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USRPT - COMMONLY ASKED QUESTIONS AND ANSWERS

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1. General

1. **Question:** How does one implement USRPT with senior swimmers who are accustomed to traditional volume training?

Answer: Traditionally-trained swimmers are not conditioned for the high-intensity swimming involved in USRPT. Consequently, they have to be gradually introduced to USRPT over at least one month. It is surprising that traditional training does not equip swimmers to perform at USRPT intensity, which is the intensity of racing. That leads one to speculate that traditional training is largely irrelevant for competing. Once USRPT is fully implemented and swimmer adaptation to the training form is complete, race-performances soon improve. The conversion of swimmers from traditional training to USRPT is covered in the document at <http://coachsci.sdsu.edu/swim/bullets/45b%20ADAPTING.pdf>.

2. **Question:** What are the initial expectations for newly introduced USRPT from a coach's perspective?

Answer: See the document referenced above. Swimmers who are dedicated to the beliefs of traditional training often are resistant to change, particularly if the USRPT tasks take them out of their comfort zone. If a coach states "reasonable performance expectations" in a USRPT set, but the swimmers are in no way adapted, swimmers view the difference between expectations and what they are able to do very negatively. It is important to gradually introduce USRPT and to wean swimmers off traditional (slow) training.

One of the biggest challenges is to undo the "brainwashing" associated with much of traditional training. "Garbage yardage" and heaps of any form of land-training are not related to performance improvements in serious swimmers despite the beliefs of both swimmers and coaches. When swimmers are schooled enough to read the research and track the performances of USRPT, conversion is much easier. When swimmers are asked to compare slower more-stressful traditional training to USRPT, the overwhelming preference and recognition of relevance is for USRPT.

The panel responsible for this article is of the opinion that coaches rather than swimmers are more resistant to changing from traditional training and all its irrelevancies to USRPT.

3. **Question:** How does one guide swimmers' perspectives about USRPT?

Answer: A step-by-step manual (<http://coachsci.sdsu.edu/swim/bullets/47GUIDE.pdf>) has been produced to lead a coach through the developmental and educational processes involved with the conversion of a traditional program to USRPT. The introduction should not be achieved in one session. It is recommended that at least one week be taken to teach the concepts and pool organizations for USRPT. There will be some clashes in terminology, for example, "failure". In traditional training failure is bad but in USRPT it is good because it indicates that a swimmer has pushed him/herself to the level of neural fatigue, a state which must be experienced for a training effect to occur.

4. **Question:** Are turns included in the race-pace time for each repetition?

Answer: When short-course 50s are performed at race-pace, in order for a swimmer to maintain the designated velocity the turns too have to be at race-pace. Consequently, USRPT trains the racing skill of turning much more frequently than traditional training. USRPT coaches frequently report that compliments about USRPT swimmers' racing skills are very frequently made by other coaches and other swimmers' parents. As well as turns, finishes should also be practiced, although not necessarily every time a hand-touch is used to complete a repetition. The senior writer of this article suggests that about a quarter of all hand-touch repetition completions be done as a race-pace finish (e.g., head-down, not breathing, increase in rate, etc.). It is further recommended that finishes be practiced in the latter repetitions of a set when fatigue is being experienced. Race-finishes are only made in fatigued states and so are best practiced in situations that closely fit what is experienced at the end of a race. When performing 25s as repetitions, finishes also can be practiced.

When training 25 m/y at 100-pace, turns usually are not included because it takes too long to return to the wall and be ready for next take-off within the 15-second rest period. Turns are always at race-pace when training 50s (200-pace turns are practiced at the same speed as if swimming a 100 or 200). In calculating an expected outcome of a race based on pace held in training, Peter Andrew has found for 100s only, another second needs to be added to the USRPT training time to account for the absent turns at practice. For example, if Michael Andrew swims 3-4 times the 100 m/y freestyle race-distance at 10 seconds per 25, on race day he is expected to swim 40.00 for the 100 FR but a 41.00 is acceptable to account for the added turns.

5. **Question:** What is the time-frame before results should be seen from USRPT?

Answer: After a sufficient base of USRPT is completed, swimming improvements can occur all year. When improvements in set completions or race-pace times are made harder there is an indication that a swimmer's performance for the targeted event has improved. Race improvements should be manifested after the training improvements have been consistently demonstrated. If for known or unknown reasons a swimmer's training performances vary frequently between improvements and regressions, positive race-predictions are unwarranted. Race-improvements can be predicted when training improvements are consistently evidenced. Individual variations in swimming capacities within a group do not allow single definite lengths of time for improvements to be expected. Race improvements are dependent on USRPT improvements.

Predicted improvements should only be relevant to the race-pace that has been practiced. For example, if a 200 m Freestyle time of 2:10.0 has been the basis of the repetition times used, when a swimmer can complete 3-5 times the 200-m race distance successfully at race-pace, one should expect the next 200 m Freestyle race to be completed in 2:10.0 or better. There is a stage in every swimmer for every event that when an adequate volume of successful practice repetitions are demonstrated at a particular race-pace, in the next race the target time or better will be achieved.

Race performances should change when swimmers start to complete significantly more repetitions before failure in one or more USRPT sets. Great individual variability exists in performance responses. However, as a very general rule-of-thumb, after a month of full USRPT participation and successful and improving race-pace sets, improvements in race-performances should occur.

Race-improvements come from technique, psychology, and conditioning, in that order. The race-specific factor in the volume specified for USRPT continually promotes the refinement of the neurological pathways associated with racing velocities and endurance, something that traditional training and its greater volumes of slow-swimming do not achieve. Very frequent or continual improvements in race performances improve swimmer motivation and confidence. Participation in the sport becomes fully enjoyable when improvements are signaled at practices and then revealed in competitions.

6. **Question:** With a swimmer who has a shoulder injury, is kicking a fair substitute to keep swimmers in the water?

Answer: Slow or distance-kicking with a board is not a substitution for kicking in free-swimming. On a board, kicking is propulsive. In free-swimming, kicking in all strokes other than breaststroke counterbalances the vertical forces created by the arms. Since the two movement functions serve different force-production purposes, their biomechanical properties are different. Isolated kicking at USRPT/traditional practices does not transfer any beneficial effects to free-swimming in serious swimmers (<http://coachsci.sdsu.edu/swim/biomechs/mookerje.htm>). However, in pre-pubescent swimmers, isolated kicking is related to 200 m swimming performance (<http://coachsci.sdsu.edu/swim/biomechs/oliveira.htm>).

Shoulder injuries in swimming are mostly over-use or land-training injuries. USRPT does not facilitate swimming-related injuries in the shoulders because of frequent rests. When techniques are correctly executed, injuries should be virtually non-existent in USRPT programs. Incorrect techniques that stress the shoulders and knees (in breaststroke) could cause injuries in both USRPT and traditional training. Correct techniques and their inclusion in USRPT practices are described in the Technique Macrocycle manual (<http://brentrushall.com/macro/index.htm>).

7. **Question:** What is the best source to understand the "science" behind USRPT?

Answer: Read the paper "Swimming Energy Training in the 21st Century: The Justification for Radical Changes (Second Edition)" for most of the answers to questions of a scientific nature (<http://coachsci.sdsu.edu/swim/bullets/energy39.pdf>).

8. **Question:** A number of coaches claim to provide USRPT experiences. For example, *Swimming World* published an article under the label of USRPT but it does not seem so (<http://www.swimmingworldmagazine.com/lane9/news/ascaeducation/39681.asp>). How does one judge a true USRPT coach?

Answer: Since the article referenced in the question concerned attributions to Dr. Rushall, he responded as follows:

"In the Swimming World article, Coach Ronald Hehn stated:

I attended Doc Rushall's clinic in Denton, TX this past December and he stressed that USRPT should not be exactly imitated; rather, each coach should exercise their creativity to have USRPT fit into their own pre-existing program. It's easier for the athletes to "buy-in" to a program that aligns with the coach's philosophy.

I asked five Denton attendees if they recall me stressing that. None responded that they did.

I thought I made it very clear that USRPT must be done exactly. USRPT only does what science says. I have tried to take all belief components out of swimming coaching. [Sure, that is extreme but it is a darn sight better than the belief-based nonsense that now pervades the sport as "traditional training".] I regret that Coach Hehn left with the wrong impression.

In the fifth and second last PowerPoint slides that I presented in Denton on the Saturday, the following were the first three bulleted points about USRPT:

- *Requires completely new thinking*
- *Discard currently held ideas.*
- *Accept that science is right and that opinions are mostly wrong.*

Those statements are the most important of those presented in the seminar. Every attempt should be made to prevent individuals from trying to translate USRPT into traditional coaching language/concepts/methods or personal biases."

There is no method currently available that endorses or verifies that a program uses USRPT as intended. That is largely due to the requirements for the coach to be highly knowledgeable about techniques, pedagogy, psychological/mental skills for race-preparation and racing, and conditioning (<http://coachsci.sdsu.edu/swim/bullets/49DEFINED.pdf>). What is required if swimmers/parents want to participate in a USRPT program is that the "customer" observes and evaluates what happens at a practice of the program in which they have an interest. Features that should be evident if the program is implementing USRPT features and structures follow.

The Swimmers

- *They perform sets in an orderly manner without the coach having to call out directions.*
- *Periodically, swimmers stop in their lanes and have a rest.*
- *Swimmers finish their participation in sets at different times.*
- *They seem to be trying very hard to swim fast and repeat each swim in a similar manner.*
- *Between sets, the swimmers interact, recover, and often get out of the pool and stand/walk on the deck.*
- *At the end of practice, swimmers are talkative, energetic, and seem happy.*

The Coach

- *Most instructions and interactions with swimmers concern technique.*
- *Organizational instructions are given at the start of practice, often between sets, and after the last set. Such instructions are brief.*
- *When practicing skills, the coach emphasizes only some features of the skill to be concentrated on by the swimmers.*
- *The coach does not time swimmers' performances very often.*
- *There is no calling out times to a group of swimmers.*
- *Most interactions with any swimmer are positive and hold the swimmer's attention.*
- *The coach physically demonstrates the technique feature being stressed.*
- *The outstanding feature that is very obvious is that the coach is coaching the swimmers to use better techniques.*
- *Very few periods of coach inactivity occur. When not coaching the coach is observing and analyzing swimmers.*

The Program

- *Each set is related to a particular event.*
- *Only one feature of technique is emphasized for the entire practice.*
- *Swimmers know their lane organizations (e.g., the order of swimming; leaving on 5-second intervals; when resting they move to the lane rope so as not to interfere with other swimmers; etc.)*
- *Very little slow swimming is exhibited by the swimmers.*

2. Training

1. **Question:** How are the sets supposed to progress and at what rate?

Answer: Swimmers are individuals and vary considerably. There is no one training prescription that benefits all swimmers. USRPT allows swimmers to work at a defined level until that performance standard cannot be maintained and also adjusts the performance standard to every individual's ability. In a USRPT set, swimmers perform to their own level of stroke quality and quantity. Other than training an individual alone, USRPT is the best form of training individualization that can be conducted with a group of swimmers. The rate of performance improvement is also an individual matter. Swimmer differences dictate that performances improve differently within a team/squad.

USRPT is only successful if swimmers want to improve. It depends upon swimmers trying their best in every set so that a beneficial outcome, called a training effect, is achieved. Improvements should be expected at every training session, not just at occasional swim meets. How training sets are formed and implemented is explained in detail in the step-by-step USRPT guide (<http://coachsci.sdsu.edu/swim/bullets/47GUIDE.pdf>).

2. **Question:** Do you find swimmers can get bored from doing these sets and if so how would you 'spice' them up?

Answer: Swimmers motivated to improve should not get bored in USRPT programs. Having a goal for every repetition in a set (i.e., the race-pace time for the repetition distance) satisfies the basic need of an optimally motivating program – there is a goal for every task. A different type of goal is encompassed in every set. Trying to improve the number of successful repetitions before the first failure and improving the total number of successful repetitions

before two successive or a total of three failures are quantifiable indications of whether or not a swimmer has improved over previous performances of the same set. Variety in training is not of concern here. Unless the same tasks are repeated, one cannot determine if swimming performances have improved from training. Traditional training restricts assessment tasks usually to tapered swim meets. The length of time between those meets usually is so long that there is little effect on the quality of swimming at daily practices. In contrast, USRPT provides daily opportunities to assess if swimming performances have changed which usually are for the better. With USRPT the vast majority of swimmers look forward to attending practices because of the motivational characteristics that are inherent in practice structures. Swimming practice attendance is usually better in USRPT programs than traditional programs. The USRPT practices have other motivational features, for example, post-set and post-session recovery periods are opportunities for social interactions that are not facilitated in typical traditional-training formats.

One further motivational aspect of USRPT is that swimmers are not exhausted and therefore, do not need tapering or extensive rest periods. USRPT swimmers should be able to swim fast all year. Extremely good performances are determined more by the motivational level for the meet than physiological recovery, the main feature of traditional program tapering. In USRPT, the approach to competing is termed "peaking", not tapering. How to peak is explained elsewhere (<http://coachsci.sdsu.edu/swim/bullets/45d%20PEAKING.pdf>).

3. **Question:** Should the goal times be current race times or PBs?

Answer: When first introduced, the "race-pace" times will depend upon the fitness state of the swimmer(s).

a. If the swimmers are unfit, which is a common state of many high-school swimmers at the start of their seasons, it is best to initially manipulate the goal-time for each USRPT set. For example, for swimming at 200-yard pace, a reasonable goal time might be "last-year's best time + 5 seconds". The level of demand should be manipulated to allow swimmers to cover a reasonable amount of total distance (3-5 times race-distance) in the repetition set. USRPT conditioning is rapid and so improvements should come quickly. It is not uncommon for initial conditioning to take three to four weeks to reach the point of using the previous year's best performances as goal times. A similar manipulation is needed for swimmers who return from extensive illness or injury.

b. If the swimmers are traditionally trained, that is they have some swimming fitness that is inappropriate for USRPT, the conversion is quite rapid to true USRPT goal times (race PBs). For the first 5-7 repetition sets, the set's goal time for each individual should be modified to slower than race-PBs to allow an acceptable total distance to be covered in the set (3-5 times race-distance). A coach should not take too long to have swimmers reach the stage of performing at true race-pace. The overall aim of USRPT is to swim fast and controlled (as opposed to all-out pace all the time as proposed by some exponents of High-intensity Interval Training). USRPT programs should always be looking for ways to challenge swimmers to perform at higher levels that relate directly to particular races. Faster swimming is achieved by also incorporating technique improvements (<http://brentrushall.com/macro/>) or mental skills (<http://brentrushall.com/personal/index.htm>).

c. Once adapted to USRPT, race times should be based on the most recent PB's achieved in competitions as long as the athlete competes often enough. Elite traditional swimmers compete less (a few taper meets per year) and can stagnate proper development and

improvement if they are waiting for a meet to assess whether race performances are better. If desired USRPT repetition performances are met, the "race-pace times" should be made more challenging regardless of what the current PB in the event is. USRPT allows athletes to expect to swim fast at every meet and eventually the swimmers will know exactly what to expect on race-day based on race-specific training and paces held during USRPT.

4. **Question:** Are swimmers expected to be able to swim 40 x 25m at 100m race-pace of current PB time, or their ultimate target time (e.g., Junior cut, National cut, or Olympic FINA A even if they are a way-off that time at the moment)?

Answer: Swimmers should not be expected to swim 40 repetitions of 25 m at a yet-to-be-performed race-pace. The 40 is an arbitrary number that if achieved indicates the target time is too easy for the swimmer. The difficulty of repetitions in terms of times to be achieved should be raised when that maximum number of repetitions is completed and the failure criteria are not demonstrated. Ideally, all swimmers should fail before the 40 (the maximum number of repetitions written for every set) is achieved. The coach has to be aware of every swimmer's performances in USRPT sets so that swimmers are challenged to the extent of always experiencing neural fatigue in a practice set, which results in a specific-event training effect. It is only when failure occurs that training effects happen (the beneficial outcomes of practicing). If a complete set is swum and obvious neural fatigue is not exhibited, then the set will not stimulate performance improvement. At best, it will only support the maintenance of current performance times. When expecting to get improvement benefits out of a practice, if a squad completes all repetitions in a set, the set is not a USRPT set. The central feature of accruing training effects at practice has not been accommodated.

USRPT is also a motivational system. Its structure is designed to have a goal for every repetition that is performed. A very high frequency of goal-attainment is important for competitive swimming enjoyment and interest. Rather than waiting for a meet for swimmers to assess if they are improving or not, that is accomplished at practice with USRPT. If a standardized set is performed twice and the number of successfully completed repetitions before the first failure is improved on the second occasion, it is valid to infer that the swimmer has improved in the potential to race that event beyond that which existed at the time of the previous training set. The organization to do that is described in the step-by-step manual (<http://coachsci.sdsu.edu/swim/bullets/47GUIDE.pdf> pages 1.22-1.27). Consequently, the goal times for every set for all swimmers should be established on an individual basis. Every swimmer should see a USRPT set as an opportunity to swim in an improved manner and perform better than before. If an unreal goal (e.g., a FINA time) was the standard always set, constant failure would result in disastrous effects. USRPT has two very important attributes; 1) it is individualized to every swimmer for all their events, and 2) swimmers are expected to improve in at least one USRPT set per training session. "USRPT swimmers should leave a practice a better swimmer than when they arrived."

5. **Question:** What happens if a swimmer fails within the first five repetitions in a set?

Answer: The answer to this question is partly addressed on page 1.24 of the step-by-step manual (<http://coachsci.sdsu.edu/swim/bullets/47GUIDE.pdf>). If previously the first five repetitions have been successfully completed, the reason(s) for the failure should be sought. Is the swimmer ill; exhausted from an outside-of-swimming stress; injured; out-of-sorts for that particular day? If there is a reasonable reason for the failure, and that reason would influence the remainder of that training session, it is recommended that the swimmer not continue and should be released early from that practice. Bad or poor swimming is bad

practice and should be prevented. There is no point in training if a substantial amount of training effects cannot be achieved. An incorrect response would be to have the swimmer complete slow "easy" swimming for the remainder of the practice. That would be a useless irrelevant activity. USRPT coaches should live by the belief that "race-pace swimming is useful; slow-swimming is useless". The recent proposal that USRPT programs minimize the amount of slow-swimming performed at a practice is being adopted by many programs.

6. **Question:** How much failure is too much failure? Physiologically and psychologically?

Answer: This question is addressed on page 1.25 of the step-by-step guide. Performance failure in USRPT is limited to neural fatigue, a state that recovers very quickly – certainly within a training session. Neural failure (an unrepeatable performance standard) is that which is experienced in a race and at meets where several events are swum in a session. Traditional training provokes performance failure due to blood acidity (high lactate levels) or the diminution of glycogen stores (the source of glucose for muscular energy and neural activity). Traditional training promotes fatigue states that are irrelevant for swimming racing or meet participation, are extremely stressful, and require extensive recovery time.

Since neural fatigue recovery occurs at USRPT practices, swimmers leave a practice recovered and with good feelings. In contrast, swimmers often leave traditional practices exhausted and with a need for as much as 48 hours for recovery, which is not accommodated because of the frequency of two-a-day or even one-a-day practices. USRPT should promote positive attitudes towards practices particularly if they are interpreted as opportunities to become better swimmers.

Every USRPT swim has a goal that requires concentration. If swimmers seem tired/listless/disinterested at a practice it is likely that some outside-of-swimming stress has produced an unacceptable level of stress reaction. That is more likely to occur on an individual basis but if it is observed across the squad (e.g., the first practice after a meet and associated travel) then program a lot of time aimed at improving turns, dives, underwater kicking, relay exchanges, etc.

7. **Question:** Before, in between, and after USRPT sets, what discipline should be enforced on the team? Drills, easy swimming, or is standing around talking acceptable practice?

Answer: In recovery periods at practice, activities should be fun or a low-stress time to counterbalance the high demands of the USRPT set. If pool space is crowded then do on-deck recovery activities (e.g., walking around the pool, going to the bathroom, light and easy calisthenics, etc.). Any safe activity that promotes active recovery is preferable to passive recovery. It is not worthwhile to perform supposedly-beneficial activities such as drills, or equipment use. Recovery periods are times when social talking can be tolerated as long as it is done quietly and does not disrupt swimmers still performing the USRPT set. As well, recovery periods are opportunities to talk about or work on turns and other racing skills. Interactions that are race-specific also allow a swimmer(s) and the coach to provide feedback and further refine technique features if required.

8. **Question:** If progress cannot be seen in a particular swimmer after several weeks are the pace times too tough?

Answer: Because abilities and endowed physical capacities differ so much between swimmers, the training responses to USRPT sets usually vary greatly within a team/squad. Training progress largely is measured by the number of successful repetitions completed

before the first failure. Of secondary importance is the total number of repetitions completed before two failures in a row or a total of three failures occur. When a swimmer does not improve in either of those two criteria over a full microcycle (usually one week) and has completed somewhere in the vicinity of 2-3 times the race-distance, it is possible that the swimmer's endurance capacity for that repetition performance has been maximized and that any further attempts at the same set will continue to show no further improvement (a "performance plateau" has been reached). Since USRPT is mostly focused on swimming fast, when a performance plateau is exhibited, a faster repetition time should be programmed and the number of successful repetitions at the new velocity standard will be reduced before the first failure.

When performances are stagnant, there are always the options of improving techniques (<http://brentrushall.com/macro/> or <http://coachsci.sdsu.edu/swim/bullets/Current44.pdf>) and focusing on mental skills training related to race-preparation and racing (<http://brentrushall.com/personal/index.htm>) to produce performance improvements.

In case the performance plateau is mediated by some factor other than training stress, technique, or mental skills, a sometimes successful coaching strategy is to increase the target time for repetitions so that they are easier and the swimmer completes more repetitions than in the plateau-state. Repetition performance standards should only be increased for this type of swimmer when the number of repetitions completed successfully is quite high (e.g., ~5 times race-distance). The size of the increase should be as small as possible (e.g., going from 36 seconds-high to 36 seconds-low for 50 m/y repetitions).

A happy swimmer is a fast swimmer. USRPT allows swimmers to lead a more balanced life because extraneous irrelevant training is not performed. USRPT allows more time for other activities normally sacrificed by traditionally-trained swimmers. Swimmers with unbalanced lives stagnate in performances or burn-out. USRPT with its integrative approach to technique, psychology, and conditioning provides opportunities to improve in performances no matter how long a swimmer's participation in the sport.¹

9. **Question:** Is USRPT modified in any way when swimming in 50 m long-course pools?

Answer: See pages 1.28 and 1.29 in the step-by-step USRPT planning and decision-making guide (<http://coachsci.sdsu.edu/swim/bullets/47GUIDE.pdf>). Long-course pools do not facilitate USRPT as well as short-course pools.

10. **Question:** What leeway is given for a race-pace time (e.g., 12.5 seconds per 25 m)? What is the acceptable range in race-pace repetition times before declaring a failure?

Answer: No leeway. Make the time on every trial. Do not teach swimmers to back off effort or expected performance ever. That makes it too easy for them to quit in a race and other training sets.

11. **Question:** How best to train 200/400 IM? Do they also do the 25s at 100 m IM Pace, or how are they mixed in with 100 m swimmers if they are at 200m pace?

Answer: See pages 1.10 and 1.11 in the step-by-step USRPT planning and decision-making guide (<http://coachsci.sdsu.edu/swim/bullets/47GUIDE.pdf>). Since the 100 m IM is a minor event, it is not considered in the USRPT explanatory papers.

¹ USRPT is very effective with masters swimmers. It improves performances notably to the extent that even in upper age-group classifications, the "clock is turned back" usually to surpass performances achieved with traditional training five or more years earlier.

12. **Question:** Is swimming a year-long program or is there time-off?

Answer: There should be no time-off from USRPT that allows detraining. If that occurs, then time is wasted recovering to the previous fitness/performance level. Retraining takes much longer than detraining. USRPT promotes a period of maintenance training as the way of releasing time away from the pool. Maintenance training is what it implies, it maintains fitness and skill levels without any detraining. What it involves is reducing the usual training volume by ~50% but retaining all the training quality factors undertaken before the change to maintenance training. When maintenance training is employed, swimmers should start the new USRPT season/semester/etc. with the same level of fitness and skill execution that existed at the end of the previous training period. Maintenance training can be employed at other times during a year (e.g., examination periods at school/college). Maintenance training is discussed in the introductory section of the USRPT article on peaking (<http://coachsci.sdsu.edu/swim/bullets/45d%20PEAKING.pdf>).

13. **Question:** We want to know what we should do if we start a set one day that we were able to complete a previous day, but cannot complete a single repetition, even after the preliminary five adjusting repetitions? What we have been doing is stopping at number 6 or 7 as if we failed, and taking one off. This usually allows us to go 2 or 3 more reps successfully before failing.

Answer: The description sounds like you are not fully fit to perform USRPT sets. You might want to repeat sets every other day rather than on consecutive days. On the in-between days do an event that is longer alternated with one that is shorter. This might be a plan: 200 Monday, 400 Tuesday, 200 Wednesday, 100 Thursday, 200 Friday.

If daily sets are required, for 200s do 50s one day and 25s the next. For 100s, you are stuck with 25s so on alternate days train for 50 m events.

However, I am set to wondering how much detraining occurred with your no-failure period? [The swimmers did three weeks of training never experiencing a failure. The absence of training effects would lead to detraining.] You might need to scale back the target times for your sets to be less than race-pace so that you can complete at least 12 50s and 24 25s. Then rebuild from there by improving the race-pace when you can do 18-24 50 m/y repetitions or 30+ 25 m/y repetitions. There could be a time when you are doing faster race-pace for 25 m/y repetitions than for 50 m/y repetitions. Ultimately, the two should catch-up.

In general, the strategy would be to adopt a race-pace where an acceptable amount of repetitions is completed and from there build the number of repetitions at that pace. When a high-end number of repetitions is achieved then consider improving the race-pace velocity for the set. It is important to accomplish an acceptable volume of specific repetitions to derive a valuable training effect (i.e., failure). Completing too few repetitions in a set is not likely to stimulate much performance improvement.

14. **Question:** Is there a need for a special diet to augment recovery from USRPT?

Answer: To these authors' knowledge, there have been no research studies on the dietary needs of USRPT swimmers. Since glycogen stores are somewhat preserved in USRPT when compared to traditional training, there is likely to be less of a demand on carbohydrate-heavy diets. As with most sports, a good well-balanced diet that meets the energy demands of USRPT participation is all that is needed.

Recovery from exercise is enhanced with the consumption of carbohydrate-protein drinks. While there are several expensive carbohydrate-protein beverages and powders-for-drinks on the market, an equally effective recovery beverage is chocolate milk in full-fat, low-fat, and fat-free forms. When consumed during a meet, the fat-free or low-fat forms are preferable because fats do slow recovery slightly. After the meet, full-fat chocolate milk is acceptable because it provides calories in the form of fats and the speed of recovery from a fatigue associated with a full day of swimming meet participation is not particularly important. After a meet, food and fluids should be consumed as soon as possible.

There are no commercial products that provide competitive swimmers with any dietary advantage over that which can be attained through good natural diets. Some commercial beverages when evaluated over a short-term may provide an energy boost but for continuous training over a season or year, natural foods are as beneficial.

Swimmers and athletes in general are warned not to buy into the hype of special "wonder foods" or particular supplements. The research literature in nutrition is deep in studies that show particular substances change some physiological parameters in the human body. However, because physiological factors are altered and in theory those factors are supposed to be associated with swimming performances, does not mean performances will be improved after their ingestion. Only a few stimulating substances (e.g., caffeine) reliably improve performances in many people. However, the effects of caffeine can be bested by better techniques or mental skills applications. There is some impressive research that suggests the effects of caffeine are placebo effects (i.e., they are in the athlete's mind).

15. **Question:** How often should USRPT be trained if stroke development is still ongoing?

Answer: Stroke/skill techniques are taught in conjunction with USRPT. Ideally, the coach works on technique and the swimmers take responsibility for and monitor their performances in every repetition set. Technique is the main feature of USRPT because there is no limit to skill development. After peak fitness for a particular race is achieved (about three months in traditional training but more likely two months in USRPT) the only opportunities to improve are through technique development and mental skills training for race-preparation and racing. To understand the relationships between technique, psychology, and fitness see <http://coachsci.sdsu.edu/swim/bullets/49DEFINED.pdf>.

3. Competing

1. **Question:** How often would you recommend competition racing throughout a cycle/semester?

Answer: USRPT swimmers should be able to compete at any time because they do not suffer debilitating exhaustion. Whenever a swimmer demonstrates improvements at practice, good meets/trips are available, and the swimmer wants to compete, racing should be accommodated. Improvements can happen from one week to the next. However, a coach should not sacrifice training for competitions. For very important meets, USRPT-peaking should be instituted to maximize swimmers' motivations and positive approaches to competing (<http://coachsci.sdsu.edu/swim/bullets/45d%20PEAKING.pdf>).

2. **Question:** Taper(?) Science?

Answer: In USRPT, it is peaking that should be employed to maximize the motivational features of performing to the best of one's capacity. Peaking does not resemble the tapering

process of traditional swimming training. Peaking is discussed at <http://coachsci.sdsu.edu/swim/bullets/45d%20PEAKING.pdf>.

3. **Question:** How is USRPT formatted for a multiple-race day?

Answer: USRPT can support the training for four events at a 2-hour practice, assuming a training set plus recovery takes no longer than 30 minutes. If each event-training is longer than 30 minutes, then usually three events can be accommodated in a session. Swimmers adapted to USRPT can tolerate that amount of fast swimming in the ultra-short interval training format that is the conditioning basis for USRPT. The advantage of this type of training is that in one practice three or more events are trained. That prepares swimmers to perform in at least three or four events in one competition session. As well, the demands of USRPT train the body to recover faster and to adapt in each race faster than in rarely-relevant traditional training. In time, coaches should notice the faster event-recoveries at meets as well as the ability of swimmers to prepare for multiple races in one session of the meet. With USRPT, there is no need to continually swim between events when races are close together. Swimmers only need to recover from one race the same way as is done at USRPT practices. A single race is not as stressful on a swimmer as a single USRPT set at practice. Well-adapted USRPT swimmers discover that swimming meets can be enjoyable because they are fully prepared for meet demands.

4. **Question:** Are there any test sets used in conjunction with USRPT?

Answer: No. USRPT sets are the basis for assessing swimmer progress. If the number of successful repetitions completed before the first failure and/or the number of successful repetitions completed before two consecutive failures or a total of three failures are better than in the previous performance of the same set, then swimming improvement in race-specific demands have been demonstrated. While no research has been published to date (any graduate student want a thesis topic?), the number of swimmers and coaches who relate practice improvements to the expectation of race-performance improvements is quite extensive. Whether the race improvements are caused by a placebo effect or an aspect of training effect is not known. It would seem a reasonable hypothesis that both true-cause and placebo work together in USRPT race-performance improvements.

To be able to trust the expectation of improved meet performances from improved training performances requires swimmers to log their training performances accurately so that improvements can be determined. The aspects of USRPT that should be recorded are:

- Every set and the pace-time.
- How many repetitions were successfully completed before the first failure.
- How many repetitions were completed before two failures in a row or a total of three failures.
- Whether there was an improvement in repetitions before the first failure or the total successful repetitions compared to the set that was swum at a previous practice.

5. **Question:** How does a swimmer cool-down at a meet using USRPT?

Answer: There is no magic cool-down. USRPT swimmers are usually able to recover from a race at a meet doing what they do at practice between sets. Cool-downs do not have to be done in the water which often requires extensive swimming at a relatively fast speed for a considerable time (just slower than 1500 m race-pace for 15 minutes (<http://coachsci.sdsu.edu/swim/training/mcmaster.htm>)). As has been stated elsewhere,

swimmers and their bodies learn to recover quickly because of the demands to recover fully at USRPT practices. That is an advantage over traditional training where performance restoration through recovery is rarely considered.

[It is the intention of the senior author of this paper to produce a USRPT paper on warming-up and cooling-down at practices and meets. It should be available before September, 2014.]

4. Technique

1. **Question:** Should technique be practiced slowly before training in USRPT sets?

Answer: Slow-swimming trains a different technique to fast-swimming. Slow-swimming should only be used for a few trials so that the swimmer understands the nature of the technique change to be incorporated into race-pace swimming. Extensive slow-swimming is only appropriate for beginner swimmers. It is not a pace that benefits racing at any level. Few people understand that techniques change with swimming velocity. In the same swimmer, the technique to swim at 1500 m pace is different to that required for 100 m pace. Technique changes should be coached during USRPT sets. If swimmers are in control of their interval and repetition times and fit in with the staggered organization within a group using the same lane, then the coach is released to work on technique with one or more swimmers every time they have a rest within a set and between sets.

2. **Question:** If technique is not correct in a USRPT set, should the swimmer be stopped or allowed to race in trashy technique style?

Answer: Swimmers should train with the technique that gives them the ability to hold repetition times that are based on their most recent race times. Since technique is the most important aspect of USRPT training, the implementation of technique instruction in a pedagogically correct manner with content that follows a sound backward-shaping procedure should pervade all USRPT sessions. Instruction should occur at race-pace because techniques are specific to particular swimming velocities. Beneficial methods of instruction and an overall program of instruction have been described and are in e-book form (<http://brentrushall.com/pedagog/index.htm>). The implementation of a correct teaching sequence, the center-to-periphery principle, and backward-shaping for productive skill development have also been described (<http://brentrushall.com/macro/>) as a technique macrocycle. It takes at least eight weeks of microcycles to complete a full macrocycle of technique instruction. Because swimmers are almost constantly changing in their capacities to swim with excellent propelling efficiency, frequently repeating the technique macrocycle throughout the year and year after year is a sound programming principle. As macrocycles are repeated, the criteria for judging whether a swimmer is complying with the technique principles should incrementally increase so that the technique aspects of performances are continually improved or refined to higher standards. It usually takes 2-3 cycles of the same technique program for a very noticeable change to permanent good technique to be observed. What is unique about USRPT technique development is that separate features of technique are instructed in-depth in a defined sequence so that stroke forms are "built" over time. The traditional coaching approach of promoting change to techniques across all features at any time does not result in effective instruction. USRPT technique instruction is effective, pedagogically sound, and data-based.

3. **Question:** When doing drill specific sets should the speed be increased, descending, or practiced at slow speeds?

Answer: *Since drills are not race-specific they are not considered in USRPT. Drills might be helpful for beginner swimmers, but they are harmful for accomplished swimmers. The theory and scientific evidence encompassing drill use in established swimming programs does not support them being beneficial in any way. See: <http://brentrushall.com/pedagog/index.htm> pages 1.3-1.11; and for a variety of research findings visit the following.*

- *Tethered swimming trains the wrong techniques (<http://coachsci.sdsu.edu/swim/training/maglisc1.htm>).*
- *Some forms of auxiliary training have to be wrong (<http://coachsci.sdsu.edu/swim/training/payne.htm>).*
- *Hand paddles violate the Principle of Specificity (<http://coachsci.sdsu.edu/swim/training/ogita.htm>).*
- *Two forms of countermovement jumping improve jumping performance (<http://coachsci.sdsu.edu/swim/training/basgier.htm>).*
- *Training emphasis on kicking does not improve free-swimming performance (<http://coachsci.sdsu.edu/swim/training/konstan2.htm>).*
- *Slow kicking does not train anything but it provides valuable recovery (<http://coachsci.sdsu.edu/swim/biomechs/mookerje.htm>).*
- *Arms-only swimming training produces training effects but they do not transfer to free-swimming (<http://coachsci.sdsu.edu/swim/training/konstant.htm>).*
- *Tethered swimming performance is associated with 50m performance in young swimmers (<http://coachsci.sdsu.edu/swim/training/douda.htm>).*
- *Resisted swimming alters arm actions (<http://coachsci.sdsu.edu/swim/training/gourgoul.htm>).*
- *Drag suits are of no value (<http://coachsci.sdsu.edu/swim/training/dragunas.htm>).*
- *Crawl-stroke drills have at least one thing in common with free-swimming (<http://coachsci.sdsu.edu/swim/biomechs/arellano.htm>).*
- *Slow butterfly swimming does not replicate fast butterfly swimming (<http://coachsci.sdsu.edu/swim/biomechs/de%20jesus.htm>).*

Swimming drills and equipment train neuromuscular patterns that are irrelevant to accomplished swimming techniques. The specificity of skill learning accounts for why one does not use drills, equipment, slow-swimming, etc. (<http://brentrushall.com/macro/>).

5. Land-training

1. **Question:** If you believe weight training to be ‘irrelevant’ how is it that weight training has shown to work with swimmers over time?

Answer: *Where is the evidence to support land-training as being beneficial to accomplished swimmers? See the following international studies which show the findings of land-training ineffectiveness to be a universal phenomenon.*

- *Weight training is of no value to age-groupers (<http://coachsci.sdsu.edu/swim/training/bulgakov.htm>).*
- *Land-training is of little value (<http://coachsci.sdsu.edu/swim/training/costill1.htm>).*
- *Strength most related to swimming 25 yards (<http://coachsci.sdsu.edu/swim/training/sharp1.htm>).*

- *Land-based training of no benefit to mature swimmers* (<http://coachsci.sdsu.edu/swim/training/tanaka.htm>).
- *Auxiliary training forms produce different effects* (<http://coachsci.sdsu.edu/swim/training/sexsmith.htm>).
- *Some forms of auxiliary training have to be wrong* (<http://coachsci.sdsu.edu/swim/training/payne.htm>).
- *Muscular strength not related to sprint-swimming performance* (<http://coachsci.sdsu.edu/swim/training/crowe.htm>).
- *High training and dryland training demands are not related to improvement in swimming performance* (<http://coachsci.sdsu.edu/swim/training/sokolova.htm>).
- *Strength training only improves strength training activities in swimmers* (<http://coachsci.sdsu.edu/swim/training/breed.htm>).
- *Aquatic plyometrics do not improve swimmers' performances* (<http://coachsci.sdsu.edu/swim/training/wilson.htm>).
- *Training on a Power Rack only improves performance on a Power Rack* (<http://coachsci.sdsu.edu/swim/training/wright2.htm>).
- *Confounded study produces dangerous implications* (<http://coachsci.sdsu.edu/swim/training/hohmann.htm>).
- *Land-training might not halt loss of swimming strength in a "hard training" program* (<http://coachsci.sdsu.edu/swim/training/havriluk2.htm>).
- *Training perspectives of Dr. David Costill on strength, training volume, and tapering* (<http://coachsci.sdsu.edu/swim/training/costill3.htm>).

Keep in mind – WEIGHTS DO NOT FLOAT!!!! If a coach stresses land-training, then pool-training will be compromised reducing the number of training effects and amounts of race-pace work.

This is not the place to go into the neurophysiology of the specificity of movement activities and the way they are coded in the brain. When a comprehensive review of the literature was conducted for the B. S. Rushall and F. S. Pyke book "Training for sports and fitness" (1990 Macmillan Australia) on the topic of one strength activity transferring effects to another activity four criteria had to be present – the training item had to replicate the movement patterns of the target movement, the contraction velocity had to be the same between the two activities, the contraction type had to be the same, and the contraction force had to be the same. A variation in one of those factors will prevent transfer and will not enhance performances (p. 229). Land- or resistance-training might be beneficial for sport injury prevention (doubtful), rehabilitation, and increasing muscle mass (inadvisable for swimming). Three other factors that moderate supposed beneficial transfer from land-training activities to swimming are:

- i. The smaller the group of muscles used in strength training activities, the lower is the potential for transfer of training effects to sporting activities.*
- ii. The more restricted/localized the strength training activity, the lower is the potential for transfer of training effects to sporting activities.*
- iii. Because of the restricted nature of any transfer effects, the benefits to be expected from general strength training programs have to be realized as being relatively insignificant or trivial.*

Thus, cross-training, various forms of strength training (e.g., core, explosive, etc.), and other fad activities (e.g., pilates, slow-speed training, etc.) provide no benefit for performances of the types of movements executed in swimming race-paces. Even when resistance-training programs change the nature of muscle fibers the changes cannot be educated into swimming or similar movements (<http://www-rohan.sdsu.edu/dept/coachsci/csa/vol21/sale.htm>). Professor Rushall's most recent in-depth discussion on the specificity of movement training is contained in a book (Volume 3) involving physical training and conditioning for baseball pitching (<http://brentrushall.com/baseball/index.htm>).

6. Age-Group Swimmers

1. **Question:** At what age should USRPT be started?

***Answer:** In moderation at the age of eight years. From then on it increases in offerings per year (see the step-by-step manual pages 1.3-1.5). The USRPT emphasis on technique at race-pace starts right from the youngest age. In the early years, coaches should aim to have their swimmers achieve because of good technique, not physical conditioning.*

2. **Question:** What stage of technique is required before USRPT can be incorporated?

***Answer:** The technique to be used in fast swimming should commence when fast swimming is required. In competitive swimming, it is pointless to teach "slow-swimming technique" no matter what a swimmer's age (<http://coachsci.sdsu.edu/swim/bullets/LTAD38.pdf>). The first level of swimming technique development in the e-book "Swimming pedagogy and a curriculum for stroke development (Second Edition)" is appropriate for the youngest competitive swimmers (<http://brentrushall.com/pedagog/index.htm>). It might take well over one year to have the four strokes and all racing skills performed competently in youngsters. The reasons for the aspects of technique that are suggested are explained in the e-book "A swimming technique macrocycle" (<http://brentrushall.com/macro/index.htm>).*

[Editor's note: At various times, new questions and answers will be added and inserted in the appropriate section.]