Pulse & Heart Rate

Lecture 2

By

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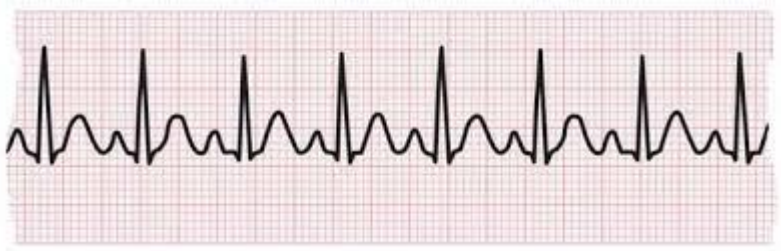
What is your heart rate?

- Heart rate is the number of times that heart beats in a minute.
- the body automatically controls heartbeat to match whatever you're doing or what's happening around you
- heart rate is an important indicator of overall health too
- When your heart rate is too fast or too slow, that can be a sign of heart or other health problems.
- A normal resting heart rate should be between 60 to 100 beats per minute, but it can vary from minute to minute.
- Your age and general health can also affect your pulse rate, so it’s important to remember that a ‘normal’ pulse can vary from person to person.

What is a fast pulse rate?

- If your heart rate is **over 100 beats per minute** when you are at rest, this is considered fast.
- A rapid heart rate, also known as tachycardia, can be related to many different health conditions. It's normal for your heart rate to increase when you're exercising or if your body is fighting off an infection.
- If you have noticed a sudden increase in your heart rate and are also feeling dizzy, faint or having palpitations (a feeling of being aware of your heartbeat, or that your heart is pounding or beating irregularly), you should speak with your doctor.
- **Tachycardia:** This is when your resting heart rate is over 100 bpm, an unusually high rate.



Tachycardia: Fast Heart Rate

What is a slow pulse rate?

- A heart rate **below 60 beats per minute** when you are at rest is considered slow (bradycardia).
- A slower heart rate can be normal for some people, including athletes, fit and healthy young adults, or those taking medications like beta-blockers. For example, it is common for someone who exercises a lot to have a resting heart rate of 60 beats per minute or less.
- However, if a slow heart rate is not normal for you, especially if you feel unwell with it, this could indicate a problem with your heart.
- If you notice your heart rate is slower than usual, and you are feeling faint, fatigued or dizzy, you should talk to your doctor.
- **Bradycardia:** This is when your resting heart rate is under 60 bpm, an unusually low rate.

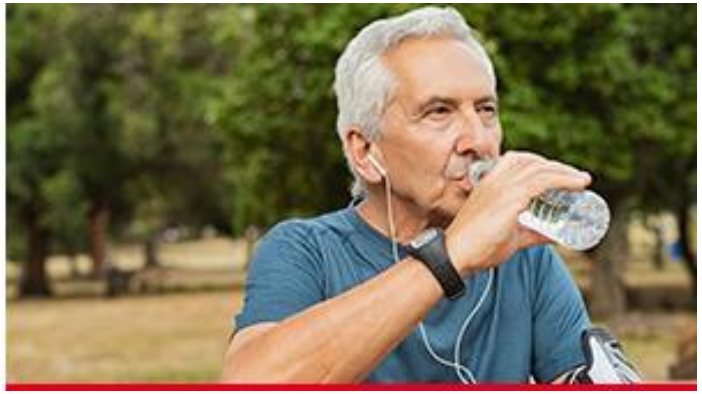
Bradycardia: Slow Heart Rate

What can cause my heart rate to change?

there are many other reasons why your heart rate may suddenly change. Some common reasons include illness or fever, dehydration, anxiety, medications, as well as other health conditions.

1- Dehydration

- When you are dehydrated, the volume of your blood decreases and your heart needs to work harder to pump blood around your body
- Staying hydrated is an important way to regulate your heart rate and has many other health benefits.
- Women should aim to drink 6-8 glasses of water per day (or 1.6 litres), and men 8-10 glasses (or 2 litres).



2- Infection or fever (including Covid-19)

- This happens as your heart pumps harder to deliver oxygen and immune cells around your body, helping to fight the infection.
- Viral infections such as the flu or Covid-19 may cause your heart rate to increase.

3- Medication

- Some medications can also cause changes to your heart rate. For example, certain asthma medications can cause your heart rate to speed up, while heart medications can make your heart rate slow down.
- If you notice sudden changes to your pulse rate after starting a new medication, and you are not feeling well, it’s best to speak to your doctor

4- Heart conditions

- In some cases, an abnormal heart rhythm (arrhythmia) can be caused by a problem with your heart's electrical conduction system.
- This can cause your heart to beat more slowly, quickly, or in an irregular way.
- Some arrhythmias are more serious than others, and some may be related to more serious heart conditions.

5- Other health conditions

There are many other conditions, which aren't heart or circulatory diseases, which can cause changes to your heart rate - including infection, anemia, or disease of the thyroid gland.

The expected resting heart rate

The expected resting heart rate ranges for children are:

- Newborns (birth to 4 weeks): 100 - 205 beats bpm*.
- Infant (4 weeks to 1 year): 100 – 180 bpm*.
- Toddler (1 to 3 years): 98 - 140 bpm*.
- Preschool (3 to 5 years): 80 - 120 bpm.
- School-age (5 to 12 years): 75 - 118 bpm.
- Adolescents (13 to 18 years): 60 - 100 bpm.
- For adults (ages 18+), the expected resting heart rate range is 60 - 100 bpm.

*These rates are for children while they're awake. They will likely be lower when they're asleep.

Slow heart rate

Among healthy people, a slow heart rate may be due to:

- being physically fit
- a medication, such as propranolol or metoprolol
- sleep (though heart rate may rise during the REM stage of sleep).

On the other hand, a slow heart rate can be a sign of disease, such as:

- heart attack or other heart disease (such as "sick sinus syndrome")
- certain infections (including Lyme disease or typhoid fever)
- high levels of potassium in the blood (hyperkalemia)
- an underactive thyroid gland.

Fast heart rate

Healthy people can have a fast heart rate because they are

- exercising, especially if it's rigorous or associated with dehydration
- nervous or excited — while a heart rate over 100 might be considered "abnormal," it is entirely expected if a tiger is headed toward you
- using a stimulant, such as caffeine or cocaine
- pregnant.

Diseases associated with a fast heart rate include:

- most infections or just about any cause of fever
- heart problems, for example cardiomyopathy (in which the pumping function of the heart is reduced), atrial fibrillation, or ventricular tachycardia
- certain medications (such as an EpiPen)
- low levels of potassium in the blood (hypokalemia)
- an overactive thyroid gland or too much thyroid medication
- Anemia
- asthma or other breathing troubl

Common symptoms of a slow heart rate include:

- Fatigue
- dizziness, lightheadedness, fainting or near-fainting
- Confusion
- an inability to exercise.

Common symptoms of a fast heart rate include:

- Fatigue
- dizziness, lightheadedness, fainting or near-fainting
- palpitations, or a pounding or fluttering sensation in the chest
- feeling your heart racing
- shortness of breath
- chest pain or tightness.

How Other Factors Affect Heart Rate

- ✓ **Air temperature**: When temperatures (and the humidity) soar, the heart pumps a little more blood, so your pulse rate may increase, but usually no more than five to 10 beats a minute.
- ✓ **Body position**: Resting, sitting or standing, your pulse is usually the same. Sometimes as you stand for the first 15 to 20 seconds, your pulse may go up a little bit, but after a couple of minutes it should settle down.
- ✓ **Emotions:** If you're stressed, anxious or "extraordinarily happy or sad" your emotions can raise your pulse.
- ✓ **Body size**: Body size usually doesn't change pulse. If you're very obese, you might see a higher resting pulse than normal, but usually not more than 100.
- ✓ **Medication use:** Meds that block your adrenaline (beta blockers) tend to slow your pulse, while too much thyroid medication or too high of a dosage will raise it.

Maintaining a normal heart rate

A healthy heartbeat is crucial for protecting cardiac health.

While exercise is important for promoting a low and healthy heart rate, there are several other steps a person can take to protect their heart health, including:

- ✓ **Reducing stress**: Stress can contribute to an increased heart rate and blood pressure. Ways to keep stress at bay include deep breathing, yoga, mindfulness training, and meditation.
- ✓ **Avoiding tobacco**: Smoking leads to a higher heart rate, and quitting can reduce it to a normal level.
- ✓ **Losing weight**: More body weight means that the heart has to work harder to provide all areas of the body with oxygen and nutrients.