BREAK POINT VOLUME
[Bill Sweetenham and Dr Ralph Richards]

'Break Point Volume' is a concept that I have used to describe and plan training programs that seek to maximise individual training response based upon annual training and competition demands of age-group swimmers. These demands progressively change during the process of maturation. It appears that long-term success as a mature senior swimmer is more likely if the developmental process follows an established course. A swimmer's career might be characterised by three phases of training.

First, there is a 'learning to swim' phase that includes the years beginning with the first swimming lessons and progressing through mini-squad training. The primary objective is to <u>learn the skills involved in swimming</u> by developing each of the four strokes as well as the core elements of body control, feel for the water, and stable (i.e. without variation change) movement patterns. I have stated on many occasions that swimming is a skill dominated sport, particularly during the developmental period of early childhood. This period may begin at 5 or 6 and continue through to 9 or 10 years of age. Skill development is paramount and therefore, the principles that guide skill learning are applied to a swimmer's training. These principles include the application of distributed and mass practice techniques, the partitioning of skills into a sequence of learning components, and the linking of individual skills to overall swimming technique. There must always be some consideration given to 'how much' practice (i.e. training) is required, but the volume requirements are always secondary to the quality of skill. Normal physical growth and development during childhood will insure that performances improve from one season to the next.

Second, there is a 'learning to train' phase that swimmers go through. Typically swimmers enter this phase having mastered basic skills and now the demands of training take centre stage. It's important to maximise one's potential during the rapid increase of physical capacities during maturation. This period begins prior to the adolescent growth spurt (about 10-11 in girls and 12-13 in boys) and extends past maturation to about 14-15 for girls and 16 for boys. The start and end points are variable due to the individual differences in the timing and rate of maturation. During this period the objective is to progressively <u>extend the volume of training</u> (i.e. 'learn to train'). Training volume becomes a critical factor influencing long-term improvement. The quality of training is expressed in terms of maintaining efficient and effective technique over progressively greater seasonal loads. The debate over 'speed training' vs 'training volume' should not be at issue if the coach recognises that both short-term and long-term training goals can be achieved through a well planned program. Speed is never ignored, but weight is given to the volume of training with respect to the portion of that training which is 'intense'.

A third phase of 'learning to achieve' one's potential occurs once the swimmer has mastered the first two phases. This typically represents the later stages of age-group competition and the transition into open competition.

The first and third phases of a swimmer's career occupies a considerable amount of any coach's attention. However, my experience tells me that many coaches have an incomplete understanding of the importance of the second phase of development. Coaches make two common mistakes during the learn-to-train phase of development. First, they risk limiting long-term success by training the swimmer as if he/she were a mature adult swimmer and; second, they fail to establish a sufficient training base. Understanding the concept of Break Point Volume helps to address the second point.

So what is 'Break Point Volume'? It is optimum volume performed at optimum skill level achieved through participation in a maximum number of training sessions at controlled intensities. The training volume achieved at the end of the maturation period will essentially be the training volume an athlete will maintain for the remainder of his/her swimming career. It is also my belief that an athlete's future ability to handle intensive training situations (i.e. a combination of high performance training volume and intensity) is largely determined by his/her recovery profile. The ability to absorb and adapt to training is largely acquired during the 'learn to train' stages of one's career. There are several important training relationships that count (i.e. make a difference in the effectiveness of the program), they include:
- Up to and through the maturation years, quantity counts more than quality (i.e. 'quality' is defined as a high proportion of training performed under anaerobic workloads).
- After maturation, it's the proportion of quality within Break Point Volume that counts. At this stage increases in quality have a significant affect.
- Recovery <u>always</u> counts.
- Quality technique and application of skills (i.e. such as turns, streamlining, starts, etc.) <u>always</u> counts.
- Frequency of exposure to stimuli <u>always</u> counts.

Long-term development programs build slowly and steadily toward Break Point Volume that is achieved some time between 13 and 15 years of age. This may amount to 2000-2500km of training annually, over 42-46 weeks and include about 400 training sessions. I have always believed that the ideal progression was to achieve Break Point Volume at age 13 (girls) and 14 (boys), but with flexibility and consideration given to the influence of school, individual maturation rate, and training history. After age 17 (or the final year of school) the program maintains Break Point Volume (and the proportion of quality swim training) and uses one's recovery profile to determine the increase in swimming intensity and land based strength/fitness training.

Understanding the relationship between <u>speed</u> and <u>effort</u> is also important in planning optimum quality within a program. Effort can be given at any time, regardless of the state of fatigue of the athlete. However, true speed training places a demand upon an athlete to practice 100% speed at 100% effort. Exerting 100% effort at high sub-maximal speeds (85% for example) develops endurance. Performing at 100% speed with high sub-maximal effort (95% for example) develops efficiency at speed. Understanding the difference between swimming 'fast' and swimming 'easy' is a vital skill that must be taught and continually rehearsed at a young age. Swimming fast <u>and</u> easy is the key to maximising individual talent.

Athletes and coaches must understand that you can train and race too hard, but you can never train and race too fast. High speed at sub-maximal effort is the goal of every training or racing situation. For example, a swimmer can go out too hard in any given race, but not too fast. The ability to swim fast and easy during the early stages of a race improves the likelihood of a strong back end. These skills are teachable and controllable. Those coaches familiar with the set of performance tests I advocate will notice great emphasis placed upon maximum speed at sub-maximum effort.[1]

As previously mentioned, some coaches overexpose immature athletes to training/racing demands that are beyond their maturation level. Overemphasis on training/racing at 50-100m prior to maturation creates a peak performance demand that is difficult to achieve. Peak performance in sprint events requires a highly developed anaerobic capacity, core body strength, and efficiency. For pre-maturation age swimmers it might be best to consider planning the majority of training/racing exposure at 25-50m and 200-400m distances, with somewhat limited exposure to 100m events.

At/after maturation, if the athlete is to continue improving the coach should try to satisfy him/herself that the answers to these questions are found within the training program.
- Is the athlete still hungry for improvement because the coach has structured a continuum of goals and incentives?
- Is the athlete able to accept responsibility, accountability, and independence for his/her commitment to the program?
- Does the athlete have great technique and race skills in one stroke or all strokes and medley swimming?
- Does the athlete have an opportunity to experience team success as part of a relay or club effort?
- Does the athlete have a balanced lifestyle?
- Has Break Point Volume been achieved at primarily controlled swimming intensities?

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[1] Refer to the publication "Bill Sweetenham's Test Sets for Age and Youth Level Swimmers" available through the Australian Swimming Coaches and Teachers Association.

- Has the swimmer developed a combination of speed and technique over short distances (i.e. efficiency at speed)?
- Has the swimmer developed goals or motivations that support his/her training/competition involvement?

There are a number of strategies that a coach may employ to support continued success through older age-groups and ultimately to a transition into open swimming. Foremost among these strategies is the establishment of team (or squad) standards. For example, you may specify that everyone in the senior-age/open squad be capable of performing a standard training set (holding 'x' time with 'y' stroke-count). A competition standard (for example top 20 at the State championships), or a training attendance standard (minimum 98% for example) each offer something different (i.e. one is related to talent the other is related to commitment). Skill and commitment can be assessed under a number of different variables. The commitment of parents may also be an important consideration in future squad placement. The age of an athlete is perhaps the least considered factor in advancing athletes from one training squad to another. Whatever criteria is used it should be based upon both skill and commitment and on future achievement, not solely upon past achievement.