

Science AMA Series: I'm Dr. Izumi Tabata, a professor at Ritsumeikan University Graduate School of Sport and Health Science, and known for the Tabata Training Protocol for High-Intensity Interval Training (HIIT). AMA!

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April 17, 2023

Abstract

Hi Reddit! I am Dr. Izumi Tabata, a professor at Ritsumeikan University Graduate School of Sport and Health Science in Japan. More than 20 years ago, I reported that high-intensity interval training (HIIT) improves aerobic and anaerobic energy releasing capacity in this research article. Thereafter, this protocol was termed “Tabata Training” and has become popular among the fitness community. AMA!

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IZUMI_TABATA [R/SCIENCE](#)

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I am Dr. Izumi Tabata, a professor at Ritsumeikan University Graduate School of Sport and Health Science in Japan. More than 20 years ago, I reported that high-intensity interval training (HIIT) improves aerobic and anaerobic energy releasing capacity in this [research article](#). Thereafter, this protocol was termed "Tabata Training" and has become popular among the fitness community. AMA!

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CORRESPONDENCE:

DATE RECEIVED:
January 29, 2018

DOI:
10.15200/winn.151714.43860

ARCHIVED:
January 28, 2018

CITATION:
Izumi_Tabata , r/Science ,
Science AMA Series: I'm Dr.
Izumi Tabata, a professor at
Ritsumeikan University
Graduate School of Sport and
Health Science, and known for
the Tabata Training Protocol for
High-Intensity Interval Training
(HIIT). AMA!, *The Winnower*
5:e151714.43860 , 2018 , DOI:
[10.15200/winn.151714.43860](https://doi.org/10.15200/winn.151714.43860)

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Thank you for doing this AMA! I was amazed by your work, however it seems difficult to transpose for non professional athletes in a non controlled environment. So, I wanted to ask how can someone know he is using his/her 170% vO2max, or at least getting close to it?

[miciomiao](#)

If you do constant intensity for 20 sec between 10 sec rest (Tabata training), the desired intensity that is supposed to be 170 % Vo2max is to exhaust the subject after completing 6 or 7 sets, or halfway during the 8th set.

How much research was carried out, before you came to the conclusion that HIIT was more beneficial for a person, than standard exercise?

[drmikeographer](#)

I never stated that Tabata protocol is better than any other training protocol. We just suggested that Tabata is one of the best training in terms of improving both aerobic and anaerobic energy releasing systems because Tabata training imposes maximally stimuli on both systems.

Is it normal for a healthy 31 year old to have a heart rate of 300bpm measured immediately after a tabata work out?

Similarly is there a linear relationship between maximum heart rate and VO2 max? In other words does 170% of VO2 max roughly correspond to 170% of predicted maximum heart rate?

[panckage](#)



In my experience, no measurement of heart rate above 220 beats/min. Heart rate and Vo2max does not linearly relate each other.

Hi Dr. Tabata,

Two questions.

1. How important is warm up before HIIT? What kind of warm up do you recommend?
2. If I want to push myself, should I go for higher intensity or more sets or something else?

[jbellis](#)

As for any other exercise, warm up is necessary before doing high intensity exercise. We check heart rate during the warm up whether it is not such different from that recorded previous experiment. As I wrote in the previous question, if you complete 8 times, you should increase intensity so that you are exhausted after completing 6 or 7 sets, or halfway during the 8th sets.

Thanks Dr. Tabata for doing this AMA- you're a legend!

1. What if any influence does HIIT have on mitochondrial stores and function?
2. What is your opinion on the supposed life-prolonging effects of HIIT? What mechanisms may be involved?
3. Where do your research interests lie right now and why?
4. What is the role of inflammation in HIIT-directed athletic improvement compared to endurance training?

[SciLi](#)

1 We did experiment studying effect of Tabata training on oxidative enzymes (mitochondria) and others (Dr M Gibala) reported such in human experiment. HIIT increases mitochondrial enzyme ~40% after 8 days of Tabata in rats (<https://www.ncbi.nlm.nih.gov/pubmed/11356760>).

2 We have recently published paper that HIIT may reduce risk of colon cancer development (Matsuo K et al 2017(<https://www.ncbi.nlm.nih.gov/pubmed/28463901>))

3 I am interested in find not only beneficial but also adverse (side) effects of HIIT including Tabata training so that I can suggest caution when one does Tabata. 4 I have not done any research on inflammation induced by HIIT. This might be next study.

In your study, all participants had to be able to keep pace during the exercises to stay in the study. That's understandable for variability reasons. It also had the HIIT group starting from a slight lower point in terms of VO2max, but gained more. They weren't beginners but just started slightly lower.

All that being said, when starting as a complete beginner do you believe HIIT will still have the same or similar benefits as the study using those that can already keep pace?

[RhyneGains](#)

Thank you I agree I have not studied Tabata training from such points of view. I will try.

Hi Dr Tabata.

I'm a big fan of the HIIT method of training.

What can I be doing during my HIIT workouts to maximise the benefits achieved?

Should I be starting with a raised heart rate? Is there an optimum work/rest ratio? Are certain exercises better than others (e.g. running, body weight cardio exercises, cycling etc.)

Many thanks

[littledip93r](#)

Thank you I have not study other than Tabata protocol so that I cannot tell you optimum work/rest ratio. You should do exercise using big muscles if you desire to increase oxygen uptake during Tabata.

Hello Dr. Tabata,

I [read](#) that HIIT due to its high duty cycle is creating scarring on the ventricles and aorta. What is your take on this?

Also, it is my understanding that HIIT increases the oxygen bearing capability of the blood. How long do these effect last, approximately, after an HIIT session?

[tareumlaneuchie](#)

We have no idea We do not reccomend this type of exercise who has risks for cardiovascular diseases. I do not know "blood bearing capabilty". So I cannot answer the second queation.

Thanks for doing this AMA!

Could you share your thoughts about slow cardio, regarding how your scientific effort is mostly focused on intervals. Would you recommend it at all and if you think there is a place for it, share your thoughts about how one should integrate them together. I'm mostly concerned about frequencies of training in different styles, how separated they should be etc. On a similar note, if it's only HIIT that is enough, how often should it be done?

[djolereject](#)

I do not recomend only HIIT including Tabata. We have significant date that is enough to reccommed low-intensty prolonged exercises. I always state that please find at least one exercise that you can continue to do before 40 years old. Any exercise is benefical. Not doing exercse (sedentary life) is not good for your health.

Did you take inspiration from the work of Peter Coe or Per-Olof Åstrand when you first designed your '96 study? How many skaters did you disqualify from your study because they could not maintain the cycle rate?

[adenovato](#)

Thank you This protocol was introduced by Mr Koichi Irisawa who was a head coach of Japan speed skating team in 1980s. So, I did nor refer to these great scientist. But of course, we referred to them during writing paper.

In your famous study, what was the purpose of having the intervals group do one day per week of 30 minutes steady state cycling at 70% VO2max followed by four of the intervals?

[klethra](#)

Thank you The reason that we put easy day during the training period is that we had thought that doing Tabata everyday from Monday to Friday was stressfull.

What sort of translation would you say your protocol has to being able to put up with the stress of longer events? In regards to injuries that come from high mileage like stress fractures, shin splints, or muscle strains

Also, what benefits, if any, would you say there is to using the protocol with simple resistance exercises?

[iAmThatGuy46](#)

This is a great idea! I would study HIIT from such point of veiw Thank you

We have not succesfull data regarding effect of HIIT using resitance exercise.