

Chapter 5

How Barton Trains

This section describes how Greg Barton actually trains. It is quickly evident that, in many ways, Barton follows the principles outlined above, but does not in other ways. In some cases, he unknowingly uses traditional approaches, arriving at these through trial and error and creating his own names for them. The reader will have to decide whether Barton unfamiliar with the traditional concepts was a disadvantage, or whether he was better off working out his own solutions since they more accurately solved the problems posed by kayak training and racing.

Percent Speed: Barton's Intensity Scale

In the author's experience, reviewing total minutes of training or the number of sessions an athlete does gives a rough idea of his training (the best paddlers usually have relatively high volumes), but it does not tell the quality of the sessions. Without knowing that, it is difficult to precisely evaluate the training.

We have seen in the General Principles section how percent of maximum heart rate is used in sports training to describe the intensity of exercise. Barton did not use this system, inventing his own instead. It is important to understand his system to understand the rest of Barton's boat training.

Most athletes' logs do not attempt to record a factor for quality, but Barton worked out a method. Here is an example, his log entry dated June 10, 1987:

9:30 am K-1 56 min. 10 km
3 x 1,000/5 min. P=30 (Pulse=180)
headwind on odd #'s

times: 3:56; 3:51; 4:01

Feeling the work — hard going through it, keep rotating
70% speed

By adding up the three pieces, one can see that Barton did about 12 minutes at 70 percent speed. He says that the rest of the workout — warm-up, warm-down,

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easy paddling between pieces — is all done at about 10 percent speed. Therefore, in this session he did 12 minutes at 70 percent speed and 44 minutes at 10 percent speed. But what does 10 percent or 70 percent mean, exactly?

I started this in the fall of 1983. After I got back from the Worlds, I was disappointed because I had stagnated that year. I needed to think of ways I could improve. In '82 and '83 I had a training log but it wasn't very detailed. And I decided I needed to work more on speed; perhaps I needed to pay more attention to what I was doing in workouts. If I was going to work once or twice on pure speed, how was I going to define it? So I came up with these percentages and decided that at least twice a week I would train at 90 percent speed or higher.

How did he calculate percent speed? In a nutshell, 100 percent was an all-out speed, which could be sustained for about 10-30 seconds; 80 percent was race pace for 500m or 1,000m.

0 percent would be I was in the boat, but not working at all. There are very few of those in my training log. SAMPLE WORKOUT: I've got an inexperienced friend in a slalom boat and I'm just along side keeping up with him.

10 percent would be a workout where I was paddling steadily, but not paddling hard. SAMPLE WORKOUT: Cruise easy, 55'. Coughing a lot — not feeling healthy.

20 percent I consider a steady paddle where I am exerting myself, where I'm working hard. SAMPLE WORKOUT: around harbor good pace. 69'.

30 percent In order to bump it up to 30 percent, I'd have to do some sort of varying of the tempo, where I'm increasing the speed, which could be fartlek a little bit, or really long intervals — 10 or 20 minute pieces. Also, maybe a distance race. Pulse rate would be between 140 and 150; stroke rate between 75 and 80. SAMPLE WORKOUT: 3 x Lido lap in 16' each (48 total).

40 percent is just moving up, doing pieces that are a bit shorter — 5-8 minutes. Pulse rate between 145 and 155; stroke rate: 75-82. 45 percent is pulse of 160 and a stroke rate of 82-87. SAMPLE WORKOUTS: warm-up with few sprints then 4 x 8', with 2' rest; 4 x 2000 meters with 2-3' rest.

50 percent is a little shorter, such as 3-4 minutes. Or maybe 5-6 minute pieces. It's a bit of a gray area. With a longer interval, sometimes if I really exerted myself, I'll call it 50 percent. Or if I do shorter intervals, but I didn't go all-out on them, or as hard as I could have, I'll call it 50 percent. Pulse rate of 165-175; stroke rate of 82-92. SAMPLE SPEED: 1,000 meters in 3:52 (light tail wind); SAMPLE WORKOUT: 5 x 4' with 2' rest.

60 percent is maybe 2-3 minutes. Pulse rate of 170-180; stroke rate of 92-96. 65 percent is pulse of 175-185 and a stroke rate of 92-100. SAMPLE SPEED: 500 meters in 1:52-3; 1,000 meters in 3:52. SAMPLE WORKOUT: 6 x 1,000 meters, every 6'.

70 percent is maybe one-minute repeats with maybe 30 seconds rest, that are somewhere just below race pace. Pulse is about 180, stroke rate 96. SAMPLE SPEED: 1,000 meters in 3:43-6 (light head wind). SAMPLE WORKOUT: 10 x 30", with 10" rest, rest 4', then 10 x 70" with 20" rest, then 5 x 20" with 70" rest.

80 percent is about race pace for 1,000 meters. Stroke rate is 100-105 per minute. SAMPLE SPEED: 1,000 meters in 3:39 (slight tail wind). SAMPLE WORKOUT: 8 x 30", with 30" rest, rest 5', then 8 x 45", with 45" rest.

90 percent is something like 250-meter pieces with full rest in between them. Or perhaps shorter repeats with a short rest, such as 15 seconds on/15 seconds off. Pulse is 180-196; stroke rate about 105-115. 95 percent is a pulse of 180 and a stroke rate of 110-120. SAMPLE SPEED: 100 meters in 18.6-19.1" (rolling start), with short rest. SAMPLE WORKOUT: 5 x 60", with 5' rest.

100 percent is absolutely no pacing whatsoever. I'm just giving everything I've got; full rest; generally 200 meters or shorter. Pulse rate of 180 and a stroke rate of 114-130. SAMPLE SPEED: 100 meters in 17.9 - 19.1" (rolling start); 100 meters in 20.3-20.5" (standing start). SAMPLE WORKOUTS: 4 x 15", with 90" rest, 2 x 60", with 5 minutes rest, 4 x 15" with 90" rest; 10 x 20" with 100" rest.

My pulse reaches maximum (180+) at 65-70 percent speed and does not increase much at higher speeds. Speed goes up after the 70 percent mark but duration of work interval decreases and duration of rest interval increases, so heart rate does not increase.

I normally think in 10 percent increments, but sometimes if I worked a little bit harder or a little bit easier, I'd bump it up or down by five percent.

Is this all done on feel? Are there any objective measurements involved?

It's been just feel. I have not used any external measurements to judge my percent speed. It's not always proportional to boat speed. There's a little compensation for effort. For example, if I'm doing two pieces at the same boat speed, but one is longer than the other, I'd call the longer one a higher percent speed because it is more taxing on my body. I wish I had a more cut and dried method, but this is the best that I've ever heard of. I'm still not satisfied with it, though. One of the reasons I came up with this system was because I always got frustrated with traditional percentages. A program would say do 5 x 2 minutes at 70 percent. And I'd say 70 percent of what? Is it 70 percent of the maximum intensity for that piece? 70 percent of an all-out 15-second maximum? Is it boat speed? Heart rate? Nobody could ever answer. So I made up my own system. I still feel that my system could be improved.

Use of Percent Speed

How did Barton use this system of percent speed in his training? Simply put, not for planning ahead, but just for recording what he had done.

"I'd decide to do a workout just for speed, or for steady endurance work, or whatever, and then after I did the workout, I'd decide at what percent speed it was

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and write that down," Barton said.

His personalized method of gauging each workout has several advantages and disadvantages, compared to the more traditional method of using percent of maximum heart rate:

- Percent speed makes an attempt to evaluate how fast the boat is moving and not just how hard the athlete is trying, although the two are often closely related. Being precisely familiar with boat speeds strikes this author as a type of biofeedback that would be very useful to a kayaker: having his own independent judgment of how fast he was moving would help in pacing, in much the same way a runner's intuitive sense of lap times would.
- It is a physiological fact that percent of maximum heart rate works well as long as the work is aerobic, but not so well when it is anaerobic. For various reasons, there is a linear relationship between increases in heart rate and increases in speed at lower levels of intensity, but not at higher levels of intensity. At these higher levels, heart rate does not go up as fast as speed does. In other words, one could not predict the differences in higher speeds as easily simply by looking at heart rate. Barton seems to have discovered this phenomenon when he saw that once he reached a pulse rate of about 180 (at 70 percent speed) his heart rate could not go up much more even though the boat could move faster.
- Barton's method has a lot of subjectivity to it, which creates a problem transferring it to someone else.
- The mere fact that Barton went to so much trouble to create a system that worked for him is impressive because it attests to his analytical abilities and his deep understanding of the sport and his training.

Barton Alternatives to the Energy Systems

Barton never had heard of the terms "aerobic system," "lactic acid system," or "ATP-CP system" until 1984 and, through 1987, did not think in these terms at all. It is interesting to note that he essentially had retained the traditional concepts and simply adopted the names used by his coaches. His terms were "speed" (90-100 percent speed on the Barton scale), which correlates to ATP-CP; "speed endurance" (50-80 percent speed), which correlates to lactic acid system, and "endurance" (50 percent speed or less), which is aerobic.

Barton's Training Year

With this background, let us examine Barton's training year. The following description is based on peaking for a big race in mid-August (like the 1987 World Championships). If the big event were later than that (like the 1988 Olympics), the first phase of the training, the endurance phase, would simply go on longer. The other phases would stay about the same length.

SEPTEMBER THROUGH MID-MARCH (26 Weeks): ENDURANCE. According to Barton, "The fall is a good time to experiment. If you're going to make

a change, such as switching paddle types or maybe changing your seat, the fall is a good time to try that."

In addition to experimentation, the two main things Barton tries to accomplish in this period are general overall conditioning, which he calls endurance training and others call aerobic training, and building strength, through weight lifting. This is a fairly traditional approach.

Going into the race season, you obviously want to be as strong as possible and have a good endurance base. As you get into more specific race-type training, you won't have as much time to devote to these two things, but hopefully, what you build up in the winter will carry you through.

What is not traditional is the fact that Barton also does speed work twice a week during this period. The traditional approach would be to confine the speed training to the spring and summer. "I also wanted to keep in contact with speed," he said. "I think speed — starts, overall sprint speed — is one of my weaknesses."

Thus, during the September to mid-March period, Barton's weekly schedule would look like this:

- Three weight workouts.
- Two speed workouts. One was pure speed, and one was with resistance. Both were done at 90-100 percent speed.
- Three endurance paddles at 30-50 percent speed.
- Two other endurance workouts, such as running, swimming, or biking.

Examination of the Categories

WEIGHTS. Barton lifts weights year-round, although as the year goes on, he does less and less. The workouts get shorter and he drops to two or even one weight workout a week, stopping altogether two weeks before a major competition. He has some interesting theories about weight training; essentially, he is less concerned about how much he lifts than about observing strict technique during the lifts and varying the types of lifts about once a month.

Barton believes weight training gives you raw strength and bulk that is not developed as much on the water because paddling a kayak is not as intensive a movement or as specific to any individual muscle as lifting weights; paddling is more endurance-oriented. A typical paddling workout includes several thousand strokes involving a variety of muscles, while weight lifting allows you to isolate one muscle or muscle group and put more stress on it. Barton explains his concern about using proper technique:

I don't record how much I am lifting very often. I check it once a month or so, but not like most people who are very concerned about it. I'm not trying to become a weight lifter. My goal is to increase strength that I can apply to paddling, that will move the boat faster. I tend to do very precise and deliberate weight movements and I end up having much smaller increases than many other paddlers do. I am trying to isolate the muscle I am working on, as it applies to paddling, whereas other people learn how to cheat better at the movement. Take curls. You can curl a lot of weight if you throw your

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body around. As soon as you start writing the numbers down all the time, you focus too much on the amount of weight and you're not really doing anything more for yourself. In paddling, when you write down a fast time, it relates directly to what you are doing: getting faster in the boat. But in weights, you could move up 30 pounds on a lift but not benefit your paddling any more. I feel that if you start cheating, really jerking around a lot, there are two things that happen. One is you're starting to pull into play muscles other than the one you are targeting. Secondly, what happens when you get into the boat? Are you going to start jerking around there, too? Start pulling all over the place? I think some of that carries over. If you use strict technique in the weight room, you're thinking in that mode and it's a little easier to transfer that into the boat. I think people who bang out as much as they can in the weight room tend to paddle that way, too.

Four Categories of Lifts

Barton has about four dozen different upper body lifts, divided into four main categories. Each category, with sample lifts, is shown below:

1. Back and latissimus muscle group

- a. Pull-ups
 - i. In front of the chin or behind the head
 - ii. Underhand or overhand
 - iii. With your own body weight alone or with weights
- b. Lat pull-downs
- c. Rowing exercises
 - i. Bench row or bent-over rowing
 - ii. Pulley rows — two-arm or one-arm. "On this, I try to use torso rotation, as if I'm doing a paddle stroke."
 - iii. One-arm row
 - iv. Pull-over — "You can use a Nautilus machine or a barbell."

2. Chest, shoulders and tricep group

- a. Bench press: inclined press, declined press
- b. Dips — with just body weight or extra weight
- c. Overhead military press
- d. Flies: Lateral flies or flies out to the front
- e. Nautilus shoulder machine
- f. Push downs on a lat machine
- g. French curls
- h. Pec-fly station on Nautilus machine

3. Bicep and forearm group

- a. Bicep curls
 - i. Barbell curls
 - ii. Dumbbell curls
 - iii. Preacher curls
 - iv. Nautilus or Universal machine curls
 - v. Reverse curls

- b. Forearm
 - i. Wrist curls
 - ii. Wrist rollers. "You take a dowel and put a string on it and attach a weight to that and curl it up."
- 4. Lower torso and abdomen group
 - a. Sit-ups
 - b. Stomach crunches
 - c. Twisting exercises
 - i. "The one you can do on the Nautilus machine."
 - ii. "Get an inclined bench and twist back and forth with a weight, or a bar over your shoulders."
 - d. Lower back
 - i. Hyper-extensions, "A sort of reverse sit-up, where you're lifting your back up."
 - ii. "Good morning" exercise

Changing the Type of Lifts

Barton takes two or three exercises from each of the four categories above and makes up a routine consisting of 10-12 exercises, which he continues for three or four weeks. He then creates a new routine. Some exercises would stay in the routine, but a number would be different.

I do this is because I think it helps to get over plateaus. I'll change to another exercise that works the same muscle, but maybe from a little different angle. As soon as I start the new exercise, I can make improvements right away. But pretty soon I reach a plateau. Then maybe I'll go back to the old one and find that, sure, maybe I've lost a bit initially, but not much. And then after a week or two, I've actually surpassed where I was. It's a way of tricking your mind and body into improving beyond what it felt was a barrier.

Here are some examples:

• 50 minutes:

- | | |
|----------------------------|---------------------------------|
| 4 x bench row with 130 lbs | 3 x dead lift 130 140, 150 lbs. |
| 5 x front pulls | 5 x pull ups |
| 2 x curls | 2 x hyper-extensions |
| 2 x paper crunch | |

• 50 minutes:

- | | |
|-----------------------------|-------------------------------|
| 2 x sit ups | 3 x upright row. 85-105 lbs. |
| 2 x incline twist | 3 x military press 85-90 lbs. |
| 1 x lay twist | 5 x 1 back pull |
| 5 x bench press | |
| 130, 150, 170, 180, 170 lbs | |

• 80 minutes:

- | | |
|--------------------|----------------------|
| 2 x crunch machine | 3 x shoulder shrug |
| 2 x leg twists | 2 x incline laterals |
| 5 x bench press | 1 x front lateral |
| 1 x dips | 2 x tricep machine |

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3 x pullover machine	1 x tricep pushdown
3 x pulldown machine	1 x bilateral machine curls
3 x one arm pulleys	1 x incline dumbbell curls
2 x hyper-extensions	3 minutes of situps
• 65 minutes:	
3 x pulldowns	3 x hyper-extensions
3 x military press	3 x bench press
3 x Nautilus crunch	3 x bench row
3 x pullover	2 x situps
3 x curls	2 x twists

Speed Workouts

Barton did two types of speed workouts: one pure speed and one with resistance, usually in the form of "buckets" (pulling a small bucket behind the boat). Both types were done at 90-100 percent speed. Here are some examples:

- a. Speed:
 - 10 x 20", with 1:40 rest
 - 5 x 40" with 3:20 rest
 - 3 x (10", with 50" rest; 20" with 1:40 rest; 30", with 2:30 rest)
 - 6 x 30", with 2:30 rest
 - 3 x (5 x 15", with 15" rest)
- b. Buckets:
 - 5 x 15", with 45" rest
 - 3 x 30", with 1:30 rest
 - 2 x (5 x 25", with 1:05 rest)
 - 3 x (5 x 15", with 30" rest)

Endurance Paddles

Examples of endurance paddles:

- 8 x 3', with 1' rest
45 percent speed
- 2 x 2000 meter time trial
60 percent speed
- 4 x (1,2,1', with 1' rest)
55 percent speed
- 5 x 6', with 2' rest
40 percent speed
- 6 x 55", with 20" rest;
6 x 45", with 20" rest;
6 x 35", with 20" rest;
6 x 25", with 20" rest
60 percent speed
- 4 sets: 30", 45", 60", 45", 30", with 15" rest except 30" rest after 60"
70 percent speed
- 2 x (1,2,3,4,3,2,1', with 1' rest)
50 percent speed
- 83' steady cruise
20 percent speed
- 6 x 8', with 2' rest
40 percent speed
- 8 x 5', with 1' rest
45 percent speed
- 4 x 2', with 2' rest
50 percent speed

Other Types of Endurance Workouts

Barton runs all year round, right up to the big race of the year. Since he has problems with his feet, he sometimes supplements the running with swimming or biking, particularly in the fall, when he is doing more of this out-of-the-boat endurance training. Essentially, he is trying to build his general endurance during the off-season and during the race season he tries to maintain his endurance level through out-of-the-boat endurance training because he is doing less endurance paddling in the boat in the spring and summer.

My main training, of course, is paddling. Weights and running are the two other things. I sort of consider them at opposite ends of the spectrum, with paddling fitting somewhere in the middle. Weights are pretty much all strength, running almost all aerobic endurance. Paddling is sort of a combination of the two. So, I figure if I'm not doing as much endurance in the boat, I can still keep up some endurance by doing some running.

Secondly, Barton uses running as a type of warm-up in the race season:

Sometimes in the morning when you get up, to get the blood pumping, I think you almost feel better the entire day if you get up and moving, rather than lie in bed for a while. I feel more alert the entire day. I think it gets your system ready to work. Maybe if you get up at 6 a.m. and run, it won't get you ready for a final at 4 that afternoon. But if you go for a short run 2 hours before your event, I think it may get your system into mode, ready to do aerobic work. I've never seen actual studies on this, but I've heard people talk about it: if you do some sort of aerobic warm-up before your event, after the start, your body will operate in an aerobic mode sooner. It used to be in a pre-race warm-up, you'd want to do a bunch of starts. But I feel all you're doing then is flooding your system with lactic acid, when probably what you should be doing is a couple of starts, just to get the feel, but then some longer pieces to get your body in tune with the aerobic part of it, so that right after the start, your aerobic system kicks right in, rather than to keep on producing this lactic acid and pouring it into your blood stream.

Examples of these endurance workouts:

- 38' run: 10' warm-up; 6 x up hill
- 34' run
- 32' biking
- 17' swim
- 12' run
- 6' warmup run "hard pace"

MID-MARCH THROUGH MID-JULY (16 WEEKS): SPEED ENDURANCE IN THE BOAT. Starting in early March, but certainly by the end of March, and ending around mid-July, Barton started doing what he called speed endurance training, or "race-pace training," what traditionalists would call lactic acid training. His week at this point would look like this:

- Two — three weight workouts.
- One — two speed workouts.
- Three speed-endurance paddles.
- Four endurance paddles.
- Two other endurance workouts.

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In this period I would say to myself, I'm going to move up to seven paddling workouts a week, or eight, or maybe occasionally up to 10. And I would vary that. Sometimes, I would paddle nine or 10 times and then I would take a week where I'd paddle only seven times, sort of have a harder week and then an easier week. Maybe easy, medium, hard; easy, medium hard, that sort of thing.

Here are some examples of the speed-endurance workouts (usually done between 60-80 percent speed), the only kind for which examples were not mentioned previously:

- 4 x 3', with 1' rest
70 percent speed
- 2 x 250m with 6' rest;
1 x 500m; 1 x 1,000 meters
80 percent speed
- 2 x (70" with 20" rest; 8 x 30",
with 10" rest), 5' rest between sets
65 percent speed.
- 6 x 250m, turn around;
6 x 200m, turn around;
6 x 150m, turn around
70 percent speed
- 10 x 60", with 2' rest
70 percent speed
- 6 x 1,000m/every 6'
60 percent speed
- 3 x 500m every 7'
75 percent speed
- 2 x 1,000m; 2 x 500m with rest
equal to paddle back to start
70 percent speed
- 3 x 55" with 15" rest
65 percent speed
- 4 x (6 x 30", with 30" rest)
75 percent speed
- 3 x (20", 30", 40", 50", with 20" rest)
75 percent speed
- 3 x (5 x 250m, with short rest)
70 percent speed

MID-JULY TO EARLY AUGUST (THREE WEEKS): SPEED IN THE BOAT.

At this time, the weekly schedule would look like this:

- Four — six speed paddles.
- Two — three speed-endurance paddles.
- Four endurance paddles.

MID-JULY TO RACE DAY (TWO WEEKS): REST. In the last two weeks before a World Championships or Olympics, Greg is worried primarily about resting and feeling technically good. All his training is geared around this.

I feel that my best races have come when I felt technically the best. The boat just feels comfortable and the stroke really smooth. Everything just feels like it's clicking right on. Physiologically, I may not even be at my peak, but I just feel that I am able to apply myself much more effectively. And sometimes even going into a race, I will do some endurance-type work, or race pace, speed-endurance-type work, more than you would really think you should be doing when you are resting, just because I start getting a feel for the stroke at that time. The first time that happened to me was in 1980. A month before the Olympic trials, I wasn't really feeling very well at all. I went to the Canadian trials, and just got hammered. Then, I arrived at our trials a week

early and started doing some really long workouts. Everybody thought I was crazy. I wasn't really killing myself, but I was putting in quite a bit of time on the water. By race day, I was feeling so comfortable in the boat, my strokes were right on. I won three out of four races at those trials. (See Appendix VIII.)