

# STROKEARCS

The Newsletter of the Association of Rowing Coaches, South Africa

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# COACHING SKILLS

## GETTING PARENTS TO WORK WITH YOU, NOT AGAINST YOU

### INTRODUCTION

Believe it or not, 99% of all parents out there are sane and workable. If you want to be a successful coach you have to deliberately make an effort to train them. The following is a list of strategies and ideas that will help you in this endeavor.

### ONE

Most parents who push, do so because they don't know how to be helpful and do not understand the effects that this has on you and their child.

### TWO

You are in a position as a coach to give parents the 2 things that they want the most and that frequently causes them to say and do unhelpful things. They want their child to feel happy. They want their child to be successful.

### THREE

Help parents redefine what it means to be a winner. Winning is not about coming in 1st. It's about pushing your own limits and constantly striving to do better than your best. You're a winner if you drop time off a previous best, even if you come in dead last.

### FOUR

Help parents redefine competition. It is not appropriate to distract a swimmer with thoughts of beating someone else. Help parents understand that a focus on the competition usually results in slower times and performance problems. The competition is your partner and your real obstacle lies within. Train them to encourage their children to compete against themselves.

### FIVE

Help refocus parents. All too often parents get their children to be concerned with the uncontrollables (UC's) in a meet (i.e., competition, crowd, race heat, water temperatures, last year's race, qualifying, etc.). Teach parents that a focus on the UC's will only get the child into performance trouble. Instead the swimmer should be encouraged to focus on what they can control (i.e., themselves).

### SIX

Don't use a crisis intervention model with parents. Don't wait for problems and emotions to arise before you are forced to deal with them. Use a preventive model and

commit yourself to training parents from day 1 in your program. Actively educate them with verbal and written material.

### SEVEN

In writing, state clearly your coaching philosophy, coaching style, club policies and view about competition. Don't leave any of this material to their imagination. They have a right to know and you have a responsibility to clarify these for them.

### EIGHT

Clearly define the roles of swimmer, coach and parent so they know what is expected of them and how they can best help the team. For parents specifically state that coaching is something you do and they don't. Define what it means to coach so that they won't have any confusion about the matter.

### NINE

Define appropriate meet/practice behavior, the do's and don'ts for both swimmer and parents and explain why this is so. Spell out clearly the consequences for violating appropriate behavior so when you intervene it doesn't come as a surprise.

### TEN



Establish yourself as an expert. You know the sport, (even if you're inexperienced) and it's your job to see that things are run the way you see fit. Although parents may challenge you on this, act as if you are the expert in a non-defensive way. If you feel unsure of yourself consult regularly with other more experienced coaches.

### ELEVEN

Define a common mission for the team and organization. Let parents know where you want to go and how they can help you and their children reach these goals.

### TWELVE

Communicate. Keep lines of communication open between you and the parents. Be approachable. Encourage them to bring their problems to you directly. Listen to them and give them the feeling that you hear them and can understand where they are coming from, even if you don't agree with them.

### THIRTEEN

Keep professional whenever possible. Do not use your emotions to respond to problem parents. If they push your buttons, keep your emotions out of your interactions with them. If you lose your professional perspective, you can't be effective.

### FOURTEEN

Help parents understand the developmental perspective

you have in training. Most parents don't understand why their child isn't going faster immediately and winning everything in sight. Explain to them about the long term process you are involved in with their child and the proper way to measure success with it.

## FIFTEEN

Teach parents the principles of peak performance which they can then use as a guideline for what to say and do with their swimmer



# SELECTION

## SEAT RACING AS PART OF SELECTION

### 1. Context

- *Selection is an issue for all crews.*
- *Dissatisfaction with selection procedures or outcomes is a common negative factor in crew performance.*
- *Good selection policy and procedures are a useful management tool.*
  - Rowing is a team sport, teams must be chosen.
  - Bad selection or selection that doesn't meet the expectations of the team will reduce performance and enjoyment.
  - Just look at all the headlines!
  - Good selection is a way of managing athletes. Use selection as a way of managing expectations, good selection shows the athletes why the decisions have been made.

### 2. Selection Philosophy

- *All selection tests are an approximation of the final event.*
  - Time.
  - Usually distance.
  - Often boat type.
- *Continuum from social to performance driven.*
  - Selection is always done before the event, no substitutions in rowing!
  - So, the selector is making a choice before the event about which athletes he / she thinks will be fastest on race day over a specific course.
  - Information to make this choice is imperfect. Tests are done before the event, over different distances, in different boats.
  - From this imperfect information the selector must extrapolate forward to race day and make a judgement.

### 3. Selection Methods

- Continuum from subjective to objective.
  - Social.
    - Who turns up.
    - Taking turns.
      - More appropriate for children, recreational.
  - Coaches opinion.

- Technique.
- Compatibility.
- Age.
- Experience / service.
  - Opinions are valid, but make sure the athletes know that opinion is the basis.
  - Technique is a valid selection criterion but hard to measure.
  - Age is a valid measurement, too young.
  - Experience, do last year's medals count?
  - Service, do you reward loyalty? What effect does this have on other people and their performance?

### – Physiology

- • Size / weight etc
- • Ergo scores
  - Training scores
  - Maxima
  - Weight adjusted maxima
  - Easily measured but what is the effect on boat speed?
  - Low tech or high tech? Height, weight, wingspan or Max oxygen uptake and anaerobic thresholds?
  - What ergo score? 2km? 5km?, maximal or submaximal? Which machine on which setting? What if any weight correction factor?

### – Racing

- Regattas
- Time trials
- Matrices
- Seat racing
  - Which regattas? If you are racing 2km then relatively easy. How to simulate the HERR or WeHERR. Henley? Boat Race?
  - Time trials. What distance? Relatively easy to manipulate.
  - Matrix. Good and useful but require fleets of identical boats, multi lane courses etc. Big assumption that 2- speed equates to 8 speed.

### 4. Choosing a Selection Process

- • *To suit crew and objective.*
- • *To suit facilities and abilities.*
- • *Usually a mix of tests is better.*
  - Fit the tests to the ambitions of the crews. Don't repeatedly test young people on the ergo. A-M small etc.
  - Fit the tests to the water and testing equipment you have. Don't seat race on the Tideway!
  - Tests should fit the training at the time, long in winter, shorter in summer.
  - Test that which you are training. Simple tests can work, pull ups!

### 5. The Case for Seat Racing

- *Advantages.*
  - Fair
  - Transparent
  - Repeatable
  - Good training

- Can be a good simulation of racing
- **Disadvantages.**
  - Time consuming
  - Requires space and equipment
  - Requires a good level of rowing ability.

## 6. Principles of Seat Racing.

- *Everything held constant except athletes.*
- *Comparisons are one to one, athlete to athlete.*
- *Each race after the null race gives only one piece of information*
  - Only thing changed is one athlete per boat. This gives a measure of those two athletes.
  - Null race tells nothing about the athletes but may tell something about a crew.

## 7. Assumptions for Seat Racing.

- *All athletes are honest and well motivated.*
- *All athletes have comparable levels of fitness and skill.*

## 8. The Rules of Seat Racing

- Only one change at a time.
- Athletes must not know what the next change is.
- Times don't matter, differences do.
  - Exception is a double change and a comparison with an earlier race.
  - Athletes know neither the number of races or the next change.
  - Total time is irrelevant to the seat racing. It does give information about the general level of the team.

## 9. Procedure

- *Use fours.*
- *Coxed is usually better than not.*
- *Decide a distance.*
- *Decide, and enforce, a rate.*
- *Boats must be similar and capable of being rigged identically. Identical boats are better.*
  - Eights too clumsy
  - Steering is vital, can distract the steersman and leads to difficulty boating crews.
  - I use 1500m
  - I use 34 or free.
  - Similar boats are acceptable, rig must be identical. Usual convention is that athletes can change height and stretcher only.
- *Course should be straight, and have consistent conditions across both lanes.*
- *Bouyed courses are significantly superior.*
- *Cox'ns, if used, say nothing except rate.*
- *Boats stay in same lane.*
- *All comparisons are done between crews with only one difference.*
- *All sequences require a null race with a small difference between the crews.*
- *Changing two athletes at a time is allowed but the comparison is with an earlier crew.*
- *If in doubt, change back.*

- If the null race has more than 1 length difference start again.
- Careful! Change two athletes so that in effect you go back to the previous line up and make a single change.
- If any result seems doubtful, change back and check.

- *Comparisons are only allowed within sessions.*
- *Less than 1 sec is not a result.*
- *All athletes should have the same number of races.*
  - You cannot compare between sessions.
  - Draws are acceptable data.
  - This applies if you have more than 2 boatfuls.

## 10. Common Errors

- *Inconsistent water.*
- *Too great a distance between crews.*
- *Rating differences.*
- *One or more incompetent athlete.*
- *Bad steering.*

## 11. Traps

- *Not thinking ahead.*
  - Decide what comparisons you need, boat crews accordingly.
- *Not having enough time.*
- *Too many races.*



ASSOCIATION OF ROWING COACHES, SOUTH AFRICA

# COACHING DEVELOPMENT THE HARDEST THING ABOUT COACHING

So what is the hardest thing about coaching anyway? It is a simple question. We all understand what it means. No doubt we all have some idea about how we would answer it. It seems like a simple question that will have a simple answer.

However, when we asked the question by e-mail recently to a group of coaches

from across the country, the answers we got were far from simple, and very far from unanimous. Even the process of how we asked the question went from simple to complex in a very short time. It all began on a peaceful morning in February. [I was sitting on the pool deck with Joel White, our women's assistant coach, and we were looking at the water while we were waiting for swimmers to come in for a morning warm up. We were just sitting there, talking a little, when Joel turned to me and said simply: "What do you think the hardest thing is about coaching?"

Phew. Pause. Gulp. Wow. Inhale. Exhale. "You know what?" I said to Joel. "That is a really important question." We didn't talk much more because swimmers came in to

swim, but I thought about it a lot more. Then, I wrote to John Leonard, and I asked John what he thought about putting the question to a lot of coaches and then trying to collect and collate the answers. "Do it," John said. And just as simply as that, the question went out by e-mail to a group of coaches, and from that group to another group, and another group ... until the e-mail had circulated to a lot of coaches all across Indiana and all across the country.

In less than a month, we received some 50 responses, also from all across Indiana and all across the country.

"The use of e-mail to create this forum is a wonderful thing," wrote Chuck Warner from Rutgers as he passed the question on to other coaches in New Jersey. "Thanks for the question," wrote Randy Julian from the USA Swimming Office in Colorado Springs: "I think ALL coaches should go through this exercise and have this discussion with their staffs." John Leonard, who saw most of the responses, wrote that he thought the question might have "hit a cord." Not everyone, however, was so complimentary.

Writing from Florida, ASCA's Guy Edson did not like the question at all. "I'll be the contrarian," wrote Guy. "I don't like the question." He continued: "I don't like throwing the question out there because it creates a frenzy of negativity. When I read the email I fell into the trap and went searching through my experiences for the most negative things I could think of. What a rush of images! But then I caught myself and thought: 'Why am I doing this?' I would never ask my swim team: 'what's the hardest part of workout?' Consider instead: 'What's the most challenging part of workout [coaching] that you have nevertheless found a way to overcome?' That is the question we should be asking.

In fact, several of the responses did go directly from identifying the hardest thing about coaching to defining a more perfect world of coaching. Chuck Warner, again writing from his Rutgers position during this very difficult year for Rutgers' men's team, lived Guy Edson's dictum by writing a very similar sentence on two different days from the two different sides of the question. "The hardest thing about coaching," wrote Chuck Warner on one day, "is keeping the spirits of our athletes high when yours are not." A few days later, Chuck wrote back: "The best thing

about coaching is going to a practice that has joy and laughter in it. You are down, and they pick you up." Both of these sentences refer to and are in the context of the decision by Rutgers to drop men's swimming after this season. Turning a potential negative into a positive is, I think, one of the points Guy Edson is making. The "joy and laughter" practice is reminiscent of Eddie Reese's famous dictum that "the magic is in the kids." True to form, Eddie Reese, in his response, did remind us again to focus more on the athletes and less on the difficulties involved in coaching the athletes.



Overall, perhaps predictably, but none the less interestingly, few of the responses identified the hardest thing about coaching as something that happens when a swimmer is in the water. Most of the responses identified things that happen out of the water as the hardest thing about coaching. From his vantage point in the National Team office, Mark Schubert put it this way: "Dealing with everything that has nothing to do with coaching... all the issues... that take place away from the pool that have a vital influence on what happens in the pool is the hardest thing about coaching."

Karin Adams, one of Chuck Warner's coaching colleagues in New Jersey, after a detailed and emotional story wrote with a full and loving heart what we heard from several young coaches: "... [we] realized that the hardest things about coaching don't happen in the

water. They happen in our emotions, our minds, our hearts ... So many directions we can all go in pondering the problem and the solution..."

Parents (the "bad kind") took some of the heaviest criticism from coaches identifying the hardest thing about coaching. "It's trying to get parents to understand the big picture ...not the age group championships ...but eventually jrs, srs, ntl, and ON!" wrote Don King from up in the North West. "It isn't the kids," wrote another. "They have good days and bad days, but they are kids. The hardest part for me is the nit-picking adults."

"When I interviewed for my job," wrote Jim Voss from Duneland, Indiana, "one board member told me that 10% of the people were going to love what I did; that 80% would go along with it; and that 10% would hate it." So, wrote Jim, I try to deal with the positive 90%, but "as a

wrap - my answer - the 10% parent." John Krick from Crown Point, Indiana, wrote that it helped him when he was advised to think of people in his club each playing a role. A person can play one role only: coach - parent - child - official, he writes. "I thought that was appropriate," he said.

"I think the answer to this question [the hardest thing about coaching] changes as our society values and morals change," wrote Meg Gates Osborne from Heritage Christian School in Indianapolis. "Presently, the feeling of 'entitlement' by athletes

[which is] being enforced by parents is inhibiting coaches from being able to truly teach life skills and values." Speaking for a lot of coaches who made a similar comment, Meg continued: "I realize that parents want the best for their kids" but sometimes winning isn't the best. "In my opinion," concluded Meg, "a pool, lane lines, and some black lines are just a place for kids to learn life lessons. It's not about the time or place. It's about how you got there and what did you learn inside those lane lines."

Younger coaches and coaches of younger swimmers frequently turned to values learned (and questions to be asked and answered) that go beyond the sport itself as the hardest thing to do "correctly" and well. "Knowing everything," is the hardest thing, wrote Lee Willing from Austin, Texas, "trying to come up with the best answers when athletes expect you know ALL answers." "My biggest fear," writes Jeff Mercer, from Pendleton, Indiana, "is not doing it right in regards to the swimmer.., In my mind is the constant yearning to know the end result."

The hardest thing is the "constant questions you need to ask yourself about each swimmer, and each program you design." is what Brian King writes from California. It is "the constant quest for improvement." And even when you are finished and you know the answer, "there are still improvements to be made," writes Brian. Meanwhile, in the middle of the country and from his work with coaches in all the Central States, Randy Julian stresses that "maintaining that core conviction about what you are doing" in the midst of all the distractions from inside and outside is the hardest thing about coaching.

As the e-mail conversation continued and responses came in from around the country, it became more and more clear that common issues exist all over the place. So much so that this email circuit began to function almost like a high level and very upscale blog spot with coaches thinking, sharing, reaching out, looking forward (they said)

to whatever summary might come from all of the answers. There maybe nothing new under the sun, or under the water either, but sharing similar experiences and ideas and thoughts with other coaches in similar situations can be helpful, supportive, educational, even liberating.



What is inspiring and very perceptible about the comments received is that coaches of all ages and of all age groups care passionately about their swimmers and about their sport and want to do a good job of teaching and helping their team members. "It's a helping profession," writes John Leonard. "We teach; we educate; and we assist."

Clearly, as swimmers age and as coaches gain more experience or coach older swimmers, some of the answers to the hardest thing about coaching question begin to involve individual swimmers in the decision and the answer. For me, it's "finding out how to motivate each swimmer," writes Alex Steger from his Thunderbolts team... but also, he continues "the more time I spend coaching the more I believe in Doc Counsilman's X-Factor talk."

"Teaching responsibility to each team member," writes Bill Wadley from Ohio State, "to the extent that they understand that they are indeed the one person who can make the biggest difference in their swimming performance." Personal individual responsibility. That is a long way from nit-picking parents and entitlement, but that too is part of the answer to this very big question.

"After a lot of thought," writes Bailey Weathers from his USA Swimming Office in Colorado Springs on this theme of personal responsibility. "It comes down to one simple thing." The hardest thing about coaching "is watching an athlete make a mistake or mistakes that will negate many of their good efforts and intentions." Armanda Juntunen, who also noted that sometimes at big clinics, a young coach's thoughts "aren't worth a stink" wrote bravely in this forum. She agrees with Bailey Weathers. The hardest thing about coaching, she writes "is watching swimmers with great potential not care, or fall short for lack of trying." The sound bite on this topic, however, came from none other than John Leonard himself.

"Unrealized potential," he wrote, "is painful to watch." Sometimes, however, everyone (swimmers, coaches, parents...) appears to do everything right, but things still don't work out. What

then? "Aye, there's the rub." Stuart Faux, writing from his Quantico Sharks team puts it this way: "I think the hardest thing about coaching is dealing with an athlete who does all the right things and works as hard as he/she can all year, only to come up a bit short at the end of the season." We have all been there, and we all recognize Stuart's wisdom when he says: "That situation is hard from two perspectives. One - convincing the athlete that if he/she 'gets back up on the horse' and keeps doing the right things, success will eventually come. [That] can be a tough sell sometimes. Two - the feeling within ourselves that we have somehow let that person down and not done our job as a coach to help them reach their goals."

Mark Hesse from Sugar Creek Swim Club says much the same thing. He writes that: "the hardest thing in coaching is seeing the disappointment of an athlete or team whom you know has done all the right things and worked hard but did not reach their goal(s). Your heart (at least mine) aches for them as you and they search for answers and justification for this perceived failure." Our heart aches too, Coach. So does Jimmy Tierney's at Northwestern. The hardest thing about coaching, he thinks, is: "motivating an athlete after a season without major success."

Long time Johns Hopkins coach George Kennedy is known to all as a sensitive soul. His heart aches too in situations such as Mark Hesse and Stuart Faux describe. But also, George reminds us, "the hardest thing about coaching is to each year get the swimmers to understand it isn't about the taper." It isn't just about how many race pace 50's is the correct number

of race pace 50's, even though, as George also notes, how many race pace 50's you do is always important. Rather, says George. "it is about understanding that it is about the entire season; what you did to get prepared for the season; and the balance of work and rest in our LIVE"- Really, he says, it's "more about the 20-22 hours a day that are outside of a coach's control ... and since we are all (to some extent) control freaks, this is very hard." Check, George. Got it.



"So, if you take this to be the hardest part." George continues, "then the real CHALLENGE for a coach is to provide the opportunities where each swimmer can 'let go' and rid themselves of the limitations that they place on themselves." The move that George just

made from what is hard to what is a challenge to be overcome is a move that several coaches made in their replies. It is also a move that is directly in line with Guy Edson's advice earlier.

Another way to listen to George Kennedy's report on the hardest thing about coaching is to hear him saying: "it's not about the taper; it's about your whole life." It is, of course, but still, what a huge statement. Keep going. The next sentence goes like this: the hardest thing about coaching is that it involves your whole life, and the whole lives of each of your swimmers too. It doesn't get any bigger than that, or any more noble either.

Coaches writing in this forum, however, were not trying to make coaching any bigger than it already is. Rather, they were sometimes wondering if it were possible to make coaching any smaller, so that it might fit more neatly into the whole rest of their lives. In short, they were worrying about the (inevitable) "B" word: "Balance."

"My knee jerk reaction [to what is the hardest thing about coaching]," writes Brian Hindson from Central Indiana Aquatics "is parents ... but really, I think it is finding the time to do everything I want to do for the kids, the team, my friends, my family, and me." Tyson Wellock puts it even more simply. The hardest thing about coaching, he says, is "balancing between the needs and commitments of your athletes and their parents, and the needs and commitments of your family." And then he adds: "We don't even have kids yet. I can only imagine." Indeed, Tyson, indeed. "Finding the happy point of 'I've done all I can' seems to be the most elusive thing to me and therefore

the toughest part of this sport," writes John Zack from Portage High School. "Knowing when you have given enough," he says "is the toughest thing." Then he adds a sentence heard in many coaching households: "Now my wife [or husband] on the other hand feels that I give enough and sacrifice enough ... but honestly, you have to wonder if it really is."

Balance. Balance. Balance. It comes up everywhere. Every coach has asked and had to answer questions such as the ones above. Once upon a time, even John Leonard challenged us to "diversify" (staying away from the "B" word for a minute) our lives when he wrote this: "If all you do is coach, what can you bring to your coaching?"

I wrote the words "once upon a time" and "even" John Leonard because the "B" word, "Balance", particularly when it occurs in a phrase such as "a well balanced life," is currently in disrepute in many high performance circles, including the ASCA Office. Guy Edson speaks every year to the ASCA Fellows about the virtues of "imbalance;" George Block, speaking last September to the 2006 Fellows Class at the World Clinic, said: "Give me the passionate unbalanced person every time." A backward glance from this perspective at George Kennedy's hunt for ways to help his athletes "remove the limitations they place on themselves" does cause a person to wonder whether removing those limitations makes the swimmers more balanced or more unbalanced in the direction of high level performance. And, if this is not enough, turn to the spring issue of the ASCA Newsletter (Volume 2007, Issue 3). There you will find a reprint of a Fast Company article by Keith Hammonds entitled "Balance is Bunk!" in which he states emphatically: "The quest for balance between work and life, as we've come to think of it, isn't just a losing proposition, it's a hurtful, destructive one (p.3)." And, a few paragraphs later, he adds "All our striving for balance is only making us crazy (p.3)." What to do? What to do? And what to say to a 30-something person who is married with children, who loves both children and spouse, and who wants to coach, and stay married, and stay sane - not to mention the thought that if this person who wants to coach is a woman, the challenge can be even harder? Is it possible to coach and "have it all" as the saying goes? Let's face it, Keith Hammonds continues, "leadership [in a competitive environment] requires commitment, passion, and to be blunt, a lot of time (p.3)." Needless to say, coaching is leadership; and coaching certainly does require "commitment, passion, and ... a lot of time." Everyone agrees on that point.

So, is that it? Is balancing coaching within the coach's whole life the hardest thing about coaching? "Yes," for some coaches; but also "No," not necessarily for all coaches. What does seem to be true is that all coaches do have to answer this balance, passion, commitment, time challenge for themselves in order to build a career in coaching. It does (one hopes anyway) help that several strategies for meeting this challenge are included in Keith Hammonds article.

Indeed, the more responses we read, the clearer it became that "what is the hardest thing about coaching?" is a very big question. Eddie Reese made it even bigger,

when he asked: "What is coaching (theoretical vs. actual)?" Mick Nelson in the USA Swimming Office had an answer for him. It is "sticking to a plan," wrote Mick. And the plan is to "recognize people's efforts," to "appreciate people," to "give people more than they expect," and "to use common sense." Easier said than done, of course, but that is precisely Mick Nelson's point. The hardest thing about coaching is doing these four things on a consistent basis. John Leonard almost got the whole definition down in three words: We "teach;" we "educate;" and we "assist." "Everything else," he says, "is too sophisticated for my simple water boy brain."

One more challenge, and then the list is done. Dave Salo, writing from his first year desk at the University of Southern California, wonders if changing jobs is the hardest thing about coaching. "The hardest thing about coaching," Dave writes "is the first year of a new assignment." Then, he explains: "The first year is theirs."

It takes a few years for it to become `mine."  
And then in time it remains important for there to be an appreciation that it is `ours' and that we are all on the same page.

There is much more wisdom here than can be unpacked in a couple of sentences. Working together, working synergistically (if we want to use a New Age type term for it), working with mutual inter-dependence is what brings about the highest levels of excellence. This is a definition worth reading over and over again. This is coaching writ both small and large. Achieving this is certainly one of the hardest and most valuable things about coaching. In other ASCA contexts, this is what "The American Swimming Team" is about: an appreciation over time that "it is `ours' and that we are all on the same page."  
Back to the topic at hand. With all the challenges that are now on the list of the hardest thing about coaching, did anyone consider not coaching? No, not even close. In fact, Ira Klein pointed out that the hardest thing of all may be not coaching at all. "The hardest thing about coaching," writes Ira "is stepping aside and from the sidelines watching others do it."

Why do we do it? Mark Hesse knows why, and a good guess is that all of the participants in this conversation will agree. We are not talking about the hardest thing about coaching, now. We are talking about the best. "The best thing about coaching," Mark Hesse writes for all of us " is 4, 5, 8, 10, or 15 years later, when you hear from or about [your former swimmers] and all the things they have done, and achieved, and have just been in their lives. Their realization of how they were transformed by the process of striving [while they were swimming] is their next step towards true greatness. For family and friends, it is heartwarming. For their coach, it is truly priceless."

Yes, Indeed, Mark. Thank you. And thanks to all for contributing to this on-going conversation.

# TRAINING PRINCIPLES

## HOW TO UNDERSTAND TRAINING

In this article professor Atko Viru of the University of Tartu, Estonia, presents a simplified synopsis on training adaptation. Re-printed with permission from *Modern Athlete and Coach*.

It is widely accepted that training consists of systematically performed exercises in order to improve the physical capacities and acquired technical skills of an event. Experience and, to a certain extent, the results of related studies suggest to the coach what are the appropriate exercises. The testing of physical capacities, the visual evaluation of technique and, above all, the competition results, will indicate how effective the training exercises have been (Figure 1).

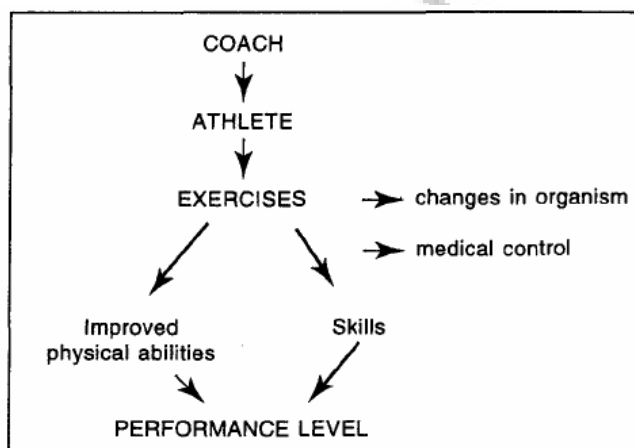


FIGURE 1

The same scheme is presented with a small modification in Figure 2. The modification consists of the additional changes in the organism that occur as the result of the performed exercises. It appears that Figure 2 represents only a small modification that emphasizes physiological knowledge. However, this modification actually means a principal change in the approach, as the new approach is based on the following established facts in physiological and biochemical studies:

1. Good performances, and top results in particular, are due to the changes in the organism that distinguishes between the 'Homo Olympicus' and a sedentary person, 'Homo Sedentarius'.
2. Certain changes are necessary to improve physical capacities, to acquire technical skills, and to achieve an extensive mobilization of the organism's motor potential during competitions.
3. The character, intensity and duration of training exercises, as well as the peculiarities in the involvement of various muscle groups and motor units, determine the adaptive changes in the organism when the exercise is systematically repeated.

4. The specific dependence of the changes in the organism on the employed exercises is based on

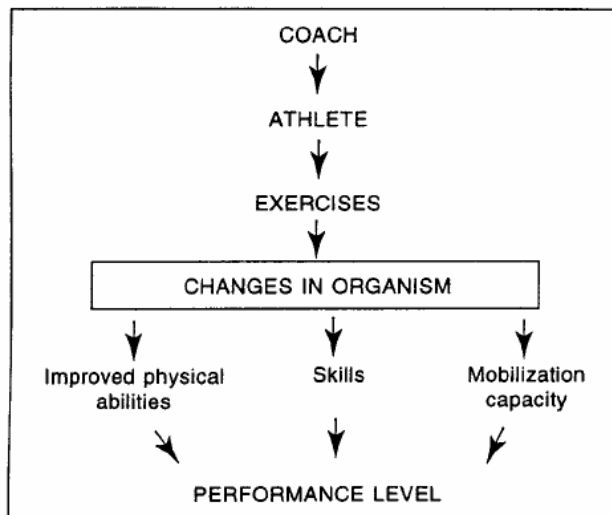


FIGURE 2

the exercise-induced adaptive protein synthesis. The metabolic and hormonal changes during and after the exercise are the inducers for the specific synthesis of proteins that assures an increase in the most active cellular structures and an increase of the enzyme molecules catalyzed in the metabolic pathways.

The idea of the scheme in Figure 2 therefore indicates that each training exercise results in specific changes in the organism which are necessary to obtain the objectives of training. Collectively the changes caused by the various exercises assure an increased performance level.

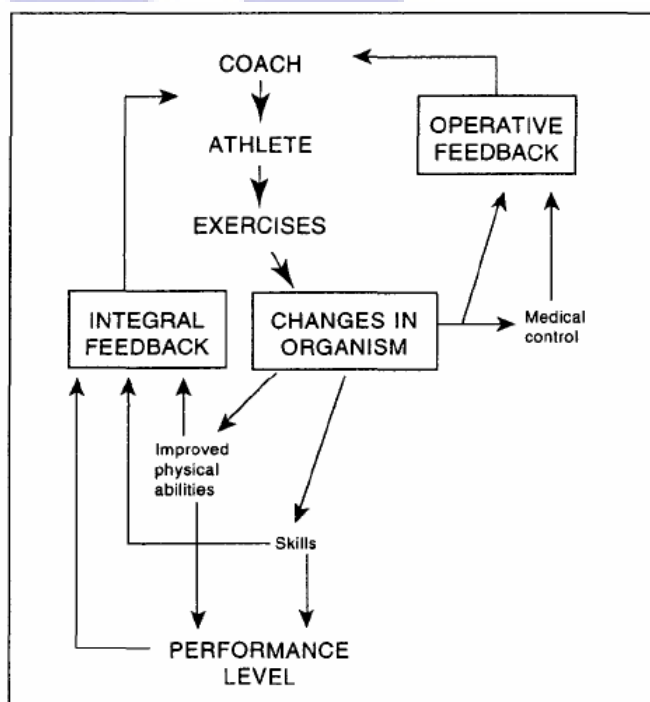


FIGURE 3

The advantages of using this scheme in the practical organization of training are:

- Each exercise will be performed in order to achieve a concrete objective in the form of a certain change in the organism.
- The resulting changes make it possible to check the effectiveness of each exercise (or at least a group of exercises).

“Blind”exercising will be avoided this way and training will become a well controlled process. However, changes in the organism are not the only objective.

They will also serve as means for an operative feedback to control the effectiveness of training (Figure 3).

The feedback from the changes in the organism is more specific in comparison to the feedback obtained from improved physical capacities and competition results. The feedback from physical capacities and competition results is an integral one, summing up the total positive and negative changes that might have occurred during a prolonged period. The conclusions made from this kind of feedback are therefore only relatively truthful, allowing the evaluation of a general trend but not the details of the whole training process.

Carrying out feedback from the changes in the organism is in reality a complicated task. There are two possibilities available to the coach:

- To use the help of sport physicians and special laboratories.
- To be supplied with tests that describe indirectly but with sufficient validity the main changes in the organism caused by certain training exercises.

Whatever the case, coaches must understand the corresponding information in order to use it for the guidance of training processes. The practical use of the scheme outlined above requires an understanding of what are the necessary changes to achieve. The aim of training - a top level performance. This, in turn, leads to an analysis of factors that limit performances in a particular event in order to find the best solution (Figure 4).

Top level competition results depend on training, as well as on genetic characteristics. However, it must be emphasized that there are no genetically induced factors that directly determine competition results in any single event. The positive (or negative) significance of genetic factors become apparent in training. There is an interrelation. Training makes it possible to use genetically induced manifestations in the improvements of performances. At the same time, the effectiveness of

training in various directions depends on the susceptibility of the organism to the various training exercises.

The tasks related to the achievement of top level performances have to be rationally distributed over the whole 10- to 12-year period during which a prepubertal boy or girl is developed into a champion. The training

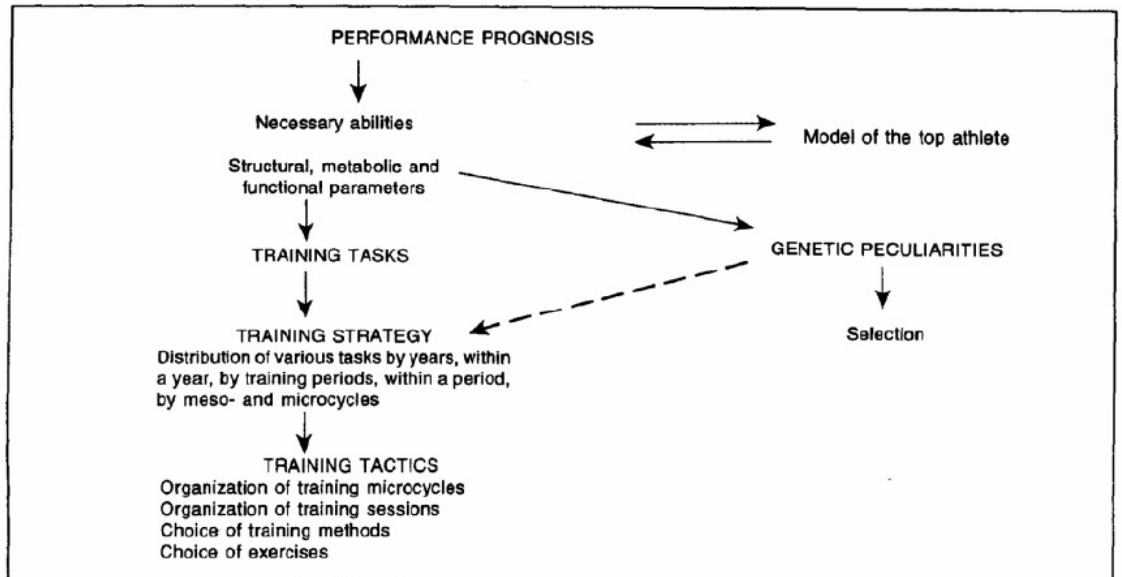


FIGURE 4

strategy has to determine how to distribute the tasks, taking into consideration the development of the organism during adolescence. This means that the most favorable age periods have to be found to induce the necessary structural, metabolic and functional changes. The distribution of the various tasks within a year's meso and microcycles also belong to the strategy of training.

The carrying out of the induction of the necessary changes is part of the training tactics, responsible for finding the most rational ways and finally the necessary training methods and exercises.



## DOPING DRUG TEST

**Everybody knows that many athletes cheat by using performance-enhancing drugs like steroids, testosterone, and EPO. But what is it like to take these banned substances? Do they really help you win? To find out, we sent an amateur cyclist into the back rooms of sports medicine, where he just said yes to the most controversial chemicals in sports.**

"OK," the doctor said when we settled into his examination room. "What do you want to be?"

I looked confused, so he explained.

"You want to be bigger? Leaner? Faster longer or faster shorter? More overall endurance? You want to see better?"

"See better?"

"Human growth hormone does that for some people. It improves the muscles in the eyes." He tried again: "So, what do you want?"

This was quite a concept. Freud wrote that anatomy is destiny, and here was a doctor giving me a chance, in my late forties, to alter my body in the most fundamental way. It was strange, but also strangely alluring.

It had taken me a while to arrive at this moment. I was sitting in the San Fernando Valley offices of a physician whose identity I've agreed to conceal—let's just call him Dr. Jones. For reasons I'll explain shortly, my goal was to experience firsthand some of the banned performance-enhancing drugs that are often abused in the endurance sports I participate in, like cycling and cross-country skiing. The menu I had in mind included human growth hormone (HGH), testosterone, and some variety of anabolic steroid, all of which are used to increase strength and shorten an athlete's recovery time by repairing muscle cells faster. Also high on my list was that powerful stuff called erythropoietin, better known as EPO, a hormone that boosts oxygen levels in the blood by prompting the bone marrow to produce more red blood cells. EPO is known to have amazing endurance-boosting effects; not surprisingly, it's been a scourge for years in professional biking and skiing. In 1998, to cite one famous example, the Tour de France nearly came to a halt when a leading team, Festina, was caught using EPO, HGH, steroids, and testosterone. The entire squad was disqualified, and dozens of riders either staged protests or withdrew in reaction to the drug tests and police raids that followed.

All of these are prescription drugs, and they all have legitimate medical applications. (HGH, for instance, is used to treat Prader-Willi syndrome, a rare disease that stunts the growth of children.) But you and I are not supposed to have them without a doctor's supervision, and they're absolutely forbidden in most higher realms of sports. There are exceptions—Major League Baseball

doesn't drug-test at all—but if you were caught using these substances in, say, the Olympics, the Tour, the NFL, or any NCAA event, you would face disqualification and suspensions, though the penalties and the testing processes vary wildly. This is one of the key problems that the World Anti-Doping Agency (WADA), an independent

drug-policy group headquartered in Montreal, is attempting to address—with the goal of standardizing everything from a list of banned drugs to the testing-and-appeals process. WADA's hope is that these rules and procedures will be adopted by sports federations around the



globe.

When I first began my quest, I'd assumed it would be easy to slide into the underground where performance drugs are bought and sold. But when I asked around, nobody, not even friends who were top amateur and professional athletes, knew where cheaters actually went to score. Their comments were always vague: "Well, they get it, believe me," they'd say, or "How about the Internet?"

So at first I just hit the streets. I live in Santa Monica, California, and I started going to Gold's Gym in nearby Venice, the place that launched Arnold Schwarzenegger and other bodybuilding greats. At Gold's you can easily meet gym rats who know where to find muscle-enhancing goodies, and after a few weeks of hanging out, I found myself sitting in a beat-up sports car with one of my new lifting buddies, a beefy guy in his early thirties who showed off his stash with unveiled excitement.

"Look, here's a good thing to start with," he said.

He handed me a bottle of pills. It was Stanazolol, an anabolic steroid that lifters use to add muscle mass. This is one of the drugs that sprinter Ben Johnson was caught using at the 1988 Summer Olympics in Seoul, where he was subsequently stripped of his 100-meter gold medal.

"Where do you get this?" I said.

"A vet I know," he answered casually. It took me a second to realize he meant veterinarian, not military veteran. "Vets and Mexican farmacias, that's where you get the best stuff." I looked at the label on the bottle—these were literally animal pills. They're used to bulk up livestock, and they're banned from greyhound racing, where they're

given to dogs to make them stronger.

"Start with this," he went on, spilling out several doses. "Good base, can't go wrong." I must have looked shocked, because he gave me a friendly punch in the arm and said, "You want to get big, don't you?"

That night at home I sat staring at the pills. Veterinarians? Mexican pharmacies? I shuddered and threw them out. I knew the only way I could play this game was under a doctor's supervision.

THAT'S WHAT LED ME, a few weeks later, to Dr. Jones. He was an internist by training and a specialist in the hot new field of anti-aging medicine, which involves helping people—who are always affluent, since these treatments are expensive—try to stave off the effects of growing old with a combination of nutrition and drugs, including HGH, steroids, and testosterone. A doctor I knew had tipped me off, with a wink, that Dr. Jones also used these drugs to "work with a lot of athletes."

Inside his waiting room, I'd squeezed in next to the World's Largest Man and a woman who I thought might be an actress—though I couldn't be certain, since she was wearing a hat and sunglasses indoors. The jumbo guy was somebody I was pretty sure spent Sunday afternoons chasing quarterbacks on television. Such people were, I would come to realize, the core of Dr. Jones's business: athletes and attractive women of all ages. Plus rich guys over 50. And the odd Playmate or two. Oh, and me.

Dr. Jones was an intense guy with a wiry build, close-cropped dark hair, and Al Pacino's restless energy. He ran a small, boutique operation: high service, high price. (I ended up spending around \$7,500 for drugs in my eight-month program.) Dr. Jones knew what I was up to and agreed to help me try the drugs in a safe manner. What he did for me—supplying drugs solely for the purpose of increasing my athletic prowess—is not illegal, but it would certainly be frowned on by many of his colleagues. For that matter, many of them disapprove of the whole notion of anti-aging medicine, believing these drugs should be used only to fight specific maladies, not the natural process of aging.

But that doesn't bother Dr. Jones. He takes anti-aging drugs himself, and in his rapid-fire style, he told me he wasn't in the "sickness" business, as he described the work of ordinary doctors. He was in the "improvement" business.

Which is how he came to ask what I wanted to be.

"I want to be leaner, stronger, with better endurance," I told him. "I don't want more mass." I thought for a moment. "And seeing better...that sounds good, too."

He looked up from taking notes and nodded. "I can help," he said.

And so he did.

## World Championships 2007



NO ONE KNOWS how long athletes have taken supplements, but it's been going on quite a while, since well before the modern era of drug manufacture. The coca leaves that South American runners used for centuries provided a natural boost. Back in the early 1900s, when racers in the first years of the Tour de France ate bull testicles as snacks, they were simply trying to increase their testosterone levels.

According to sports historians, the use of drugs in athletics appears to have been routine by the post-World War II era. Amphetamines were the favored way to improve endurance, while steroids were the muscle builder of choice. At the Olympic level, abuse was rampant, and it wasn't until the 1968 Summer Games in Mexico City that any rudimentary drug testing was enforced, largely in response to the obvious doping going on by Eastern Bloc teams. Much later, in the breakthrough 1998 lawsuit that several hundred former East German athletes brought against their trainers, doctors, and coaches, the "vitamin" regimens they were duped into following—in fact, they were given steroids—were compared to torture by the Nazis. East Germany's state-supported system of doping, which often began before puberty, left a legacy of Olympic medals—along with deformed offspring, heart attacks, facial disfigurement, and lifelong sexual dysfunction. Sometime in the late 1970s, what was called "blood packing" began to supplement amphetamines. More red blood cells translates into more oxygen being distributed throughout the body, thus resulting in increased endurance. This was before EPO, and in those days blood was drawn, usually by team doctors, spun in a centrifuge to increase the

concentration of red blood cells, and reinjected into the body.

This worked just fine until a certain line was crossed—different in every individual and hard to predict—and thickened blood started turning to sludge. Heart attacks and strokes followed. Athletes would mysteriously die in their sleep, because their lowered heart rates were unable to pump the enriched, heavy blood. According to Dutch media reports, from 1987 to 1990, 17 Dutch and Belgian professional cyclists died as a result of abusing EPO.

Because no foreign substances were involved, blood packing was considered legal, if unethical. At the 1984 Los Angeles Olympics, eight U.S. cyclists, including gold medalist Alexis Grewal, gave themselves transfusions of previously frozen packed blood inside their hotel rooms before competing in the 118-mile road race. The International Olympic Committee tested the riders, detected the doping, and briefly covered up the results before announcing, in 1985, that new rules were being written to ban any "artificial" means of altering one's blood chemistry.

When EPO emerged in the late eighties, blood packing became passé. EPO occurs naturally in the body, but only in tiny amounts. Researchers at Amgen Inc., a California pharmaceutical company, figured out how to synthesize it in quantities that could help people who weren't producing enough red blood cells, like cancer patients suffering from anemia. EPO was also a gift from the gods for athletes looking to cheat. It was easy to administer—a clear liquid injected with simple shots—always effective, and, until recently, impossible to identify, because there was no chemical test to alert doctors to its presence.

The difficulties of detecting EPO finally drove anti-doping officials to decree that they would disqualify any athlete found with a red-blood-cell concentration—known as the hematocrit level—of more than 50 percent. (The hematocrit level for an ordinary, active person is between 34 and 46 percent.) Of course, the 50 percent mark only gave athletes a defined limit. You could use EPO to jack up your levels higher than that while training, and as long as you competed with a level of 49.9 percent, you'd be fine.

It wasn't until the Sydney Olympics in 2000 that anti-

doping experts, led by Françoise Lasne, a researcher at the French National Anti-Doping Laboratory, had come up with a method to distinguish the red blood cells produced by EPO from those produced naturally—enabling chemical detection of the drug. But each year, with new generations of drugs, cheating becomes more sophisticated, and EPO isn't the only substance that boosts red-blood-cell production.

Johann Muehlegg, the German cross-country skier who in 1999 left Germany's team to race for Spain, relied on a drug called darbepoetin—a genetically engineered version of EPO—to raise his levels at the Salt Lake Games. He won three individual races: the 30-kilometer freestyle, the 10K pursuit, and the 50K classic. When his darbepoetin use was detected by a chemical test before his third win, he defended taking it, since the drug, at that time, was not officially banned. Under the tortured rules of the Olympics, he was allowed to keep his 30K and 10K golds, which he won before he was tested, but had to return the 50K medal, which he won afterward.

Great. As if you could race dirty on Saturday and clean on the Monday before. Obviously, the playing field is still not very level.

THE ABUSE OF DRUGS IN SPORTS has been an interest of mine for years, but it wasn't until the mid-eighties, when I started competing as an amateur in cross-country ski races in Europe, that I was suddenly immersed in a world with two classes of racers: athletes

who played clean, and those who didn't.

The Swedish skiers I hung out with back then, some of the best long-distance skiers in the world, were all convinced that the Finns were the worst Scandinavian cheaters, and they appear to have been right. In 2001, following a



series of positive doping tests at the World Championships, almost the entire Finnish men's team was suspended, and the country's men's and women's coaches were banned from international competition for life.

It was maddening to see skiers I knew to be playing fair, guys who trained their hearts out with little financial reward, lose to the cheaters. Over the years, it only got worse, the drugs more potent, the means of evading detection increasingly devious. Every time one of my athletic heroes tested positive, I was furious, as if I'd been

personally betrayed.

But there was another feeling, too: deep curiosity. I'd read reams about cheating as an issue, but I'd never read anything describing what it felt like to do it. Obviously, the allure of victory was incredibly powerful—why else would the best athletes in the world risk their health and lives abusing these drugs? So I wondered, Do performance drugs make you just 1 percent faster and stronger? Or 10 percent? Are the enhancements so subtle that only elite athletes gain an edge, or are they powerful enough that an everyday wannabe like me would notice a dramatic change?

Though I knew I would be courting health risks, I decided there was only one way to find out: try it myself, and see what it did.

My plan was simple. I would train as I always do—about 15 to 20 hours a week—while taking various supplements under Dr. Jones's supervision. I started in January 2003. In eight months, I intended to ride the 1,225-kilometer (761-mile) Paris-Brest-Paris bicycle race, a once-every-four-years sufferfest that's popular among amateur ultracyclists. I would first have to qualify by completing a series of 200-, 300-, 400-, and 600-kilometer rides within certain time limits. The PBP was a quirky event, a ride rather than a real race, with no prizes, no ranking of finishers, no doping controls. So if the drugs helped me, I wouldn't be knocking anybody else down in the standings. And since this was a monster ride—which I'd have to complete in less than 84 hours—it would serve as a real test of my augmented self.

THE ONLY REMAINING question: Where to begin?

"Let's start with human growth hormone," Dr. Jones announced that first day in his office. I wasn't surprised. HGH is the foundation of his anti-aging regimen, and it's one of the hottest banned supplements in sports. It's a protein produced by the pituitary gland that's involved with various strength- and growth-related body processes, including normal growth during childhood, adult sexual function, bone strength, energy levels, protein formation, and tissue repair.

"Between 20 and 30 years of age," Dr. Jones explained in a long, impressive presentation, complete with fancy computer graphics, "our growth hormone is at its absolute peak. And then all of a sudden, it drops."

He ticked off the negative effects of low HGH levels: "Total cholesterol goes up, good cholesterol goes down, bad cholesterol goes up. Reduced body tone, decreased muscle strength, reduced lean body mass, increased total body fat, reduced exercise performance, decreased mental function."

It was the bit about "reduced exercise performance" that athletes seized on in the mid-nineties. If lower HGH levels hurt performance, the reasoning went, then higher levels would help it. And while there are sophisticated tests for steroids, there is still no means to detect HGH. It was so widely abused at the 1996 Summer Games in Atlanta that

athletes joked about renaming them "the Human Growth Hormone Olympics." Dr. Jones started me out small, with only 0.1 international units a day, five days a week—about what he would give a Rodeo Drive matron. (The international unit, or IU, is a worldwide standard calibrating the effective dosages—which vary in volume depending on the drug—for substances like hormones and vitamins.) I told him I wanted more, and I wanted more than just HGH.

"We have to introduce one at a time," he said firmly. "That's the only way to monitor what each does. We start slowly and build."

I asked him what to expect.

"I really can't promise you anything about the growth hormone except that it costs a lot of money," he said with a smile. (My HGH cost about \$750 a month.)

"Do you take it?"

He nodded. "I take a lot of things."

"What does it do for you?"

"That doesn't matter. It may do something for me, nothing for you—it's very response-specific." He warned me not to expect too much, too fast. "Nothing will happen very quickly. This is a gradual process."

I didn't listen, of course, or believe. Who would? For the first time in my life I was injecting a foreign substance into my body, and it was simply impossible not to expect swift and dramatic changes. Dr. Jones showed me how to prep my leg with a prepackaged alcohol pad, then load the syringe with 0.1 IU of HGH, painlessly sliding in the ultrathin needle.

"My 81-year-old mother does this, so you can, too," he said when I flinched at the idea. "It's no different from what diabetics do every day."

Yeah, except that it seemed so wrong—and so bizarre.

ON THE WEEKEND OF MARCH 1, after only a few days of treatment, I traveled to Furnace Creek, California, and rode in the Death Valley Double Century. I didn't feel very augmented: The race was a minor disaster, and I limped over the finish line so late that they were timing by calendar, not stopwatch. I felt disappointed not just in my performance but, oddly, in my drug.

I was soothed a bit the next week when I went in for my first follow-up with Dr. Jones. I handed his nurse the stylish silver kit I'd been given to house my HGH bottles and syringes so that she could safely dispose of my used needles.

"You're not using the growth hormone?" she asked, puzzled.

"Sure I am. For two weeks."

She held up a small vial with an unbroken seal. "This is the growth hormone. It hasn't been opened."

I pointed to a large vial filled with red liquid. "That's what I've been injecting." Then a quick burst of panic. "What is it?"

"Don't worry. It's vitamin B12. We use it to mix with the growth hormone. This is just the extra B12 we didn't use yet. Don't worry, B12 is good stuff. Gives you more energy."

"I'm an idiot."

"The growth hormone does help with cognitive functions," she said cheerfully. "They're starting to use it with early Alzheimer's."

After a few weeks of the HGH, I began to notice subtle changes. My skin started getting... better. Sun blotches that I'd had on my arms for a year faded away. One morning I woke up and a scar on my forehead—which I'd gotten from a mountain-bike endo two years earlier—was more or less gone. Even though I was training like a madman, I looked more rested. Younger. A little fresher.

Then I started to realize that my eyesight really was improving. I'd been thinking about getting glasses to read fine print on maps, but now there was no need. The glasses I used for night driving stayed in the glove compartment, unused, unnecessary.

Dr. Jones had a specific protocol he wanted to follow, partly for safety reasons and partly so I could discern what each drug was doing. After the HGH, he added testosterone, giving me a 200-milligram injection and a pump vial full of Testocream, white stuff that I rubbed on the sides of my stomach. "It's like with a bathtub," Dr. Jones explained. "The shot fills the tub. The cream keeps replenishing it every day to top it off."

For most men—and women—testosterone production peaks in your twenties and slowly declines. Testosterone urges the RNA, or message center, in muscle cells to create more protein, hence more muscles. Higher testosterone levels have been shown to increase energy and aggression, in both men and women. Anti-aging types believe that testosterone decline is a big factor in the loss of muscle and the increase in fat that are standard signs of getting older. Not to mention a loss of libido. There can be side effects from taking it—ranging from acne to high blood pressure—but the drug's many fans think the trade-off is worth it.

I walked out of Dr. Jones's office smiling broadly, then waited for a werewolf surge. And I waited. But the truth is, I didn't feel much of anything. No irresistible bursts of lust or rage, no particular feelings of omnipotence. That afternoon I went home and celebrated my newfound energy and aggression with a long nap.

IT WASN'T UNTIL I ADDED EPO to my diet, two weeks later, that I began to notice serious differences.

"You have to be careful with this stuff," Dr. Jones warned after explaining the routine: three injections a week of 1,500 IU each. I was expecting a lecture on the dangers of thickened blood, but he meant something else: he wanted me to take it easy while racing, lest people catch on.

"One of my bike racers who isn't really a climber went on a training ride and dropped the best climbers on his team," he said. "They were like, 'Um, what are you taking?'"

It wasn't cheap—\$2,000 for ten vials totaling 100,000 IU. At my prescribed dose, each vial would last two weeks. Before the first EPO shot, my base hematocrit level was 43.8 percent, well below that magical 50 percent disqualification level. That seemed like a reasonable goal—hematocrit levels high enough to be bounced from the Olympics. Sweet.

The morning after I took my first dose, I woke up with a strange headache, a very distinct kind of pain that I would come to associate with EPO. It defied all manner of ibuprofen and aspirin but gradually went away.

Within three weeks, my hematocrit level had risen to 48.3. By this time, my testosterone levels had shot up to 900 nanograms per decaliter, from a previous mark of 280. (My starting level was just below normal.) My HGH had increased only slightly, which Dr. Jones found unusual. He upped my HGH dosage to 1.2 IU a day, speculating that the long hours I spent training might be keeping the level down.

Despite these measurements, I remained skeptical about all the drugs until March 29, when I rode an event along the central coast of California, the Solvang Double Century, at what for me was a fast and hard pace, finishing in around 11.5 hours. About ten hours in, it dawned on me that something was definitely happening. Sure, I'd been training hard, but I'd done enough of that to know what to expect. All around me were riders—good, strong riders—who looked as worn out as you'd expect after ten hours in the saddle. I was tired, but I felt curiously strong, annoyingly talkative and fresh, eager to hammer the last 40 miles. The last time I'd ridden 200 miles, I felt awful the next day, like I'd been hit by a truck. After the Solvang race I woke up and felt hardly a touch of soreness. I also felt like I could easily ride another 200, and I realized that I'd entered another world, the realm of instant recovery. I'll be frank: It was a reassuring kind of world, and I could see why people might want to stay there.

When I checked in with the good doctor soon after the race, he wasn't surprised about what I'd experienced. "With your hematocrit levels higher, you don't produce as much lactic acid, which means you can ride harder, longer, with less stress. The growth hormone and testosterone help you recover faster, since you're stronger to start with and recover more quickly. All those little muscle tears repair much more quickly."

He shrugged. "It works," he said. "It always works."

## World Championships 2007



It all started to make sense. Feeling like I did after the 200-miler would be a huge advantage in a long stage race like the Tour de France. I understood what five-time Tour winner Jacques Anquetil meant back in 1967 when he said, "You'd have to be an imbecile or a hypocrite to imagine that a professional cyclist who rides 235 days a year can hold himself together without stimulants."

Back then, "stimulants" mostly meant amphetamines, which kept riders going through day after day of hard stages. The new drugs had the same rejuvenating effects but simply worked much better, without the crash and depression of uppers.

I began to adjust my training schedule for harder rides and less rest and I felt fine. It wasn't a huge difference—I added about 10 or 15 percent more effort to my training—but had I been competing at a top level, it would have represented a major advantage.

A MONTH LATER, when I added a basic anabolic steroid to the mix, I felt like I'd grabbed on to a car moving at 60 miles an hour. The effect was powerful, fast, and difficult to modulate.

Dr. Jones gave me a steroids tutorial over lunch one day, at a Middle Eastern place on Ventura Boulevard. He explained how "steroids" is a broad term for various synthetic substances related to the male sex hormones,

and that they promote the growth of skeletal muscle and the development of male sexual traits. Though each steroid has different effects, they generally increase the amount of nitrogen in the body, which in turn stimulates protein synthesis.

All of which is a fancy way of saying that steroids help the body create muscle. They're used medically to treat everything from anemia to leukemia to AIDS, helping patients build strength.

Dr. Jones took out a pen and drew a chart on the paper tablecloth. On one side he listed various kinds of steroids: Anadrol 50, Winstrol, Deca, Anavar. Then he added columns labeled MASS, STRENGTH, WATER GAIN, RETENTION. For each drug, he filled in a number from one to a hundred.

"What you want is something that doesn't give you a lot of mass but adds strength," he said. "I'd start with Deca. It has almost no liver toxicity and has the nice benefit of helping joint pain. In Europe, it's used for arthritis. There's only one reason everybody doesn't use Deca."

"You grow two heads?"

"Worse, at least for most athletes. You can test positive for up to a year."

I stared at the chart, fascinated. Then it struck me that there was no column for side effects, nasty little consequences like liver damage, impotence, and steroid rage. I asked Dr. Jones about this.

He sighed and gestured along the wide table. "We don't have enough room to list them," he said. "The problem with steroids is that they do have some benefits, but nine out of ten people who are drawn to them can't resist abusing them. Then there's all the black-market junk out there. I'm not going to lie to you and tell you that if you try this stuff a little, it will kill you. It won't. But you stay on it very long and you'll have problems."

"Like?"

"Your hair may start to fall out. Your testicles shrink. Of course, the testosterone can cause all that, too. But any steroid will accelerate it.

"Deca's not so harmful to your liver," he went on, "but most steroids can knock the hell out of it. You can get huge mood swings. Anger, irritability. Sex is a mess. There's a surge in libido, then it falls off a cliff and you don't even want to think about sex. Then, when you stop your dosage, you start to shrink. Depression can set in. Your body starts to slide back to what it was, and most people don't like that. People forget that it's the drugs and not them. It's like when you take Viagra and you think that's how you'll always perform. No, no, no."

All the same, I wanted to try it.

"If you want to try 200 milligrams of Deca for a limited time, coming back to my office every week, OK," said Dr.

Jones. "It'll probably help your shoulder, if nothing else." My left shoulder had been hurting for a year since a bike accident. He explained that Deca helps the joints retain water, which eases pain.

Throughout this experiment, I'd been e-mailing people whom I'd encountered on various Web sites, like Extreme-Athlete.com, where steroid users get together and compare notes. That night I went to one of the bodybuilding sites I'd joined and listed what I was taking: the HGH, the testosterone, the EPO, and now the Deca. I thought I was really pushing the limits, but, tellingly, I was immediately mocked for my timidity and puny dosages.

"Dude, why not just take aspirin?" wrote a guy who called himself the Great One. "Try like 600 milligrams of test and 400 to 600 of Deca a week, girlie boy. And what's with this human growth stuff? My mom takes that. Why not Dianabol?" he wrote, referring to a particularly potent anabolic steroid. "You afraid of getting strong?"

It was standard practice on these sites to close messages with a quote or a quip like "I may die, but they'll need a big coffin." The Great One signed his with a thought from Nietzsche. "Everything that elevates an individual above the herd and intimidates the neighbor," it read, "is henceforth called evil."

ONCE I STARTED THE DECA, I didn't even think about lifting weights. I wanted to get stronger, not bigger. Within two weeks, the pain I felt in my left knee after 100 miles or so—100 was now just a standard ride—went away, coming back only on the most brutal hills. My shoulder felt much better. And then one morning I stepped on the scale.

Two hundred and nine pounds.

I was stunned. I'd never weighed this much. When I first saw Dr. Jones, I weighed 195, which was high for me.

Immediately I hopped on the bike and rode like hell for a few hours. When I got back, I stepped on the scales: 201. I'd lost eight pounds on a not very hot day when I was drinking plenty of fluids?

"What's the problem?" Dr. Jones demanded when I told him I was freaking out over the weight gain. He had me stand on a machine that measured body weight and fat. I weighed 207, but my body fat had dropped to 6.5 percent, down from 10 percent.

"Don't give me this you're-getting-fat crap," he said in an exasperated tone. "You sound like some teenage girl. You've lost six pounds of fat and gained 12 of muscle. That's why you're heavier. And like I told you, the Deca supersaturates the muscle cells with fluid. That's one of the reasons your joints feel better."

At this point my little adventure started to feel pretty creepy, as if there were something inside my body taking over. Which, in a way, there was. I was getting big without trying. When I went for ocean swims, I had trouble getting into my wetsuit. I didn't look cut, though—it was more of a

puffy, rounded bigness, making me look like a shorter version of Shaq. Without a jump shot. I did my final 600K qualifying ride for Paris-Brest-Paris on June 15, out of Princeton, New Jersey. This was 200 kilometers farther than I'd ever ridden. By now my HGH levels were 20 percent higher than when I'd started. My testosterone was 300 percent higher. My hematocrit level hovered around 50 percent. I weighed 205—a ten-pound gain—but my body fat was the lowest it had ever been.

We left Princeton at 4 a.m. on a misty, muggy morning. It was a strange course. The first 200 was flat and easy, then came 200 killer kilometers that involved 12,000 feet of climbing, then another fairly hilly 100 and a flat final leg. The whole thing would take me about 31 hours.

I'd been overseas the week before and was tired and jet-lagged at the start. During the easy section, I dragged along, barely staying awake. But when we moved into the hills, I started to feel stronger. I wasn't fast up the hills—but then, I never had been. My weight gain was a hindrance, but I had deep reserves of power and endurance. I rode through the darkness with an image of myself as some kind of tank, just moving along, unstoppable.

At 2 a.m., we took a break at a convenience store in Easton, Pennsylvania. It was Saturday night and the place was filled with kids coming and going to parties and dates. I got a glimpse of myself in the glass of a freezer door. I had a light on my helmet and a bunch of other blinking gizmos attached to my arms and ankles. My face looked like one of those "thousand-yard stare" photos from Vietnam.

What have I done? I wondered. I had a life once, and now I'm standing in the Easton WaWa in the middle of the night, looking like a cyborg, with thousands of dollars of drugs coursing through my veins. I started looking forward to the moment when the whole thing would be over.

THE WEEK BEFORE I arrived in France, it was more than 100 degrees, and people were dying all over the country. But a few days prior to the August 19 start of the PBP, the weather broke, and the ride started at 5 a.m. in a light chill. Perfect cycling weather.

I was riding a tandem bike with my pal Bob Breedlove, an ultracycling legend from Des Moines, Iowa. Bob called me out of the blue in June and said he wanted to do the PBP on a tandem—as he had three times before—but that his regular riding partner had bailed. Bob liked to ride long and fast; he'd celebrated his 50th birthday the previous summer by riding across the United States in nine and a half days.

About five hours into the ride, Bob mentioned casually that he preferred doing the race on a tandem, because the heavier bike made it so much more difficult. "A course like this is terrible for a tandem," Bob said happily. "All the hills! You'd do it much faster on a regular bike, no doubt about it."

But we muddled through. I felt shockingly strong until the

final 200 kilometers, when my stomach started to shut down. Unaccustomed to the aero bars on the tandem, I'd also developed agonizing saddle sores. These were typical woes of ultrariding, but through it all, my legs and heart felt fine. Five months earlier, I couldn't have imagined riding this far and feeling so strong. We finished the 1,225-kilometer ride in just under 76 hours—sleeping only twice for a few hours. The next morning, if it weren't for my saddle sores, I could have easily done it again. Obviously, Dr. Jones's program had worked.

I'd started months earlier with the goal of using the performance enhancers to complete the PBP. Now that it was over, I was relieved. When I got back from France, I immediately quit everything: no HGH, no testosterone, no EPO, and, God knows, no steroids. It was wonderfully liberating to be freed from a routine that had started out feeling illicit and interesting but had become just an annoying daily chore, like taking vitamins.

Since then, I haven't had my hematocrit level checked, nor my body fat, HGH, or testosterone. But already my eyesight is starting to slip a bit and I find myself squinting to read small type. I'm sure my recovery times from a hard workout have increased. Even if I keep training as hard, my endurance will drop. LOOKING BACK On the whole saga, I find myself wondering whether I'd keep taking these drugs if I could afford them.

For me, it would be a quality-of-life question, not a performance issue. If the HGH weren't so expensive, I'd probably continue with it, at least until I had a good reason not to, like some new evidence that it makes you grow extra ears. (The side effects of HGH are reportedly mild—one is fluid retention.) If nothing else, it helped my eyesight, and I had more energy. Lately, I've been reading studies about how endurance athletes suffer from low testosterone, which leads to early signs of osteoporosis, so I'm going to continue to monitor my levels and, if they drop too far, consider boosting them with the cream.

With the EPO, even if somebody gave it away, I wouldn't go down that road. Using it is too much of a literal and figurative headache, and if you get sloppy there's always the danger of nasty results. And I would never touch steroids again, unless I had some specific medical need. It's all just too powerful, too strange, and it's hard to read a list of the side effects and not feel like you're playing Russian roulette.

As for the larger issue of drugs in sports, eight months in the world of the artificially enhanced convinced me more than ever that it's critical for an organization like the World Anti-Doping Agency to succeed. This group, founded after the Salt Lake Olympics by Canadian anti-doping leader Dick Pound, represents the most serious international attempt to come to grips with sports doping. WADA is the logical response to an argument that gets aired from time to time: that since cheating is impossible to eliminate, the only recourse is to simply legalize everything—that way, no athlete has a hidden advantage over another, since everyone would be free to try anything that might increase endurance.

Like a lot of powerfully bad ideas, that one has a certain mad logic. But it would turn every sport into a test of how much damage an athlete was willing to risk to improve performance, and would basically force every serious athlete to cheat and risk his or her health. Athletic contests would have a strange life-or-death quality. If we don't keep drugs out of these events, they become freak shows, the athletes like gladiators—with us playing the role of decadent Romans, urging them on. Besides, on a fundamental level, drugs ruin the simple joy of competition. With drugs in the mix, it's not about the athletes, it's about the chemistry.

Now that I was off the program, I started to think about what I'd train for next. Probably something shorter than the PBP—say, the Canadian Ski Marathon, a two-day, 100-mile event. I got a calendar out and began to work on the training schedule. I'd done the race before and knew it would be long, cold, and brutal.

Sounded fun to me. And this time I'd do it on my own.