



Compiled by Michael Ursu - Gold Licence

Coaching Philosophies and Strategies for Working with Talented Age-Group and Youth Swimmers

By: Bill Sweetenham

The successful coach (like the successful athlete) is single minded in working toward his/her goals.

Along the way we develop a philosophy that shapes what we believe and influences the strategies we use to achieve the desired result.

The following points (listed in no particular order) are a collection of ideas that I've found useful in developing talented age-group and youth swimmers.

"It's also my experience that coaches who apply senior elite training strategies to their age-group (junior) programs may misdirect their efforts or fail to achieve all they could".

These points are offered as examples of my views on communication, training, competition, and team building.

You may want to incorporate any/all of them into your program.

COMMUNICATION

- Make eye contact and verbal communication with every swimmer at every training session.
- Conduct one-on-one training sessions with deserving and talented athletes.
- Talk to a different athlete for 10 minutes before and after each training session.
- Never sit down while on pool deck, always stand facing your squad.
- If outdoors, try not to have the sun behind you.

- Dress and look professional while on deck.
- No mobile phone on deck.
- Offer constant quality feedback (both positive and negative).
- Motivation is a lifestyle ... it's not just getting excited one week prior to a competition.
- Communicate to your Team/Club/Squad by meeting monthly with parents; fortnightly with the full Team/Squad; almost daily with the Club President; and individually or with small groups of swimmers at every session.
- Never coach tired or make emotional decisions on the spot.
- Give your best coaching efforts to your most deserving and committed athletes.
- Convert negatives into positives.
- Educate both the athletes and their parents about nutrition and drugs.
- Develop a positive public relations network and sell your program and the achievements of your athletes to the largest possible audience.

TRAINING

- Train your second best stroke at an event distance above your goal swim ... i.e. main stroke freestyle, second stroke backstroke – train for the 200m backstroke.
- Use stroke-count as a training tool prior to learning to use stroke-rate as a training tool.
- Teach rhythm, control, and breathing (emphasise breathing out) as well as training pace.
- Use controlled breathing often in training sets (a guideline is one breath every 5-6 seconds).

- Learn to even-split all repeat swims of 100m or more using even stroke-counts.
- Female swimmers and young male swimmers should practice a slight negative split strategy.
- As a guide – training consists of a minimum 70% of training volume at or below 70% of maximum oxygen consumption.
- Alactic sprints practiced at the commencement of a training session enhances speed; alactic sprints practiced at the end of a training session enhances race specific endurance.
- On a frequent basis combine short, intensive strength exercises in close proximity to alactic swimming sets.
- Practice alactic sprint sets as pull, kick, swim and/or drill sets (with an emphasis on distance per stroke/pull/kick at a specific race stroke/pull/kick rate).
- Know the difference between effort and speed.
- Sustain, rather than descend, high performance endurance sets (mature breaststrokes may be the exception to this).
- Maintain consistent weekly training volume and vary the training intensity within this volume (rather than varying the volume from week to week).
- Keep one training session per week 'open' to allow individual adjustments in program design from swimmer to swimmer.
- Females (and some males) perform resistance pull sets without leg flotation devices, practice race stroke-rate.
- Use an 'Individual Checking Speed' (ICS) training set on Monday morning or after a session off.
- Practice underwater – fast/streamlined push offs and dolphin kicking.
- Race someone faster during each training session.
- Do some training activity (in every workout) that requires 100% effort ... i.e. this may be a swim, or swimming set, or a technical aspect of swimming.
- Consider 3 smaller volume training sessions a day ... i.e. during training camps and school holidays ... rather than 1-2 larger volume sessions as a way to achieve your training objectives.
- Drills should be done in a progression - commencing with very basic skills and progressing to race objectives ... i.e. basic skills such as body position, reducing resistance, distance per kick or armstroke – race skills such as pace, stroke-length, and stroke-rate.
- Correct faults immediately.
- Females to use land based training (2-3 exercises) every day prior to pool training; mature females to add 3x45 minute sessions weekly.
- Develop core body strength ... i.e. trunk - abdominal, hip, lower/upper back ... first.

COMPETITION

- During maturation hold back two events from your competitive repertoire, these may be used to kick-start continued improvement should your performances (in your main event) plateau.
- There is no such thing as 'social competition'.
- Have a strategy for social interaction (fun away from the pool) and a strategy for competition (serious and competitive).
- Prepare to overcome the 'third day let-down' at Championship Meets by participating in weekend meets and then swimming a test set (or time trial with 3% of PB) on Monday.
- Follow a full training program on Monday and have another day/session rest that week (if required).
- Practice a 3-session progression containing quality swims to prepare for 'heat-semi final-final' competition format.
- Swim heats using specific race strategy on the front-half, swim finals using specific race strategy on the back-half to educate young swimmers in competitive skills.

- Prepare to race fast in winter ... i.e. Northern Hemisphere Summer.
- Practice relay skills with all team/squad members.
- Use a 3-2-1 ratio to construct your seasonal competition calendar ... i.e. three competitions below one's current ability, two competitions equal to one's current ability, and one competition above one's current ability.
- Encourage weekly (juniors) or fortnightly (seniors) club swims for all team members.
- Have your Club conduct their Club Championships on the same day as another (or several others) Club and compare results.
- Differentiate the training of males and females at maturation to individualise the strengths and weaknesses of each group.
- Schedule an additional training session per week for some groups of females.
- Maintain an uncompromising standard for each training group ... i.e. attitude, attendance, training commitment, competition standard, skill and proficiency.
- Program recovery during school exam periods and adjust morning training times during school holiday periods (if possible).
- Have all swimmers making a national qualifying time compete in an additional swim meet (not open to the other members of your team) prior to the Championships.
- The goal is to improve upon time or practice a Championship meet program.
- Simulate major meets (States and Nationals) in the home program, so that the step-up to the real thing is easily made.
- Learn to swim fast heats and faster finals by scheduling morning quality sessions (as well as afternoon quality sessions).
- 'B' finals are a second chance for swimmers not capable of making an 'A' final – they are not for 'A finalists' swimming below their capability.

TEAM BUILDING

- Have a social program in your Club ... i.e. beach days, movie nights, bowling, etc.
 - At least once a year invite the School Principal Teacher/Phys.Ed. (from the local schools your swimmers attended) to come along to your training session ... i.e. put on a morning tea ... or Club competition and sell the benefits of your program.
 - Offer something different, challenging, and special in your program for each age ... i.e. 12 years – weekend training camp, 13 years – one-week school holiday camp, 14 years – gym training education program, 15 years – bus tour and competition, etc.
 - Conduct specialised and/or additional training sessions from time-to-time ... i.e. only swimmers above 800 IPS, or stroke specialists, or State Championship finalists, etc.
 - Rotate the leader of each lane ... i.e. last swimmer into the water is the leader, or swimmer with the lowest heart-rate leads the next repeat/set, etc.
 - Have occasional workouts that equalise the talent in your squad ... i.e. girl or juniors wear fins, boys or seniors use band only pull, etc.
 - Recognise and applaud 100% attendance at scheduled training sessions.
 - Encourage volunteer help and manage the way help is provided to achieve your objectives ... i.e. use parents as record keepers, communicators, publicists, technical officials, organisers – not as coaches.
- ## GENERAL
- If it's measurable... measure it!
If it's controllable ... control it!
Record everything!
 - Age-group swimming is a means to an end, not an end in itself.
 - Most squads are made up of 10% Achievers, 25% Survivors, and 65% Decliners – your job is to build a team having the highest possible percentage of Achievers.

STROKE MECHANICS

From: Michael Ursu
(Continued from ISSUE 8)

FREESTYLE:

By design the "Freestyle Stroke" is the most efficient out of all the strokes, as the "Arms" and "Legs" are used in an alternating manner. Consequently the swimmer experiences a rest phase during recovery.

The PULL, The arm under water is held against the pressure of the water. It is this leverage that moves the swimmer forward.

The RECOVERY arm moving through the air enters the water for another pull prior to the lifting from the water of the other arm.

The TIMING of the arms varies.

- Some swimmers swim with a catch-up motion out in front...this necessitates a strong six beat kick and complete elbow extension in front regardless of distance of event.
- Four beat kickers complete elbow extension primarily for distance of 400m. and up.
- Two beat straight up and down kickers go directly into the catch position.
- The arm cycle may be divided into the following phases:
 1. Entry
 2. Catch
 3. Pull
 4. Push
 5. Recovery

The mechanics after the catch are the same as climbing over a fence shoulder high.

The press down or through is, one hand at the time, however bending of the elbow joint for power is the same.

The hand enters finger tips first somewhere between the head and shoulders.....near shoulder entry more common.

After the entry the hand holds the pressure on the water as the forearm follows the same path and through the same hole.

At this time the body rotates on its long axis during the forward motion.

- The recovery skill of an individual is just as important as the 'sprint' or 'distance' capability of an individual.
- Build your training program for under-12's around a 200 IM focus.
- Swimmers must perform the training program to your standards (objectives) and not necessarily to the standard they are willing to offer.
- Offer variety and stimulus by changing training lanes, group order, starting end, workout presentation, etc.
- Ask yourself ... how can I make (encourage) swimmers to go faster this year?
- Do not use 'National Qualifying Times' as a recognition of excellence (remember NQT's are a 'minimum meet entry standard').
- Charge double squad fees to all 'casual' or 'visiting' swimmers during summer school holiday periods.
- Devote more of your time to the dedicated/talented athletes during summer training.
- Educate your swimmers about rules (strokes, starts, turns, etc.) by having a starter and referee attend your training sessions on a regular basis.
- Do not be afraid to forward athletes on to a higher level program if your program does not cater to their needs.
- Athletes and coaches succeed on their strengths and fail due to their weaknesses.
- Spend time and effort on building upon strengths and eliminating weaknesses.
- Measure your coaching ability by the success of your 'least talented, but most committed' athletes.
- Part-time commitment always equals part-time results.

This motion is generated by the opposite arm which is finishing its PUSH PHASE and begins recovery.

The momentum of body rotation drives the arm into the catch position where the action described above is repeated and the next cycle begins.

This action uses mainly the muscles of the shoulders girdle and the large latissimus muscle along the side under the arm. During the PUSH phase the force is directed through the hand, forearm, and upper arm with strength being applied throughout the stroke and a feeling of acceleration at the end of the arm action just prior to recovery.

Note: The muscle action changes from PULL to PUSH as the body moves over the arm.

The bend elbow changes from almost straight at the ENTRY and CATCH to a bend elbow as much as 90 degrees, then back to almost straight as the arm leaves the water and starts the recovery phase.

It is imperative that the elbow is kept high through this phase and not drop and slip backward in the water.

The RECOVERY should be as straight forward in relation to the long axis of the body to eliminate swaying action. The elbow should be high and the shoulder out of the water as the arm reaches forward to start the next cycle.

The recovery should be smooth and done at the same speed the body is moving forward.

The ENTRY should be controlled and soft, this will allow for a good CATCH and will help maintain a good streamline and the application of force and acceleration of the PULL/PUSH can start again achieving a constant acceleration of both arm cycles.

BREATHING and HEAD POSITION

It is very important for a swimmer to have the correct head position as it has a direct effect on the body position and particularly determines the timing of the kick.

NOTE:

- The head to HIGH will cause the hips to be LOW.
- The head to LOW it will affect the breathing pattern, as the position of the bow wave given off by the foremost portion of the head will be too low for the swimmer to breath.

The HEAD is an extension of the spine and rotates smoothly with the body to facilitate the breathing. The head should be tilted up slightly, depending upon the buoyancy of the individual swimmer. The

BREATH itself, takes place at the bottom of the bow wave.

The air is exhaled throughout the stroke with the final thrust at the surface just before the inhalation begins. Regular breathing should be maintained, not as a gasp in or blast out.

It is very important that the swimmer maintenance a relaxed breathing action as it will help recovery and most important, how the swimmer will feel when asked to bring the race home.

LEG KICK, the variation of the kick is done by using the same technique...it is the timing in relation to the arms action that makes the difference.

1. Six beat: there are three leg kicks for each arm pull which equals six for the complete cycle.

The timing is natural if the cycle of the kick is not broken.

The kick starts from the hip with the knee bending on the down kick and the knee straightening on the upwards kick.

Most champion swimmers have a pronounced hyper extension of the knee joint, with the leg almost inverting during the upwards cycle.

As mentioned before the down kick starts from the hip and the knee follows through with an extension of the lower leg and complete extension of the foot and a wipe/flip of the foot at the end of the kick.

2. Two beat cross over: In this kick one leg crosses over the other, and then the opposite as the other arm is used.

3. Straight-up and down two beat: has the same timing as in the cross-over, the differences is the kick is straight up and down and the downward whip of this kick carries more force than the cross-over two beat.

Swimmers with strong downward force achieve a high chest position in the water allowing them to have a faster arm turnover.

Points to Remember:

In freestyle the body rolls should be equal in both sides, so that a proper BALANCE is achieved and maintained during the race.

The roll should be as far to each side as to allow the shoulders to clear the water during the recovery. The head should always be held in the mid-line of the body to the non-breathing side; this will keep the roll on the long axis constant, clears shoulders for recovery, and keeps timing of the kick in tidy.

The timing of the breathing process is very important and becomes sloppy during the season when swimmers do a lot of distance work.

The timing of breathing is described in a simple way as follows:

As the finger tips of the non-breathing hand enters the water the head begins to turn as the hand on the breathing side passes the face the breath should be taken. Learning to breathe on either side with equal skills is important for the advance competitors and should be practiced in training by all swimmers.

The skill of breathing both sides will help during races, however it will also help conditioning through hypoxic work and protect the swimmer from shoulder injuries as it will maintain a proper balance consequently the same pressure will be applied on both shoulders.

The principles that will determine whether or not the swimmer has an efficient stroke during a RACE, are:

- Rhythm (Balance or Timing)
- Streamlining
- Stroke Mechanics

All the above parameters are influencing the amount of ENERGY per stroke the swimmer is burning.

The lowest the better with as much distance per stroke as possible.

FREESTYLE DRILLS

The drills I use in my program are aimed at developing an efficient stroke.

I use the theory that we have to swim efficiently (good technique) at low speed and transmit the same efficient stroke to "Race Pace" or in competition.

The drills I use are presented in sequence, but should be interchanged during the season to help concentration and retention.

The swimmers must concentrate constantly and should be constantly reminded about their stroke faults.

The success of the stroke work practice will be determined only by the retention of the swimmers.

KICKING DRILLS

Drill 1

Hold side of the pool face above water and kick.

The swimmer must constantly be instructed by the coach on correct technique.

Kicking and holding on the side of the pool will give swimmers a better feel of the correct kicking and will eliminate excess knee bend.

Drill 2

Use a kick board, face in water, push off from wall, and kick...ask the swimmer to concentrate on proper technique.

Drill 3

Use a kick board, but lie in side stroke position board under extended arm and kick.

Ask the swimmer to concentrate on kicking down and back during the forward motion.

Drill 4

Push from side of pool without a kick board and kick, face in the water, both arms out in front in a perfect streamline position.

Drill 5

Repeat drill number three without a board, resting head on outstretched arm. Practice first on pool deck until swimmer understands the pattern required.

BREATHING DRILLS

Playing in the water with drills to teach breath control, as no degree of competence in swimming can be achieved without a perfect breathing skill.

Drill 1

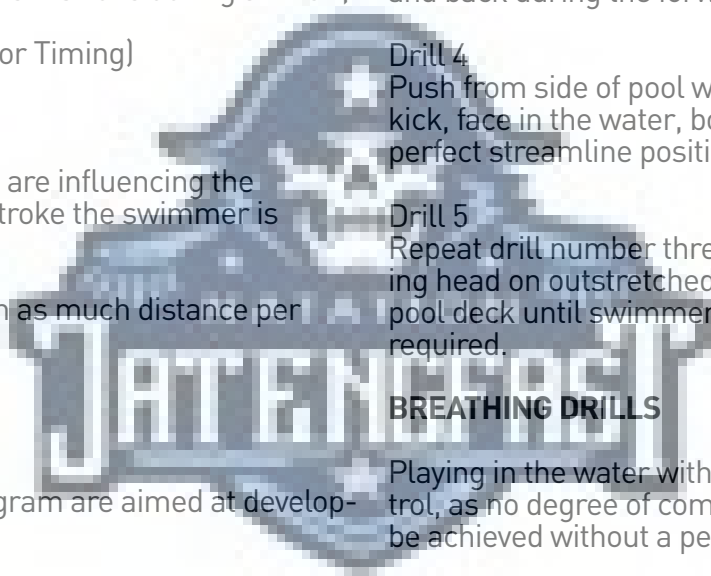
Hold the side of the pool and BOB the face up and down. Inhale air when the face is above water and exhale air when the face is under. Repeat 50 times.

Drill 2

The same as number 1, except that the swimmer rotates the head to inhale air as in swimming, exhale under water.

Keep the opposite ear in the water and hands on deck.

Exhale while head under water, turning head slowly and blow harder as mouth clears the water. Always move the head smoothly through the exercise....avoid jerking. Repeat 50 times.



Drill 3
As drill 2, except that the legs are kicking during exercise.
Repeat 50 times.

Drill 4
Kicking on the board with both arms out in front.

Then place one arm only on the board for support and recover the other arm and breathe while kicking.

Practice one arm recovery ½ pool than change to opposite side.

ARMS DRILLS

Drill 1(Chicken Wing)
Swimming freestyle up and down the pool, the swimmer touches their armpits with their thumbs, during recovery.

The swimmer should breath bilaterally and stroking continuously with the “chicken wings” action.

Very little pull takes place as the aim of the drill is to create a high elbow action that will aid in recovery.

Also the “chicken wing” action will rotate force the swimmer to rotate the shoulder girdle up so it will clear the water on the forward reach. (This drill should be performed sparingly and always maintaining a strong flutter kick).

Drill 2
Use pull boy to support feet and legs, without kicking and breathing, execute a specific number of arm pulls.

Concentration should be on arm pattern without breathing.

Drill 3
Same as above adding breathing technique.
Try first breathing every 6 strokes than 5, than 3.

This will allow more time to concentrate on the exhaling and preparing to breath.

Drill 4
Same as three except no pull boy.

Begin with a push from the wall and do not breathe for the first three arms.

Drill 5 (Catch-up Stroke)
The catch up drill is the best drill for developing timing of the kick, breath and pull.

The catch-up stroke starts from the prone glade with a kick.

The swimmer should place the left hand on the right, than he/she pulls the right arm through, concentrating on leading the elbow with the hand.

The swimmer should breathe on the side he/she is pulling.

The left hand remains on the surface until the right hand returns to the extended position. (The swimmer should kick continuously)

Then repeat the cycle with the left hand.

Caution should be exercised concerning dropping the elbow when performing this drill.

Drill 6 (One arm drill)
In this drill the swimmer holds one arm to his side, he than swims kicking, breathing rolling normally while stroking with the other arm.

Keeping his hand on his side allows a more natural body roll.

The swimmer should concentrate on the arm that is stroking, about timing of the kick, breathing, and head position.

The swimmer should perform this drill by going one length with one arm then one length with the other arm.

Concentration should be given to the arm pull pattern.

Drill 6 (Wall swimming)
This drill is performed by swimming around the pool with one shoulder touching the wall of the pool.

The swimmer should make every attempt to keep his shoulder in contact with the wall.

The elbow is brought high during the recovery.

Swimmer breathes towards the wall with fingertips near the water level.

The swimmer must pivot the shoulder above the water as he swings the arm forward.

This drill helps the swimmer not to pull wide and forces the swimmer to pull under and not outside their body.

After few laps, change direction to practice the other side.

Drill 7 (head above water)
Swimming with the head above water allows the swimmer to see the arm entry, placing it in front of the body, and recovery.

During this drill the swimmer should concentrate also on the stroke pattern under water.

Drill 8 (Exaggerated roll)

The drill starts on the left side, with the left arm extended forward over the head.

The right arm is resting on the side, with fingers pointing towards feet.

The swimmer kicks ten times and then presses water with the left hand and at the same time lifts the right elbow to perform a recovery action.

While the left hand is pulling through, the right continues to recover as the roll across the stomach with the face in the water takes place.

As the left arm finishes the push phase, the right hand enters the water.

Now the swimmer is on the right side ready for another ten kicks.

The legs should continue to kick while the roll takes place and is completed. (Then the cycle is continued)

By kicking ten times the swimmer has time to concentrate on the timing of the drill.

When roll, correct stroke and correct breathing is achieved during the ten kicks, the count drops to six kicks on each side, and finally to three kicks on each side.

This drill is a good tool during the warm-up exercise when warm-up for a competition, as it coordinates the stroke and gives a feeling of strength.

RACE PACE SPECIFIC DRILL

(Used with all strokes)

In my program, I am very specific when it comes to teaching and training swimmers on how to race in each event.

For this reason, I very seldom time swimmers for 25m sprints at maximum speed....In my opinion it does not serve any purpose.

I found, especially young age group swimmers develop wrong interpretation about what we ask them to do in a 50,100,200 or 400 meter events in regards to pacing.

In our HVO's work (fast repeats of 25m), I practice how I would like to see the swimmer swimming their 1st, 2nd, third and fourth 25 in their 100 race pace.

If we do them with dive I ask the swimmer to practice their first 25.

If I want to work on their 2nd, 3rd or fourth 25 than we start from the flags and I time them from feet on the wall after they execute a turn.

SUMMARY

The purpose of practicing drills is to improve the mechanics of the stroke.

However we have to remember that conditioning the swimmer to race is part of the equation in producing great results with minimum energy expended.

One simple tool the swimmer can use to gauge his stroke efficiency is "STROKE COUNT".

The swimmer will be asked to count his/her arm pulls and keep the same number of strokes each length of the pool and relate the result to a specific pace time.

Next the swimmer should be asked to eliminate one or two strokes and achieve the same pace time; the result is speed improvement and a more efficient stroke.

The better a swimmer becomes in developing their strength and conditioning themselves for a particular race the better the result.

When a swimmer through not pacing themselves properly during a race will result in deterioration of its stroke mechanics, and usually his/her stroke rate slows, stroke count goes up, and the time suffers.

STROKE FAULTS TO AVOID

Over the years I found that the most common, producing the greatest loss of power comes from:

- Dropping the elbows during the pull phase.
- Shoulders to low during recovery phase.
- Head to high.
- Incorrect timing and balance of the stroke.
- Bend knee instead of a limber action.
- Snaking of the body at the hips instead of a smooth roll on the long axis.

Soapbox 3

A Commotion about Notions

By The Late Bernie Wakefield

That great thinker of modern times, Edward De Bono, was first to publicise the principle of Lateral Thinking - at least in contemporary literature.

Just the very idea of pursuing other pathways of thought is in itself, a revelation.

Large problems and even small but elusive dilemmas facing us in day-to-day living can be analysed and determined with this simple talent within us. That is, if we possess, or can be taught, this intuitive skill.

Curiously enough though, the human mind can become so cluttered or dogmatic in its deep studies, it can refuse to admit there is such a passage to alternate thought and clings tenaciously to old and well-trodden paths of rationalisation.

Often, researching scientists follow this middle of the road approach' in order to obtain an errorless result (Proof).

In this respect, when dealing with human life, it is an admirable and recommended way to go.

It does however, drag scientific progress forward at draughthorse speed in comparison to the racehorse speed of lateral thinking. I admit to having some reservations on the term lateral thinking'.

To my often irrational mind it sounds like, sideways thinking'.

I prefer the expression, cast about reasoning in much the same way as a fisherman would cast around in different directions to catch fish.

Ideas and related thoughts are like slippery fish; they dart about constantly and are often difficult to hook. So a better result may be obtained by the angling method of casting about for new or abstract concepts - sometimes even into areas that are seemingly unproductive.

As an old fishing fanatic I have often caught outside fish in water too shallow to float the boat, simply by reasoning as a fish would on a flowing tide - slide into the shallows and ambush the little fish that think they reside there in safety.

Inspirational mind-images are like that, frequently hiding under the surface of the stream of consciousness waiting to be hooked!

De Bono wrote many books and conducted seminars on this very theme - on different ways of using our natural resources to obtain an objective result.

Certain methods of separating those mixed thoughts swirling around the mind require long, reflective hours, others demand instantaneous action.

These clear conclusions that require resolution in microseconds will be dealt with later.

Usually the long-term, time wasting decision we attain after days of gut-retching misery, is nearly always the right one anyhow - or at least one we can live with guilt-free!

Using De Bono's counsel these assessments can be achieved with some degree of certainty in minutes.

One such technique he taught for solving a worrying and sometimes insurmountable calculation is as simple as knowing how to spell.

All you need is a sheet of paper and a pencil.

Divide the paper into two columns.

Head one "The very worst things that can happen if I decide to..."

On the other side of the paper write the heading "All the best things that could occur if I make the same decision."

De Bono insists that the solution will be reached long before you finish either list.

The reason is radiantly lucid.

You have been forced to deliberate in an emotionless manner - the only sure way you can accomplish a result that has a very good chance of being right. Emotion causes all sorts of mental anxiety and the mind struggles to make momentous judgments when in this situation - if it has not been trained.

Most if not all the great ideas formulated over the centuries of civilisation were made when the mind was free of stress. Allowing the brain to operate in an unflustered and relaxed situation enables it to reach decisive conclusions without having to dodge the weapons of fear, anger, jealousy, hate, panic and other undisciplined thoughts.

The Americans came up with a slang word that very nearly fits similar situations - a "hunch".

These hunches often appear when the mind is on 'off-load' and are often described as 'gut feelings' but it really is the mind ticking over without strain and successfully searching those molecules of memory for an answer to the predicament.

"Intuition" and "instinct" are other perfectly good ways of describing this condition but it is sometimes associated with a feeling of illusion or mystery.

However, there should be no mystery about this "feeling", it is a thing, not just a word but a real and quite wonderful area of human ability.

You may not be able to see it but it is there -an inherent means of tapping our inner world of sub-conscious thinking. You don't have to prove it by mathematics or pure logic.

Like the normally invisible Universes of Protons and Neutrons; it exists. Remember what teachers say about multiple-choice questions in exams?

Always stick with your first thoughts, they are nearly always right.

Coping with instant decisions

Sometimes decisions have to be made instantly. Athletes of all calibres and professions are burdened with these pesky distractions that always arrive when least expected.

It is a final and your swimmer in lane 4 is expected to win this event in a certain manner. The plans have been made and there doesn't seem to be anything that can block the path to victory.

Suddenly, over in lane 8, an outside 'smoke' appears and dashes to a two metre lead. If the race is a 100m an instant decision has to be made in order to catch up. Increase the stroke rate? Or maybe stay cool and stick with the plan you have always used?

Possibly that swimmer is well known for these 'rabbit' tactics and you have nothing to fear from this ploy. But maybe he isn't and perhaps he was foxing in the heats; what now? Immediately you could find yourself in a totally invidious position.

You have decided to remain with your strategy and swim your own race but with 20m to go, lane 8 is still in front.

The ground you are making up at that pace is not sufficient to win -unless there is a dramatic slump in form of the front-runner. Are you going to risk the race and a possible fast time and throw everything into a last second burst of speed which may deprive you of energy or technique?

Or, do you hold your composure, maintain your race plan and keep an optimistic finger or two crossed?

Some tough decisions to make and not a lot of time to make them in. Psychologists call this decision making, "coping".

The art of making instant determinations under extreme pressure.

No place or time to be fiddling with paper and pencil!

Coping under Pressure

The skill of coping is best learnt in the training pool with the coach setting up similar situations that will severely test the swimmer.

They say that 'Forewarned is Forearmed' so if the race goes into this mode, staying calm and deciding what to do is just another mundane decision.

Being able to cope with any situation when it inevitably arises is part of every champion's armoury. Throwing in the occasional obstacle when it is least expected in training will assist in the swimmer staying relaxed and accepting it as normal if a similar event occurs during a race.

There are many ways of 'educating the Id' when encountering unexpected conditions.

As a coach you can use your 'cast-about' thinking to come up with a few to test your swimmers.

Perhaps the squad has entered the intensity phase of the macro cycle and now could be an excellent time to chuck a few worrying problems their way - just in case!

There is nothing quite like "experience" for learning - very fast!

- How about setting up a 'break-start' situation in a pre-arranged effort swim?

But do not recall the swimmers; see if they all continue to fight in this situation or stop, assuming it will be pulled up. No matter how good the starter, these things have been known to occur.

Ask Mark Stockwell about getting 'caught on the blocks' in the final of the 100m Freestyle at the Los Angeles Olympics.

A gold medal instead of silver may have been his had he studied the style of the Starter who had been using an over-fast starting technique for the entire meet!

- Use different timing techniques when doing Starts Training.

Not to confuse the swimmer but to teach them to concentrate more on preparation.

Study the Opposition

- “Know thy enemy,” says the Bible wisely.

Not that you should regard the starter as your enemy but it is always the smart thing to do at any meet; check out his techniques or idiosyncrasies.

Have a good knowledge of the rest of the field and how they take their races out.
Be like the Boy Scouts and always, ‘be prepared’.

Even so, shocks can and will occur and your swimmer needs to be able to cope with it when it does occur - without panic!

- Arrange a “rabbit” swimmer – preferably from unknown – in an organised effort swim.

Place him/her in an outside lane and watch the result to see how your swimmers react.

- Change the distance, or a stroke, of a formal effort swim (part of your normal program) – at the very last moment.
- Make them turn one metre short of the wall on a particular set.

This may seem as a negative exercise – to create an error into the pattern of racing but it does assist in realising the magnitude of such a careless error in a race.

And coping with such a situation if it does occur.

- After completion of a long set, tell them they are one lap short and now, for being careless, do it as an effort.

A bit unfair –but it does sort out the committed.

Be prepared for an angry reaction but learning to put up with life’s little peculiarities is just part of the Great Game of Life. One must adapt – or die!

You can always make it up to them later – if they do a good time!

- Spring an effort or quality swim on them after formal training has ended.

“Surprise, surprise, now we are going to do an effort 100 Freestyle!” But let’s not overdo it.

Swimmers have an amazingly short sense of humour in these circumstances!

- Organise an 800m or some such distance swim.

At the finish, tell the winner it is only 700 and keep going – or else!

This is guaranteed to tickle their funny bone!

Other simple drills can be entered into the training loads to toughen up the swimmer, physically or mentally so when a ‘crunch’ occurs they can handle it with strength.

Drills such as...

- Staying under water for longer than required on each turn.
- On starts, do the same.
- Swim first or last 25m of any sets – Butterfly
- Allow no kickboards or fins into the pool for a week – but do not change the program.
- Practise kicking the last 25m hard in any quality set.

Selecting the correct kick intensity is just as important as arms concentration during a race.

- In Butterfly and Breaststroke, count kicks for last lap and keep them the same rate as previous laps.
And, of course, the same speed!

That’s just a few, now it’s your turn.

Stroke Changing?

One of the reasons swim times are not dropping as they once did is that huge advances in technique and radical changes in training methods have reduced the possibility of large drops.

Another reason is that doping controls are preventing the cheats from prospering.

Perhaps pursuing the Lateral thinking paradigm may be the only answer to our future speed increases?

Maybe we should look closely at our present strokes and see if there is another method of propulsion within the stroke that has somehow passed us by as we relentlessly chased our tails in ever decreasing circles for stroking excellence.

One such thought has intrigued me for years without coming to any definite conclusion.

I’m referring to changes within the Butterfly stroke, because I see within this stroke the potential for great improvement.

Now that isn't an original or contemporary thought.

Many coaches have expressed the same notion since the inception of the stroke. Possibly Butterfly has always loomed as the opponent of Freestyle as the fastest stroke of the four competitive strokes.

Only the restrictions of the turn laws reduce it to second place in the sprinters stakes. An interesting comparison would be to line up the fastest Freestylers in the World against the fastest Butterflyers and compete them over a short distance – perhaps 25m.

My guess is that the Freestyler will nearly always win because of the probable better finishing process of legally being able to lunge with one arm compared to a requirement of a perfect layout of two arms in Butterfly. I seriously doubt there would be much in it if the Butterflyer had the benefit of finishing with one arm extended for the last stroke.

FINA changed the rule of turns in Backstroke to a 'no touch' situation. The only reason for change was to quicken up the times swum for this stroke event and make it easier for referees to sort out infractions of turns.

I see no reason why changes cannot be made to Butterfly and Breaststroke to enable turns and finishes with a one hand touch instead of two. And disregard the accompanying nonsense about being perfectly on the breast, etc.

So the possibility for increase in speed is
(a) rule changes to quicken up the turns and finishes or
(b) change the stroke pattern.

A Reflection

Let's pause a second and think about stroke progress over the years. Freestyle or crawl stroke as it was previously called, has just about ended its evolution – over any distance because the development of stroke technique and smarter training methods have peaked.

Ditto Backstroke. Breaststroke is close to its apex after a stormy and controversial history. The youngest stroke, Butterfly, has also appeared to have reached terminal velocity in terms of technique and speed.

Probably the reason for all this lack of forward development is because we have pursued technique as far as we can – within the rules of swimming – or have we? Let's look again at Freestyle.

It all began with a pattern that was dominated by the arms.

Then different types of kick entered the race for more speed. However, at that time it was considered as two parts – the arm stroke and the kick.

It's true we have now welded it into a certain pattern, albeit with a multitude of variations with arms and leg movements. Nevertheless we are still uncertain just how to match the kick and the stroke for best individual performance- especially over set distances.

Backstroke is almost identical and is simply upside down Freestyle – or close enough for this debate. Breaststroke suffered for many years from the thought that it was two separate parts; so much percentage speed from the kick and so much from the stroke.

It is only lately we have come to look at it as a design of stroke and kick in perfect continuity. Note that I have referred to these event strokes as stroke and kick.

It is my belief that the Butterfly stroke has suffered because we still speak about it having a such and such arm pattern and a dolphin kick. However, in reality, the entire stroke in combination of body and limbs is the closest humans can come to the natural action of sea denizens.

There is no separate stroke and kick with fish. It is a total action. The beautiful Butterfly stroke also has no division when it is done well.

Now if we refer to the so-called kick in Butterfly as a dolphin or flip action, we are closer to the truth.

Going back again to the infancy of Butterfly, 60 years ago; a giant Dutch girl by name of Ada Kok held the World record for 100m (1.04.4) for something like 10 years.

This was in itself a remarkable record in a period when times were dropping rapidly in all events and strokes as we absorbed new knowledge.

What is even more astonishing is that she did it with a ONE beat kick. Now I am not going to pursue that theory; she was just a freakish swimmer much like a number of Breaststrokers who, much later, developed a lot of speed through a narrow kick and fast turnover stroke and which certainly held back the advancement of that stroke for at least 10 years.

The point I intended to make was Ada's big kick was possibly more whale-like than dolphin and she possibly set up a huge shedding of vortices to enable her to perfect a powerful Action -Reaction flow field – a Newtonian concept.

Overall, the presumably not so powerful, but more effective, two beat flip used today produces more speed. This is probably because the less ponderous hip action created, reduces the form drag significantly in relation to the fluke-like movement of the one beat.

The stroke then refined itself from that point until the present moment when progress is being made only because we are swimming further distances under water.

Are we blind to the possibilities of this situation? The action underwater is not directly the same as the 'pure' dolphin action we use in butterfly.

It is a much faster turnover and strongly resembles the flipping body action of fishes – in a sideways action.

It could nearly be described as a twin Freestyle kick in unison. I believe now that some swimmers are experimenting with a sideways action underwater because it does not depart from the rules and it appears to produce more speed.

There is much less hip action in this underwater movement than a normal Butterfly rhythm. Surely the answer now must be to marry this, three or four – or could it be up to six beat kick into the Butterfly stroke. I believe it is possible. Over the years I have closely watched the development of this stroke and have seen some unique actions, some of them quite ugly, some different in other respects to the norm but many of them effective in their application.

A number of young swimmers I have observed used a conventional two beat action but at the end of the second flip emerged a flutter – a hybrid or could it be an embryonic, third kick perhaps? It is certainly possible and in my opinion it would certainly lift this stroke into another higher gear.

Another small but maybe interesting point.

The Chinese girls have been noted using a very high action in the arm recovery of Freestyle sprinting and this has been so potent that it is being rapidly copied. In the eighties a certain German swimmer by the name of Kristin Otto, a mermaid of many stroke talents and no doubt pharmaceutically assisted, swam butterfly with a notably high arm recovery.

That's just a thought, I'm not sure if it would synchronise with and assist a multiple beat action of the legs. Perhaps now you may understand why I appeared to waste so much time on discoursing the brain-tools of reasoning at the beginning of this article. Call it lateral thinking or whatever you like, but new ideas are like stars in the sky, limitless, and not always what they seem.

You may need to use special telescopes of reasoning to discover the one that you are seeking.

An Analogy or two

The growth of the internal combustion engine is a good analogy in relation to stroke evolution.

It is far from being the most perfect distributor of energy for the modern motorcar but it has been modified by researchers, thinking in a straight line, to the highly complicated and costly model fitted to all people movers on the road today.

The Steam engine emerged as an industrial unit of power some 50 years prior to the development of the internal combustion motor, fulfilling all the tasks it was designed for.

It was probably the real catalyst and driving force of the Industrial Revolution. With the emergence of passenger and other transport vehicles on the road it competed with the internal combustion engine for the powering of these units.

Despite offering vastly more power, less pollutants, and cheaper running costs, as its fuel did not require expensive refining, it fell well behind in the race for supplying energy for transport.

A steam engine built to today's exacting standard would not have the problems of its early days like excess water consumption or the need to carry a heavy load of coal. Only Factories, Locomotives and Ships stayed with steam despite its superiority at that time – not to mention less moving parts, silent running and no necessity for gears.

So how come this enigma?

No doubt politics and the money behind the big business of oil production played a large part in its demise. But how much better off would mankind be today had science followed its predictable pattern? And how much cleaner the Earth? And, who would hold the balance of power?

Nearer to the exercise of swimming, would the strokes be faster or more efficient today had we followed another pattern of stroke making? This is only one small failure of man to follow the course of nature and reality of science.

Mostly it has followed a foreseen blueprint. Copy the present champion.

Science and its discoveries is like a child growing up in a changing world of its own making. It stumbles and falls in infancy but makes fewer failures as it grows stronger and learns more about the world and its unchanging physical laws.

The emergence of man predictably follows the same pattern.

Over the past two thousand years or so since the great civilisation and knowledge of the Greeks, Man has stumbled a lot and accomplished little – up to the past two hundred years.

And then suddenly, came an explosion of knowledge. The advancement of man in this period is almost beyond belief if we compare the difference in years.

Why is this? Why did it take 2300 years for a man like Lavoisier to discover the real elements – not Aristotle's water, fire, earth and air?

Many of the Newtonian laws of relativity and mechanics have been surpassed, although still in common usage today – plane geometry for instance – but it still took 150 years and the genius of Einstein to develop quantum mechanics from Newton's work. But have we reached the end of the line with the atomic structure?

Or are there other worlds existing inside the tiny universes of Quarks and Mesons, etc?

The Future

How much farther can we go or do we now just refine everything we have discovered in this last frenzied two centuries or so. Probably so, it is difficult to imagine present laws of physics being overturned but it is certain we will develop new theories to improve on them.

And what the hell has all this to do with swimming?

I sure get carried away!

It could be possible we have reached our pinnacle because we are now obstructed by the physical and immutable laws of the atomic universe. For example; Man will never travel beyond the speed of light and that will end our travels through the universe and beyond. That is the certainty of science.

The Greek science of Aristotle was bound by tradition that prevented or slowed mans progress but science today is in full cry although still partly fettered by dogma or religion. However, man himself has not reached the "perfection" of science within himself.

Call it evolution of the species, survival of the strongest or natural selection, as did Darwin. Perhaps it is just a primitive desire to improve our lot in life ... an obsession to forever grasp for the stars.

It may be possible that we have not yet achieved the limits of conditioning and improvement of athletes by legal means.

Environment alone has accounted for a healthier life form in previous backward nations and we are still only on the edge of the perimeter in genetic research.

That too is a certainty to produce greater champions.

Any other progress will need to be made by improvements to technique – and that may require new pathways of thinking'. So here we are, by very devious means, back to lateral thinking.

And let us not ever forget man's power of will, his ability to not only survive by strength of character but his inherent striving to improve – by any means.

Swimming itself can be compared to the progress of man, scientific or otherwise.

It began with his ability to float and progress through the water at a moderate speed by using his arm as he did in dugouts and canoes.

Competitive swimming did not emerge however until the last few hundred years – as did Newtonian laws.

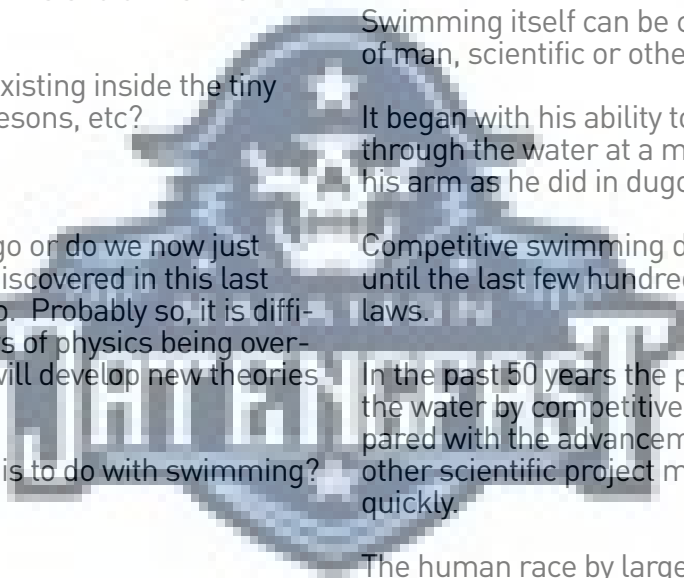
In the past 50 years the progress of speed through the water by competitive swimmers can be compared with the advancement of aviation or any other scientific project man has pursued ... very quickly.

The human race by large, tends to be copyists or modifiers; few have left their mark in history as vehicles of original thought yet we are all blessed with the same brains.

It just seems that the dreamers and not the analysts are responsible for new or original ideas – or at least are the ones who excite the builders to create, modify, perfect and prosper from their theories.

Did evolution or "natural selection" intend it to be this way? Why are we blessed with what appears to be two sets of brains, one logical and one imaginative, both far bigger than we are ever able to use in this era of time.

If not two separate brains then at least one split into two – a right side and a left side with one more predominant than the other side.



Is this what divides our poets and our scientists? What governs this phenomenon? There are some questions that may never be answered.

Perhaps, in this game of swimming competition, we need scientific analysts to build an accurate machine and assess its progress but we also need coaches of vision and intuition to prepare the way or – an alternate way.

Preparation of Sprint Swimmers

by: Gennadi Touretski

Summarised: by Michael Ursu

Gennadi: Coached for many years in Australia as the Head Coach of Australian Institute of Sport.

Some of his swimmers included Olympic Champions Alexander Popov and Michael Klim.

Gennadi is presently leaving in Switzerland and is helping Ian Thorpe in his comeback trial.

Introduction

The men's 100 Freestyle is regarded as the blue ribbon event of the Olympic Swimming, World Championships, with many gold medallists becoming household names.

Among the Olympic 100 Freestyle champions are two Australians ... John Devitt and Michael Wenden who were successful in 1960 and 1968 respectively.

I have been privileged to coach Aleksandre Popov the World 100m Freestyle champion in 1994 and 1998, double Olympic Champion in the 50 and 100m Freestyle in 1992 and 1996 and the current World Record Holder (48.21 set in 1994).

At the recent 1998 World Championships in Perth, Western Australia, Australian sprinters achieved significant success.

Michael Klim took a silver in the 100m Freestyle, a bronze in the 50m Freestyle, and gold medal in the 200m Freestyle.

Philosophy of Coaching

The philosophy of coaching sprint swimmers is not very different to training the other distances.

My philosophy is based on the understanding of two things.

- Firstly, athletes should be fit both physically and mentally and,
- Secondly technique should be perfected.

This approach helps us divide the preparation into specific parts.

There is no one particular successful method.

The great individual variation in the make-up of athletes ... age, gender, anthropometrical characteristics dictate that the preparation must be tailored to suit the requirements of each swimmer.

If we examine the characteristics of current champions in the sprint events,

- most of them are very tall (greater than 190cm in height),
- look very athletic and
- aged between 18 and 25 years.

In developing athletes, it is very important to find the key that is suitable for each individual personality.

For example, the key for the performance of Michael Klim for all distances and strokes is the 200m Freestyle event.

In comparison Aleksandre Popov, prepares for the 50 and 100m events only, without paying attention to his 200m performance.

One of the most important parts of the preparation is the training plan.

Our approach is based on the transformation of training from general to specific, aerobic to anaerobic, from endurance to speed.

The key of this preparation is to support and maintain speed throughout every phase right through the training season.

If there is a single factor that can identify the champion sprint athlete, and a common feature of the best sprint training programs, it is the ability to swim competitive speeds under the pressure of high workloads and training volume.

This is particularly important during the preparation about 4-5 weeks prior to the competition, when other swimmers do not swim close to competitive speeds.

The plan usually consists of four parts:

- General
- Specific
- Competitive
- Recovery

General Preparation

This phase starts with two weeks of technical and coordination work and reaches a volume of 40-50% of the peak volume for the season.

This is usually 35-50km of swimming per week with about 10 sessions per week in the water, and 5x45-minute dry land sessions of fitness work and

2x30-40 minute running sessions. At this time, we discuss the plan for the season and the means of developing technique.

Progressively the plan is to re-establish the level of the previous preparation. Testing including blood testing, body composition (skinfolds), the 7x200m Step Test, and 25m times is conducted.

It is very important to motivate the swimmers and prepare them for the goal of the cycle. A great deal of communication between the swimmer and the coach is essential.

In this stage we use sprint assisted training with surgical tubing, towing machine, and fins with the purpose to stimulate the physiological and neuromuscular adaptations necessary to swim fast while holding good technique (distance per stroke).

Occasionally we use fitness exercises in the water such as water polo and other games, and a great variety of swimming drills during regular training.

The next stage is to increase the training volume in three weeks up to a maximum of 80-100km per week.

This is achieved primarily by low to moderate intensity aerobic work in the AM sessions with total volume of 5-6km per session, with individual sprint and technique work conducted at the end of the session.

An example of this would be:

300m warm-up
DIVE 4 x 25m IM (SPRINT)
1x5000 distance with cruise speed
400m kick + 8x50m kick on 50
400m resistance (surgical tubing) + 8x25m assisted sprint

The afternoon session is based on repeating the previous distance work but this time broken into 100m's intervals but with a similar structure:

500m warm up
10x25m on 60
30x100m on 1:30 (1:10 for Michael Klim, heart rate 140-150bpm)
500m drills
20x100m on 1:40 (1:05, heart rate 150-160bpm)
400m kick
4x100m on 1:40
8x25m dive start on 2:00

The requirements for distance swimming and longer intervals centre on controlling the number of strokes per lap. For Michael, he is instructed to use no more than 30 strokes per lap swimming Freestyle.

We continue this type of work for 2-3 weeks with the intensity increasing after two weeks.

Specific

The goal of the 'Specific' phase is to prepare the skills and energy systems necessary for the competition. At this stage, the aim is to maximise the volume of swimming undertaken at competitive speeds.

From analysis of the training of the best athletes, it is evident that the proportion of speed and/or specific work rarely exceeds 20% of the total training volume. While the volume of work decreases and following the recommendation to decrease this some six weeks before racing.

The weekly training volume is still quite substantial and may reach 50-60km per week in this phase. In this phase, Michael Klim does not swim further than 6.5km per session with up to 10-12 sessions per week.

An example of the afternoon session for a standard Wednesday in the weekly program is:

600m warm-up
8x50m on 50 D1-4
8-10 x (400m [4:30] + 60s rest + 100m Freestyle (55 to 52 seconds))
1000m kick and pull
10x50m alt 100m pace, easy
300m swimming down
Competitive
The word 'tapering' is very commonly used by coaches.

The swimmer should develop his readiness in the general and specific phases to achieve competitive speeds in a heavy workload. This is particularly important for the second 50m of a 100m race and the second 100m of a 200m race.

Later this is achieved by reducing the volume and improving the recovery: speed will automatically develop through heightened activity of the nervous system and super compensation of physiological capacities. At this stage, a favourite exercise is three days of simulated competition approximately three weeks from competition, with a further day of time trials approximately 10 days from competition.

This work typically takes the form of:

300m warm-up
1x100m Butterfly (e.g. 54.60)
3x50m on 3:00 (e.g. 25.0, 24.6, 24.6)
6x100m recovery on 1:40 heart rate 130-140bpm
8x25m dive on 2:00
1000m kick and drills

The last high intensity training session is held five days before competition.

Technique

The key is constant attention to the quality of technique but without making excessive changes such that swimmers "lose" their technique and/or feel for the water.

To illustrate this point, I would like to relate a story from last year where we discussed technique with Scott Volkens (coach of Samantha Riley and Susie O'Neill) and a top Russian coach Victor Advyenko (coach of Olympic Champions Denis Parikratov and Evgeny Sadovyi).

Both described their training theories in about 20 minutes:

Journalists and coaches were very surprised that the two coaches had very different approaches:

Advyenko's approach could be characterised as high volume – low intensity while Volker's is medium volume and higher intensity. Both coaches have been extremely successful at the international level.

I have had the opportunity to work with both Volkens and Advyenko ... they shared one characteristic ... a great ability to control, influence and teach efficient technique. The most important aspect in teaching is that the swimmer is learning and acquiring the correct technique.

The swimmer needs to develop a self-organised psychosomatic system based on positive feedback using information derived from the training program.

The role of the coach is extremely important in selecting the information and using the correct words and images for the swimmer to understand and learn the skills.

In Australia, this is best illustrated by the 'heart rate' set where the coach informs the swimmer of the desired pace and heart rate. The swimmer needs to develop a balance between effort and technique in order to achieve the correct pace and intensity. In my opinion when we speak of technique we need to understand that this includes:

- biomechanical parameters such as stroke rate and stroke length,
- physiological responses such as lactate and heart rate, and of course
- performance and split times.
- This should act as positive feedback and influence the technique in the best possible way.

Immediately after the 1996 Olympic Games, Michael Klim's technique was modified to incorporate the old-fashioned straight arm recovery.

The longer recovery seems to lengthen the stroke.

The particularities of Michael's technique (straight arm recovery and late body pitch) moves his centre of mass forward which helps him to reach the correct horizontal body position without over kicking.

Generally I use the principle of the three R's to explain and teach good swimming technique.

Rhythm

The basis of maintaining the quality of motion. As soon as rhythm is lost, distance per stroke and speed decrease.

Range Through the stroke we can determine the optimal range for competitive swimming. In training the goal is to reduce the number of strokes per length.

Relaxation

John Weismuller was reported to have said that the secret of sprinting is in the recovery part of the stroke. The feel of the water is the ability to balance the propulsive forces and counter them through the stroke. In training, the goal is to minimise the intra cycle fluctuations in acceleration and deceleration that occur at different phases of the stroke.

Starts

The importance of starting and turning is well described in swimming literature.

In the 100m Freestyle event, the start and turn cover almost 30% of the total distance at a speed greater than the average race speed.

There are six essential points:

- Centre of gravity is in line with the front edge of the block
- The hips push forward as a trigger motion
- At the moment of leaving the block, the body is outstretched in a straight line, at the lowest possible angle to the water
- The whole body enters the pool through the same small hole
- The body remains rigid and streamlined in a torpedo-like trajectory

- The body reaches the surface at the smallest possible angle

Turns

- Maintain the maximal possible speed in the last 5m before the wall
- Use a minimum radius of rotation (head close to knees)
- No twisting of feet on the wall
- Streamline the body in the drive from the wall
- Stay under the following wave
- Keep lowest possible angle when breaking the surface

Summary

We need to answer many questions, in order to predict the situation in the Olympics. I will be considering the following issues:

- Predicting the opposition
- Competitive model for each individual event
- A model of the basic characteristics of each athlete
- The effects of various training factors such as volume, intensity, race schedule
- Methods of controlling and monitoring the athletes condition
- Calculating the magnitude and structure of the training loads
- The principle model of rehabilitation and support for the training process
- Prediction of positive and negative factors during training and competition phases up to and during the Olympics

As a coach I see three key steps in this planning process:

- Increase the number of competitive opportunities (quality racing)
- Improve the swimming technique
- Improve the fitness qualities of swimmers

The problem of organising sprint training is complex despite its outward simplicity. Perhaps sprint swimming is at a lower level of evolutionary development than that of other events on the swimming program.

Animal experiments and practical experience show that speed develops 3-4 times slower than strength and 23 times slower than endurance.

