

An introduction to

# COACHING YOUNG ATHLETES



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## FROM THE PUBLISHER

I must admit I heaved a sigh of regret when I read this special report. If only it had existed 20-odd years ago, and been read by my parents or even the PE teacher at school, I might have been David Beckham by now! In my day they never thought that kids could be trained as young athletes – we were just sent out to horse around in the playground and the only advice we received was 'Any fighting and you'll get six of the best'. At least that's the way I remember it. Or perhaps, come to think of it, I was meant for other things.

This special report on the care and training of young athletes has been written by the Peak Performance team of experts, including coaches, athletes and fitness specialists. It begins with words of wisdom from Raphael Brandon: 'Remember not to treat young athletes as adults in miniature' and the whole report continues in the same vein: how to bring out the best in kids and help them to achieve their athletic potential. If they want to, that is. As Bruce Tulloh points out later in the report, kids can have talent and drive and enthusiasm, and then, suddenly, decide to do something quite different. And you, if you're a parent or coach, have to let them. That's what Bruce himself did.

I hope you enjoy this special report and find it useful.

A handwritten signature in black ink that reads "J. A. Pye." The signature is written in a cursive, slightly slanted style.

Jonathan Pye  
Publisher

# COACHING YOUNG ATHLETES

## ARTICLE ONE:

### AVOID TRAINING CHILD ATHLETES LIKE ADULTS

Training theory and coaching methods are mostly based on the physiology of adults, which creates problems considering the vast differences in physiology between adults and children.

The purpose of this article is to help coaches become aware of the kinds of training that are right for young athletes and the kinds of training that aren't.

Exercise will neither stunt nor promote growth in terms of height. Instead, it thickens the bones by increasing mineral deposits, which is a positive benefit of exercise for children.

However, growing bones are sensitive to stress, especially repetitive loading, and so there are injury risk factors associated with bone growth.

#### BONE GROWTH EXAMPLES

##### ■ The epiphyseal plate

A fracture to the epiphyseal plate prior to full growth would be quite a serious injury because it could disrupt bone growth. In addition, anabolic steroid use in children can stunt growth by causing premature calcification of the epiphyseal plate.

##### ■ The female knee cap

The changes in female body shape during the growth spurt also lead to particular injury risks. The hips widen, placing the femur, or thighbone, at a greater inward angle. During running or walking, this increased femur angle leads to greater inward rotation at the knee and foot.

##### ■ Traction injuries

They're another type of injury associated with bone growth. Again, they are caused by repetitive loading while the tendon is sensitive to stress. In particular, they are characterised by crescendo pain, ie it gets worse as the activity continues.

#### MUSCLE AND FAT

As with bones, muscle growth is also uneven. Muscle mass increases steadily until puberty, at which point boys show faster muscle growth.

At 15, the average boy has 25% relative muscle mass, which increases to 44% at 19. At 15, the average girl has 27% relative muscle mass, which increases to 39% at 19.

The difficulty for most teenage girl athletes, at a time when they start to gain weight, is striking the right balance between keeping in shape, which means about 18% body fat, and not being too paranoid about weight gain and thus not eating enough. Coaches need to make girl athletes aware that eating the right kinds of foods is the way to avoid unwanted weight gain.

The right foods include fruits, cereals, wholemeal bread, pasta, rice, potatoes and vegetables, which are all complex carbohydrates and full of nutrients. Protein foods, such as lean meat and fish, which are low in fat, are also necessary for a healthy diet. Foods that need to be avoided are those that are high in fat and simple sugars and empty of nutrients, such as cakes, chocolate, biscuits and sugary drinks.

### **PHYSICAL ABILITY AND STRENGTH TRAINING**

Coaches should remember that children will get bigger, stronger and faster every year, regardless of the training you do with them. Keeping it fun, concentrating on skills and laying foundations for the future, represent the best coaching policy for children. Specialised, advanced training should be saved for later, when the athlete will really need it!

Eastern European coaches have long been strength training young children with bodyweight exercises and light weights. The focus has been on technique and general conditioning – for instance, teaching the power clean with a very light bar.

Extensive research on the differences between weight training for adults and children, including experiments.

### **AEROBIC AND ANAEROBIC DEVELOPMENT**

Cardiorespiratory function also develops throughout childhood. Lung volume and peak flow rates steadily increase until further growth. For example, maximum ventilation increases from 40 L/min at five years to more than 110 L/min as an adult.

Cardiovascular function is also different for children. They have a small heart chamber and lower volume than adults. This results in a lower stroke volume than adults, both at rest and during exercise.

Although they are biomechanically and physiologically inefficient, children rely heavily on aerobic metabolism for exercise. They have been described as aerobic animals!

## ARTICLE TWO:

### HOW A YOUTH RUGBY COACH USES PSYCHOLOGY

Coaches have a tendency to tackle poor performance by increasing training load, which may actually exacerbate the problem rather than solving it.

Underperformance can be caused by a number of factors, including injury, fatigue, loss of confidence or motivation, relationship problems (within or outside the team), and other external stressors, such as exams, career or financial problems.

Keeping players in a physical state that allows for peak performance week after week is difficult; ensuring their physical and mental recovery is even more challenging.

Recovery may be most important for youth players as 30% of team sport players aged 16-20 suffer from staleness. Such athletes face often-conflicting pressures from teachers, parents, coaches, peers, relationships, work and training, which can lead to staleness, burnout and injury.

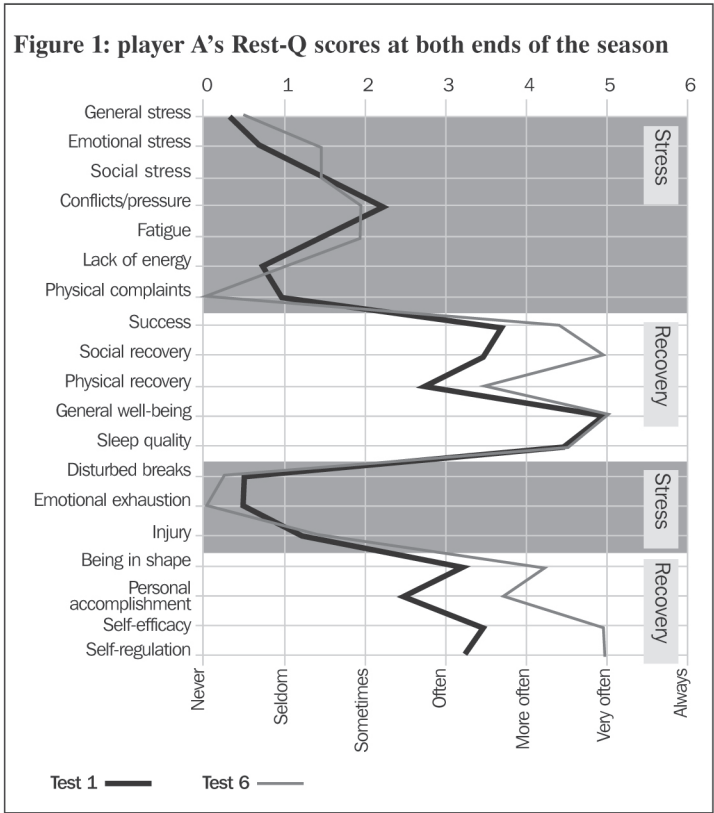
The concept of 'unexplained performance syndrome' is explained, the follow on from 'overtraining syndrome', with preventative measures suggested.

One commonly-cited tool is the Profile of Mood States questionnaire (POMS), which, as its name suggests, measures moods. However because moods can be contagious between adolescent groups, it is not the ideal tool for team sports.

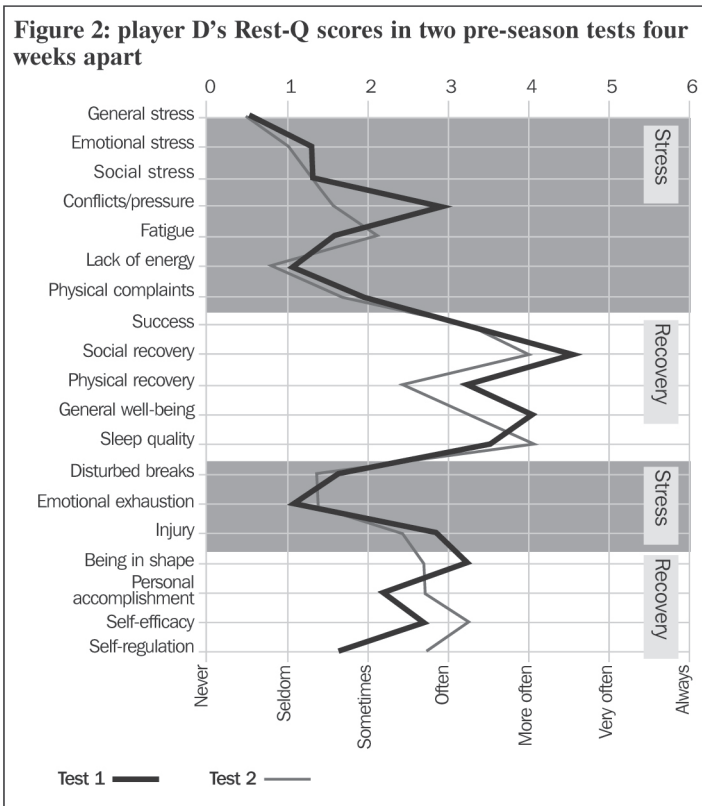
A more recent psychological tool is the Rest-Q attempts to integrate the useful parts of the POMS into a more functional assessment of an athlete's current training status. It uses 19 scales relevant in the recovery process, such as general stress, self-efficacy and emotional exhaustion, and has been demonstrably effective in monitoring training dosages in elite training camps.

An experiment among rugby academy players monitors the levels of recovery and stress in conjunction with their physical fitness.

**Figure 1: player A's Rest-Q scores at both ends of the season**



**Figure 2: player D's Rest-Q scores in two pre-season tests four weeks apart**



**ADVANTAGES OF LIVING AT HOME**

A practical guide for dealing with players studying for their A-levels and moving to university is provided. It focuses on how to diagnose players suffering from UPS using Rest-Q.

The Rest-Q is not a substitute for good communication between the coach and his individual players. But it has been found to be very useful for analysing each player and feeding back information which might be affecting performances as quickly as possible.

The coaching staff have realised that they are as important as physiotherapists to injured players and now play a more active role in communicating with them.

## **ARTICLE THREE:**

### **THE MOST EFFECTIVE STRENGTH TRAINING FOR KIDS**

The science behind strength training for young children is extensively discussed.

The basics are introduced along with an example of how children progress in strength. For example, the average six year-old boy can do five press-ups, a 12-year-old boy can do 15 press-ups and 18-year-olds can do 25 press-ups. In contrast, the average six-year-old girl can do five press-ups, a 12-year-old girl can do 12 press-ups and an 18-year-old girl can still only do 12 press-ups.

#### **HOW DOES STRENGTH INCREASE?**

Not all the natural development of strength is due to gains in muscle bulk. Strength also improves because of maturation of the neural systems.

There is some evidence to suggest that muscular recruitment also improves with age; adults are able to recruit more motor units when performing maximum efforts, compared to children.

Strength naturally increases with age because of body growth and development of the neuromuscular system, and the majority of the existing research provides convincing evidence that strength in children be increased through training.

A study of 9-11 year old boys confirms what other, earlier studies also show – that if intensity, volume, frequency and duration are sufficient, young children can significantly improve their strength by the same relative amount as adults.

It is accepted that in adults strength increases as a result of both hypertrophy and neuromuscular improvements. However, it appears, and other studies support this, that children increase strength in training solely from neuromuscular improvements.

#### **DESIGNING PROGRAMMES**

The research describing how a child develops strength, both through natural growth and through training, helps us to design appropriate strength programmes for young athletes.

Strength training for pre-pubertal athletes should focus on skills and techniques; since all the improvements from strength training come from neuromuscular development, this is the ideal time to teach coordination and stability.

Prepubescent children should be taught all the big muscle-group, free-weight and bodyweight movements with light loads. For example, power clean, bench press, press-ups and squats. Any child taught these has an advantage because good technique is learned at a young age, which allows for high-intensity training to be performed safely and effectively as the child gets older.

Post pubescent, girls at 18 have 50% of the upper limb muscle of boys and 70% of the lower-limb muscle. Almost all the differences in strength between the sexes is due to differences in muscle mass, and if strength is calculated relative to limb volume, i.e. the force per size of muscle, then both sexes have equal strength.

Girls need to compensate for this natural disadvantage by prioritising strength training from puberty onwards, otherwise strength will plateau. Particular attention to strength must be made by girls involved in sports with upper-body components.

Puberty provides a great window of opportunity for them to develop strength through training because of the high testosterone levels.

Many coaches and parents believe that strength training is bad for children and even potentially dangerous. For instance, a myth exists that heavy weight-lifting too young will stunt growth. There is little research to suggest that weight training for young children is unsafe – in fact, most of it confirms that weight training is one of the safest exercises they can do.

Weight training with heavy loads is very safe if technique is correct and posture and stability are maintained. Poorly performed weight exercises are just as dangerous for adults as for children.

**EXAMPLE PROGRAMME**

The following is an example of a strength workout currently being performed by a pubertal male tennis player. This player has been carrying out regular gym training for two years.

Exercise	Weights and reps
Leg press	1 x 20 warm-up, 2 x 10 RM
Bench press	1 x 10 warm-up, 2 x 10 RM
Squat jumps	3 x 10, 15 kg
Lat pull downs	1 x 10 warm-up, 2 x 10 RM
Lunges – jumping	Bodyweight, plyometric
Single arm row	2 x 10 RM
Sit up and throw	3 x 15, 5 kg medicine ball
Twisted curls	3 x 20 bodyweight