



Pacing with a Heart Rate Monitor

The goal of pacing using a heart rate monitor is to reduce how often you experience post-exertional malaise (PEM)

Why use a heart rate monitor?

Pacing with a heart rate monitor (HRM) is one tool you can use to stay within your energy envelope (the amount of energy you have available). A HRM can give you real-time feedback that you are going over your safe limit and that you need to stop and rest. This is one way to reduce how often you experience post-exertional malaise (PEM) and improve your quality of life. Using a heart rate monitor can help you to:

- Work out your "safe" activity levels
- Provide awareness to yourself and others of your activity limits
- Reduce how long it takes you to recover from an activity

Working out your safe activity limits using HRM

The anaerobic threshold

Your body has two energy systems: the aerobic and anaerobic. Using HRM can help you to better understand how your body is using these two systems.

Aerobic system: Provides energy for long, sustained tasks including normal daily activities.

Anaerobic: For short, intense bursts of activity and produces lactic acid. Lactic acid is toxic to tissues and causes pain.

Anaerobic threshold: The point at which your body switches from aerobic to anaerobic energy is called the anaerobic threshold.

Research suggests that the aerobic energy system does not work properly in people with ME/CFS. This means that your body may cross the AT and

switch to using the anaerobic energy system much earlier than healthy people, often from everyday tasks like cooking or showering. Spending too long using anaerobic energy can trigger PEM.



Crossing the AT is inevitable for people with ME/CFS. Using a HRM can help you monitor and limit when you do go over your AT. Spending shorter amounts of time over the AT will help minimise PEM.

Steps for pacing with HRM

1 Choosing a Heart Rate Monitor

There are an increasing number of options on the market that vary in price and quality. The most accurate monitors use a chest strap. Some people prefer a HRM that is worn on the wrist. Some features that you may want to consider when choosing a HRM:

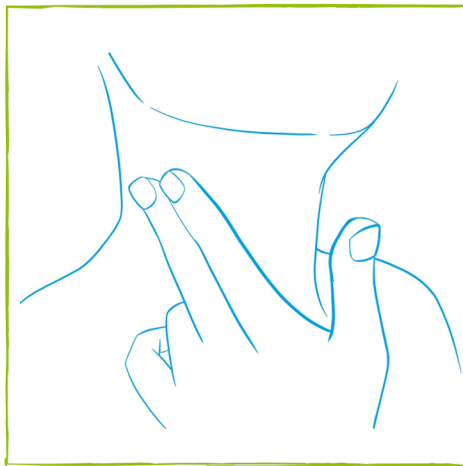
- What is the cost?
- Is it compatible with your phone?
- Can you set an alarm at your chosen heart rate?
- Does it display HR continuously without having to press a button?
- Is it waterproof?
- What warranty is offered?
- What materials is it made from if you have sensitivities?

You can also take your pulse manually instead of using a HRM. The easiest places to feel your pulse are on your wrist or your neck. To take your pulse at your wrist, place two fingers between the bone and the tendon on the underside of your wrist on the thumb side.

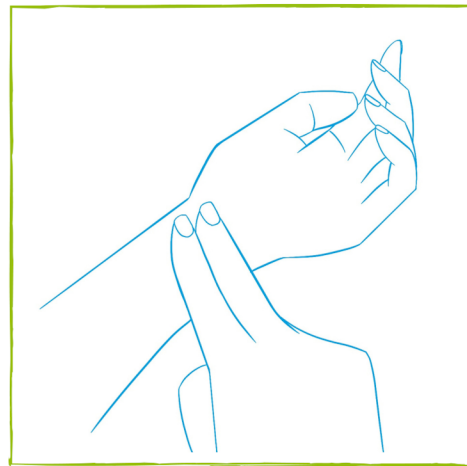
How to manually take your pulse

- *Option 1: To take your pulse at your neck, place two fingers just under the jaw and to the side of your windpipe.*
- *Option 2: To take your pulse at your wrist, place two fingers between the bone and the tendon on the underside of your wrist on the thumb side.*

Time the number of beats you feel for 60 seconds. This is your heart rate in beats per minute.



Option 1



Option 2

2 Estimate your heart rate at the anaerobic threshold

Each person's AT will be different. While a cardiopulmonary exercise test is the only way to accurately establish your AT, a rough estimate (for people with ME/CFS) can be obtained by calculating 55% of the maximum heart rate for your age.

You can estimate your AT using this formula: $(220 - \text{age}) \times 0.55$

For example, the estimated heart rate at AT for a 38-year-old is $(220 - 38) \times 0.55 = 100$ beats per minute (bpm). Remember this is just an estimate, so you should view it as a guide only.

3 Living within your limit

When you know your estimated AT, wear your HRM every day and track how often you go over your AT and for how long each day. Some HRMs have their own apps which will do this, and there are also standalone apps you can use. The goal is to better understand your body, how different activities impact you and to find ways to minimise PEM.

Using a symptom diary in conjunction with your HRM can help you better understand the levels of activity which trigger PEM for you.

The symptoms you may experience are very individual. You might feel breathless or have trouble finding words. You may also not notice any symptoms when you are at your AT but experience PEM a day or two later. The HRM can show when you have been at your AT and that you need to rest more often.

4 Adjust your limits

As your AT is an estimate, you might find you need to adjust your HR limit once you are used to using a HRM and have noted your symptoms during daily activities and in the days following.

Set an alarm – Setting an alarm before you reach your AT can remind you to check in with your symptoms. A HR 10% below your AT is suggested to keep you in your “safe” zone.

Calculate 10% of your AT using this formula – $AT \times 0.1$ – for example, 10% below AT for a 38-year-old is 100×0.1 so 10% below 100bpm AT is 90bpm.

Adjust down – If you experience symptoms before your AT is reached, you may need to lower your HR limit.

Adjust up – If you find you don't experience PEM after an activity or on subsequent days, you may be able to carefully increase your limit. There are no hard and fast rules because every individual has a unique symptom profile and their living situations might be very different.

5 Adjust your expectations

It can be confronting to see how easily your body crosses the AT. You may have to make changes to how you do things.

It may not always be practical for you to stop what you are doing, for instance if you have caring or work responsibilities. For most people with ME/CFS, it will be impossible to remain under the AT all the time, especially if you experience orthostatic intolerance. HRM is just a tool to help you find ways to minimise PEM. Be kind to yourself and find what works for you.

5 Resting Morning Heart Rate

Resting morning HR can also be used to manage your energy envelope

- Take your HR while lying down each morning before you have eaten or taken any medication
- Keep a simple record of your resting morning HR and any symptoms that you are experiencing
- Tracking this may help you to identify any patterns

You may notice an increase in your resting morning HR if you have passed your energy envelope and developed PEM. This may occur the following day or may take a few days. Some people with ME/CFS also report a drop in their resting HR as they are recovering from PEM.

7 Using a HRM is just one tool in your pacing toolkit

Pacing with a HRM can help you find a safe level of activity but may not be appropriate or useful for everyone. While many patients report that using a HRM is helpful, it might not suit your individual circumstances.

For someone with severe or very severe ME/CFS, there may be no safe level of activity as even very small amounts of energy use may push you over your AT.

It is also important to remember that there are other factors that cause PEM, such as cognitive tasks like concentrating on something or reading or environmental changes.

These will require different energy management strategies such as breaking up cognitive tasks or making changes to your home. Reducing the number of things that drain your “energy battery” may help you to improve your quality of life while living with ME/CFS.

Additional resources

- <http://www.cfselfhelp.org/library/pacing-numbers-using-your-heart-rate-to-stay-inside-energy-envelope>
- <https://academic.oup.com/ptj/article/90/4/602/2888236>



www.emerge.org.au
1800 865 321

Patient Support and Information Service

Speak with our friendly team during business hours, Monday to Friday. Our team can provide you with information on ME/CFS and Long COVID and support you in navigating general health and community services. We can also answer common queries related to the programs and services provided by Emerge Australia.

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