

400m TRAINING OVERVIEW

The 400m is a sprint. Let me repeat that. The 400m is a sprint. It is unlike all other sprinting events and to most coaches considered the hardest to train for. “The 400m can be known as the dreaded long sprint race that nobody wants to run, but generally speaking it isn’t that much different than the 200m with the exception of speed endurance. Like the 200m, the 400m race has a drive phase or acceleration out of the starting blocks. After the 400m runner has accelerated out of the starting blocks, they will try to reach and then maintain a near maximum race velocity. However, the greatest challenge in the 400m is not only fine tuning the energy system training, but teaching athletes how to actually race the 400m faster so they can be successful beyond 200m-300m.”¹

For anyone wondering “well what can I expect to a run a 400M in given a 100m or 200m time I have run” here is your answer:²

100m in terms of 200m $\Rightarrow \sim 0.494(B) = 1600(B) \div 3239 \Rightarrow A$

100m in terms of 400m $\Rightarrow \sim 0.223(C) = 12,800,000(C) \div 57,489,011 \Rightarrow A$

So: $A = \sim 0.494(B) = \sim 0.223(C)$

Using an approximate time like this or a goal for a specific time in a 400m is key to 400m training. They focus your path and show you the necessary techniques and such to labor upon.

The pacing of the 400m is something you must keep note of too or you will doubly hurt your race time. Each 100m split should take up this portion of the race:³

SPLIT	% OF TOTAL RACE TIME
0-100m	~25.4%
100-200m	~23.3%
200-300m	~24.4%
300-400m	~26.9%

As an equation, this looks like, where x is the 0-100m time and y is the total time:

$$y = \left(\frac{1000}{254} \right) x \approx 3.937x$$

EXAMPLE: (50, 12.7) $\Rightarrow 12.7 + 11.65 + 12.2 + 13.45 = 50$

¹ How to run the 400m trackstarusa.com/how-to-run-the-400m

² Note that these values are accurate with a range of $\pm 3.32\%$

³ 400 Metre Pace brianmac.co.uk/sprints/pred400.htm

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“The 400m sprinter derives 14% of their fuel from the anaerobic alactic (phosphagen) energy system, 48% from the anaerobic lactic (glycolytic) energy system and 38% from the aerobic system. The following table provides possible training loads for the development of each energy system. The "% effort" column is calculated using the athletes current 100m time.”⁴ To train each of these sources follow this chart⁵:

Energy System		Quality	% effort	Recovery	Rep Distance	Total distance
Anaerobic Alactic (Phosphagen)	Sp	Power	95-100%	>3 minutes	30m to 80m	200m to 400m
	SpE	Capacity	85-95%	>8 minutes	150m to 400m	400m to 800m
Anaerobic Lactic (Glycolytic)	SE1	Power	75-85%	1:4 active	100m to 300m	800m to 1600m
	SE2	Capacity	65-75%	1:2 active	400m to 700m	1600m to 3000m
Aerobic	E1	Power	55-65%	1:1 active	1km to 3km	3000m to 5000m
	E2	Capacity	45-55%	1:1 active	1km to 3km	5000m to 8000m

To estimate your 400m potential, use your 200m PR. “Take the your best 200 metres time and double it [then] subtract the result from your best 400 metres time. Suitability to 400 metres racing:

<4 seconds ⇒ excellent

4 - 5 seconds ⇒ average

5+ seconds ⇒ poor”⁶

⁴ 400 metres Training brianmac.co.uk/sprints/tp400.htm

⁵ 400 metres Training brianmac.co.uk/sprints/tp400.htm

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“The following table ... indicates the types of training exercises that can be used to develop the sprinter's energy systems and can be used to guide you in the preparation of training programs.”⁷

Energy System	Type of training	Distance	Speed	Recovery	Total distance
Aerobic Power	Extensive Tempo	>100m	60-70%	30-90 sec	1400-3000m
Aerobic Capacity	Extensive Tempo	>200m	70-80%	30-90 sec	1400-2000m
Aerobic & Anaerobic	Intensive Tempo	>80m	80-90%	30-120 sec	800-1800m
Anaerobic	Speed	20-80m	90-95%	3-5 min	300-800m
Alactic	Speed	20-80m	95-100%	3-5 min	300-500m
Anaerobic	Speed Endurance	30-80m	90-95%	1-2 min	300-800m
Alactic	Speed Endurance	30-80m	95-100%	2-3 min	300-800m
Anaerobic	Speed Endurance	80-150m	90-95%	5-6 min	300-900m
Glycolytic	Speed Endurance	80-150m	95-100%	6-10 min	300-600m
Anaerobic	Special Endurance	150-300m	90-95%	10-12 min	600-1200m
Glycolytic	Special Endurance	150-300m	95-100%	12-15 min	300-900m
Lactic acid tolerance	Special Endurance	300-600m	90-95%	15-20 min	600-900m

SUPPLEMENTAL READING:

- 1) <https://www.brianmac.co.uk/conditon.htm>
- 2) <https://www.brianmac.co.uk/enduranc.htm>

⁷ Sprinting [brianmac.co.uk/sprints/index.htm](https://www.brianmac.co.uk/sprints/index.htm)