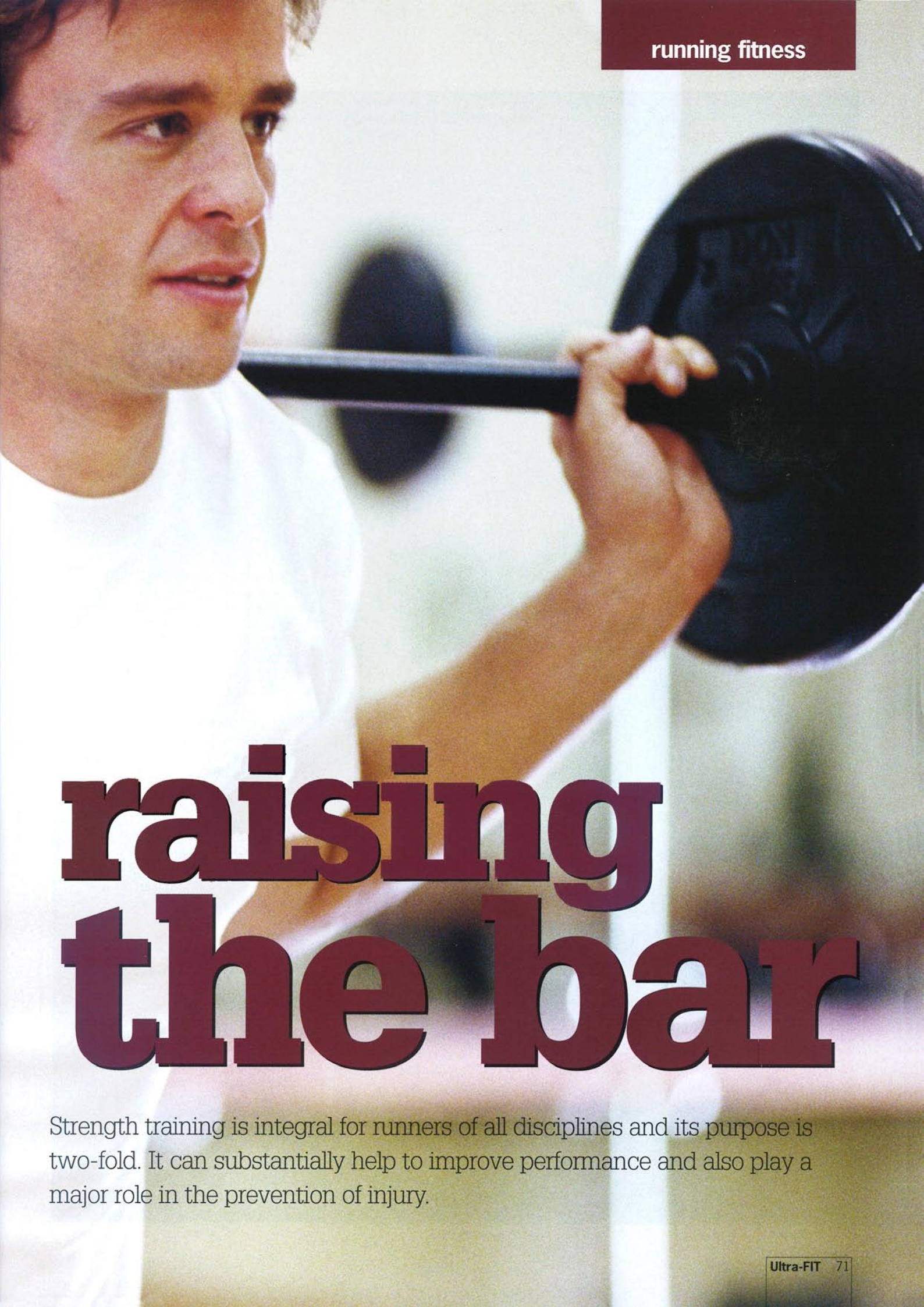


raising the bar

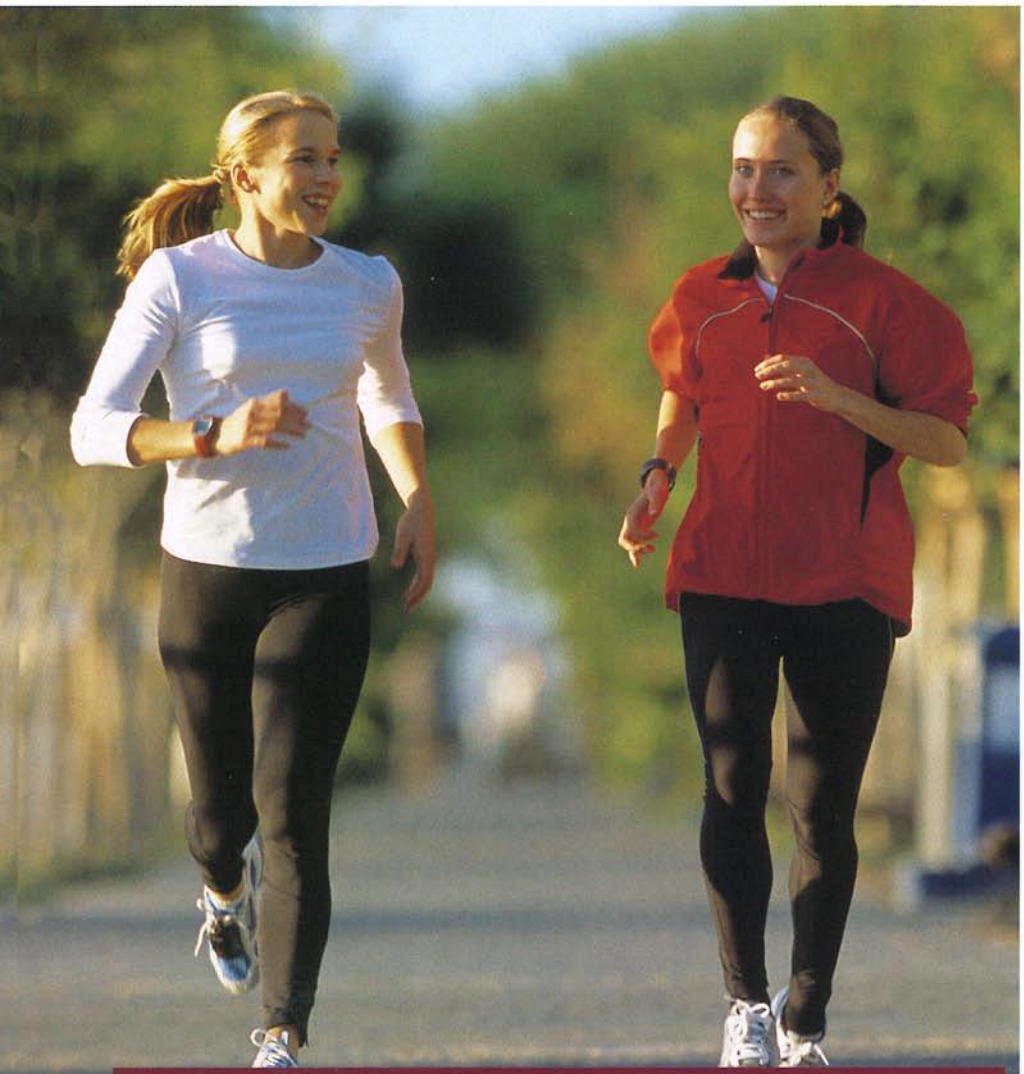
Strength training is integral for runners of all disciplines and its purpose is two-fold. It can substantially help to improve performance and also play a major role in the prevention of injury.

Runners are only as strong as their weakest link. Intensive training can exert stress on the body and also exacerbate any underlying weakness. It therefore follows that a stronger and more stable body has increased resistance to the stress of training. Runners should not wait until they become injured before undertaking strengthening work, but incorporate it into all running schedules as a means to prevent injury. They can then enjoy the other benefits which this specific training will bring.

Strength is not necessarily synonymous with being overly muscular. For the majority of people it is relatively difficult to gain muscle mass, and with the high mileage of the endurance athlete this is especially hard to achieve. The concern that training with weights will bring about muscle bulk is unfounded.

The power and stability gained from strength training results in improved running economy. It is common knowledge that Paula Radcliffe, Liz Yelling and other elite endurance athletes find time to incorporate strength training sessions into their schedules.

Power is a combination of strength and speed and thus a key factor in performance. Training should be focused on the development of strength through the full range of movement specific to the running discipline. It is with this in mind that we come to the key exercises below which focus on strengthening the primary running muscles (quadriceps, hamstrings and glutes) :-



Key Points

- To achieve good technique is vital (practise with an empty bar or broomstick) as this must always take precedence over lifting weight
- A warm up should always be incorporated. Performing 2x10 reps of the exercise without weight (or using a light weight) is an easy and effective way to warm up the muscles throughout the range they will be worked. If the weight being lifted is heavy, it will be necessary to continue warm up with a few reps increasing the weight each time until desired weight for exercise is reached
- Ensure a steady weekly progression and do not try to do too much too soon
- A spotter (or 'catcher') is someone who stands very close to the lifter ready to assist if needed. A spotter should always be used if in any doubt about ability to lift the weight
- Learning how to remove and replace the bar on to the rack correctly is important. If in doubt always ask for assistance
- Weight programmes should always incorporate an initial phase of strength and conditioning (e.g. body weight circuits covered in the previous issue). It is advisable to continue with conditioning throughout the year
- Gyms can be daunting places so it may be helpful to work with a training partner

Power Clean

PC1 – Starting Position: feet shoulder width apart under bar and very slightly turned out; hips low, chest up, back flat, straight arms with back of hands turned inwards towards each other, shoulders over bar, stomach tight, eyeline forward throughout all stages of lift

In all exercises thumbs should be wrapped around bar when gripping.

Turning wrists in will help elbows to be positioned correctly in the third stage (PC3).

The initial shape should create a triangle between the arms, thighs and back. In the next position (PC2) the hips drive through to fill this space.

PC2 – Extension: as legs gradually extend, bar comes up slowly. As it passes knees vigorously extend legs and drive hips through explosively so they fill the triangular space. This extension continues through body and shoulders shrug. Arms stay long, bar stays close to body and moves up in a vertical line

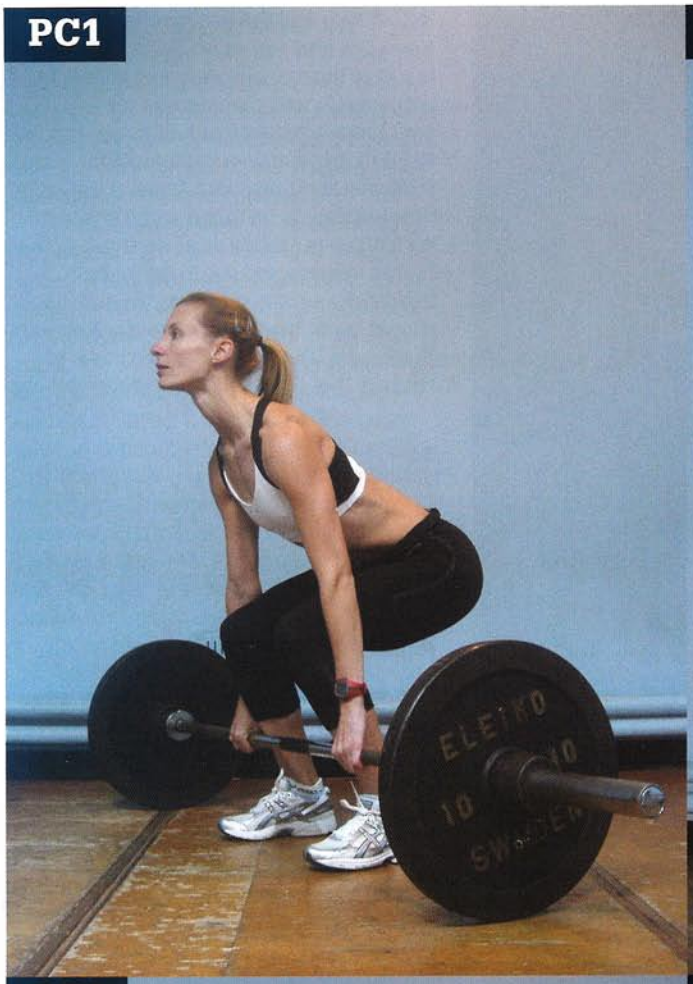
At this stage there can be a tendency to pull the bar up too early. Keep arms long and allow hip drive to move the bar upwards.

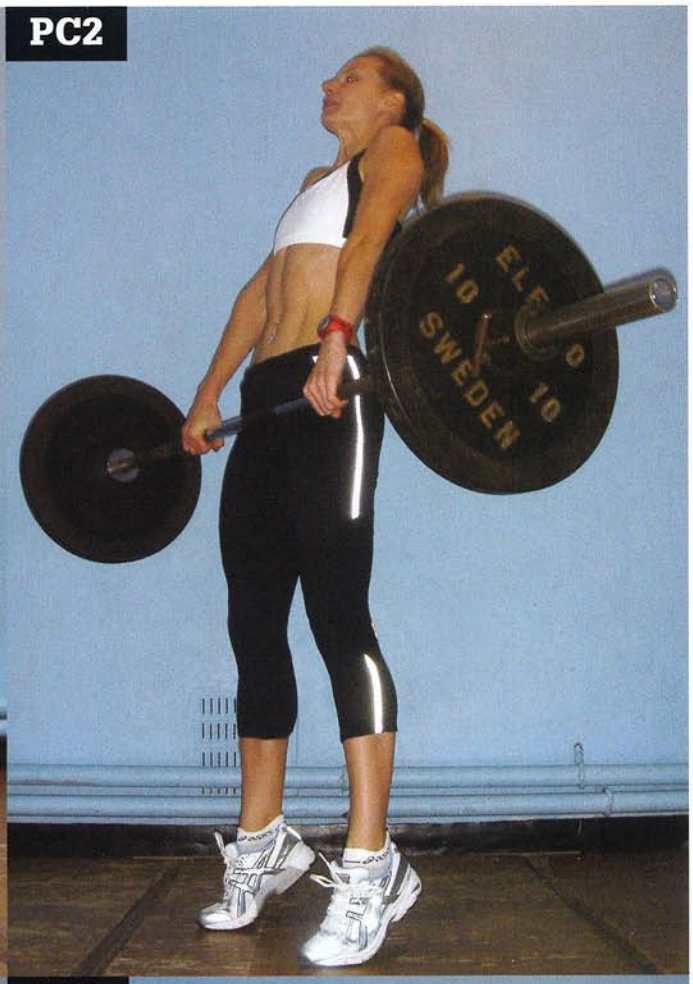
PC3 – High Pull: at this point the bar is moving. Continue this movement and pull bar upwards with elbows high to ceiling. Try to maintain extension and keep bar in vertical line close to body

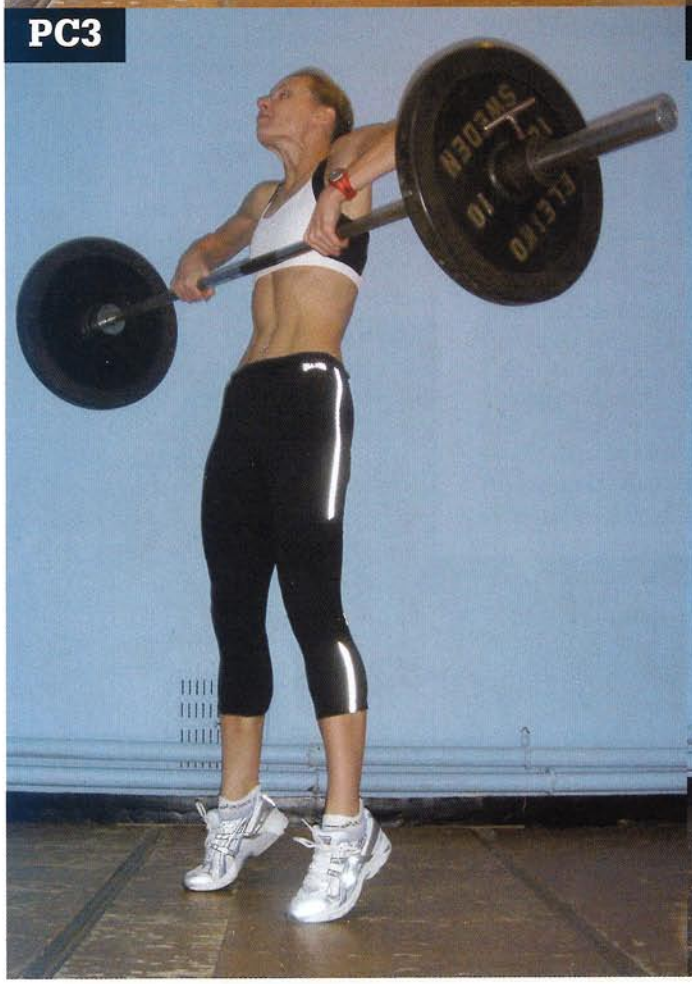
PC4 – The Catch: keep bar in same plane and move elbows quickly underneath it. Receive bar across collarbone with slight bend of knees. Keep back flat with elbows and chest up

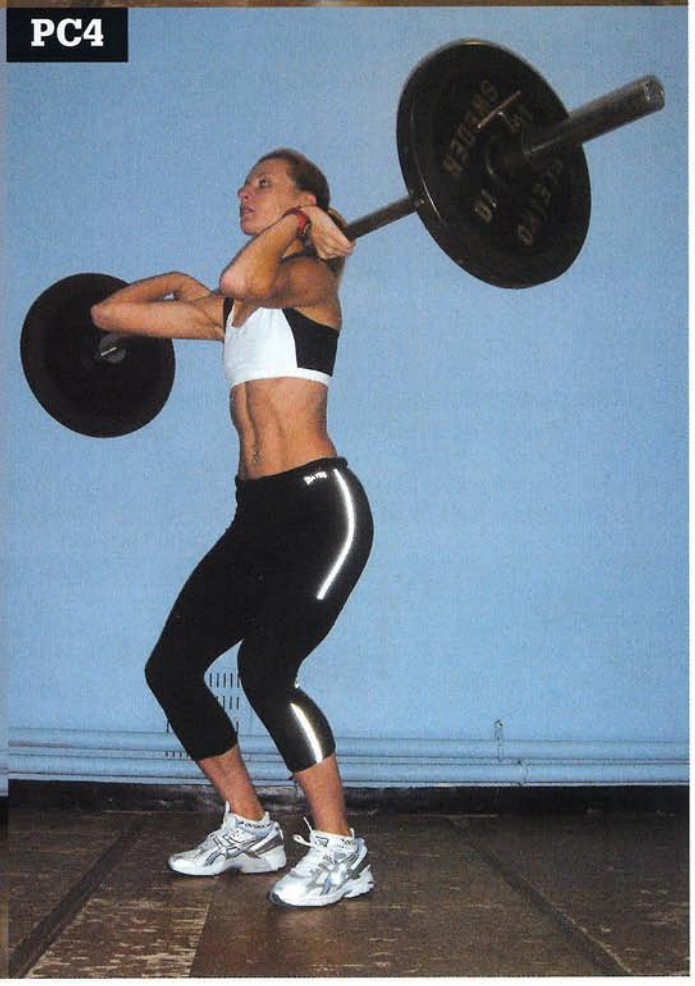
Return to starting position: reverse elbow action keeping elbows high and bar close to body. At the same time guide bar to thighs then back to ground

Breathe in as bar is lifted up to catch position and breathe out as it is returned to starting position


PC1


PC2


PC3


PC4

Squat

S1 – Starting Position: stand feet shoulder width apart, very slightly turned out; chest up, back flat, stomach tight, eyeline forward, arms wide enough to be comfortable; ensure a stable position of bar on shoulders

S2 – Squat Position: in a controlled way bend legs making hips go backwards; ensure back flat, chest up, eyeline forward and feet flat on floor. It is not necessary to go beyond a 90 degree angle and range depends on individual flexibility. It is imperative that the correct positions of the back and chest are maintained and are not compromised in an effort to squat lower.

Return to original position by driving hips through to vertical in controlled manner (so legs straighten); keep chest up and eyeline forward

Single Leg Squat

SLS1 – Starting Position: feet hip width apart, front foot flat, back foot resting on elevated surface; chest up and eyeline forward. Position should feel stable before initiating squat. Use of a spotter may be required to help guide back foot into correct position

SLS2 – Single Leg Squat Position: keep chest up and eyeline forward. In a controlled way bend front knee so hips lower (directly downwards) and front leg is at an angle close to 90 degrees. Do not let line of bending knee extend beyond line of toe on ground

For both double and single leg squat breathe in on squat and out on return to starting position

The single leg squat is an excellent exercise to load the gluteus muscle and strengthen the legs in a running specific range. This should initially be performed without any weight to ensure good technique and gain an understanding of the foot stability that will be required. If lifting weight it may be advisable to start with a few weeks of double leg squats before progressing to the single leg squat.

Repetitions

As a general rule the lighter the weight the greater the number of repetitions (reps) that can be performed e.g. squat 3x15@30kg and the heavier the weight the fewer the reps e.g. squat 3x3@ 150k. This is a very general overview and shows two extremes. It was thought that for endurance athletes it would be appropriate to lift many reps on a lighter weight with relatively short recovery. General thinking now appears to be that enough strength endurance is already attained through the higher mileage and the focus for both middle distance and endurance athletes should be on maximum strength. Although there have been a number of studies to support this, it is still the subject of debate.

"Teaching athletes good technique at a young age can help to ensure better progression towards more intensive work at a later date"

Learning to power clean with a broomstick is an excellent way to ensure good technique

As in any training programme it is advisable to begin by building a base. It is also necessary to change the programme regularly by adjusting reps and weights as this encourages the body to adapt in order to cope with the load. This phasing often takes place in 6 week stages.

For example, there is no point in trying to perform 3x3 power cleans @ 50kg unless a few weeks have first been spent lifting 3x10 @ 25kg, followed by a similar period doing 3x6 @ 40kg. To try to lift too much too soon can cause both injury and frustration. Maximal strength may be gained by lifting between 4 to 6 reps per set and depending on the weight between 2 to 3 sets can be performed. The rest time between sets should be such that the muscles do not cool down excessively, but recover sufficiently to complete the following set. A period of between 3 to 5 minutes may be needed.

This is just a general guideline and it is always better to work with an experienced coach who will help design an individual and specific training programme that compliments the running schedule. This type of strength work is incorporated in order to enhance performance and should not become the main aim.

Teaching athletes good technique at a young age can help to ensure better progression towards more intensive work at a later date. Young males have the advantage of increased testosterone at puberty. This leads to an improvement in strength which continues until they reach late teens. Young females do not have this benefit and thus the early commencement of strength training can be extremely beneficial. It is the neuromuscular adaptations gained from strength training which help an athlete improve co-ordination. This in turn enables a runner to become more economical and efficient. **UF**

Further information on weightlifting courses can be found on **www.bwla.co.uk**

Nina's clothes supplied by USA PRO (www.usapro.co.uk), 0116 283 8181
Nina's trainers supplied by ASICS (www.asics.co.uk), 01925 243360

Update of Case Study Shân Hughes (Age - 51)

	Initial	After 6 weeks	After 12 weeks
weight	110.2kg	110.2kg	108.5kg
% fat	47.50%	46%	45%

Shân has made great progress. The length of her interval sessions has continued to increase and so the total time she runs weekly is also increasing. She can now run continuously for over 15minutes which is a superb achievement. Her programmes still consist of a mixture of running sessions (now both interval and continuous) and bike sessions which act as the recovery or 'easy' days. Although the weight and fat loss is slow she can now fit into clothes which she has not worn for some time. She is feeling very encouraged by this and says 'Even though the scales are not showing any big changes I'm feeling quite positive as I can now wear trousers that I haven't been able to get into for ages. I've even had to take a couple of pairs to the charity shop. It's great to have a bit more choice of what to wear each day. I know I'm making progress so I just need to keep persevering.''

You can read about Shân's progress and follow her weekly programme on the publications page at **www.ninaanderson.com**

"Even though the scales are not showing any big changes I'm feeling quite positive as I can now wear trousers that I haven't been able to get into for ages"

Nina has a passion for athletics and fitness. She started jogging at the relatively late age of 25, and only stepped on to the track for the first time four years later. Now, at the age of 35, she is a competitive athlete (400m and 800m). As an athletics coach she specialises in technical drills, strength and conditioning, and designing individual running programmes. Together with this, Nina works as a Fitness Mentor with a very wide range of clients. **www.ninaanderson.com**

Next issue

In order to run more quickly you need to learn how to train more quickly. Nina Anderson explains how the addition of a few speed sessions into your weekly routine can help you reap the rewards of faster times.