

DECIDING ON THE RIGHT TECHNIQUE

THE shot putt technique is not confined to a rigid series of movement skills learnt in a rote (mechanical repetition) fashion. Rather it explores root throwing movements and adapts them to the particular discipline. The events rules and constraints form the mechanical considerations on which technique is constructed, giving the performer an efficient means of gaining the greatest distances, ie size of the circle, shot placed in the neck etc. Once a thrower has mastered the fundamentals of the shot putt, having tried both the linear (O'Brien) method and the rotational (spin), a decision then can be made on adjustments of the basic technique to suit the style of the individual. This is the critical moment for the athlete as many of the skills associated with shot putt become integrated to the athlete's neuromuscular system, which forms the basis on which speed, strength, mobility and fitness are built.

WHY DO SHOT PUTTERS NEED TO BE STRONG?

THE generation of force, and its application to gain maximum distance is the objective of all throwing events, but the shot, because of the weight of the implement and confines of the circle, means it is essential that the athletes are both strong and have sufficient body mass to off-set any reaction to the delivery action.

The secret to success can be found in Newton's Laws of Motion! The coaches knowledge of forces, masses and vectors (magnitude in a given direction) are integral to adapting the body to gain the best mechanical advantage.

It becomes quite obvious, that by applying great forces, exerted by the body in such a way that directs energy into the implement, good performances will be achieved.

SHOT PUTTING AS A SPEED EVENT

THE three variables which affect the ultimate distance thrown are: angle of release, height of release and velocity of release.

As the height of the release is mostly determined by the stature of the athlete, very little, or no, influence can be applied to cause a change.

HOT SHOTS

UNLOCKING the secrets of becoming a better shot putter can be found in the old athletics adage "Athlete First". Throwing, when observed at a high national or international level, is epitomised by strong, well conditioned athletes of both sexes.

The chronological path of development must be expressed by key stages of training exposure, ultimately looking at

life time best performances at the ages of 26-32 years of age and above.

The coach who guides an athlete to levels of excellence must, as with any practitioner, have a menu of training strategies on which to call at appropriate/critical periods both during physical and cognitive stages of growth, and progressed as the athlete's experience is increased.

The angle of release can vary, 41 degrees is the optimum angle, but the variations of three degrees above or below represent no significant increase or decrease in distance!

The **velocity** ($V=d/t$) is the factor that can be influenced greatly. An increase in strength, both gross and dynamic, in conjunction with improved efficiency (technique), are the focus of the coach and athlete.

DEVELOPING POWER

IN OUR everyday language, the word **power** ($P=W/t$) is constantly in use. As might be expected in athletics our intuitive understanding of the term leads to many differences in meaning and interpretation.

Power is related to work on the basis of time. It is a trainable component, involving gross/elastic/special strength. Not only does power refer to the application of work, but also over a distance as rapidly as possible. Thus, the range and speed of movement become important parameters.

It is undoubtedly true that lifting weights is the most rapid and effective way of gaining strength. It is also true that any form of strength training must be gradual and progressive.

The utilisation of weight training and other methods of gaining dynamic strength/speed must be based upon working with high loads and low repetitions (80-100% maximum; 5-1 reps) see Table 1.

The power clean and the snatch are total body exercises involving a rapid acceleration of the bar over a relatively small distance, in a short period of time.



By Andy Vince, BAF Chief Coach for Throws

Although the exercises are not specific to the requirements involved in the shot putt, it does duplicate the training effect of recruiting muscle fibres (white) fast twitch, which contribute to the development of power.

Plyometric training is essential in the development and recruitment of fibres, which relates directly to the athlete's ability to react to the middle of the circle after the shift/spin.

The former is an important technical consideration. Otherwise, reacting immediately, drifting from the power leg (right leg) (diagram 1) and lifting into the bow position, cannot be achieved.

Effective lift and displacement of the hips and shoulders is essential and is a by-product of reactive training.

HOW DO SHOT PUTTERS BECOME BIG AND STRONG

THE article has already established that the athlete must, if superior distances are to be achieved, have enough body mass and strength to impart an instantaneous velocity and subsequent acceleration on the body from rest, (best of the circle) to the moment of transfer of energies into the implement (moment of release).

The muscles of the body grow and become stronger because of the process of ADAPTATION. The progressive increase of stresses to the muscles and skeletal system, force the body to react and grow in a directly specific fashion to the stress applied. The main strength exercises for the shot putter are categorised in Table 1.

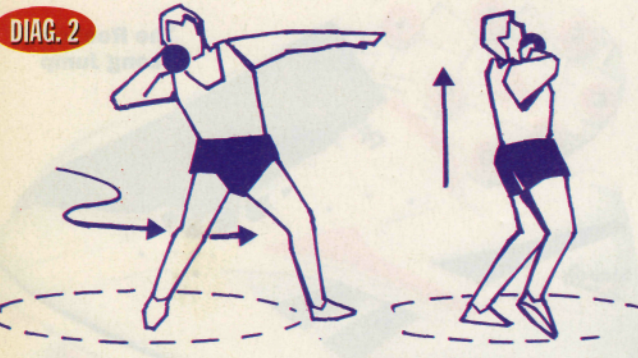
The early months of the winter preparation (October/December) should be spent building up a strong foundation of strength, both gross and dynamic in nature. This will be achieved by high reps (8-12) for the main postural and large muscle groups in the body ie buttocks, legs, chest. The effect, if supplemented by good nutrition (high carbohydrates/protein), will result in an increase in functional body weight and also a reduction in body fat percentage (ideally 9-13%) for males

TABLE 1 – STRENGTH TRAINING FOR THE SHOT PUTTER

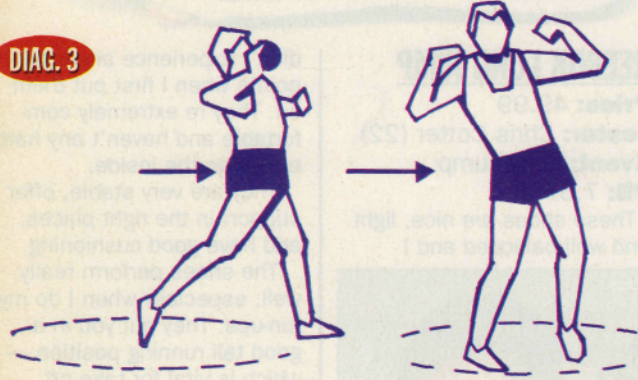
	Exercise	Reps	Training Phase	Sets	Training phase
GENERAL	Squats	8-12	(Oct-Dec)	5	(Oct-Dec)
	Bench press	5-8	(Dec-Mar)	4	(Dec-Mar)
	Shoulder press	5	(Mar-May)	3	(Mar-May)
SPECIFIC	Cleans	5-8	(Oct-Mar)	5	
		1-5	(Mar-May)	3	
	Snatch	3-5	(Mar-Sep)	3	
	Pull press	5-8	(Oct-Mar)	5	
		3-5	(Mar-May)	3	



DIAG. 1



DIAG. 2



DIAG. 3

and (15-18%) for females. The increase in lean body mass should ensure that more power is generated in the throw and greater distances achieved. This will only be true if dynamic/explosive movements are produced by the athlete in a manner expressed by good technique.

SHOT PUTTING AS A POWER EVENT

EXPLOSIVE strength is the most essential quality that shot putters must possess! The representation of this in a performance is displayed as a controlled glide or relaxed spin followed by a sharp acceleration of the implement. The resultant velocity of the implement is known as the impulse (FxT). The force generated by the cumulative effects of the forces transferred between the body segments – muscle contractions – make up the sum force represented in the putt.

A typical plyometric training session for a shot putter would include a combination

of hopping, bounding, hurdle jumping and box work (depth jumping). The sessions should be geared to the age, physical condition, athletes experience and most importantly the time of the year. It is important that the sessions are kept fairly short and contacts limited to no more than 10 on each exercise. The maximum number of sets would be determined by the former considerations (recommend five sets max for each exercise).

Medicine ball training is an excellent way in which to initially introduce base root throwing movements.

Also progress the weight of the ball to affect rapid recoil and return of the muscle fibres and thus aid development of elastic strength (eccentrically).

TABLE 2 – ELEMENTS OF A PROGRAMME FOR A SHOT PUTTER

KEY H = high volume L = low volume		
THROWING	Winter	Summer
1. Throwing for technique	(H) Nov-May	(L) May-Sept
2. Throwing for distance	(L) Dec (M) Jun-May	(H) May-Sept
3. Throwing medicine balls	(H) Nov-April	(L) May-Sept
4. Throwing light + heavy implements	(H) Nov-April	(L) May

Unlike certain plyometric training, the medicine ball can be adapted in a more event-specific fashion suiting the shot putt event. This involves a neuro-muscular effect directly transferable to the execution of the event.

The shot putt is very much like the discus in its core training (see Max Jones article – Training for Discus, *Athletics Weekly* 20th April issue). The differences are to be found in special technical training, and the need to maintain a greater body mass. The important messages for the shot putter are simple, but essential if continued improvement is desired, along with injury free training.

Key points which need constant evaluation.

1. The shot putter is an "Athlete First" and must display the physical attributes of agility, speed, fitness and leanness of body.
2. The technique reflects the shot putter's physique along with their ability to express power and aggression in a controlled manner.
3. Shot putters must be dynamically strong. Being big and slow never won anybody an Olympic medal!
4. Lifting weights is only one medium which improves strength and speed. The use of plyometric training involving speed must exist at all stages of preparation during the winter and the summer.
5. Tests and measurements are useful for evaluation of the shot putter's ability to apply power.

EXAMPLES

- a) Standing long jump
- b) 30m sprint
- c) three bunny hops
- d) overhead shot

There are no single ways in which shot putters develop into better athletes, but the body and mind must work in harmony if the greatest distances are to be achieved at the correct time of year.

"REMEMBER, GOOD SHOT PUTTERS ARE MADE OVER A NUMBER OF YEARS, NOT DURING THE FLOWERING OF ADOLESCENCE."

THE SCHEDULE

THE variations from athlete to athlete will be great. No one individual because of physical difference (ie level of fitness, age, body type, experience etc.) will progress training the same way as another.

The young maturing athlete will have to spend more time, after specialisation, building strength, fitness and developing basic motor skills.

The format of a training programme will be similar for all throwing events at both beginner and advanced level. The differences in athletes training will be reflected by: the time allocated each day/week to the event; the level of commitment given in contrast to other sports; general social life.

The coach and athlete must break down the athletes school/working week and place each segment of work into a workable timetable.

Important considerations to remember are:

1. Food (meals) must be consumed at least two hours before training, then within 20mins of completion (replenish glycogen level) ie fruit, pasta, carbohydrate compound.
2. REST is the most important route to improvement, taken at the right times allowing the body time to repair and grow.
 - a) After hard, high intensity sessions/competition recovery is required; 72 hours full recovery.
 - b) Medium intensity session; 48 hours full recovery.
 - c) Low intensity session; 12-24 hours recovery.

Remember by working split routines (ie legs, arms, shoulders) or by having a number of low intensity sessions within a training unit, sessions can be concentrated in blocks of time/hours/days/ weeks.

These suggestions highlight the whole picture to allow coaches to programme and plan their athletes' training.

The secret of a well balanced training programme is adapting and adjusting as you learn more about the event and the athletes individual physical needs.

"LISTEN TO YOUR BODY AND IT WILL GUIDE YOU TO ACHIEVING YOUR OBJECTIVES."