The value of research to the enhancement of pistol shooting performance

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The Olympic Games has now finished and it's worth looking at the results and comparing them with the science or research that supports pistol shooting. Prior to the 2008 Beijing Olympic Games, Chinese journals reported significant increases in research related to the Olympic sports, including shooting, where China was then ranked first on the medal tally. It was interesting for me, after reading a well-written research paper published in 2011 based on the Italian team, to look at the 2012 shooting medal tally and see how Italy rose from being ranked 7th in Beijing to 3rd in London.

It seems no coincidence that there are improvements when there is focus on any particular sport and questions are asked about the way it is performed and what methods athletes and coaches use. I have seen this happen in many sports in the past. When a sport is investigated, the result is generally that new information and methods are developed that provides valuable knowledge, and performance enhancement occurs.

Whilst Australia may not allocate the level of funding to the shooting sports as is the case in other countries, we can still benefit from the research published in those countries. Here is an update on some of the latest research that I have been able to find relating to pistol shooting.

The "Italian Team" study involved a multi-action plan (MAP) intervention model applied to the Italian shooting team in preparation for the London 2012 Olympics to help the athletes improve, stabilise and optimise their performances during practice and competition. Shooters were asked to accurately and extensively describe their usually optimal sequence of actions for the execution of a single shot from start to follow through. Then they were asked to identify only the essential three or four components that they considered fundamental to a good performance.

Following this, many practice sessions took place where shooters rated their performance in those fundamental components and this was related to their scores shot on the range. The study
showed that many elite shooters were not entirely aware of the core components of their shooting action. This process helped them to identify those components and thus deal with dysfunctional effects of distress more effectively. The shooters who did not go through this MAP process were not as capable of managing distress. The message for shooters is that there can be different strategies to achieve optimal performance based on the individual’s state at any given time.

New research into the effect that stance width has on performance was published in 2011. This is often a contentious issue between coaches and shooters with many different opinions seen in coaching magazines at any given time. Most instructional books suggest that correct pistol stance should be shoulder width apart. This particular study took the research one step further by not only measuring postural stability, previously done many times, but also measuring pistol stability.

Data was collected during the performance of ten shots at five different stance widths of 30, 45, 60, 75 and 90cm. Subjects included nationally ranked shooters in the USA who took part in the study. The NOPTEL optoelectronic training system was used to assess shooting mechanics and two force plates were used to assess postural sway. In what may surprise many shooters, the results showed that the 30cm stance width produced the lowest sway especially during the last three seconds before shot execution and this resulted in an improvement in shooting performance.

Whilst I can’t go into detail for all the new research related to pistol shooting, here are some key concepts derived from additional research that may be of interest:

- Increased shoulder fatigue causes the trapezius and the deltoid muscles to transfer load to the triceps muscles and as a result increases shooting time as the shooter attempts to stabilise due to the fatigue
- Music therapy (MT) and mindfulness meditation therapy (MMT) improved shooters' sports performance scores after four weeks of training, however, MT was slightly better than MMT. Perhaps a way of getting youngsters into the sport is to allow the provision of music during practice sessions once coaching has occurred
- The mechanic measures that best predict air-pistol shooting performance determined that Hitr (a measure of hold and smoothness of triggering, which assesses the percentage of time aiming in an area the size of the nine-ring when centred over the actual shot) was the most important individual criterion followed by Target (Target fine is a measure of hold and aim, which assesses the percentage of time the centre of hold is over the ten-ring on the target). The authors suggest these two measures should be the key focus for shooters during training
- Whilst it may be difficult sometimes to read a scientific manuscript and generate valuable coaching tools that you can apply in real life coaching, research does often provide answers or supporting evidence to current questions and concepts and should not be ignored. As shown in currently successful countries, training is combined with research and an evidence based approach is then taken for all training methods and techniques.

Given we are now at the very start of a two year cycle leading into the Commonwealth Games, what will you do to improve your success in the lead up to the games in Glasgow in 2014? Knowledge is power and a little bit of extra reading now may make just enough difference for Australia to move into more frequent medal contention in future Olympic Games.

References