

# *TECHNICAL COLUMN*

# PRINCIPLES OF POWER

*Article by John Swift*



There are fewer personal and physical components that are revered more than that of **POWER** yet some suggest that the average person only achieves 10 to 20 percent of their full potential ?! ...

The martial arts provide an opportunity to unlock this potential **POWER**.

As with any physical exercise component, power can initially be determined by personal size / weight, age or gender but in every aspect - it can be conditioned and developed. The *use* of that weight, as well as body position and balance is key and so, of course, are the simultaneous use of speed, strength, kinetic energy and gravity.

Power can be explosive and short in duration - a board break, or more dynamic with repetitious strikes - full contact sparring or pad and bag work. Either way, its execution normally involves maximal controlled exertion.

The development and correct utilisation of power can take time to maximise, master and apply. The fundamentals of **SPEED** and **STRENGTH** contribute largely to a performers power output so should be developed directly in relation to achieve best results. Having said that, speed and strength are difficult to build together, as often the weight loading on a muscle to build strength can reduce its speed. To balance this, supplement your program of training with the appropriate use of weights or resistance work and explosive fast, repetitious power based drills.



On a more technical based level ... to develop power you do not only work the specific muscle group in order to achieve increased performance but also work groups that support and allow for the efficient delivery of the movement. So when developing power in a single punch, for example, it is not only the arm that works but even as far down as the feet whereby we can initiate a pivoting motion which will encourage power loading in the legs, turning of the hips, mid-section and the shoulder.

Similarly with a kick, the technique or end result of striking the target is reliant on the correct positioning of the standing leg, knee chamber, use of hips, precise extension of the limb and use of striking tool.

Naturally, years of structured guidance and consistent martial arts training will improve fitness and condition for power – both physically and mentally. In addition, with appropriate technical knowledge and understanding of a given technique, power will be further increased.

## WEIGHT TO SURFACE AREA RATIO

The concept of applying the impact force onto the smallest possible target area will concentrate the force and therefore increase its effect. Martial arts strikes are often concentrated by the delivery of specific striking tools, as follows -

### Ball of the foot

Front kick  
Traditional Turning Kick  
Twisting Kick



### Heel of the foot

Axe Kick  
Hook Kick  
Spinning Hook Kick  
Reverse Turning Kick



### Sword of the foot

Side Kick  
Back Kick  
Jump Back Kick

### Fore fist – 2 Inner Knuckles

Obverse punch  
Reverse punch  
Turning punch  
Crescent punch  
Upset punch



### Other basic hand tools

Knife hand  
Ridge hand  
Finger tips  
Palm Heel  
Hammer fist (base – below little finger)



There are of course other striking tools but with all aspects of delivering and developing power it is important to remember that striking with power holds danger of injury and correct technique should also minimize the risks involved.

## BREATH CONTROL

Breath control can be used in order to apply more power, a sharp exhaling of breath at the moment of impact or exercise and the stopping of breath during the execution of a movement will tense the muscles and abdomen to concentrate maximum effort on the delivery of the motion. Someone lifting weights or doing a press up will exhale whilst the muscle is in contraction and inhale whilst they are relaxed. The 'ki-hap' in martial arts is well known and is used with equal effect and reasoning.

## REACTION FORCE

According to Newton's Law in physics, every force has an equal and opposite force, this principle is present in almost every martial arts system.

In a traditional style of martial arts the 'reaction force' can be in the form of the reverse hand being drawn back to the hip as the obverse / lead hand delivers the strike – a 'pull and push' motion. In addition, a hip twist in a reverse punch will also contribute to the generating of increased power.



Different situations and applications can require varied power responses, in some instances there may be an opportunity to utilise our opponent, their positioning and weight. Often when instructing principles of striking I will relate to 4 levels and options.

#### Level 1 Power

Striking a target that is **moving away** from you, the target absorbs the impact and forces it further backwards

#### Level 2 Power

Striking a **static target**, with the absorption of the impact the target backwards

#### Level 3 Power

Striking a static target that **cannot move** backwards i.e. back against a wall / trapped in position

#### Level 4 Power

Striking a target that is **moving towards you**



The level of power generated should increase as you get closer to level 4. An example could be to draw an opponent onto a strike as the images suggest - a shoulder grab or trap and then pulling the opponent onto a knee strike, obviously reaction force as well as the other fore-mentioned elements could be applied.



### DEVELOPING POWER - OVERVIEW

When offering recommendation on improving power I often refer back to the use of 'plyometrics' and cross training with weights and resistance work. The principles of weight, bounce or rebound loading the muscles can quickly develop speed, strength and ultimately **explosive power**.

It is important to remember that even a simple exercise such as a press up can be executed in such a way so as to promote power development, a standard press up done as a 'jump' or 'clap' press up like wise a squat can be done as a jump squat, a front lunge as jump front lunge and so on.

### TIPS

1. Use a gradual / progressive approach to increasing work load and weight as it will allow for better more consistent results and also minimise risk of injury

2. Intense resistance training can be hard – be disciplined and always use the correct technique as cheating an exercise on attempt to squeeze out extra repetitions will only hinder longer term progress.
3. Schedule your power training – 2 to 3 explosive sessions per week will allow for recovery
4. ‘Knowledge is more powerful than force’ – proverb. It is true in most instances but imagine having both! Always try to develop a good understanding of the technique and movement required, then train you body and mind to maximise it

## TRAINING IDEAS

### PLYOMETRICS

Plyometrics are types of exercise that involve generating a large amount of force quickly; it normally involves leaping and bounding but can be varied to suit the desired outcome. Refer to my jump kicking article for further information.

#### *Try -*

- For leg strength - jump as high as you can from a squad position. Advance to jumping obstacles, frontal or sideways and vary the heights of the obstacles.

### WEIGHT TRAINING



This can offer variety in your training and again be structured to suit. Loading specific muscles with weight and ensure maximum exertion over minimum time period (strength and speed) will be of great benefit.

#### *Try -*

- Scheduling a training program that involves bench press sets for push or punching power and squats or quad curls for kicking power.

A spotter is recommended in case of exercise failure and gain advice from your gym for best use of their equipment.

### RESISTANCE TRAINING

This is a method that can incorporate either or both of the previous two factors and involves the use of elements that will slow or reduce the rate at which the movement can be carried out.

#### *Try -*

- Dragging a weight whilst sprinting.
- Using a gym rubber band whilst extending a strike
- Or even Piggy back squats



**ALTERNATIVES** – may involve a combination of the previously mentioned elements

**Try -**

- Short shuttle runs – from still position to full motion (In a sport martial arts context – a hand or leg blitz whilst sparring). This could progress to short **hill** sprints – advanced version could be to wear a weight vest or run on sand banks
- Full contact bag and work – can be broken down to specific skills or techniques
- Flat out / 100% sparring – apply time constraints to enable performance bench marking

### **FACTS AND STATS**

1. The average person entering the room as a martial arts beginner develops as much as eight times the punching or kicking power by the time that they reach black belt.
2. Anyone can smash through a board, piece of concrete or whack a pad, true power lies in the application of good basics, knowledge and understanding of a technique as well as specific training and guidance
3. Muscular power is determined by how long it takes for strength to be converted into speed
4. Too much or too little power can affect timing and accuracy. The skilful utilisation of the power will be determined by your judgement of situational factors, its requirements and efficient use.
5. Though 'power' is often related directly to strength and speed, good mobility is required so as to channel and use its full potential – flexibility and agility should be honed to ensure its efficiency.



As with many of the articles and discussions I have contributed to, it is wise to schedule your training program in view of what you would like the end result to be. Be realistic and be sure not to neglect the mental aspect of any component of training and conditioning too as the beating of that inner opponent will ultimately lead to the defeat of the outer one and the achievement of your goals!

If you would like further information John has Taekwondo and Kickboxing schools in the Worcestershire and Bromsgrove District areas as well as affiliated clubs all over the UK, feel free to contact him via email on [info@vervemartialarts.co.uk](mailto:info@vervemartialarts.co.uk) or telephone 01562 827437. Alternatively visit his website at [www.vervemartialarts.co.uk](http://www.vervemartialarts.co.uk).