavoro in campo. In aggiunta il gruppo di lavoro ha fatto 8 settimana di squat jump, mentre il gruppo di controllo squat e pressa a 6RM.
- Results lend support to the effectiveness of ballistic resistance training for improving vertical jump performance in elite jump athletes
- Med. Sci. Sports Exerc., Vol. 31,



# ELASTICI E FORZA?....SI

- The purpose of this study was to determine whether a 4-week isotonic resistance training program using Theraband elastic tubing and lightweight dumbbells would significantly increase concentric shoulder rotator strength or velocity of serve or both in a group of elite-level tennis players. Twenty-two male and female varsity college tennis players were randomly assigned to control or 4-week training groups. Functional performance was assessed before and after training by recording the peak and average velocities of eight maximal serves. The experimental group exhibited significant gains in internal rotation torque at both slow (120 deg/sec) and fast speeds (300 deg/sec) for total work and in peak torque to body weight ratio and torque acceleration energy at the fast speed. This group also exhibited significant gains in external rotation torque for the same parameters at fast speed. Regarding speed to serve, the experimental group exhibited significantly greater increase in peak speed (+6.0% compared with -1.8%) and average speed (+7.9% compared with -2.3%) compared with the control group. ***In conclusion, resistance training using Theraband tubing and lightweight dumbbells may have beneficial effects on strength and functional performance in college-level tennis players.***
- [Am J Sports Med.](#) 1998 Jul-Aug;26



# ALLENIAMO I LANCI CON ATTREZZI SPORT SPECIFICI

- **PURPOSE:**

- The main purpose of this study was to compare the effect of a specific resistance training program (throwing movement with a pulley device) with the effect of regular training (throwing with regular balls) on overarm throwing velocity under various conditions.

- **METHODS:**

- The training forms were matched for total training load, ie, impulse generated on the ball or pulley device. Both training groups (resistance training  $n = 7$  and regular training  $n = 6$ ) consisted of women team handball players, and trained 3 times per week for 8 weeks, according to an assigned training program alongside their normal handball training.

- **RESULTS:**

- An increase in throwing velocity with normal balls after the training period was observed for both groups ( $P = .014$ ), as well as throwing with heavier balls and throwing like actions in the pulley device. Although the regular training group seemed to improve more (6.1%) in throwing velocity with normal balls than the resistance training group (1.4%), this difference was not statistically significant.

- **CONCLUSIONS:**

- These findings indicate that resistance training does not surpass standard throwing training in improvement of overarm throwing



# PERIODIZZAZIONE, COME E QUANDO?

Blocchi mensili? Settimanali?

Pre-season – blocco natalizio?...

Per quali obiettivi?

- Forza
- Massa corporea,
- Diminuzione % grasso,
- Velocità
- Miglioramento analisi chimiche



TABLE 2. Training programs.

| Monday                     | P<br>4- to 6-RM Training Loads     |       |       | NV<br>8- to 10-RM Training Loads  |       |       |
|----------------------------|------------------------------------|-------|-------|-----------------------------------|-------|-------|
|                            | Set 1                              | Set 2 | Set 3 | Set 1                             | Set 2 | Set 3 |
| Leg press                  |                                    |       |       |                                   |       |       |
| Bench press                |                                    |       |       |                                   |       |       |
| Unilateral leg curl        |                                    |       |       |                                   |       |       |
| Shoulder press             |                                    |       |       |                                   |       |       |
| Seated cable row           |                                    |       |       |                                   |       |       |
| Calf raise                 |                                    |       | NP    |                                   |       | NP    |
| Latissimus pull down       |                                    |       | NP    |                                   |       | NP    |
| Dumbbell lateral raise     |                                    |       | NP    |                                   |       | NP    |
| Lumbar extension           |                                    |       | NP    |                                   |       | NP    |
| Dumbbell internal rotation |                                    |       | NP    |                                   |       | NP    |
| Dumbbell external          |                                    |       | NP    |                                   |       | NP    |
| Abdominal crunch           |                                    |       | NP    |                                   |       | NP    |
| <b>Wednesday</b>           | <b>8-to10-RM Training Loads</b>    |       |       | <b>8- to 10-RM Training Loads</b> |       |       |
|                            | Set 1                              | Set 2 | Set 3 | Set 1                             | Set 2 | Set 3 |
| Split squat                |                                    |       | NP    |                                   |       | NP    |
| Close-grip bench press     |                                    |       | NP    |                                   |       | NP    |
| Unilateral leg curl        |                                    |       |       |                                   |       |       |
| Shoulder press             |                                    |       |       |                                   |       |       |
| Seated cable row           |                                    |       |       |                                   |       |       |
| Calf raise                 |                                    |       | NP    |                                   |       | NP    |
| Dumbbell fives             |                                    |       | NP    |                                   |       | NP    |
| Lumbar extension           |                                    |       | NP    |                                   |       | NP    |
| Dumbbell internal rotation |                                    |       | NP    |                                   |       | NP    |
| Dumbbell external          |                                    |       | NP    |                                   |       | NP    |
| Abdominal crunch           |                                    |       | NP    |                                   |       | NP    |
| <b>Friday</b>              | <b>12- to 15-RM Training Loads</b> |       |       | <b>8- to 10-RM Training Loads</b> |       |       |
|                            | Set 1                              | Set 2 | Set 3 | Set 1                             | Set 2 | Set 3 |
| Leg press                  |                                    |       |       |                                   |       |       |
| Bench press                |                                    |       |       |                                   |       |       |
| Unilateral leg curl        |                                    |       |       |                                   |       |       |
| Shoulder press             |                                    |       |       |                                   |       |       |
| Seated cable row           |                                    |       |       |                                   |       |       |
| Calf raise                 |                                    |       | NP    |                                   |       | NP    |
| Latissimus pull down       |                                    |       | NP    |                                   |       | NP    |
| Dumbbell lateral raise     |                                    |       | NP    |                                   |       | NP    |
| Lumbar extension           |                                    |       | NP    |                                   |       | NP    |
| Dumbbell internal rotation |                                    |       | NP    |                                   |       | NP    |
| Dumbbell external          |                                    |       | NP    |                                   |       | NP    |
| Abdominal crunch           |                                    |       | NP    |                                   |       | NP    |

# COMPARAZIONE TRA MODIFICHE INFRASETTIMANALI E MENSILI

- The purpose of this study was to compare linear periodization (LP) and daily undulating periodization (DUP) for strength
- One repetition maximum (1RM) was recorded for bench press and legpress as a pre-mid, and posttest. Training involved 3 sets (bench press and leg press), 3 days per week. The LP group
- performed sets of 8 RM during weeks 1–4, 6 RM during
- weeks 4–8, and 4 RM during weeks 9–12. The DUP group
- altered training on a daily basis (Monday, 8 RM; Wednesday,
- 6 RM; Friday, 4 RM). Analysis of variance with repeated mea-
- sures revealed statistically significant differences favoring the
- DUP group between T1 to T2 and T1 to T3. **Making program**
- **alterations on a daily basis was more effective in eliciting**
- **strength gains than doing so every 4 weeks**
- Journal of Strength and Conditioning Research, 2002,



# SPEED LADDER?

- <http://cwheel.blogspot.it/2011/02/agilityspeed-ladders-benefits-and-myths.html>
- <http://www.youtube.com/watch?v=bKQWytTSbUE>





# ENDURANCE RUNNERS

- Endurance runners should include *heavy resistance training* in their training programmes to enhance endurance performance, such as improving sprinting ability at the end of a race.
- [J Sports Sci.](#) 2011 Oct;29(13):1359-71



# MIRARE ALLA PERFEZIONE CONDIZIONA LA PERFORMANCE IN MEGLIO O IN PEGGIO?

- **Perfectionism and performance in a new basketball training task: Does striving for perfection enhance or undermine performance?**
- The findings suggest that perfectionism is not necessarily a maladaptive characteristic that generally undermines sport performance. Instead, when learning a new training task, perfectionism may enhance performance and lead to performance increments over repeated trials.
- [Psychology of Sport and Exercise](#)
- [Volume 9, Issue 5](#), September 2008, Pages 620–629



# TAKE HOME MESSAGES

- Scriviamoli insieme
- 1)
- 2)
- 3)
- 4)
- 5)
- 6)
- ...



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