

## The Skinny on the Physiology of Swimming...

A variety of researchers have studied practice length vs. performance of world-class swimmers and with regards to practice length they agree on the following.

1) A bare minimum of six two hour swimming sessions per week year round with two short 2-4 week "vacations, is required to reach world class speeds. Most if not all world-class swimmers complete two swimming practices per day (twelve per week) plus dry land exercises to achieve world-class speeds. Taking the "summer off" or a "season off" to play another sport is in the long term not recommended. Swimming has two phases, anaerobic and aerobic conditioning. Your anaerobic conditioning will decline less rapidly than your aerobic conditioning, but often it will depend on the individual. As a distance swimmer myself, I knew that if I took even a day off, I noticed it took me half of a practice to recover my peak aerobic strength, which is why I usually put in an extra 6000-8000 yards on Sundays.

Please talk amongst yourselves to see if car-pooling can help ensure you can attend practice on a daily basis. If you're 13 or older ride your bike or run to practice. The bottom line is find a way to get to practice everyday.

If you are a young swimmer training three days per week in group one, don't worry you still have time. One can delay six day per week training to as late as high school and still achieve state cuts if you have a little talent and the right coach (this is obviously not recommended). Twelve and under swimmers who wish to achieve state cuts should be attending practice a minimum of five days per week. Four days per week training is very risky and unless you have a lot of talent AND a great coach, you probably will not attain state cuts. Those of you who have higher goals, like making the top five at states, or junior and senior national cuts, it is highly recommended you begin six day per week training by the time you are eleven years old. There are always exceptions. Adam Mesner, a recent Michigan State Champion, All-American and NCAA Division I 200 butterfly champion started six day per week practices at age 13. He also had an abundance of natural ability, a long course pool to train in, a great coach, and a great desire to swim fast. Had he actually trained harder, he probably would have made an Olympic team. Mesner's great quote after winning high school states and setting a record was, "I've made it this far training only single sessions." Most of us do not have naturally perfect strokes and they must be learned with much effort.

Attaining state cuts or national cuts is not the end of the world. Learning about the sport and learning good stroke technique so that you can be a life long swimmer is our main goal. As a team, we as coaches, aspire for all swimmers to at least achieve state qualifications for at least one event, hence our discussion of practice time is critical to your performance. It is a reasonable and worthy aspiration that will teach you the meaning of dedication to achieve goals, whether they are athletic, academic, career, or family related. Along the way we hope you will make friends, memories, and have a little fun.

2) Warm up periods are critical for both attaining optimum speeds and for safeguarding against muscle and tendon strains, tears, or sprains. Typical warm-ups can last from 500 to 3,000 yards depending on the ability of the swimmer. Most everyone on our team from group two up should warm-up with at least 1000-1500 yards at the beginning of practice and at the beginning of meets. It is also recommended to warm-up and warm-down before and after events with a few hundred yards of swimming and perhaps technique drills to prep you for your events.

Warming up actually works at the cellular level to prepare the body to begin maximum output. There are a variety of enzyme systems that produce ATP (energy) that you use in your races. These enzymes produce peak ATP production systems, and **CANNOT** be jump started. A good warm-up gets these enzyme concentrations optimized for subsequent peak energy flow (and waste removal too). Cellular wastes like carbon dioxide and lactic acid accumulate rapidly and your long sets in practice build up these enzyme systems over the course of the season. Energy production and waste removal go hand in hand.

There is much more physiology that you can learn about swimming, but the best thing I can say is come to practice with a positive mental attitude ...BE HAPPY....HAVE FUN SWIMMING HARD...HAVE FUN COMPETING against your friends and against the CLOCK!

3) Breathing - Monitoring your breathing during practice and during a race can give you a qualitative indication of whether you are in outer space or really paying attention and trying to improve. Breathe in deep into your stomach and lungs with both your mouth and nose, you exhale mostly through your mouth. Prior to a race it is OK to take a few deep, slow breaths to eliminate some CO<sub>2</sub> pre-emptively. Goals for the 50yard freestyle should be to perform the race with as little as one breath. Start out by trying to do no breath 25's at the end of practice. In any race 200 yards or longer you should be breathing every stroke as soon as your stroke rate has stabilized

**Coach Paul**

